ARKANSAS COLLEGE OF
OSTEOPATHIC MEDICINE

Course Name: Biomedical Essentials of Comprehensive Osteopathic Medicine-1
Class of/Semester/Year: 2028/Fall/2024
Date Last Revised: June 21, 2024

Approved By: Shannon Ramsey Jimenez

Shannon Ramsey Jimenez, DO
Dean of ARCOM

Note: Final Approval. May be released to students. Schedule subject to change with advance notice.

Office of the Dean
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Arkansas Colleges of Health Education
Course Syllabus

Course Name:	Biomedical Essentials of Comprehensive Osteopathic Medicine-1 (BECOM1)
Class of/Semester/Year:	Class of 2028/Fall 2024
Course Designation:	COM 551
Term Dates:	July 19, 2024 – December 6, 2024
Course Dates:	July 22, 2024 – December 3, 2024
Total Contact Hours:	94 Lecture Hours; 12 TBL Hours
Credit Hours:	8 Credit Hours
Assessment/Grading:	Six Written Exams
Location:	Lecture Hall 2, TBL Rooms
Course Director:	Brandy Ree, PhD and Meredith Akins, PhD
Office Hours:	By appointment

Syllabus is subject to change

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Course Description:
Biomedical Essentials of Comprehensive Osteopathic Medicine-1 (BECOM-1) provides students with a foundation upon which to further develop a growing understanding of important structure-function interrelationships in states of health and disease. The course integrates fundamentals of traditional medical science disciplines (molecular and cellular biology, genetics, developmental biology, histology, physiology, pathology, microbiology and pharmacology) across levels of organization of the human body: from molecules – to cells – to tissues – to organs – to organ systems – to the entire body. These biomedical principles and processes are considered in the context of the body's natural ability to maintain homeostasis through self-regulation and self- healing mechanisms. Interdisciplinary, interdepartmental teams of College faculty engage with students in various learning activities aimed at an integrated approach to learning. Student learning as well as formative and summative student assessments within the BECOM- 1 course is organized around various activities, which could include, but are not necessarily limited to the following: large group classroom application activities; small group case-based learning and discussion sessions; team-based learning (TBL) session; independent guided reading and study. Student learning is assessed using computer-based examinations. In keeping with the mission, values, and goals of ARCOM, the BECOM-1 course emphasizes the importance of life-long learning with an aim to foster and support the broader development of osteopathic medical competencies and promote the best osteopathic patient-centered care possible.

Course Goals:
The following course goals reflect broad and enduring knowledge, skills, behaviors, and responsibilities that students should attain as a result of successfully completing the course:

1. Demonstrate a general knowledge of the basic medical sciences in the areas of genetics, biochemistry, cellular biology, and select aspects of physiology and pharmacology.
2. Gain specific and more in-depth knowledge of the basic science areas specific to molecular biology, cellular biology and biochemistry.
3. Exhibit professional behaviors through positive interactions with peers, faculty and staff.

Course Expectations and Student Responsibilities:
Students should refer to the ARCOM Student Handbook & Clinical Training Manual, as well as the ACHE Student Handbook and ACHE Course Catalog for information regarding professional standards, acceptable conduct, dress code, and program requirements.

Video Capture of Educational Content:
Consistent with the policies surrounding video capture and posting of educational content, recordings of any learning activity are considered a supplemental resource to advance student understanding and for reference at future stages of student education. Recorded materials should not be utilized to replace attendance in the classroom, laboratory, or clinical setting. ARCOM makes no guarantees of reliability for video capture and reserves the right to not allow the recording of learning activities. There is no substitute for class attendance, being actively engaged in the learning process, investing in the comprehension and application of course material, and interacting with instructors and colleagues. Becoming an osteopathic physician involves much more than the acquisition of knowledge and attainment of a professional title. Professionalism, ethics, problem solving, and communication are among the vital skills that are best developed in active and interactive settings. As such, ARCOM expects students to attend all learning activities and offers no guarantees or warranties as to the recording of educational classroom/laboratory content. There will be no video capture of in-class applications team-based learning (TBL), Foundations of

Osteopathic Patient Care (FOPC), or Osteopathic Principles and Practice (OPP). Students are not permitted to render any audio and/or visual recordings of these in-class sessions.

Dress Code:
Students should refer to the ACHE Student Handbook, as well as their course syallbi, for the dress code for campus and academic activities.

Professionalism:

- Students will conduct themselves professionally at all times, during all educational activities conducted on or off campus. This includes interactions with all faculty, staff, students, clinical faculty, guest lecturers, health care providers, patients, and any other member of the ARCOM community. Unprofessional behavior, conduct, or attire inconsistent with the ARCOM dress code will not be tolerated and will result in administrative action. Students aredirected to the ARCOM Student Handbook & Academic Catalog for a full definition of professionalism and list of expected professional behaviors.
- Any unauthorized recording of learning materials and activities used in connection with the ARCOM curriculum or reproduction, rendering, possession, or dissemination of these materials including assessment materials, is considered unprofessional behavior and a violation of copyright. Such behavior is subject to action by the Student Conduct Committee(SCC) for disciplinary action, which may include receiving a grade of "zero" for a graded assessment, course failure, probationary action, suspension, or dismissal from ARCOM.
- Computers, tablets, or notebooks should only be used during lectures to take notes or reference appropriate class topics and reference materials. Students should not be on the internet viewing social media sites, performing online shopping, or playing games, etc. Thisis disrespectful to the lecturer, inhibits peer learning, and is unprofessional behavior.

Diversity, Equity, and Inclusion:
ACHE is committed to a campus environment that is inclusive, safe, and respectful for all persons, and fosters an environment free of harassment and discrimination. To that end, all course activities will be conducted in an atmosphere of friendly participation and interaction among colleagues, recognizing and appreciating the unique experiences, background, and point of view each student brings. Students are expected at all times to apply the highest academic standards to this course and to treat others with dignity and respect.

Attendance Policy:
Osteopathic medical education prepares students for professional clinical practice. Lectures and labs include didactic material, case presentations, patient demonstrations, informal discussions, team-based learning, and the practice of psychomotor skills. Consistent and prompt class attendance is essential for the learner to benefit from the full educational experience.
Therefore, ARCOM Faculty have adopted the following attendance policy:

1. Attendance at all lecture sessions within a given course is strongly encouraged, but not required.
2. Attendance is required for all guest lecturers and team-based learning experiences. A pattern of absenteeism or tardiness for these sessions is considered unprofessional behavior and may result in a referral for disciplinary action for violations of the ACHE Student Code of Conduct consistent with the ACHE Student Misconduct Policy.
3. Since laboratory sessions are designed to develop the clinical and psychomotor skills necessary for success as an osteopathic physician, students are expected to attend all laboratory sessions (as outlined in the course syllabus) and all lectures tied to labs. If, for any reason, a student misses more

than 10% of these required sessions for a given course, the student will receive 1% decrease in final average for each percentage missed over 10%.

Example: A course with 20 laboratory sessions.

A student who misses 3 laboratory sessions (15%) will receive an 5% reduction in his/her final average. A student who misses 4 laboratory sessions (20%) will receive a 10% reduction in his/her final average.

4. All simulated events, including standardized patient encounters, simulated patient encounters, and skills events are required, and an absence or tardiness will result in the loss of additional 2% of the final percentage per simulated event, or as otherwise stated by the course director.
5. This attendance policy does not override any assignments that require attendance to perform. Therefore, if a student misses an event that requires an assignment to be submitted based on the educational experience, the student will lose points for not successfully completing the assignment.
6. If a student misses an exam, he/she will receive a grade of zero. A make-up exam will only be administered on a case-by-case basis with the approval of the course director and/or the Dean of ARCOM.
7. Students considered academically "at-risk" may be held to a separate attendance policy administered by the Office of Academic Affairs.
8. Students must be physically present to receive credit for attendance. Virtual attendance of lectures does not count as in-person attendance.
9. Students must refer to the Outlook Live calendar for all course schedules and changes.
10. Students are responsible for all missed learning material/experiences.
11. As it is not possible to replicate lab experiences, faculty members are not obligated to provide makeup learning experiences.
12. There are no excused absences; however, extenuating circumstances (e.g. serious illness/injury, etc.) may be addressed on a case-by-case basis by the ARCOM Dean.
13. Absence from class to attend professional events, such as a state or national conference, may be approved on a case-by-case basis by the ARCOM Dean.
14. Absence from class due to planned events of a personal nature are not excused absences.
15. A pattern of tardiness is unacceptable. While Faculty understand there may be unavoidable instances, tardiness will not be tolerated on exam days or when guest speakers are in attendance. Admittance to the classroom may be prohibited and, in that circumstance, the student would be marked as absent.

This attendance policy will be strictly adhered to. It is expected that students will use good judgment when being absent, only doing so rarely and for legitimate or necessary reasons.

Course Faculty:

Faculty Member	Office	Phone	Email
Brandy Ree, PhD	279	479-308-2369	brandy.ree@achehealth.edu
Meredith Akins, PhD	265	479-308-2336	meredith.akins@achehealth.edu
Kenneth Hensley, PhD	281	479-308-2361	kenneth.hensley@achehealth.edu
Matthew White, PhD	277	479-308-2371	matthew.white@achehealth.edu
Jessica Sanford, PhD	274	479-308-2357	Jessica.sanford@achehealth.edu
Barry Prior, PhD	275	479-308-2352	barry.prior@achehealth.edu
Cindy Fuller, PhD	278	479-308-2363	cindy.fuller@achehealth.edu
Josh Burns, PhD	273	479-308-2367	joshua.burns@achehealth.edu

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Leslie Ziegler, MD	N/A	GUEST	lzieglerMD@gmail.com

Faculty Office Hours:
While faculty maintain an open-door policy, **it is strongly recommended that a student in need of a faculty member's time and attention reserve an appointment directly via e-mail** or telephone communication with the faculty member.

Required Course Resources:

Title	Edition	Authors	ISBN-13
Marks' Basic Medical Biochemistry	6th	Lieberman and Peet	978-1975150143
Biochemistry-Lippincott Illustrated Reviews	8th	Abali et al.	978-1975155063
Medical Genetics	6th	Jorde, Carey, & Bamshad	978-0323597371
Katzung's Basic & Clinical Pharmacology	16th	Katzung & Vanderah	978-1260463309
Berne and Levy Physiology	8th	Koeppen and Stanton	978-0323847902
Medical Microbiology	9th	Murry	978-0323673228

Recommended:

Title	Edition	Authors	ISBN-13
Schaechter's Mechanisms of Microbial Disease	6th	Engleberg, DiRita, and Dermody	978-1975151485

Molecular Biology of the Cell, 4th edition, Alberts et al. ***Free online:***
http://www.ncbi.nlm.nih.gov/books/NBK21054/?term=Molecular%20BIology%20of%20the%20cell

Library qbanks. The new links are:
https://library.achehealth.edu/exam-prep-medicine/AM-review
https://library.achehealth.edu/exam-prep-medicine/LWW-review

Osteopathic Core Competencies:
The faculty and administration of ARCOM attest that Osteopathic Core Competencies are met in this course.

1. **Osteopathic Philosophy/Osteopathic Manipulative Medicine (OPP/OMM):** Demonstrate and apply knowledge of accepted standards in osteopathic manipulative treatment appropriate to the specialty. Remain dedicated to life-long learning and to practice habits in osteopathic philosophy and OMM.
2. **Medical Knowledge (MK):** Demonstrate and apply knowledge of accepted standards of clinical medicine in the respective area; remain current with new developments in medicine and participate in life-long learning activities.
3. **Patient Care (PC):** Demonstrate the ability to effectively treat patients and provide medical care that incorporates the osteopathic philosophy, patient empathy, awareness of behavioral issues, the incorporation of preventive medicine and health promotion.
4. **Interpersonal and Communication Skills (ICS):** Demonstrate interpersonal and communication skills that enable a physician to establish and maintain professional relationships with patients, families, and other members of health care teams.

5. **Professionalism (PRO):** Uphold the Osteopathic Oath in the conduct of one's professional activities that promotes advocacy of patient welfare, adherence to ethical principles, and collaboration with health professionals, life-long learning, and sensitivity to a diverse patient population; be cognizant of physical and mental health in order to effectively care for patients.
6. **Practice-Based Learning and Improvement (PBL):** Demonstrate the ability to critically evaluate methods of clinical practice; integrate evidence-based medicine into patient care; show an understanding of research methods; improve patient care practices.
7. **Systems-Based Practice (SBP):** Demonstrate an understanding of health care delivery systems; provide effective and qualitative patient care with the system; and practice cost effective medicine.

Grading Information:
Grading point values and scale are consistent with policies outlined in the ARCOM Student Handbook & ACHE Course Catalog. Students will receive a numerical grade (percentage) at the end of the course with 70% or greater required to pass.

Students are required to pass all components of each course with a C (70%) or better to progress to the next semester. To receive a 70% or better, a student must complete all requirements of the course as defined in the syllabus.

Grade Determination and Scheduled Assignments:

Date	Assessment (CC)	Percentage of Final Grade
Thursday, August 8, 2024 @8:30 AM - 10:30 AM	Exam #1 (MK)	**15%**
Friday, August 30, 2024 @8:30 AM - 10:30 AM	Exam #2 (MK)	**15%**
Friday, September 20, 2024 @8:30 AM - 10:30 AM	Exam #3 (MK)	**15%**
Friday, October 11, 2024 @8:30 AM - 10:30 AM	Exam #4 (MK)	**15%**
Thursday, October 31, 2024 @1:00 PM - 3:00 PM	Exam #5 (MK)	**15%**
Tuesday, December 3, 2024 @8:30 AM - 12:30 PM	Exam #6 (MK)	**25%**
TOTAL:		**100%**

Examinations:
There will be a total of 6 written summative examinations which includes the cumulative Final Exam. Timing of the six exams will be determined by at least 85 seconds/item, and students will be informed of the total number of items on the exam in advance by the course director.

TBL Modules:
Individual readiness assurance tests (iRAT) and team readiness assurance tests (tRAT) assignments will be given as part of the BECOM-1 TBL modules are ***not*** scored but should be viewed as an excellent opportunity to test one's knowledge in preparation for upcoming high stakes exams. Students will know what they have scored on the quizzes which will contain exam-level items. These sessions are mandatory.

Clinical Correlations:

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These encounters will expose students to bona fide patients. The goal is to solidify basic science knowledge by anchoring it to a genuine clinical example. Patients will be individuals from the community who have elected to sacrifice their own time for the benefit of the medical student experience. It is paramount students exhibit appreciation, respect, and professionalism during these sessions. Typically, a clinical faculty will be present to field clinically based questions and to introduce the patient. While a short intro/interview will occur in each of the sessions, the majority of time will be dedicated to Q and A with the student audience. No exam items will be derived from these sessions. Students should view this opportunity as a safe environment to explore their knowledge and ask questions to resolve gaps. These sessions are mandatory and may be tied to select TBL modules.

Remediation:
Students who do not pass the course, and are approved for remediation, will take a cumulative remediation exam covering all content delivered in BECOM1.

Course content, sequencing, grading, and examination policies are subject to change by administration with the approval the Curriculum Committee. Students will be given advanced notice of any substantive changes by email and the ARCOM portal.

Biomedical Essentials of Comprehensive Osteopathic Medicine-1 Course Schedule:
Refer to the OUTLOOK Student Calendar for official (up to date) schedule

Day	Date	Time	Session #	Title	Instructor
Mon	Jul 22	9 AM	1	Chemistry Review	Hensley
Tue	Jul 23	9 AM	2	Protein	Ree
Wed	Jul 24	9 AM	3	Protein Disorders	Ree
Thu	Jul 25	10 AM	4	Blood Buffering, Hb, & Mb	Hensley
Thu	Jul 25	11 AM	5	Enzymes I	Hensley
Fri	Jul 26	10 AM	6	Enzymes II	Hensley
Fri	Jul 26	11 AM	7	Nucleotides	Ree
Mon	Jul 29	9 AM	8	Nitrogenous Base Metabolism	Ree
Mon	Jul 29	10 AM	9	DNA Structure & Replication	Ree
Tue	Jul 30	10 AM	10	DNA Repair	Ree
Wed	Jul 31	9 AM	11	Transcription	Ree
Fri	Aug 2	10 AM	12	Translation	Ree
Fri	Aug 2	11 AM	13	Microbial Genetics	Burns
Mon	Aug 5	8 AM	14-15	TBL:	All Faculty
Thu	Aug 8	8:30 AM		**BECOM1 Exam #1**	
Fri	Aug 9	9 AM	16	Biomembranes & Membrane Transport	White
Fri	Aug 9	10 AM	17	Cell Signaling & Communication I	Ree
Fri	Aug 9	11 AM	18	Cell Signaling & Communication II	Ree
Mon	Aug 12	9 AM	19	Regulation of Gene Expression I	Ree
Tue	Aug 13	9 AM	20	Regulation of Gene Expression II	Ree
Wed	Aug 14	10 AM	21	Cell Cycle	Ree

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Wed	Aug 14	11 AM	22	Chromosomal Abnormalities	Ree
Thu	Aug 15	9 AM	23	Inheritance Patterns & Human Disease I	Ree
Thu	Aug 15	10 AM	24	Inheritance Patterns & Human Disease II	Ree
Fri	Aug 16	10 AM	25	Population Genetics & Recombination Frequency	Ree
Fri	Aug 16	11 AM	26	Epigenetics & Genomic Imprinting	Ree
Tue	Aug 20	9 AM	27	Gene Therapy	Ree
Wed	Aug 21	9 AM	28	Cell Death & Differentiation I	White
Thu	Aug 22	10 AM	29	Cell Death & Differentiation II	White
Fri	Aug 23	9 AM	30	Molecular Basis of Cancer	White
Fri	Aug 23	10 AM	31	Biotechniques: Nucleic Acid Detection	White
Mon	Aug 26	8 AM	32-33	TBL:	All Faculty
Fri	Aug 30	8:30 AM		**BECOM1 Exam #2**	
Wed	Sep 4	9 AM	34	Cell Signaling & Metabolism: Fuel Sources in the Fed & Fasting States I	Ree
Thu	Sep 5	9 AM	35	Cell Signaling & Metabolism: Fuel Sources in the Fed & Fasting States II	Ree
Thu	Sep 5	10 AM	36	Carbohydrates	White
Fri	Sep 6	9 AM	37	Carb Metabolism I: Glycolysis	Sanford
Fri	Sep 6	10 AM	38	Carb Metabolism II: Glycolytic Regulation, Pentose Phosphate Pathway & Polyol Pathway	Sanford
Fri	Sep 6	11 AM	39	TCA Cycle, Anaplerotic Reactions	Hensley
Mon	Sep 9	9 AM	40	ETC, Oxygen Reduction, & Redox Biochem I	Hensley
Tue	Sep 10	9 AM	41	ETC, Oxygen Reduction, & Redox Biochem II	Hensley
Tue	Sep 10	10 AM	42	Gluconeogenesis & Glycogen Metabolism	Hensley
Wed	Sep 11	9 AM	43	Inborn Errors of Glucose/Glycogen Metabolism	Hensley
Thu	Sep 12	8 AM	44	Lipids & Lipid Metabolism I	Hensley
Thu	Sep 12	9 AM	45	Lipids & Lipid Metabolism II	Hensley
Thu	Sep 12	10 AM	46	Defects in Lipid Metabolism	Hensley
Tue	Sep 17	9 AM	47-48	TBL:	All Faculty
Fri	Sep 20	8:30 AM		**BECOM1 Exam #3**	
Tue	Sep 24	9 AM	49	Amino Acid Metabolism I	Hensley
Wed	Sep 25	8 AM	50	Amino Acid Metabolism II	Hensley
Wed	Sep 25	9 AM	51	Amino Acid Metabolism III	Hensley
Thu	Sep 26	10 AM	52	Inborn Errors of Amino Acid Metabolism	Hensley
Thu	Sep 26	11 AM	53	Synthesis & Catabolism of Porphyrins	Hensley
Fri	Sep 27	9 AM	54	Porphyria Clinical Correlation	Hensley
Fri	Sep 27	10 AM	55	Iron Metabolism	Hensley
Fri	Sep 27	11 AM	56	Biochemical Basis for Anemias	Hensley
Mon	Sep 30	9 AM	57	Case Study in Hematologic Disease	Hensley/ *L.Ziegler

Tue	Oct 1	9 AM	58	Water Compartments	Akins
Tue	Oct 1	10 AM	59	Ion Gradients	Akins
Wed	Oct 2	9 AM	60	Membrane Potential	Prior
Thu	Oct 3	10 AM	61	Action Potential	Prior
Thu	Oct 3	11 AM	62	Biochemistry of the Synaptic Cleft	Hensley
Fri	Oct 4	10 AM	63	Skeletal Muscle Physiology I	Prior
Fri	Oct 4	11 AM	64	Skeletal Muscle Physiology II	Prior
Mon	Oct 7	9 AM	65	Smooth Muscle Physiology	Prior
Mon	Oct 7	10 AM	66	Cardiac Muscle Physiology	Prior
Tue	Oct 8	9 AM	67-68	TBL:	All Faculty
Fri	Oct 11	8:30 AM		**BECOM1 Exam #4**	
Mon	Oct 14	9 AM	69	Principles of Microbiology & Infectious Disease	Burns
Tue	Oct 15	9 AM	70	Bacteria-Introduction	Burns
Wed	Oct 16	9 AM	71	Intro to the Immune System	Fuller
Thu	Oct 17	10 AM	72	Microbial Virulence Factors	Burns
Thu	Oct 17	11 AM	73	Gram Positive Cocci I	Burns
Fri	Oct 18	9 AM	74	Gram Positive Cocci II	Burns
Fri	Oct 18	10 AM	75	Gram Positive Bacilli I	Burns
Tue	Oct 22	9 AM	76	Gram Positive Bacilli II	Burns
Tue	Oct 22	10 AM	77	Gram Negative Bacilli I	Burns
Wed	Oct 23	8 AM	78	Gram Negative Bacilli II	Burns
Wed	Oct 23	9 AM	79	Other Gram Negatives & Mycoplasmataceae	Burns
Fri	Oct 25	9 AM	80	Hospital Acquired Infections	Burns
Fri	Oct 25	10 AM	81	Zoonotic I	Burns
Fri	Oct 25	11 AM	82	Zoonotic II	Burns
Tue	Oct 29	9 AM	83-84	TBL:	All Faculty
Thu	Oct 31	1 PM		**BECOM1 Exam #5**	
Fri	Nov 1	9 AM	85	Spirochetes	Burns
Fri	Nov 1	10 AM	86	Mycobacteria	Burns
Fri	Nov 1	11 AM	87	Mechanisms & Impact of Multidrug Resistance	Burns
Mon	Nov 4	9 AM	88	Intro to Viruses	Fuller
Tue	Nov 5	9 AM	89	DNA Virus I	Fuller
Tue	Nov 5	10 AM	90	DNA Virus II	Fuller
Wed	Nov 6	9 AM	91	RNA Neg. Sense Virus	Fuller
Thu	Nov 7	10 AM	92	Positive Sense ssRNA Viruses & dsRNA Viruses I	Fuller
Thu	Nov 7	11 AM	93	Positive Sense ssRNA Viruses & dsRNA Viruses II	Fuller
Fri	Nov 8	8 AM	94	Emerging Infectious Diseases	Fuller
Fri	Nov 8	9 AM	95	Introduction to Fungi, & Primary, Endemic & Opportunistic Fungal Pathogens I	Fuller

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Mon	Nov 11	9 AM	96	Introduction to Fungi, & Primary, Endemic & Opportunistic Fungal Pathogens II	Fuller
Tue	Nov 12	9 AM	97	Parasites I	Burns
Tue	Nov 12	10 AM	98	Parasites II	Burns
Wed	Nov 13	9 AM	99	Parasites III	Burns
Fri	Nov 15	10 AM	100	Microbiology Lab Diagnostics: Culture & Sensitivity	Burns
Fri	Nov 15	11 AM	101	The Global Burden of Infectious Disease	Burns
Wed	Nov 20	9 AM	102	Integrated Clinical Biochemistry I	Biochemistry
Wed	Nov 20	10 AM	103	Integrated Clinical Biochemistry II	Biochemistry
Wed	Nov 20	11 AM	104	Integrated Clinical Biochemistry III	Biochemistry
Mon	Nov 25	10 AM	105-106	TBL:	All Faculty
Tue	Dec 3	8:30 AM		**BECOM1 Exam #6**	

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Appendix:

BECOM1 Fall 2024 Learning Objectives with *Core Competency*:

(Any changes to the learning objectives will reflect on lecturers presentation slide)

1. **Chemistry Review;** *MK*
   - 1.1. Describe the structure of an organic chemical bond.
   - 1.2. Classify biologically relevant organic functional groups and correctly draw electron configurations around oxygen and carbon atoms.
   - 1.3. Define chemical oxidation and reduction.
   - 1.4. Select whether a given functional group is more or less oxidized (or reduced) than another functional group.
   - 1.5. Draw and/or name linear alkanes, alkenes, alkynes, aldehydes, ketones, alcohols, mono- and di-carboxylic acids and amines (with carbon atoms up to 10).
   - 1.6. Draw and/or name: Pyruvate, lactate, acetate, acetoacetate, beta hydroxybutyrate, acetone.
   - 1.7. Draw and/or name mono and disaccharides: Glucose (dextrose), fructose, sucrose in openchain (Haworth) or ring (hemiacetal) form.
   - 1.8. Define and calculate concentration based on mass percentage; volume percentage; molarity and molality.
   - 1.9. Write and balance simple organic chemical equations.
   - 1.10. Write and interpret a rate law for an elementary chemical reaction.
   - 1.11. Write and interpret an equilibrium expression for a reversible reaction.
   - 1.12. Draw a reaction diagram and explain the relationship of DG to Keq.
   - 1.13. Explain the pH scale and calculate [H+], [OH], pH and pOH.
   - 1.14. Implement equilibrium chemistry to calculate pKA, [H+] or pH for a weak acid in aqueous solution.
2. **Proteins;** *MK*
   - 2.1. Recognize and classify 20 proteogenic amino acids.
   - 2.2. Diagram formation and hydrolysis of the peptide bond.
   - 2.3. Describe hierarchical levels of protein structure.
   - 2.4. List common post-translational modifications (PTMs).
   - 2.5. Distinguish the terms cofactor, coenzyme and prosthetic group and give two examples.
   - 2.6. Demonstrate how protein structure is disrupted by agents /conditions.
   - 2.7. Demonstrate examples of aberrant protein structure and trafficking in the etiology of disease.
   - 2.8. Compare and contrast processes of cellular protein turnover.
3. **Protein Disorders;** *MK*
   - 3.1. Differentiate between the protein detection techniques of western blot, ELISA, and flow cytometry.
   - 3.2. Describe how select protein disorders may occur along a spectrum citing G6PD deficiency and PKU as examples.
   - 3.3. Name disorders associated with dysfunction in protein turnover.
   - 3.4. Differentiate Hurler syndrome from I cell disease.
   - 3.5. Compare and contrast Marfan's with Homocystinuria.
   - 3.6. Examine how alpha-1 antitrypsin deficiency (AAT) presents with liver and lung complications.
4. **Blood Buffering, Hb, & Mb;** *MK*
   - 4.1. Explain how a buffered system functions and its components.
   - 4.2. Name the major biological buffers.

4.3. Name major forms of human globin and describe their physiological roles and clinical significance.
4.4. Distinguish and describe negative and positive cooperativity.
4.5. Diagram oxygen binding curves of adult Hb, HbF, and Mb and explain significance.
4.6. Describe the role of 2,3 BPG in altering Hb oxygen affinity.
4.7. Explain the Bohr effect and Haldane effect.
4.8. Compare and contrast Mb with Hb O2 binding behavior.
4.9. Map arterial blood gas (ABG) values to respiratory or metabolic acidosis and identify whether there is compensation.

5. Enzymes I; *MK*
5.1. Classify the six main classes of enzymes and unique features of each.
5.2. Demonstrate how enzymes accelerate the rate of biological reactions.
5.3. Explain the physical basis for enzyme catalysis using transition state theory and a reaction coordinate.
5.4. Discuss the concept of enzyme specificity.
5.5. List the main ways enzyme activity is governed.
5.6. Distinguish cofactors from allosteric regulators.
5.7. List enzymatic biomarkers for select disorders (e.g. pancreatitis, liver injury).

6. Enzymes II; *MK*
6.1. Recognize the features of a Michaelis-Menten enzyme scheme.
6.2. Define allostery as it applies to enzymatic regulation.
6.3. Interpret a Lineweaver-Burk transformation.
6.4. Explain the physical meaning of Km as it applies to glucokinase and hexokinase.
6.5. Discriminate competitive and noncompetitive enzyme inhibition.
6.6. Give examples of enzyme importance in clinical diagnosis.
6.7. Describe function and difference of phase I and II enzymes in drug metabolism with particular reference to acetaminophen.

7. Nucleotides; *MK*
7.1. List the components of a nitrogenous base, nucleoside, and nucleotide.
7.2. Distinguish a nitrogenous base from a nucleoside and nucleotide
7.3. List the major purine and pyrimidine structures
7.4. Distinguish the major purine and pyrimidine structures
7.5. List the major products produced from nitrogenous bases other than nucleic acids.

8. Nitrogenous Base Metabolism; *MK*
8.1. Explain the importance of Folate in nucleic acid synthesis.
8.2. List the major products produced from nitrogenous bases other than nucleic acids.
8.3. Diagram how disruption in nucleotide metabolism can manifest in gout and how NSAIDs and allopurinol are used as an intervention.
8.4. Explain salvage of nitrogenous bases and diseases/therapeutic strategies involving this process.
8.5. Describe the key steps in nitrogen base synthesis and how regulation occurs.

9. DNA Structure & Replication; *MK*
9.1. Describe the components and architecture of a DNA double helix and explain where proteins bind to the DNA helices.
9.2. Describe the detailed structure of nucleic acids explaining the differences.
9.3. Summarize the underlying central dogma of molecular biology and describe any exception(s).
9.4. Describe the packaging of DNA in eukaryotic nuclei, and review the enzymatic activities required to free DNA from the packaging for access by other proteins.
9.5. Describe the distinctions between the human genome and mtDNA.
9.6. Summarize the aspects of DNA replication and why discontinuous synthesis is required.

9.7. Describe the structure of telomeres, explain how replication leads to shortening of telomeres, and describe how select cells maintain an adequate length of their telomeres.
9.8. Describe the function of DNA topoisomerases and explain the role of these enzymes in changing the topology of chromosomes.

10. DNA Repair; *MK*
10.1. Summarize the major DNA repair pathways.
10.2. Describe how ultraviolet light and high-energy xrays damage DNA, and how this damage is repaired.
10.3. Describe how polycyclic hydrocarbons in cigarette smoke damage DNA and how this damage is repaired.
10.4. Explain how platinum drugs and nitrogen mustards damage DNA and how this damage is repaired.
10.5. Describe and explain commonly used lab tests for DNA mismatch repair in biopsy tissues.
10.6. Explain the term microsatellite instability, describe a lab test for microsatellite instability, and link microsatellite instability to deficiency in a DNA repair pathway.
10.7. List hereditary cancer syndromes and specify the associated defects in DNA repair, as well as the pattern of inheritance. List any modification in chemotherapy or radiotherapy of tumors that must be made for affected patients.
10.8. Describe how chemotherapy and radiotherapy kill tumor cells and how these treatments can be tumorigenic in normal cells.
10.9. Describe the various types of mutations.

11. Transcription; *MK*
11.1. Describe the relationships of coding strands, noncoding strands, and template strands to each other, individual genes and to entire chromosomes.
11.2. Compare and contrast promotor elements, enhancers, activators, repressors and silencers.
11.3. Outline the assembly of a transcription initiation complex, paying special attention to steps that can be regulated by metabolites or hormones, particularly steroids.
11.4. Interpret a graph of the structure of a promotor and a gene.
11.5. Describe the modifications of precursor mRNA (pre-mRNA) at the 5'- end and at the 3'- end and explain the purpose of these modifications.
11.6. Describe the splicing of pre-mRNA and provide an example of alternative splicing.
11.7. Compare and contrast exons and introns and relate these to a gene, as well as the final product of translation.
11.8. Explain how a point mutation can alter splicing and hence the amino acid sequence of a protein.
11.9. Explain the term cryptic splice site and provide an example.
11.10. Compare and contrast how transcription is distinct in prokaryotes versus eukaryotes.
11.11. Define operon and provide an example.

12. Translation; *MK*
12.1. Explain what comprised an aminoacyl-tRNA and how it is generated.
12.2. Describe factors that determine the start, continuation, and end of translation.
12.3. Explain why some DNA mutations in the coding sequence do not result in a mutant protein.
12.4. Explain why a one-base or two-base insertion or deletion is usually a loss-of-function mutation and why no mutant protein accumulates in the tissue.

13. Microbial Genetics; *MK*
13.1. Describe how DNA is transferred between bacteria using conjugation, transformation, transduction, and transposons.
13.2. Discuss the difference between conjugation, high frequency recombinants, and site-specific recombination.
13.3. Assess mechanisms of molecular information flow between bacteria and eukaryotes.

13.4. Address specific differences in the role of DNA and RNA as handled in DNA replication, transcription, and translation in bacteria.
13.5. Discuss bacterial transcriptional control mechanisms.
13.6. Analyze the role of quorum sensing and virulence.
13.7. Decipher the 'ABCDES' mnemonic as it relates to the list of toxins that are transferred by lysogenic phages in specialized transduction.
13.8. Discuss how "omics" tools are important for our understanding of the human microbiome.

14-15. TBL; *MK*

16. Biomembranes & Membrane Transport; *MK*

16.1. Diagram the Singer-Nicolson model of cell membrane.
16.2. Describe characteristics of molecules that can passively diffuse across a lipid bilayer.
16.3. Describe how the following are transported across biological membranes: O2, CO2, NH3, K+, Na+, glucose.
16.4. Contrast the following units used to describe concentration: mM, mEq/l, mg/dl, mg%. List the typical value and normal range for plasma Na+, K+, H+ (pH), HCO3-, Cl-, Ca2+, and glucose, and the typical intracellular pH and concentrations of Na+, K+, Cl-, Ca2+, and HCO3-.
16.5. Explain how energy from the Na+ and K+ electrochemical gradients across the plasma membrane can be used to drive the net "uphill" (against a gradient) movement of other solutes.
16.6. Describe the mechanisms and role of selective transporters for amino acids, neurotransmitters, nutrients, etc.
16.7. List major cell organelles delimited by their membranes, and their essential roles in cell physiology.
16.8. Trace endosomes as they are internalized, sorted, re-presented or digested in lysosomes..

17. Cell Signaling & Communication I; *MK*

17.1. Describe physiological homeostasis, positive and negative feedback.
17.2. Diagram connections from membrane signals to gene transcription.
17.3. Compare and contrast PI3K, PLC gamma and Jak/Stat pathways.
17.4. Define what second messengers are citing two examples.
17.5. Briefly describe major types of signaling processes.
17.6. Recognize an example of each of the following major classes of receptors and describe their mechanisms of action.
17.7. List molecular events that activate and terminate signaling via GPCRs and heterotrimeric G proteins.
17.8. List molecular events that activate and terminate signaling via small G proteins.
17.9. Describe the RAS/RAF/MEK/ERK signaling pathway, and list hormones and their receptor that use this pathway.

18. Cell Signaling & Communication II; *MK*

18.1. Discuss pathomechanism through which mutations in receptor tyrosine kinase linked signaling proteins can promote cancer.
18.2. Discuss how receptor tyrosine kinase activation triggers signaling and regulates gene transcription.
18.3. Explain the biochemical basis for the success of Imatinib in CML.
18.4. Describe TNF-alpha receptor function in immune signaling and its antagonism by Etanercept (Enbrel) and Humira (Adalimumab) for autoimmune diseases.
18.5. Describe the insulin receptor, discuss molecular events that occur after ligand binding, and outline mechanisms by which insulin controls glucose homeostasis.
18.6. Explain the biochemical strategy of using Herceptin in HER2+ breast cancer.
18.7. Explain how other effectors of signaling cascades (e.g. caffeine, Viagra) alter cellular responses.

18.8. Explain how erythropoietin promotes increased hematocrit and how this can be accomplished therapeutically.

19. Regulation of Gene Expression I; *MK*

19.1. Describe the effect of chromatin structure on translation, considering DNA methylation, histone methylation, and histone acetylation.
19.2. Explain the meaning of the terms CpG dinucleotide and CpG island.
19.3. Compare and contrast promotor elements, enhancers, activators, repressors and silencers.
19.4. Describe the splicing of pre-mRNA and provide an example of alternative splicing.
19.5. Discriminate between cis-acting elements and trans-acting factors, citing examples of each.

20. Regulation of Gene Expression II; *MK*

20.1. Describe factors that set the gross rate of protein synthesis.
20.2. List antibiotics that interfere with protein synthesis and describe their mechanism of action.
20.3. List some inhibitors of eukaryotic protein synthesis that are potent toxins and mechanism of action of each.

21. Cell Cycle; *MK*

21.1. Diagram the various stages of the cell cycle, describing defining events/features of each.
21.2. Describe how the cell cycle is regulated and explain how Cdk's and cyclins govern the cell cycle.
21.3. Distinguish a sister chromatid from a homologous chromosome.
21.4. Compare and contrast the RB and p53 pathways.
21.5. Explain how DNA damage in the G1 phase normally leads to cell cycle arrest and possibly apoptosis.
21.6. Compare and contrast an oncoprotein and a tumor suppressor.
21.7. Describe the genetic makeup of a typical tumor.
21.8. Compare and contrast major genetic causes of the hereditary brest and ovarian cancer syndrome, FAP, Lynch syndrome and familial melanoma.
21.9. Differentiate whether a patient with colorectal cancer has sporadic cancer, FAP or Lynch syndrome using patient history, clinical findings and lab tests.
21.10. Given an abnormality in a growth-promoting signaling pathway in a breast carcinoma, lung carcinoma, colorectal cancer or melanoma, list drugs that target these signaling pathways and can potentially be used as treatment.

22. Chromosomal Abnormalities; *MK*

22.1. Describe a normal human karyotype and define the meaning of aneuploidy.
22.2. Explain how karyotyping is utilized to diagnose disease.
22.3. Discuss mechanisms of chromosomal abnormalities and genomic imbalance and provide examples of diseases associated with trisomies, chromosomal deletions, and other chromosomal abnormalities.
22.4. Classify the different types of structural chromosomal abnormalities.

23. Inheritance Patterns & Human Disease I; *MK*

23.1. Explain the terms allele, homozygosity, heterozygosity and compound heterozygosity.
23.2. Compare and contrast penetrance and variable expressivity.
23.3. Compare and contrast dominant and recessive inheritance.
23.4. Explain the meaning, and provide examples, of the terms haploinsufficiency, gain-of-function mutation, loss-of-function mutation and dominant negative effect, thereby relating these terms to dominant and recessive inheritance.
23.5. Compare and contrast the expected phenotypes of X-linked disorders in male and females.
23.6. Describe the pattern of inheritance of DNA in the mitochondria.
23.7. Explain the term germline and somatic cells, and recognize the significance to mutations within

each.

23.8. Discriminate between the autosomal dominant, autosomal recessive, x-linked dominant, x-linked recessive, and mitochondrial inheritance patterns represented within a pedigree.
23.9. Identify common diseases associated with each of the above-mentioned patterns of inheritance.
23.10. Describe the pathophysiologic mechanisms (e.g., trinucleotide-repeat mutations, sex-limited, sexinfluenced, etc.) that result in disorders of a nonclassic inheritance and give clinical examples of each.

24. Inheritance Patterns & Human Disease II; *MK*

24.1. *See previous session.*

25. Population Genetics & Recombination Frequency; *MK*

25.1. Describe the use of polymorphic markers in linkage analysis.
25.2. Solve problems concerning genotype and allele frequencies.
25.3. Use the Hardy-Weinberg equilibrium equation to predict genotype and allele frequencies.
25.4. Interpret scenarios about factors responsible for genetic variation in/among populations.
25.5. Solve problems concerning polymorphic markers and linkage analysis.
25.6. Calculate recombination frequency.
25.7. Explain information related to LOD scores.

26. Epigenetics & Genomic Imprinting; *MK*

26.1. Compare and contrast Mendelian inheritance and non-Mendelian inheritance due to imprinting.
26.2. Describe the basis of epigenetic inheritance.
26.3. Discuss, with examples, disorders associated with multifactorial inheritance and describe how environmental factors can interact with genetic factors to produce disease.
26.4. Identify the inheritance pattern and diseases associated with genomic imprinting.

27. Gene Therapy; *MK*

27.1. Differentiate between appropriate medical applications of recombinant DNA.
27.2. List the different vectors used in gene therapy.
27.3. List the advantages and disadvantages of the different viral vectors used in gene therapy.
27.4. Compare and contrast gene replacement therapy and gene blocking therapy.

28. Cell Death & Differentiation I; *MK*

28.1. Distinguish different levels of cellular potency, contrasting between totipotent, pluripotent, multipotent, unipotent, and terminally differentiated cells.
28.2. Describe key genetic factors involved in cellular differentiation and reprogramming.
28.3. Describe the location and physiologic function of stem cells in the body.
28.4. Discuss the therapeutic potential of stem cells.
28.5. Demonstrate a basic understanding of cell stress and stress response pathways.
28.6. Compare and contrast major mechanisms of cell death.
28.7. Describe events of intrinsic and extrinsic apoptotic pathways, identifying the key molecules involved and their function.
28.8. Discuss physiologic roles for apoptosis, and circumstances in which dysregulation of apoptosis can produce disease.
28.9. Describe the pathologic consequences of necrosis.
28.10. Describe and contextualize less common forms of cell death, such as necroptosis, pyroptosis, and anoikis.
28.11. Diagram the mTOR signaling axis as it pertains to autophagy induction.
28.12. Describe the three major types of autophagy and provide context of each.
28.13. Discuss disease states associated with autophagy and the potential for pharmacologic manipulation.

29. Cell Death & Differentiation II; *MK*

29.1. *See previous session.*

30. Molecular Basis of Cancer; *MK*
- 30.1. Describe principles of the cellular origins of cancer.
- 30.2. Discuss carcinogenesis and the underlying genetic mechanisms that lead to tumor formation and progression.
- 30.3. Diagram key signaling pathways hijacked by tumor cells.
- 30.4. Describe hallmarks of cancer, including sustained proliferative signaling, evasion of growth suppression, resistance to cell death, replicative immortality, angiogenesis, invasion and metastasis, reprogrammed metabolism, and evasion of immune destruction.

31. Biotechniques: Nucleic Acid Detection; *MK*
- 31.1. Describe principles of common blotting procedures including Northern and Southern blots.
- 31.2. Diagram basic principles of polymerase chain reaction (PCR), reverse transcriptase PCR, and quantitative real-time-PCR.
- 31.3. Describe principles of common blotting procedures including Northern and Southern blots.
- 31.4. Diagram basic principles of polymerase chain reaction (PCR), reverse transcriptase PCR, and quantitative real-time-PCR.
- 31.5. Discuss key applications of PCR in diagnostic testing.
- 31.6. Describe principles of DNA genotyping and sequencing, and discuss current application of this technology.
- 31.7. Define single nucleotide polymorphisms (SNPs) and microsatellites.
- 31.8. Describe transcriptomic approaches used to measure gene expression (microarray, RNA Seq).
- 31.9. Discuss chromosomal analyses (fluorescence in situ hybridization, karyotyping).
- 31.10. Diagram CRISPR/Cas9 technology and discuss within the context of gene editing.

32-33. TBL; *MK*

34. Cell Signaling & Metabolism: Fuel Sources in the Fed and Fasting States I; *MK*
- 34.1. Identify the normal range of plasma glucose concentrations, and list the chemical forms and anatomical sites of storage pools for glucose and other metabolic substrates.
- 34.2. Identify the hormones that promote the influx and efflux of glucose, fat, and protein into and out of energy storage pools and their impact on the uptake of glucose by tissues and establish specific roles for insulin, glucagon & catecholamines.
- 34.3. Describe the changes in metabolic fuel utilization that occur in long- and short-term fasting and in acute and sustained exercise and diagram how increases or decreases in hormone secretion produce these changes.
- 34.4. Describe the role of appetite and metabolic rate in the maintenance of long-term energy balance and fat storage.
- 34.5. Identify the factors that regulate appetite and fuel oxidation.
- 34.6. Describes the concerns surrounding reintroducing nutrients to someone in a nutrient deprived state.

35. Cell Signaling & Metabolism: Fuel Sources in the Fed and Fasting States II; *MK*
- 35.1. *See previous session.*

36. Carbohydrates; *MK*
- 36.1. List the major carbohydrates in the American diet.
- 36.2. Describe how dietary carbohydrates are converted into monosaccharides.
- 36.3. Describe the role of GLUTs in the transport of glucose.
- 36.4. Globally explain the process of glycolysis.
- 36.5. Describe the importance of glycogen with respect to energy.
- 36.6. Explain the biochemical basis for the symptoms of lactose intolerance.
- 36.7. Draw the global pathways of glucose metabolism.
- 36.8. Identify carbohydrates based upon standard nomenclature.

37. Carb Metabolism I: Glycolysis; *MK*

37.1. List the control points of glycolysis.
37.2. Summarize how glycolysis is regulated.
37.3. Summarize the potential fates of pyruvate and under what biological conditions determine this fate(s).
37.4. List the vitamins /coenzymes used by glycolytic enzymes and the PDH Complex.
37.5. Describe the clinical result of severe thiamin deficiency, and connect the symptoms to the biochemical role of thiamin in the PDH complex and TCA cycle.

38. Carb Metabolism II: Glycolytic Regulation, Pentose Phosphate Pathway & Polyol Pathway; *MK*
38.1. Sketch signaling pathways that regulate glucose metabolism.
38.2. Diagram how the energy in reduced coenzymes from glycolysis is shuttled to the mitochondria.
38.3. List the major differences in fructose and glucose metabolism citing concerns about high fructose corn syrup consumption.
38.4. Draw the polyol pathway and describe its health significance in diabetes.
38.5. Explain the purpose of the PPP (i.e. HMP shunt).
38.6. Describe how the PPP can lead to pathologies within the eye and nerves within a diabetic state.
38.7. Discriminate between fructose and glucose metabolism.
38.8. Differentiate essential fructosuria from hereditary fructose intolerance.

39. TCA Cycle, Anaplerotic Reactions; *MK*
39.1. Describe how catabolic products of glucose, fatty acids and amino acids serve as substrates or intermediates of the TCA cycle.
39.2. Diagram the Cori cycle and explain how its disruption leads to lactic acidosis.
39.3. Summarize the intermediates and products of the TCA cycle.
39.4. Describe the roles of citrate synthase, isocitrate dehydrogenase, and alpha-ketoglutarate dehydrogenase in the TCA cycle.
39.5. Name the vitamins / coenzymes used in the TCA cycle.
39.6. Define anaplerosis, cataplerosis and medical importance of these reactions.
39.7. List the major anaplerotic (cataplerotic) reactions of the TCA cycle.
39.8. Explain the role of oxaloacetate in ketosis and diabetic keto acidosis.
39.9. Explain the role of isocitrate dehydrogenase and oncometabolites in cancer.

40. ETC, Oxygen Reduction, & Redox Biochemistry I; *MK*
40.1. Define reactive oxygen species (ROS) and list the four major ROS in order of sequential one-electron reduction.
40.2. Describe the mitochondrial electron transport chain (ETC) and explain its relationship to ROS production in ischemia/reperfusion injury.
40.3. Describe how redox-cycling metals, NADPH oxidase, NOX, COX and flavin oxidases generate ROS as part of the immune function and pathologically.

41. ETC, Oxygen Reduction, & Redox Biochemistry II; *MK*
41.1. Describe how ROS/RNS react pathogenically with proteins, lipids and DNA.
41.2. List major antioxidant scavenging systems; antioxidant enzymes; their substrates and products; and the regulation of antioxidant enzymes by Nrf2/Keap1.
41.3. Describe the structure of glutathione; explain its role as an antioxidant enzyme; as a phase-II detoxification enzyme; and its relationship to erythrocyte hemolysis in hemolytic anemia.
41.4. Describe dietary requirements for antioxidant intake.

42. Gluconeogenesis & Glycogen Metabolism; *MK*
42.1. Describe the roles of pyruvate carboxylase, PEPCK, glucose 6-phosphate and the malate/OAA shuttle in gluconeogenesis.
42.2. Map TCA cycle intermediates to gluconeogenesis.
42.3. Explain how activities of glycolysis and gluconeogenesis are reciprocally regulated by the PFK2/FBPase2 system.

42.4. Explain levels of gluconeogenesis control: Allosteric effects, substrate availability and hormonal signaling.
42.5. Explain the biochemical basis for the effects of ethanol ingestion on gluconeogenesis.
42.6. Explain the contribution of glycogenesis and glycogenolysis to blood glucose regulation.
42.7. Describe the roles of glycogen synthase and branching enzyme in glycogenesis and the clinical consequences of deficiencies in glycogen utilizing enzymes.
42.8. Diagram and explain reciprocal regulation of glycogen synthesis and glycogenolysis during the fed/fast cycle.

43. Inborn Errors of Glucose/Glycogen Metabolism; *MK*

43.1. Recognize and explain biochemical bases for hereditary glycolytic diseases: Glucose 6-phosphate dehydrogenase (G6PDH) deficiency, pyruvate dehydrogenase deficiency, LDH deficiency.
43.2. Recognize and explain biochemical bases for hereditary gluconeogenic diseases: Pyruvate kinase deficiency, PEPCK deficiency, Von Gierke disease (GSD Type I).
43.3. Recognize glycogen storage diseases from clinical signs and symptoms and name enzyme defects in: Von Gierke (GSD1), Pompe, Cori, Anderson, McArdles, Hers.
43.4. Recognize and explain etiology of hereditary galactosemia.
43.5. Recognize and explain etiology of hereditary fructose intolerance and essential fructosuria.

44. Lipids & Lipid Metabolism I; *MK*

44.1. Define lipid and differentiate between lipid and fatty acid.
44.2. Explain the main steps in de novo fatty acid synthesis (lipogenesis) and identify regulatory mechanisms.
44.3. Explain the main steps in lipolysis and identify regulatory mechanisms.
44.4. Describe the structure of a triacyl glyceride (TAG), a glycerophospholipid, cholesterol and its bile salt metabolites.
44.5. Describe pathways of cholesterol and fatty acid uptake in the gut; and the mechanisms which these molecules are transported through the body via lipoprotein particles.
44.6. Explain the differences in structure and function of chylomicrons, VLDL, LDL, HDL.
44.7. Explain the role elevated cholesterol plays in gall bladder dysfunction and in atherosclerosis.

45. Lipids and Lipid Metabolism II; *MK*

45.1. List the main steps in de novo fatty acid synthesis and identify regulatory mechanisms.
45.2. List the main steps in lipolysis and identify regulatory mechanisms.
45.3. Diagram the pathway of fatty acid beta oxidation to acetyl CoA including mechanisms of fatty acid transport into mitochondria.
45.4. Describe the formation of ketone bodies and explain their physiological purpose.
45.5. Describe the structural differences between phosph-, sphingo- and glycerolipids and their general purposes.
45.6. Define eicosanoid and describe steps by which they are synthesized from membrane-bound arachidonic acid.
45.7. Diagram the bifurcation of the eicosanoid pathway between cyclooxygenase and lipoxygenase branches,and describe the major function of downstream products (prostaglandins, prostacyclins and thromboxane from the prior and leukotrienes from the latter).
45.8. Describe the roles of eicosanoids in inflammation and explain how prostaglandins are blocked by NSAIDs.

46. Defects in Lipid Metabolism; *MK*

46.1. Name and describe major types of lipid catabolism disorders: MCAD, LCAD, VLCAD, carnitine palmitoyltransferase deficiency; their enzyme mutations responsible, clinical signs and symptoms.
46.2. Name and describe major types of hereditary lipid storage diseases: Tay-Sach's, Gaucher's,

Neimann-Pick, Krabbe, Fabre, Metachromatic lekodystrophy; their enzyme mutations responsible, and recognize signs and symptoms.

46.3. Describe the Fredrickson classification of primary (familial) dyslipidemia, signs and symptoms of subtypes and biochemical etiologies of the subtypes.

46.4. Identify causes of secondary dyslipidemias.

47-48. TBL; *MK*

49. Amino Acid Metabolism I; *MK*

49.1. Describe the three main routes of protein catabolism.

49.2. Explain how proteins are digested and amino acids absorbed in the gut.

49.3. List the steps in the principal pathway of amino acid catabolism and explain the function of enzymes at each step.

49.4. Recognize and describe reactions catalyzed by glutamine synthetase, glutaminase, glutamate dehydrogenase and general transaminases.

49.5. Trace the flow of nitrogen from a protein in peripheral tissue to urea in the kidney.

50. Amino Acid Metabolism II; *MK*

50.1. Describe the urea cycle, name diseases of urea cycle dysfunction, understand the mechanism for treating these with phenylbutyrate.

50.2. Differentiate OTC deficiency from hereditary orotic aciduria.

50.3. Describe the metabolic defects giving rise to, and symptoms resulting in: phenylketonuria; maple syrup urine disease (MSUD); albinism; alkaptonuria; tyrosinemia; homocystinuria; methyl malonic acidemia.

50.4. Recognize and describe ammonia neurotoxicity, understanding its relationship to hepatic pathology.

50.5. List the types of kidney stones and explain how UTIs can cause stones via ammonification.

51. Amino Acid Metabolism III; *MK*

51.1. Diagram the linked folate cycle, methylation cycle and transsulfuration pathway.

51.2. Explain the role of PLP, FH4, vitamin B12, and BH4 cofactors in amino acid metabolism.

51.3. Explain the mechanism of anti-folates in cancer therapy.

51.4. Draw homocysteine vs. cysteine, explain the origin and fate of hCys and its relationship to cardiovascular and neurological disease.

52. Inborn Errors of Amino Acid Metabolism; *MK*

52.1. Explain the biochemical nature of amino acid metabolism disorders, symptoms, and treatments for: phenylketonuria; cysteinuria; homocysteinuria; maple syrup urine disease; albinism; alkaptonuria.

52.2. List the metabolic intermediates that can define the common inborn errors in amino acid metabolism.

52.3. List the enzymes that account for inborn errors of amino acid metabolism.

52.4. Connect inborn errors of amino acid metabolism with vitamin deficiencies that can produce similar biochemical effects.

53. Synthesis & Catabolism of Porphyrins; *MK*

53.1. Discuss the normal balance of red blood cell synthesis and destruction, including how imbalances in each lead to anemia or polycythemia.

53.2. List the two reagents used to synthesize the porphyrin ring.

53.3. Describe the various levels (e.g. transcription, translational, and posttranslational) of regulation for heme biosynthesis.

53.4. Explain the overall process of heme degradation.

53.5. Distinguish between conjugated and unconjugated bilirubin and describe the conversion of heme from red blood cells to conjugated bilirubin in the bile.

53.6. Analyze laboratory data on direct and total bilirubin for compatibility with a diagnosis of increased hemolysis, decreased conjugation of bilirubin, or impaired excretion of bilirubin.
53.7. Explain how bili-lights can lower the concentration of bilirubin in the blood.

54. Porphyria Clinical Correlation; *MK*
54.1. *See previous session.*
55. Iron Metabolism; *MK*
55.1. Describe how iron is taken up into the body, how it is transported in the blood, how and in which tissues it is stored, what the majority of iron is used for, and how iron is lost from the body.
55.2. Explain the role of hepcidin in regulating iron homeostasis.
55.3. Identify the approximate daily net absorption of iron from the diet into the bloodstream in pregnant women, lactating women, and non-pregnant adults.
55.4. Calculate the transferrin saturation from the serum iron and the total iron-binding capacity and apply the transferrin saturation to determine whether a patient is iron-deficient or iron overloaded.
55.5. Recognize and discriminate from CBCs and blood smears: Iron deficient anemia, anemia of chronic disease, megaloblastic anemia.
55.6. Recognize and discriminate sideroblastic anemia from marrow aspirate.
55.7. Recognize and discriminate clinical cases of iron overload disease or iron poisoning.
56. Biochemical Basis for Anemia; *MK*
56.1. Explain why anemias commonly present with fatigue or muscle weakness irrespective of cause.
56.2. Describe how nutrient status can be a major factor in anemia.
56.3. Elucidate how certain protein deficiencies result in hemolytic anemia.
56.4. Provide examples of drugs or toxins may prompt anemia.
56.5. Predict given certain facts the type of anemia (e.g. microcytic, macrocytic, etc.) that would result.
57. Case Study of Hematologic Disease; *MK*
57.1. Apply knowledge obtained throughout the semester to develop differential diagnosis for bona fide clinical scenarios in blood disorders.
58. Water Compartments; *MK*
58.1. Identify the major water compartments of the body.
58.2. Identify major routes and normal ranges for water intake and loss, and predict how changes in intake and loss affect the distribution of total body water.
58.3. Differentiate between the terms osmole, osmolarity, osmolality and tonicity. List the typical value and normal range for plasma osmolality.
58.4. Identify normal extracellular fluid (plasma) osmolarity and concentrations of Na+, K+, Cl, HCO3-, proteins, creatinine, and urea, and contrast these values with those for intracellular fluids.
58.5. Identify how regulation of the concentrations of K+, Cl-, and other Na+ solutes influence cell volume.
58.6. Contrast the movement between intracellular and extracellular compartments caused by increases or decreases in extracellular fluid osmolality.
58.7. Given the composition and osmolality of a fluid, identify it as hypertonic, isotonic, or hypotonic. Predict the change in transcellular fluid exchange that would be caused by placing a red blood cell in solutions with varying tonicities.
58.8. Demonstrate the ability to use the indicator dilution principle to measure plasma volume, blood volume, extracellular fluid volume, and total body water, and identify compounds used to measure each volume.
58.9. Contrast the change in plasma electrolytes, hematocrit, proteins, and colloid osmotic pressure

following resuscitation from hemorrhage using a) water and b) 0.9% NaCl.

58.10. Predict the changes in extracellular volume, extracellular osmolality, intracellular volume, and intracellular osmolality caused by infusion of three liters of 0.9% NaCl, 0.45% NaCl, and 7.5% NaCl.

59. Ion Gradients; *MK*

59.1. Contrast the following units used to describe concentration: mM, mEq/l, mg/dl, mg%.

59.2. List the typical value and normal range for plasma Na+, K+, H+ (pH), HCO3-, Cl-, Ca2+, and glucose, and the typical intracellular pH and concentrations of Na+, K+, Cl-, Ca2+, and HCO3.

59.3. Differentiate the following terms based on the source of energy driving the process and the molecular pathway for: diffusion, facilitated diffusion, secondary active transport, and primary active transport.

59.4. Define the term "steady state," and differentiate it from "equilibrium." Relate the pump-leak model of steady-state ion content to cell solute gradients and cell volume maintenance.

59.5. Define the following properties of ion channels: gating, activation, and inactivation.

60. Membrane Potential; *MK*

60.1. Based on the principle of ionic attraction, explain how a potential difference across a membrane will influence the distribution of a cation and an anion.

60.2. Write the Nernst equation, and indicate how this equation accounts for both the chemical and electrical driving forces that act on an ion.

60.3. Based on the Nernst equilibrium potential, predict the direction that an ion will take (follow) when the membrane potential a) is at its equilibrium potential, b) is higher than the equilibrium potential, or c) is less than the equilibrium potential. List values in a typical non-excitable cell for the membrane potential, for ENa, EK, ECl, and ECa.

60.4. Define the concepts of electrochemical equilibrium and equilibrium potential, and give internal and external ion concentrations. Be able to calculate an equilibrium potential for that ion using the Nernst equation. Contrast the difference in EK (the Nernst potential for K+) caused by a 5 mEq/l increase in extracellular K+ with the change in ENa (the Nernst potential for Na+) caused by a 5 mEq/l increase in extracellular Na+.

60.5. Explain how the resting membrane potential is generated and calculate membrane potential by using either a) the Goldman-Hodgkin-Katz equation. Given an increase or decrease in the permeability of K+, Na+, or Cl-, predict how the membrane potential would change.

61. Action Potential; *MK*

61.1. Contrast the cell to cell spread of depolarization at a chemical synapse with that at a gap junction based on speed and fidelity (success rate). At the chemical synapse, contrast the terms temporal summation and spatial summation.

61.2. Contrast the gating of ion-selective channels by extracellular ligands, intracellular ligands, stretch, and voltage.

61.3. State the cell properties that determine the rate of electronic conduction.

61.4. Differentiate between the properties of electrotonic conduction, conduction of an action potential, and saltatory conduction. Identify regions of a neuron where each type of electrical activity may be found.

61.5. Know the properties of voltage-gated Na+, K+, and Ca2+ channels, and explain that voltage influences their gating, activation, and inactivation.

61.6. Explain how the activity of voltage-gated Na+, K+, and Ca2+ channels generates an action potential and the roles of those channels in each phase (depolarization, overshoot, repolarization, hyperpolarization) of the action potential.

61.7. Contrast the mechanisms by which an action potential is propagated along both nonmyelinated and myelinated axons.

61.8. Predict the consequence on action potential propagation in the early and late stages of

demyelinating diseases, such as multiple sclerosis.

61.9. Distinguish the effects of hyperkalemia, hypercalcemia, and hypoxia on the resting membrane and action potential.

62. Biochemistry of the Synaptic Cleft; *MK*

62.1. Differentiate between neuromuscular synapse structure / function and central nervous system synapse structure /function.
62.2. List, describe the structure, and explain the function of the four main cell types in the central nervous system (neuron, astrocyte, oligodendrocyte, microglia).
62.3. Explain how astrocytes functionally interact with neurons within the tripartite synapse.
62.4. List three ways of differentiating synapses based on neurotransmitter function.
62.5. Describe the stepwise mechanisms of neurotransmitter vesicle fusion and exocytosis.
62.6. Describe the mechanism of botulism toxin (BoTox) in relationship to neurotransmitter release.
62.7. List five excitatory and one inhibitory neurotransmitter.
62.8. Explain how glutamate excitotoxicity can occur and describe the consequences to neurons.
62.9. Explain the concepts of spatial and temporal summation of action potentials impinging on a neuron.
62.10. Describe synaptic neurodegeneration as it pertains to (1) amyotrophic lateral sclerosis and (2) Alzheimer's dementia.

63. Skeletal Muscle Physiology I; *MK*

63.1. Draw and label a skeletal muscle at all anatomical levels, from the whole muscle to the molecular components of the sarcomere. At the sarcomere level, include at least two different stages of myofilament overlap.
63.2. Draw a myosin molecule and label the subunits (heavy chains, light chains) and describe the function of the subunits.
63.3. Diagram the structure of the thick and thin myofilaments and label the constituent proteins.
63.4. Diagram the chemical and mechanical steps in the cross-bridge cycle, and explain how the crossbridge cycle results in shortening of the muscle.
63.5. Identify the multiple sources, localization, and roles of calcium in muscle contraction and relaxation.
63.6. Describe the roles of ATP in skeletal muscle contraction and relaxation.
63.7. Describe the role of the myosin crossbridges acting in parallel to determine active force and the rate of crossbridge recycling to determine muscle speed of shortening and rate of ATP utilization during contraction.
63.8. Differentiate between an isometric and isotonic contraction.
63.9. Draw and interpret the length versus force diagram for muscle and label the three lines that represent passive (resting), active, and total force. Describe the molecular origin of these forces in the three muscle types.
63.10. Describe the relationship of the myosin-thick filament bare zone to the shape of the active length:force relationship.
63.11. Draw and interpret force versus velocity relationships for two skeletal muscles of equal maximum force generating capacity but of different maximum velocities of shortening.
63.12. List the energy sources of muscle contraction and rank the sources with respect to their relative speed and capacity to supply ATP for contraction and how they are different in the three muscle types.
63.13. Construct a table and explain the similarities and differeneces of structural, enzymatic, and functional features of the three major categories (fast-glycolytic, fast-oxidative-glycolytic, and slow-oxidative fiber types) of skeletal muscle fiber types and their relative plasticity.

64. Skeletal Muscle Physiology II; *MK*

64.1. *See previous session.*

65. Smooth Muscle Physiology; *MK*

65.1. Describe the differences in actomyosin regulation of, respectively, smooth and skeletal muscle and indicate the structural similarities and dissimilarities in their respective contractile units.

65.2. Explain why smooth muscles can develop and maintain force with a much lower rate of ATP hydrolysis than skeletal muscle.

65.3. Differentiate between muscle relaxation from the contracted state and the phenomenon of stress relaxation and give examples of each process.

65.4. Diagram the intracellular pathways that control contraction and relaxation in smooth muscle.

65.5. Differentiate between electromechanical coupling and pharmacomechanical coupling.

65.6. Describe the distinguishing characteristics of multi-unit and unitary smooth muscles.

65.7. Describe the mechanisms responsible for myofilament calcium sensitization and desensitization.

66. Cardiac Muscle Physiology; *MK*

66.1. State the steps in excitation-contraction coupling in cardiac muscle. Outline the sequence of events that occurs between the initiation of an action potential in a cardiac muscle cell and the resulting contraction and then relaxation of that cell. Provide specific details about the special role of Ca2+ in the control of contraction and relaxation of cardiac muscle.

66.2. Compare cardiac and skeletal muscle with respect to: cell size, electrical connections between cells, and arrangement of myofilaments. Based on ion permeability and electrical resistance describe role of gap junctions in creating a functional syncytium.

66.3. Identify the role of extracellular calcium in cardiac muscle contraction. Identify other sources of calcium that mediate excitation-contraction coupling, and describe how intracellular calcium concentration modulates the strength of cardiac muscle contraction.

66.4. Describe the role of Starling's Law of the Heart in keeping the output of the left and right ventricles equal.

66.5. Describe the difference in the way changes in preload and changes in contractility influence ventricular force development. Compare the energetic consequences of these two separate.

67-68. TBL; *MK*

69. Principles of Microbiology & Infectious Disease; *MK*

69.1. Assess the number one cause of death by disease in the United States, the world, and Arkansas.

69.2. Differentiate the terms: incidence, prevalence, outbreak, epidemic, and pandemic.

69.3. Differentiate categories of symbiosis (commensalism, mutualism, and parasitism) and explain why their definitions are not absolute.

69.4. Differentiate between modes of direct, indirect, vehicle, and vector associated transmission.

69.5. Define accuracy and precision.

69.6. Interpret a 2x2 table containing true positive (TP), true negative (TN), false positive (FP) and false negative (FN) data; identify which is impacted most by disease prevalence.

69.7. Explain the significance of SPPIN and SNNOUT.

70. Bacteria – Introduction; *MK*

70.1. Differentiate Gram-positive and Gram-negative bacteria in terms of major cell wall components, the number of layers (membrane, wall, etc.), the presence or absence of teichoic acid, and the presence or absence of LPS.

70.2. Identify the component of LPS that is endotoxin, what triggers its release, and its effect on the body; recall the one Gram-positive organism that contains an LPS-like molecule.

70.3. Identify attributes associated with atypical membrane structure.

70.4. Identify the major components of a typical bacterial cell wall and identify the genus of bacteria with non-typical cell wall organization.

70.5. Interpret the mnemonic 'Some Pretty Bad Killers Have Pretty Nice Shiny Capsules' and what these organisms have in common.

70.6. Assess the roles that unique external structures, cytoplasmic structures, and endospores have in bacteria.
70.7. Identify the terms that describe temperature tolerance and aerotolerance.
70.8. Differentiate the strict aerobes and anaerobes discussed in class via Gram-stain, morphology, and colony characteristics.
70.9. Identify attributes of a bacterial growth curve.
70.10. Identify the growth phase where antimicrobial agents are most effective.

71. Intro to the Immune System; *MK*

71.1. Explain the basic principles of the immune system as they relate to effective immune function
71.2. Recognize the importance of the immune system in maintaining homeostasis, the prevention of immunopathologies, elimination of threats to the body, and the response to vaccination
71.3. Compare the innate and adaptive arms of the immune system, including key structures, cells, molecules and processes, and the time course of the responses
71.4. Compare primary and secondary immune responses
71.5. Define immunization and its goals, including the concept of herd immunity, active and passive immunization, natural and artificial immunization, and provide examples of each
71.6. Review and explain key methods utilized for detection of antibodies and antigens

72. Microbial Virulence Factors; *MK*

72.1. List bacteria that form capsules
72.2. Identify which capsules are not composed of polysaccharide and the fungi that produces a capsule.
72.3. Describe the attributes of a microbe that contribute to invasiveness.
72.4. Compare/contrast LPS and LOS in terms of source and biological activity; identify the component that is endotoxin.
72.5. Describe the function of siderophores.
72.6. Differentiate endotoxin from exotoxin and identify the mechanisms associated with each that harm the host during infection.
72.7. Describe A-B toxin structure/function
72.8. Describe β pore forming toxin structure/function.
72.9. Discuss the utilization of A-B toxins and pore forming toxins in disease
72.10. Compare disease outcomes between bacteria that use toxins as primary virulence factors.
72.11. Describe the mechanism of action and patient presentation of a patient exposed to superantigen toxins including Toxic Shock Syndrome Toxin-1 (TSST-1).

73. Gram Positive Cocci I; *MK*

73.1. Describe the Gram stain morphology of staphylococci and streptococci.
73.2. Identify Gram-positive cocci when given the results of the biochemical tests discussed in class.
73.3. Compare and contrast the pathogenesis of *Sta. aureus* and *Sta. epidermidis*.
73.4. Describe *Sta. aureus* virulence factors including: protein A, exfoliatin, enterotoxin, toxic shock syndrome toxin (TSST), and Panton-Valentine leukocidin.
73.5. Describe staphylococcal food poisoning.
73.6. Differentiate staphylococcal toxic shock syndrome from most other causes of sepsis.
73.7. Identify which of the following skin infections: cellulitis; folliculitis, furuncles, and carbuncles; impetigo; erysipelas; scalded skin syndrome; and necrotizing fasciitis are caused by *Sta. aureus*, Grp. A strep, or both.
73.8. Explain why antimicrobial treatment for cellulitis should not only cover Grp A strep.
73.9. Explain how acute endocarditis differs from subacute endocarditis; identify the organism(s) most often associated with each.
73.10. Identify the most common cause of osteomyelitis in children with sickle cell anemia.

73.11. List the serious illnesses that may result from untreated strep throat
73.12. Match the exotoxins of group A strep with their mechanisms of action.
73.13. Identify the most common cause of pneumonia in adults and otitis media in children.
73.14. Identify what procedure needs to be performed first when a blood culture is positive for *Str. gallolyticus/bovis*.

74. Gram Positive Cocci II; *MK*
74.1. *See previous session*.

75. Gram Positive Bacilli I; *MK*
75.1. Compare and contrast *Actinomyces* and *Nocardia* in terms of common sites of infection, cell structure, oxygen status, acid-fastness and the presence or absence of sulfur granules.
75.2. Identify the foods commonly associated with transmission of *Listeria*
75.3. Explain why infection with *Listeria* during pregnancy is a significant concern.
75.4. Assess *Listeria* related meningitis.
75.5. Identify the bacterial agents and symptoms associated with Anthrax, Reheated Rice Syndrome, Diphtheria, Botulism, Tetanus, Gas gangrene, Pseudomembranous colitis.
75.6. Identify which *B. anthracis* plasmid (pXO1 or pXO2) encodes for the capsule and virulence factors; state the function of the virulence factors and identify the unique characteristic of the *B. anthracis* capsule.
75.7. Differentiate the mechanisms of action and disease presentation of tetanus toxin and botulinum toxin.

76. Gram Positive Bacilli II; *MK*
76.1. *See previous session.*

77. Gram Negative Bacilli I; *MK*
77.1. Identify where Enterobacteriaceae normally reside.
77.2. Describe the appearance of lactose fermenters on MacConkey agar.
77.3. Identify the rapid lactose fermenters and slow lactose fermenters.
77.4. Describe *Pseudomonas aeruginosa* including: the oxidase reactivity, odor, and lactose utilization.
77.5. Specifically address the appearance of *P. aeruginosa* on MacConkey agar, explain why it is notorious, and decipher the mnemonic 'BE PSEUDO'.
77.6. Match commonly encountered GNRs with the following attributes: a red pigment, rapidly forms purple colonies on MacConkey agar, smells like grapes, swarmer, currant jelly sputum, rose spots.
77.7. Differentiate the anaerobic GNRs discussed in class; identify which target the throat, and which is most likely to involve the abdomen.
77.8. Describe Lemierre's syndrome.
77.9. Describe the classical presentation of *Salmonella* serovar *typhi* and describe typhoid differs from non-typhoidal strains of *Salmonella*.
77.10. Identify the significance of *E. coli's* O, H and K antigens
77.11. Explain how EHEC and EIEC differ from EPEC and ETEC.
77.12. Describe *E. coli* O157:H7 and the triad of symptoms associated with hemolytic uremic syndrome.
77.13. Identify which of the GNRs discussed in class is expected to yield a positive fecal leukocyte test.
77.14. Differentiate *Campylobacter*, *Vibrio cholerae* and *Yersinia enterocolitica* in terms of source and presentation.
77.15. Describe Guillain-Barre in terms of pathology, presentation, and CSF findings; assess which Gram-negative rods can proceed to Guillain-Barre.

78. Gram Negative Bacilli II; *MK*

78.1. *See previous session.*

79. Other Gram Negatives & Mycoplasmataceae; *MK*

79.1. Differentiate Neisseria meningitidis and N. gonorrhoeae in terms of diseases they cause, the presence or absence of a significant capsule, and utilization of glucose and maltose.
79.2. Compare/contrast LOS and LPS; recall the #1 cause of septic arthritis in a sexually active person, explain how a person can be re-infected with gonorrhea and identify its selective agar as discussed.
79.3. Explain why *Moraxella* can be confused with *Neisseria* and how it can be differentiated from Neisseria.
79.4. identify the 3 leading *Moraxella*-related illnesses.
79.5. Assess *Chlamydia*, describe how the cell wall differs from other Gram-negative organisms and list the illnesses caused by serotypes A-C; D-K; and L1-L3.
79.6. Differentiate elementary bodies from reticulate bodies and identify which is visualized using a Giemsa stain.
79.7. Identify the #1 cause of reactive arthritis (Reiter's Syndrome) and its classical triad of symptoms.
79.8. Differentiate the chancre and degree of lymphadenopathy caused by syphilis, lymphogranuloma, and *H. ducreyi.*
79.9. Assess *Haemophilus influenzae* B (HiB); recall the growth factors required by HiB, describe the presentation of epiglottitis.
79.10. Identify the components of the Hib vaccine and explain why the Hib vaccine doesn't protect against Hib-induced otitis media.
79.11. Describe the classical presentation of Legionnaire's disease, how it is transmitted and the preferred stain and growth media for *Legionella*.
79.12. Identify the organism that causes whooping cough and describe its classical presentation.

80. Hospital Acquired Infections; *MK*

80.1. Evaluate the etiology of selected catheter-associated urinary tract infections.
80.2. Evaluate the etiology of selected central line-associated bloodstream infections.
80.3. Evaluate the etiology of selected ventilator-associated pneumonias.
80.4. Evaluate the etiology of hospital acquired pneumonias.
80.5. Evaluate the etiology of *Clostridioides difficile* infection.

81. Zoonotic I; *MK*

81.1. Review malaria and babesia in terms of their vectors, why they are often confused, and which is most likely to be encountered in the US today.
81.2. Differentiate Ehrlichia and Anaplasma in terms of the wbc type that contains the morula of each and recall which is transmitted by the same vector as Babesiosis and Lyme disease.
81.3. Match the organism, disease name, and animal vector responsible for Bartonellosis, Brucellosis, Psittacosis, Q Fever, Tularemia, Pasteurellosis.
81.3.1. Describe the typical exposure and presentation of a patient.
81.4. Match the pathogens, vector, and illness name for the three rickettsia's discussed in class.
81.5. List the triad of symptoms caused by rocky mountain spotted fever.
81.6. Assess attributes of *Y. pestis* virulence, mechanisms of transmission, and the vector.
81.6.1. Describe a Bubo.

82. Zoonotic II; *MK*

82.1. *See previous session*.

83-84. TBL; *MK*

85. Spirochetes; *MK*

85.1. Compare and contrast the 3 genera of spirochetes discussed in class and which can be visualized with Giemsa stain or Gram's stain.
85.2. Identify the spirochete that can only be visualized with dark field microscopy.
85.3. Identify the vector for Lyme disease and the time needed to cause infection.
85.4. Name and recognize the classical rash associated with Lyme disease.
85.5. Predict the most likely type of cardiac event that can occur in secondary Lyme disease.
85.6. Differentiate the organisms that cause endemic and epidemic relapsing fever including which occur in the US, and mode of transmission; explain why the fever is relapsing.
85.7. Describe how leptospirosis is transmitted and explain the significance of conjunctival suffusion.
85.8. Explain the significance of Weil's disease.
85.9. Identify the 3 stages of untreated syphilis and the significance of chancres, a palmer rash, gummas, and Argyll-Robertson (AR) pupils.
85.10. Differentiate between RPR/VDRL and FTA-ABS tests in terms of which is most sensitive and specific for syphilis.
85.11. Explain why a Jarish-Herxheimer reaction occurs, when it is most often observed, and how it is treated.

86. Mycobacteria; *MK*

86.1. Recall the lipid substance unique to mycobacteria that confers "acid-fastness" and interpret an acid-fast smear.
86.2. Explain how *M. tb* can overcome phagocytosis.
86.3. Differentiate primary and secondary tuberculosis in terms of localization and the significance of a Ghon complex.
86.4. Differentiate the TB skin test, IFN-gamma Release Assay, and QuantiFERON gold tests in terms of how each is performed and interpreted and if vaccination with BCG may cause a false positive TB test.
86.5. Identify the hypersensitivity reaction associated with tuberculosis
86.6. List the key cells involved in formation of a granuloma and/or a positive TB skin test.
86.7. Identify the two mycobacteria species discussed in class that form Mycobacterium avium complex (MAC) and identify the CD4 threshold that puts someone with HIV at risk of MAC infection.
86.8. Explain why MAC is seldomly confused with TB.
86.9. Differentiate lepromatous and tuberculoid leprosy in terms of severity of disease, the presence or absence of granulomas, and explain why culture is not used to diagnose leprosy.
86.10. Identify an animal reservoir for leprosy.

87. Mechanisms & Impact of Multidrug Resistance; *MK*

87.1. Discuss the virulence attributes that contribute to multi-drug resistance.
87.2. Describe the unique drug resistance attributes associated with selected organisms of concern.
87.3. Assess the impact antimicrobial resistance has on patient outcomes and patient care.
87.4. Identify organisms that are current and future concerns due to the increased prevalence of drug resistant isolates.

88. Intro to Viruses; *MK*

88.1. Describe viral diversity factors, including structural and nucleic acid diversity
88.2. Describe factors used for viral classification
88.3. Compare and contrast nucleic acid types and structures, and life cycles of different types of viruses
88.4. Compare how the different virus types produce mRNA
88.5. Interpret patterns of viral replication and explain cellular effects of viral infection

88.6. Describe the role of select viruses in causing cancer
88.7. Explain the methods for clinical identification of viruses and diagnosis of viral diseases
88.8. Identify how selected viral diseases differentially affect different populations

89. DNA Viruses I; *MK*
89.1. Recognize the life cycles of DNA viruses
89.2. Identify families and major characteristics of DNA viruses
89.3. Describe, compare, and differentiate the clinical presentation, epidemiology and transmission of the DNA viruses, including those that cause cancer
89.4. Describe the diagnosis, prevention and treatment of DNA viruses and viral diseases, including any available vaccines, the nature of the vaccine, and administration timing, as well as physical measures to prevent infection and pharmaceutical interventions as mentioned in class
89.5. Identify how selected viral diseases differentially affect different populations-comprehension

90. DNA Viruses II; *MK*
90.1. *See previous session.*

91. RNA Negative-Sense Virus; *MK*
91.1. Recognize the life cycles of -ssRNA viruses
91.2. Identify families and major characteristics of -ssRNA viruses-comprehension
91.3. Describe, compare, and differentiate the clinical presentation, epidemiology and transmission of the -ssRNA viruses-analysis
91.4. Describe the diagnosis, prevention and treatment of -ssRNA viruses and viral diseases, including any available vaccines, the nature of the vaccine, and administration timing, as well as physical measures to prevent infection and pharmaceutical interventions as mentioned in class-comprehension
91.5. Describe the significance of RNA-dependent RNA polymerase-comprehension
91.6. Identify how selected viral diseases differentially affect different populations-comprehension

92. Positive Sense ssRNA Viruses and dsRNA Viruses I; *MK*
92.1. Recognize the life cycles of +ssRNA viruses and dsRNA viruses
92.2. Identify families and major characteristics of +ssRNA viruses and dsRNA viruses
92.3. Describe, compare, and differentiate the clinical presentation, epidemiology and transmission of the +ssRNA viruses and dsRNA viruses
92.4. Describe the diagnosis, prevention and treatment of +ssRNA viruses and dsRNA viruses and viral diseases, including any available vaccines, as well as physical measures to prevent infection and pharmaceutical interventions as mentioned in class
92.5. Describe the significance of RNA-dependent RNA polymerase and reverse transcriptase
92.6. Identify how selected viral diseases differentially affect different populations

93. Positive Sense ssRNA Viruses & dsRNA Viruses II; *MK*
93.1. *See previous session.*

94. Emerging Infectious Diseases; *MK*
94.1. Describe what emerging and re-emerging infectious diseases are
94.2. Differentiate, compare and contrast current emerging and re-emerging infectious diseases; describe their significance, importance, and factors that contribute to emergence/re-emergence
94.3. Describe the clinical presentation, laboratory identification, prevention and treatment of discussed organisms and diseases
94.4. Identify the disproportionate effects of emerging and re-emerging infectious diseases on minority populations

95. Introduction to Fungi, & Primary, Endemic & Opportunistic Fungal Pathogens I; *MK*
- 95.1. Differentiate and compare fungi and bacteria
- 95.2. Recall the definitions of a yeast, mold, and dimorphic fungi
- 95.3. Recall fungal cell membrane and cell wall compositions
- 95.4. Compare and contrast the mechanisms of action of selected antifungal drugs, and explain their potential significant toxicity
- 95.5. Differentiate and assess selected primary and opportunistic fungal pathogens and the diseases caused by each
- 95.6. Describe the disproportionate effects of fungal diseases on minority populations

96. Introduction to Fungi, & Primary, Endemic & Opportunistic Fungal Pathogens II; *MK*
- 96.1. *See previous session*.

97. Parasites I; *MK*
- 97.1. Identify the general characteristics of phylum Protista.
- 97.2. Differentiate cysts and trophozoites in terms of motility, metabolic activity, and ability to reproduce.
- 97.3. Differentiate the symptoms of diarrheal illness caused by *Entamoeba histolytica*, *Giardia* lamblia, and *Cryptosporidium parvum.*
- 97.4. Recall which protozoa are diagnosed using a blood or bone marrow smear.
- 97.5. Interpret a modified acid-fast stain of a fecal ova and parasite exam to differentiate *Giardia*, *Cryptosporidium* and *Cyclospora*.
- 97.6. Differentiate babesiosis, leishmaniasis, and malaria in terms of vectors and symptoms; explain why *Plasmodium falciparum* is a medical emergency and why its fever cycle is unpredictable.
- 97.7. Recall the significance of a “banana-shaped gametocyte”.
- 97.8. Recall the protozoa that is commonly confused with malaria.
- 97.9. Describe how a person is infected with *Naegleria* and why it is lethal.
- 97.10. Compare and contrast African vs South American trypanosomiasis in terms of the organism's name, geography, vector, and common presentations.
- 97.11. Identify the toxoplasmosis definitive host and discuss the risks toxoplasmosis poses to a developing fetus.

98. Parasites II; *MK*
- 98.1. Recall the helminths that enter via the skin and those that make their way to the lungs.
- 98.2. Explain why *Taenia solium is* worse than *T. saginata*.
- 98.3. Differentiate taeniasis vs cysticercosis.
- 98.4. Identify a fluke that causes gallbladder cancer and one that causes bladder cancer.
- 98.5. Explain how *Diphyllobothrium latum* can cause macrocytic anemia.
- 98.6. Identify the organism(s) that cause lymphatic filariasis.
- 98.7. Differentiate *Loa loa* and *Onchocerca volvulus* in terms of their respective vectors, clinical presentation, and likelihood of causing vision loss.
- 98.8. Describe the treatment for *Dracunculus medininsis*.

99. Parasites III; *MK*
- 99.1. *See previous session*.

100. Microbiology Lab Diagnostics: Culture & Sensitivity; *MK*
- 100.1. Describe the limitations of bacterial culture including time to results, growth requirements, and culture requirements for bacteria, viruses, and fungi.
- 100.2. Differentiate minimal inhibitory concentration (MIC) and minimal bactericidal concentration (MBC).
- 100.3. Describe the Kirby-Bauer MIC method.
- 100.4. Identify the criteria for obtaining optimal blood culture results.

100.5. Explain the rationale for drawing blood cultures distal to a port.
100.6. Identify the most likely blood culture contaminant.
100.7. Explain the primary utility of blood agar (BA), mannitol salt agar (MSA), MacConkey agar (Mac), and chocolate agar (CHOC).
100.8. Describe how BA differentiates alpha, beta, and gamma hemolysis.
100.9. Describe how MSA differentiates *Sta. aureus* from coagulase negative staphylococci.
100.10. Describe how MAC Differentiate lactose fermenters from non-fermenters; recall the #1 lactose fermenter.
100.11. Differentiate *Sta. aureus* from *Sta. epidermidis*, and *Str. pyogenes* (GAS) from *Str. agalactiae* (GBS) when provided hemolysis results, a gram-stain, catalase activity, coagulase activity, bacitracin sensitivity, CAMP results, or optochin sensitivity

101. The Global Burden of Infectious Disease; *MK*
101.1. Identify the relationship between DALY, morbidity, and mortality.
101.2. Assess the significance of the global burden of infectious disease, the impact of vaccine preventable disease, and antibiotic resistance using DALY.
101.3. Compare the etiology and epidemiology of the 7th cholera pandemic, Ebola, and MERS.
101.4. Assess the impact of respiratory and diarrheal diseases between nations with high and low sociodemographic indexes.

102. Integrated Clinical Biochemistry I; *MK*
102.1. TBD

103. Integrated Clinical Biochemistry II; *MK*
103.1. TBD

104. Integrated Clinical Biochemistry III; *MK*
104.1. TBD

105-106. TBL; *MK*

ARKANSAS COLLEGE OF
OSTEOPATHIC MEDICINE

Course Name: Capstone-1
Class of/Semester/Year: 2027/Fall/2023
Date Last Revised: June 18, 2024

Approved By: Shannon Ramsey Jimenez

Shannon Ramsey Jimenez, DO
Dean of ARCOM

Note: Final Approval. May be released to students. Schedule subject to change with advance notice.

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ARKANSAS COLLEGE OF OSTEOPATHIC MEDICINE

Arkansas Colleges of Health Education
Course Syllabus

Course Name:	Capstone-1
Class of/Semester/Year:	Class of 2028/Fall 2024
Course Designation:	COM 532
Term Dates:	July 19, 2024 – December 6, 2024
Course Dates:	July 19, 2023 – December 3, 2024
Total Contact Hours:	11 Lecture Hours, 2 Lab Hours
Credit Hours:	1 Credit Hours
Assessment/Grading:	Point System
Location:	Lecture Hall 2, OMM Lab, TBL Rooms, TEAMS
Course Director:	Jeanne Rupert, DO PhD
Office Hours:	By appointment

Syllabus is subject to change.

ARKANSAS COLLEGE OF OSTEOPATHIC MEDICINE

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ARKANSAS COLLEGE OF OSTEOPATHIC MEDICINE

Course Description:
The Capstone-1 course introduces students to skills necessary to be successful in medical school and as physicians. It includes topics such as learning strategies, resources use and evaluation, professionalism, and professional identity development. It includes obtaining certifications necessary for participating in patient care and an early clinical experience where students will interact with patients in the first semester.

Course Goals:
The following course goals reflect broad and enduring knowledge, skills, behaviors, and responsibilities that students should attain as a result of successfully completing the course:

1. Learn more about campus resources.
2. Gain a deeper understanding of the professional responsibilities of a physician.
3. Learn about the ethical obligations of a physician.
4. Develop skills of effective communication.
5. Learn ways to discuss difficult topics with a variety of people.
6. Learn about how research informs osteopathic medical practice, and how students might participate.
7. Obtain certifications necessary to safely participate in patient care.
8. Participate in early clinical experience to practice professional communication and demeanor skills, improve confidence, and serve our community.

Course Expectations and Student Responsibilities:
Students should refer to the ARCOM Student Handbook & Clinical Training Manual, as well as the ACHE Student Handbook and ACHE Course Catalog for information regarding professional standards, acceptable conduct, dress code, and program requirements.

Video Capture of Educational Content:
Consistent with the policies surrounding video capture and posting of educational content, recordings of any learning activity are considered a supplemental resource to advance student understanding and for reference at future stages of student education. Recorded materials should not be utilized to replace attendance in the classroom, laboratory, or clinical setting. ARCOM makes no guarantees of reliability for video capture and reserves the right to not allow the recording of learning activities. There is no substitute for class attendance, being actively engaged in the learning process, investing in the comprehension and application of course material, and interacting with instructors and colleagues. Becoming an osteopathic physician involves much more than the acquisition of knowledge and attainment of a professional title. Professionalism, ethics, problem solving, and communication are among the vital skills that are best developed in active and interactive settings. As such, ARCOM expects students to attend all learning activities and offers no guarantees or warranties as to the recording of educational classroom/laboratory content. There will be no video capture of in-class applications team-based learning (TBL), Foundations of Osteopathic Patient Care (FOPC), or Osteopathic Principles and Practice (OPP). Students are not permitted to render any audio and/or visual recordings of these in-class sessions.

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- Students will conduct themselves professionally at all times, during all educational activities conducted on or off campus. This includes interactions with all faculty, staff, students, clinical faculty, guest lecturers, health care providers, patients, and any other member of the ARCOM community. Unprofessional behavior, conduct, or attire inconsistent with the ARCOM dress code will not be tolerated and will result in administrative action. Students aredirected to the ARCOM Student Handbook & Academic Catalog for a full definition of professionalism and list of expected professional behaviors.
- Any unauthorized recording of learning materials and activities used in connection with the ARCOM curriculum or reproduction, rendering, possession, or dissemination of these materials including assessment materials, is considered unprofessional behavior and a violation of copyright. Such behavior is subject to action by the Student Conduct Committee(SCC) for disciplinary action, which may include receiving a grade of "zero" for a graded assessment, course failure, probationary action, suspension, or dismissal from ARCOM.
- Computers, tablets, or notebooks should only be used during lectures to take notes or reference appropriate class topics and reference materials. Students should not be on the internet viewing social media sites, performing online shopping, or playing games, etc. Thisis disrespectful to the lecturer, inhibits peer learning, and is unprofessional behavior.

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ACHE is committed to a campus environment that is inclusive, safe, and respectful for all persons, and fosters an environment free of harassment and discrimination. To that end, all course activities will be conducted in an atmosphere of friendly participation and interaction among colleagues, recognizing and appreciating the unique experiences, background, and point of view each student brings. Students are expected at all times to apply the highest academic standards to this course and to treat others with dignity and respect.

Attendance Policy:

Osteopathic medical education prepares students for professional clinical practice. Lectures and labs include didactic material, case presentations, patient demonstrations, informal discussions, team-based learning, and the practice of psychomotor skills. Consistent and prompt class attendance is essential for the learner to benefit from the full educational experience.
Therefore, ARCOM Faculty have adopted the following attendance policy:

1. Attendance at all lecture sessions within a given course is strongly encouraged, but not required.
2. Attendance is required for all guest lecturers and team-based learning experiences. A pattern of absenteeism or tardiness for these sessions is considered unprofessional behavior and may result in a referral for disciplinary action for violations of the ACHE Student Code of Conduct consistent with the ACHE Student Misconduct Policy.
3. Since laboratory sessions are designed to develop the clinical and psychomotor skills necessary for success as an osteopathic physician, students are expected to attend all laboratory sessions (as outlined in the course syllabus) and all lectures tied to labs. If, for any reason, a student misses more than 10% of these required sessions for a given course, the student will receive 1% decrease in final average for each percentage missed over 10%.

   Example: A course with 20 laboratory sessions.

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4. All simulated events, including standardized patient encounters, simulated patient encounters, and skills events are required, and an absence or tardiness will result in the loss of additional 2% of the final percentage per simulated event, or as otherwise stated by the course director.
5. This attendance policy does not override any assignments that require attendance to perform. Therefore, if a student misses an event that requires an assignment to be submitted based on the educational experience, the student will lose points for not successfully completing the assignment.
6. If a student misses an exam, he/she will receive a grade of zero. A make-up exam will only be administered on a case-by-case basis with the approval of the course director and/or the Dean of ARCOM.
7. Students considered academically "at-risk" may be held to a separate attendance policy administered by the Office of Academic Affairs.
8. Students must be physically present to receive credit for attendance. Virtual attendance of lectures does not count as in-person attendance.
9. Students must refer to the Outlook Live calendar for all course schedules and changes.
10. Students are responsible for all missed learning material/experiences.
11. As it is not possible to replicate lab experiences, faculty members are not obligated to provide makeup learning experiences.
12. There are no excused absences; however, extenuating circumstances (e.g. serious illness/injury, etc.) may be addressed on a case-by-case basis by the ARCOM Dean.
13. Absence from class to attend professional events, such as a state or national conference, may be approved on a case-by-case basis by the ARCOM Dean.
14. Absence from class due to planned events of a personal nature are not excused absences.
15. A pattern of tardiness is unacceptable. While Faculty understand there may be unavoidable instances, tardiness will not be tolerated on exam days or when guest speakers are in attendance. Admittance to the classroom may be prohibited and, in that circumstance, the student would be marked as absent.

This attendance policy will be strictly adhered to. It is expected that students will use good judgment when being absent, only doing so rarely and for legitimate or necessary reasons.

Course Faculty:

Faculty Member	Office	Phone	Email
Jeanne Rupert, DO PhD	219	479-308-2342	Jeanne.Rupert@achehealth.edu
Monica Rojas, MD	211	479-308-2343	Monica.Rojas@achehealth.edu
Louay Nassri, MD	216	479-308-2324	Louay.Nassri@achehealth.edu
Connie Manning, MLIS	107	479-308-2310	Connie.Manning@achehealth.edu
Zahra Kamarei, MLS	105	479-308-2303	Zahra.Kamarei@achehealth.edu
Ken Hensley, PhD	281	479-308-2361	Kenneth.Hensley@achehealth.edu

Faculty Office Hours:

While faculty maintain an open-door policy, **it is strongly recommended that a student in need of a faculty member's time and attention reserve an appointment directly via e-mail** or telephone communication with the faculty member.

Required Course Resources:

Title	Edition	Authors	ISBN-13
Carelearning Modules: 1. OSHA BBP Certification 2. HIPPA Certification			

Osteopathic Core Competencies:

The faculty and administration of ARCOM attest that Osteopathic Core Competencies are met in this course.

1. **Osteopathic Philosophy/Osteopathic Manipulative Medicine (OPP/OMM):** Demonstrate and apply knowledge of accepted standards in osteopathic manipulative treatment appropriate to the specialty. Remain dedicated to life-long learning and to practice habits in osteopathic philosophy and OMM.
2. **Medical Knowledge (MK):** Demonstrate and apply knowledge of accepted standards of clinical medicine in the respective area; remain current with new developments in medicine and participate in life-long learning activities.
3. **Patient Care (PC):** Demonstrate the ability to effectively treat patients and provide medical care that incorporates the osteopathic philosophy, patient empathy, awareness of behavioral issues, the incorporation of preventive medicine and health promotion.
4. **Interpersonal and Communication Skills (ICS):** Demonstrate interpersonal and communication skills that enable a physician to establish and maintain professional relationships with patients, families, and other members of health care teams.
5. **Professionalism (PRO):** Uphold the Osteopathic Oath in the conduct of one's professional activities that promotes advocacy of patient welfare, adherence to ethical principles, and collaboration with health professionals, life-long learning, and sensitivity to a diverse patient population; be cognizant of physical and mental health in order to effectively care for patients.
6. **Practice-Based Learning and Improvement (PBL):** Demonstrate the ability to critically evaluate methods of clinical practice; integrate evidence-based medicine into patient care; show an understanding of research methods; improve patient care practices.
7. **Systems-Based Practice (SBP):** Demonstrate an understanding of health care delivery systems; provide effective and qualitative patient care with the system; and practice cost effective medicine.

Grading Information:

Grading point values and scale are consistent with policies outlined in the ARCOM Student Handbook & ACHE Course Catalog. Students will receive a numerical grade (percentage) at the end of the course with 70% or greater required to pass.

Students are required to pass all components of each course with a C (70%) or better to progress to the next semester. To receive a 70% or better, a student must complete all requirements of the course as defined in the syllabus.

Grade Determination and Scheduled Assignments:

Date	Assessment (CC)	Percentage of Final Grade	points out of 100
Friday, July 26, 2024	Personal Study Plan	10%	**10**
Friday, July 26, 2024	Resource Finding Assignment	10%	**10**
Friday, August 16, 2024	Communication Worksheet 1	10%	**10**

ARKANSAS COLLEGE OF OSTEOPATHIC MEDICINE

Friday, August 23, 2024	Communication Worksheet 2	10%	**10**
Friday, September 6, 2024	OSHA BBP Certification	10%	**10**
Friday, September 6, 2024	HIPPA Certification	10%	**10**
Tuesday, December 3, 2024	Communication Worksheet 3	10%	**10**
Tuesday, December 3, 2024	Clinical Experience	30%	**30**
TOTAL:		**100%**	**100**

Examinations:
There will be no examinations. The OSHA and HIPPA assignments, and Clinical Experience are graded as Pass/Fail. The Learning Plan Assignment, Resource Finding Assignment, and Communication Worksheets are graded numerically.

TBL Modules:
TBLs may be used at the discretion of the course directors or speakers.

Remediation:
If approved for remediation, remediation will be a written assignment accessing a clinically relevant topic in current medicine, assigned by the course director.

Course content, sequencing, grading, and examination policies are subject to change by administration with the approval the Curriculum Committee. Students will be given advanced notice of any substantive changes by email and the ARCOM portal.

Capstone-1 Course Schedule:
Refer to the OUTLOOK Student Calendar for official (up to date) schedule

Day	Date	Time	Session #	Title	Instructor
Fri	Jul 19	4 PM	1	Intro to Course & Learning Plan Assignment	Rupert
Thu	Jul 25	9 AM	2	Finding Resources & the Medical Literature using the Library	Manning/ Kamarei
Thu	Aug 1	11 AM	3	Defining Professionalism	Rupert
Wed	Aug 7	9 AM	4	Professionalism in Clinical Settings	Rupert/TBD
Thu	Aug 15	11 AM	5	Introduction to Medical Ethics	TBD
Fri	Aug 23	11 AM	6	Ethics with Special Populations	Nassri/ Rojas/ Rupert
Wed	Aug 28	9 AM	7	Language in Medicine	Rupert
Fri	Sep 6	1 PM	8	Panel: Discussing Race/Culture with Colleagues & Patients	Nassri/ Rojas/TBD
Wed	Sep 11	4 PM	9	Overview of Research Studies-*Asynchronous*	Hensley
Wed	Sep 18	9 AM	10	Patient-Centered Outcomes Research	Rupert
Thu	Sep 26	9 AM	11	Research Opportunities Summer 2025 & Beyond	TBD

Fri	Oct 4	9 AM	12	Blood/Body-Fluid & Airborne Pathogens- *Homework*	Rupert
Thu	Oct 10	8 AM	13	HIPPA - *Homework*	Rupert
Thu	Oct 17	9 AM	14	Clinical Experience- *Due Date 12/3*	Rupert
Fri	Oct 25	1 PM		Clinical Experience- *Asynchronous*	Rupert
Wed	Oct 30	9 AM		Clinical Experience- *Asynchronous*	Rupert
Thu	Nov 7	8 AM		Clinical Experience- *Asynchronous*	Rupert
Wed	Nov 13	8 AM		Clinical Experience- *Asynchronous*	Rupert
Tue	Nov 19	9 AM		Clinical Experience- *Asynchronous*	Rupert
Wed	Nov 27	8 AM		Clinical Experience- *Asynchronous*	Rupert
Tue	Dec 3	2 PM		Clinical Experience- Due	Rupert

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Appendix:

Capstone-1 Fall 2024 Learning Objectives with *Core Competency*:

(Any changes to the learning objectives will reflect on lecturers presentation slide)

1. **Intro to Course & Learning Plan Assignment;** *MK, PC, ICS, PRO*
   - 1.1. Discuss study styles.
   - 1.2. Investigate best practice for personal study needs.
   - 1.3. Create a personal study plan.
2. **Finding Resources & the Medical Literature using the Library;** *MK, PC, ICS, PRO*
   - 2.1. Demonstrate to find resources, including journal articles, books, databases, review q-banks.
   - 2.2. Discuss how to acquire resources via interlibrary loan.
   - 2.3. Distinguish why it is better to utilize library resources over search engines like Google.
3. **Defining Professionalism;** *PC, ICS, PRO*
   - 3.1. Discuss social definitions of professional behavior.
   - 3.2. Describe how generational differences affect views on professionalism.
   - 3.3. Explain special considerations related to the Internet and social media.
4. **Professionalism in Clinical Settings;** *PC, ICS, PRO*
   - 4.1. Recognize the role of a physician in the community.
   - 4.2. Discuss entities that regulate or guide physicians.
   - 4.3. Discern appropriate physician behavior.
5. **Introduction to Medical Ethics;** *PC, ICS, PRO*
   - 5.1. Identify the key principles of medical ethics.
   - 5.2. Discuss the application of medical ethics to patient care.
   - 5.3. Describe how medical ethics influences what is expected of students.
6. **Ethics with Special Populations;** *MK, PC, ICS, PRO*
   - 6.1. Explain special ethical considerations with the Pediatric population.
   - 6.2. Discuss special ethical considerations with non-English speakers.
   - 6.3. Describe special ethical considerations with patients with mental/psychological disabilities.
7. **Language in Medicine;** *MK, PC, ICS, PRO*
   - 7.1. Discuss how words can determine relationships.
   - 7.2. Discern how use of language influences patient care.
   - 7.3. Describe how precise communication can change outcomes.
8. **Panel: Discussing Race/Culture with Colleagues & Patients;** *MK, PC, ICS, PRO*
   - 8.1. Describe the responsibility to create positive workspaces and care environments.
   - 8.2. Make use of techniques that can invite understanding when discussing race/culture.
   - 8.3. Discuss how cultural humility leads to the best patient care.
9. **Overview of Research Studies;** *MK, PC, ICS, PRO*
   - 9.1. Identify types of research studies.
   - 9.2. Explain the components of a journal article, the types of journal articles and their level of evidence for answering clinical questions.
   - 9.3. Describe the publishing process, including the difference between peer-and non-peer reviewed Literature.
10. **Patient-Centered Outcomes Research;** *MK, PC, ICS, PRO*
    - 10.1. Describe patient-centered outcomes research.
    - 10.2. Discuss how patient-centered outcomes research supports patient autonomy.
    - 10.3. Explain how patient-centered outcomes research addresses clinical effectiveness.
11. **Research Opportunities Summer 2025 & Beyond;** *MK, PC, ICS*

11.1. Recognize resources available through ARCOM/ACHE to help students get involved in research.
11.2. Describe how research activity supports growth as a medical student.

12. Blood/Body-Fluid & Airborne Pathogens *(homework module)***;** *MK, PC, ICS, PRO*
12.1. Recognize steps to take if exposed to a bloodborne pathogen.
12.2. Explain how properly used PPE and appropriate housekeeping methods protect against exposure to bloodborne pathogens.
12.3. Describe aspects of a bloodborne pathogen exposure control plan.
12.4. Describe how exposure to bloodborne pathogens commonly occurs.
12.5. Recognize workers who are at risk of exposure to bloodborne pathogens.

13. HIPPA *(homework module); MK, PC, ICS, PRO*
13.1. Describe the key aspects of HIPPA.
13.2. Identify protected health information.
13.3. Discern proper PHI use and disclosure.
13.4. Interpret patients' rights and HIPPA security rules in various case scenarios.

14. Clinical Experience *(Due Date 12/3/24)***;** *MK, PC, ICS, PRO*
14.1. Explore communication styles in a clinical setting.
14.2. Relate what you learned from the experience.

ARKANSAS COLLEGE OF
OSTEOPATHIC MEDICINE

Course Name: Fundamentals of the Anatomical Sciences (FAS)
Class of/Semester/Year: 2028/Fall/2024
Date Last Revised: June 4, 2024

Approved By: Shannon Ramsey Jimenez

Shannon Ramsey Jimenez, DO
Dean ARCOM

Note: Final Approval. Schedule subject to change with advance notice.

Office of the Dean
479.308.2380 | PO Box 10366 | Fort Smith, AR 72917

ARKANSAS COLLEGE OF OSTEOPATHIC MEDICINE

Arkansas Colleges of Health Education
Course Syllabus

Course Name:	Fundamentals of the Anatomical Sciences-1 (FAS1)
Class of/Semester/Year:	Class of 2028/Fall 2024
Course Designation:	COM 571
Term Dates:	July 19, 2024 – December 6, 2024
Course Dates:	July 19, 2024 – December 4, 2024
Total Contact Hours:	56 Lecture Hours; 20 Lab Hours; 2 TBLs
Credit Hours:	6 Credit Hours
Assessment/Grading:	Four Lecture Exams; Three Lab Practicals; Two TBLs
Location:	Lecture Hall 2, Anatomy Laboratory
Course Director:	Raja Rachakatla, PhD and Caitlin Yoakum, PhD
Office Hours:	By appointment

Syllabus is subject to change

ARKANSAS COLLEGE OF OSTEOPATHIC MEDICINE

Table of Contents

Course Description:
The OMS Fundamentals of Anatomical Sciences courses are designed to provide an overview of the four subdisciplines of anatomy: Gross Anatomy, Embryology, Histology and Neuroanatomy. The main goals of the first course, Fundamentals of the Anatomical Sciences-1 (FAS-1), are to 1) provide gross anatomy instruction of the back, upper and lower limbs, thorax, abdomen, and pelvic/perineum regions of the body and 2) establish foundational knowledge in histology upon which the student can later relate to more specific systemic histology. Large group sessions will consist of PowerPoint-based lectures with active learning strategies and opportunities to apply course concepts. The format of anatomy laboratory sessions will include small group learning in which teams actively learn about the aforementioned regions of the human body via dissections within and among groups. Surface anatomy, medical imaging, and clinical correlations will be emphasized to provide meaningful context to students' learning of the anatomical sciences.

Course Goals:
The following course goals reflect broad and enduring knowledge, skills, behaviors, and responsibilities that students should attain as a result of successfully completing the course:

1. Develop a vocabulary of anatomical terminology to communicate the language of medicine clearly and accurately.
2. Compare the wide range of anatomical variations.
3. Recognize basic human development principles as they apply to infertility, pregnancy, and congenital malformations.
4. Apply knowledge of human structure in functional terms to better understand clinical problems.
5. Use the basic principles of medical imaging techniques and the three-dimensional perspective of the human body to recognize anatomical structures in medical images.
6. Interpret the interrelationship of cells, organs, and organ systems needed as a foundation for other basic and clinical science courses.
7. Demonstrate the collaborative skills necessary to work effectively in a team.
8. Practice observational skills and attention to detail.
9. Palpate surface anatomical landmarks in preparation for the physical examination of patients.
10. Demonstrate the value and necessity of arriving at all meetings and situations on time and fully prepared to develop professionalism.
11. Practice a sense of compassion and respect for others, especially under stressful/difficult circumstances.

Course Expectations and Student Responsibilities:
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Dress Code:
Students should refer to the ACHE Student Handbook, as well as their course syllabi, for the dress code for campus and academic activities.

DRESS CODE FOR THE ANATOMY LAB

i. Scrubs must be worn in the lab and washed after every lab.
ii. A lab coat is highly recommended and should be laundered regularly (e.g., every two weeks).
iii. Shoes must be worn that cover the entire foot (i.e., no open-toed shoes, flip flips, or sandals).
iv. Examination gloves must always be worn.
v. Particulate masks will be kept in the lab for use when needed for chemical sensitivity (respiratory or mucosal irritation).
vi. Protective eyewear is mandatory when using power tools in the lab and will be provided.

REQUIRED GROSS ANATOMY LABORATORY SUPPLIES

i. Any color of **scrubs** (e.g., https://www.allheart.com/womens-scrub-sets and https://www.allheart.com/mens-scrub-sets) and a **lab coat** (e.g., https://www.allheart.com/lab-coats)
ii. **Nitrile exam gloves** (e.g., https://www.amazon.com/Nitrile-Exam-Gloves-Disposable-Convenient/dp/B00KE233NU/ref=pd_lpo_121_bs_t_2?_encoding=UTF8&refRID=00THSKCN4DNGTZQZSJ6N&th=1)

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ACHE Anatomical Donors for Dissection:
The human donors studied in the gross anatomy laboratory are gifted from selfless individuals and their next-of-kin for your education. The privilege of dissecting a human donor should not be taken lightly. You are one of a very small group who can participate in this unique experience, for which there is no substitute. You must conduct yourself in the laboratory in a manner indicating proper respect for the donor.

One of the best ways to think of your anatomical donor is your first patient. Treat the donor as you would a living patient. There is a zero-tolerance policy regarding disrespect to the donors, no matter what seems like a good idea at the time. A sense of humor in the gross anatomy laboratory is not uncommon. It might be beneficial to your learning; make sure it is not at the expense of the anatomical donors. **CELL PHONES OR OTHER PHOTOGRAPHIC EQUIPMENT (e.g., iPads) ARE NOT ALLOWED IN THE ANATOMY LAB AT ANY TIME.**

The ACHE Anatomical Donation follows both state and federal legislation (i.e., Revised Arkansas Anatomical Gift Act and Revised Uniform Anatomical Gift Act [A.C.A. 20-17-1201 et. seq]).). Any violation of this law is punishable by a fine and a possible jail sentence.

General Laboratory Policies:
- **Visitors are not permitted in the anatomy laboratory at any time** without prior permission from the Anatomy Chair.
- Anatomical material must not be removed from the laboratory.
- No photographs (still or video) are to be taken.
- Eating, drinking, or smoking (or other tobacco use) is not permitted in the laboratory.
- If fluid splashes into your eye, immediately rinse it out thoroughly at the eye-wash station in the lab to prevent corneal damage and immediately see a faculty member.
- You are always encouraged to wear a lab coat with your name on it and left in the anatomy lab until taken home to wash every couple of weeks. Closed-toe shoes are required to prevent injury from dropped dissection instruments.
- Use disposable latex or vinyl gloves while dissecting to minimize odors and skin irritation. Hand odors can be further reduced by applying petroleum jelly (Vaseline) to your hands before gloving.
- You are strongly discouraged from wearing contact lenses in the lab due to eye irritation from the fixative vapors.
- Take reasonable precautions against theft of books and instruments by writing some form of identification on each and storing them in plastic bins under your anatomical donor. Do not borrow those of others without their permission.
- If you cut yourself, remain calm and immediately see a faculty member. Superficial cuts may be treated by rinsing the cut under running water and applying antiseptic and a Band-Aid. Deeper cuts may require you to go to Urgent Care and complete an ARCOM Anatomy Accident Report.

General Care of Anatomical Donors:

- Handle human material with care and respect. Try to keep the dissecting tables clean and orderly. Place excessive fat, tissue, gloves, and paper towels that contacted anatomical specimens in either the metal bucket underneath the dissecting table or one of the 50-gallon red biohazard containers. DO NOT include paper towels used for washing hands any other non-anatomical material. **Keep all donor organs (e.g., heart, lungs, brain) at the origin table.**
- Try to avoid letting slippery fluids drip onto the floor and clean up any spills promptly to avoid potential injury from falls or cuts if your feet slip.
- While dissecting, keep regions of the donor beyond the dissection field covered to minimize drying, odors, and excessive fumes.
- While dissecting, exposed structures may be moistened from time to time by spraying "rejuvenating or wetting solution," but avoid creating pools of fluid in the body bags or supersaturating the covering cloths because it may lead to mildew formation.
- At the end of each laboratory session, moisten the dissected region, if necessary, with the "rejuvenating/wetting solution" provided and lay the reflected structures, including skin flaps, back in place. Also, moisten the cloths, if necessary, and lay them over the dissected areas. Close the zippered body bag and clean up the table before leaving the lab. Periodically check sites beyond the immediate dissection field to ensure that dehydration is not occurring.
- Do not leave sharp (e.g., scalpels) instruments where they may pose a hazard to whoever handles the donor next. Dispose of scalpel blades in the sharp's containers located in the lab.
- You should not uncover the donors or otherwise disturb the dissection materials of other student groups in their absence unless you have their permission, and you must moisten and cover exposed tissues when you have finished reviewing them. The basic rule is to treat all the donors as if you had dissected them.
- The anatomical models in the Model Lab are expensive. Do not handle them roughly or take them out of the Model Lab. Also, avoid scratching or marking the anatomical models with pens or pencils.

Pregnancy:

Students who are pregnant or suspect they may be pregnant should notify the FAS Course Director immediately. Although no data currently available has demonstrated teratogenic effects in humans of vapor concentrations in medical anatomy laboratories, students should consult their physician for advice about wearing a protective vapor mask.

Attendance Policy:

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9. Students must refer to the Outlook Live calendar for all course schedules and changes.
10. Students are responsible for all missed learning material/experiences.
11. As it is not possible to replicate lab experiences, faculty members are not obligated to provide makeup learning experiences.
12. There are no excused absences; however, extenuating circumstances (e.g. serious illness/injury, etc.) may be addressed on a case-by-case basis by the ARCOM Dean.
13. Absence from class to attend professional events, such as a state or national conference, may be approved on a case-by-case basis by the ARCOM Dean.
14. Absence from class due to planned events of a personal nature are not excused absences.
15. A pattern of tardiness is unacceptable. While Faculty understand there may be unavoidable instances, tardiness will not be tolerated on exam days or when guest speakers are in attendance. Admittance to the classroom may be prohibited and, in that circumstance, the student would be marked as absent.

This attendance policy will be strictly adhered to. It is expected that students will use good judgment when being absent, only doing so rarely and for legitimate or necessary reasons.

Course Faculty:

Faculty Member	Office	Phone	Email
Joanne Peterson, PhD	276	479-308-2368	joanne.peterson@achehealth.edu
Raja Rachakatla, PhD	239	479-308-2366	raja.rachakatla@achehealth.edu
Caitlin Yoakum, PhD	236	479-308-2359	caitlin.yoakum@achehealth.edu
Heather Guzik, M.A.	245	479-308-2364	heather.guzik@achehealth.edu
Lucy Bowland	238	479-308-2365	lucyna.bowland@achehealth.edu

Faculty Office Hours:
While faculty maintain an open-door policy, **it is strongly recommended that a student in need of a faculty member's time and attention reserve an appointment directly via e-mail** or telephone communication with the faculty member.

Required Course Resources:

Title	Edition	Authors	ISBN-13
Moore's Clinically Oriented Anatomy	9th	Arthur F. Dalley, II; Anne M. R. Agur	978-1975154066
Grant's Dissector	17th	Alan J. Detton	978-1975134600
Netter Atlas of Human Anatomy	8th	Frank H. Netter	978-0323680424
Textbook of Histology	5th	Leslie P. Gartner	978-0323672726
The Developing Human: Clinically Oriented Embryology	11th	Keith L. Moore, T.V.N. (Vid) Persaud, and Mark G Torchia	978-0323611541
Grant's Dissection videos	Provided by the Library; see link in Canvas		
This collection of approximately 80 high-resolution videos, totaling more than 13 hours, demonstrate the Grant's method of cadaver dissection sequences, as described in Grant's Dissector. Organized by body region, each video includes narration by Dr. Alan Detton and on-screen labeling and text. The videos show students what they are expected to achieve in lab, the steps required for each dissection, and the information they need to learn for practical exams.			

Recommended Course Resources:

Title	Edition	Authors	ISBN-13
Gray's Anatomy for Students' (GAS)	5th	Richard L. Drake, A Wayne Vogl, and Adam W.M. Mitchell	978-0323934237
Acland's Video Atlas of Human Anatomy	https://library.achehealth.edu/acland		
Contains nearly 330 videos of real human anatomic specimens in their natural colors, including five new, groundbreaking videos of the inner ear. Dr. Robert Acland presents moving structures—muscles, tendons, and joints—making the same movements in life. The videos show complex structures step by step—from bone to surface anatomy—to provide a foundation for understanding anatomical structure and function. The entire series was digitally re-mastered, producing clearer, brighter, and more detailed videos than seen in previous versions.			
Anatomical Sciences Ebook Collections	https://library.achehealth.edu/anatomy		
Contains a database of links to textbooks in gross anatomy, embryology, histology, and neuroanatomy			

Osteopathic Core Competencies:
The faculty and administration of ARCOM attest that Osteopathic Core Competencies are met in this course.

1. **Osteopathic Philosophy/Osteopathic Manipulative Medicine (OPP/OMM):** Demonstrate and apply knowledge of accepted standards in osteopathic manipulative treatment appropriate to the specialty. Remain dedicated to life-long learning and to practice habits in osteopathic philosophy and OMM.

2. **Medical Knowledge (MK):** Demonstrate and apply knowledge of accepted standards of clinical medicine in the respective area; remain current with new developments in medicine and participate in life-long learning activities.
3. **Patient Care (PC):** Demonstrate the ability to effectively treat patients and provide medical care that incorporates the osteopathic philosophy, patient empathy, awareness of behavioral issues, the incorporation of preventive medicine and health promotion.
4. **Interpersonal and Communication Skills (ICS):** Demonstrate interpersonal and communication skills that enable a physician to establish and maintain professional relationships with patients, families, and other members of health care teams.
5. **Professionalism (PRO):** Uphold the Osteopathic Oath in the conduct of one's professional activities that promotes advocacy of patient welfare, adherence to ethical principles, and collaboration with health professionals, life-long learning, and sensitivity to a diverse patient population; be cognizant of physical and mental health in order to effectively care for patients.
6. **Practice-Based Learning and Improvement (PBL):** Demonstrate the ability to critically evaluate methods of clinical practice; integrate evidence-based medicine into patient care; show an understanding of research methods; improve patient care practices.
7. **Systems-Based Practice (SBP):** Demonstrate an understanding of health care delivery systems; provide effective and qualitative patient care with the system; and practice cost effective medicine.

Grading Information:

Grading point values and scale are consistent with policies outlined in the ARCOM Student Handbook & ACHE Course Catalog. Students will receive a numerical grade (percentage) at the end of the course with 70% or greater required to pass.

Students are required to pass all components of each course with a C (70%) or better to progress to the next semester. To receive a 70% or better, a student must complete all requirements of the course as defined in the syllabus.

Grade Determination and Scheduled Assignments:

Date	Assessment (CC)	Percentage of Final Grade
Monday, August 19, 2024 @8:30 AM-10:30 AM	Block 1 Lecture Exam (Histology)	14%
Monday, September 23, 2024 @10:00 AM-12:00 PM	Block 2 Lecture Exam (Back & Upper Limb)	14%
Monday, September 23, 2024 @1:00 PM-5:00 PM	Block 2 Lab Practical (Back & Upper Limb)	14%
Monday, October 21, 2024 @10:00 AM-12:00 PM	Block 3 Lecture Exam (Lower Limb & Thorax)	14%
Monday, October 21, 2024 @1:00 PM-5:00 PM	Block 3 Lab Practical (Lower Limb & Thorax)	14%
Monday, November 18, 2024 @10:00 AM-12:00 PM	Block 4 Lecture Exam (Abdomen & Pelvis & Perineum)	14%
Monday, November 18, 2024 @1:00 PM-5:00 PM	Block 4 Lab Practical (Abdomen & Pelvis & Perineum)	14%
Throughout Semester	Assignments	2%
TOTAL		**100%**

Classroom Examinations and Laboratory Practicals:
The four-scheduled classroom examinations will consist of multiple-choice items. On average, there will be three to five questions per 50-minute lecture. The anticipated examination format will be computer-based (ExamSoft/Examplify), and the test duration will vary, but will allow for 82 seconds per questions similar to NBOME standards.

Each of the three-scheduled laboratory practicals will consist of approximately 50 items, stemming from the cadaveric donors, bones, medical images, and/or models. Format will be open response and students will receive one minute to answer each item. The anatomy lab will be off limits to students on days in which lab practicals are being set up and administered.

Grading policies will be consistent with ARCOM policies and procedures. Students will receive a numerical grade (percentage) at the end of the course. A $\geq$70% average from all exams is required to pass the FAS course. Be advised that other courses may require a $\geq$70% average on lecture tests AND a $\geq$ 70% on practical exams to pass a given course (e.g., OPP and FOPC).

Alternate Dissection Protocol:
The class will be divided into A and B groups, performing every other dissection (refer to FAS course schedule). However, all students are responsible for learning regions dissected by the other group. The alternate dissection protocol increases students' independent study time.

Assignments, Dissection Captains and Grading:
OMS Dissection captains (MSB students will not participate as captains) will be responsible for learning and teaching the dissection to their lab group during their assigned dissection. Additionally, they will teach the subsequent lab group what happened in the previous dissection so that they understand what structures were located and the extent of the dissection performed. Students are required to be dissection captain twice - some tables will have an opportunity for a third, volunteer captain. Students must have a cumulative exam grade of 70% or higher to pass the course. The 2% gained from being a prepared dissection captain can only be added on after 70% has been achieved from exam scores. There may be opportunity for a student to serve as dissection captain three times. If this is the case, we will use the highest 2 grades to determine the dissection captain score. Captains will be graded each week by a professor based on predetermined questions or discussions that all tables will participate in. Captains will be graded on a scale of 1-5 for preparedness, professionalism, proper documentation, and leadership skills. Additionally, captains will be graded by their peers based on leadership, professionalism and ability to teach.

Course Specific Grading Information:
Computer-based examinations and laboratory practicals evaluate acquired medical scientific knowledge, whereas the quality of dissections assesses completion of assigned laboratory work. Grading percentages for all assessments used to calculate the final course grade are outlined in the syllabus.

Remediation:
Remediation will be offered to any student who does not achieve a 70% or higher average from their combined lecture and lab exam scores (assignments score NOT included) AND receives approval from SPC. Remediation exams will take place after the conclusion of the semester of the failure. Students will remediate only those blocks where they did not show competency by achieving a 70% average score (exams scores do not round up). For blocks with both a lecture and lab exam, students will be given both lecture and lab questions, however, lab questions will be in the form of digital images taken in the donor lab.

Example: Based on the student grades below, this student, if approved by SPC, would be eligible for remediation. Their remediation exam would only include the topics in Blocks 1 and 3 since the average score from the lecture and lab fell below 70%. *Assignment grades would not be added due to the final average on exams being below 70%.

	Block 1	Block 2		Block 3		Block 4		Final
	Lecture 1	Lecture 2	Lab 1	Lecture 3	Lab 2	Lecture 4	Lab 3	
Score	69.9%	70%	70%	71%	61%	65%	75%	
Average	69.9%	70%		66%		71%		68.8%

At the conclusion of this course, students can expect to have a comprehensive understanding of anatomical terminology, variations, and landmarks of structures below the neck with the ability to better understand some clinical applications. Additionally, students will gain confidence in modern imaging techniques and basic histological processes that will allow them to better understand the holistic practice of medicine. Finally, this course will allow the students to interact with their first patient, allowing them to navigate the healthcare system with compassion and respect for others in difficult situations and the opportunity to work as a team to complete simple and complex dissections.

Course content, sequencing, grading, and examination policies are subject to change by administration with the approval the Curriculum Committee. Students will be given advanced notice of any substantive changes by email and the ARCOM portal.

Fundamentals of the Anatomical Sciences Course Schedule:

Refer to the OUTLOOK Student Calendar for official (up to date) schedule

Day	Date	Time	Session #	Title	Instructor
Fri	Jul 19	9 AM	0	A0-Course Introduction	Anatomy Faculty
Fri	Jul 19	10 AM	1	Anatomicomedical Terminology & Overview of Bodily Systems I	Rachakatla
Fri	Jul 19	11 AM	2	Anatomicomedical Terminology & Overview of Bodily Systems II	Rachakatla
Mon	Jul 22	10 AM	3	Intro to Histology	Peterson
Mon	Jul 22	11 AM	4	Nucleus	Peterson
Wed	Jul 24	10 AM	5	Cytoplasm	Bowland
Wed	Jul 24	11 AM	6	Epithelium & Glands	Rachakatla
Mon	Jul 29	11 AM	7	Connective Tissue	Guzik
Wed	Jul 31	10 AM	8	Skin Histology I	Bowland
Wed	Jul 31	11 AM	9	Skin Histology II	Bowland
Mon	Aug 5	10 AM	10	Bone & Cartilage Histology I	Yoakum
Mon	Aug 5	11 AM	11	Bone & Cartilage Histology II	Yoakum
Wed	Aug 7	10 AM	12	Blood Cells	Peterson
Wed	Aug 7	11 AM	13	Hemopoiesis	Peterson
Mon	Aug 12	10 AM	14	Muscle Tissue	Guzik

Mon	Aug 12	11 AM	15	Nerve Tissue	Yoakum
Wed	Aug 14	1 PM	16	TBL: Ethics 1	Anatomy Faculty
			17		
			18		
Mon	Aug 19	8:30 AM		**Anatomy Block 1 Lecture Exam (Histology)**	
Wed	Aug 21	10 AM	19	Vertebral Column	Guzik
Wed	Aug 21	11 AM	20	Extrinsic Back Muscles	Bowland
Wed	Aug 21	1 PM	L0	AL0-Intro to Anatomy Lab Group A	Anatomy Faculty
Wed	Aug 21	2 PM	L0	AL0-Intro to Anatomy Lab Group B	Anatomy Faculty
Mon	Aug 26	10 AM	21	Intrinsic Back Muscles & Suboccipital Region	Peterson
Mon	Aug 26	11 AM	22	Medical Imaging Techniques	Yoakum
Mon	Aug 26	1 PM	L1	AL1-Superficial Muscles of the Back Lab Group A	Anatomy Faculty
Wed	Aug 28	10 AM	23	Spinal Canal Contents	Yoakum
Wed	Aug 28	11 AM	24	Shoulder Region	Rachakatla
Wed	Aug 28	1 PM	L2	AL2-Intermediate & Deep Muscles of the Back & Sub-Occipital Region Lab Group B	Anatomy Faculty
Wed	Sep 4	10 AM	25	Pectoral Region & Superficial Structures of the Upper Limb	Rachakatla
Wed	Sep 4	11 AM	26	Axilla	Bowland
Wed	Sep 4	1 PM	L3	AL3-Vertebral Canal, Spinal Cord, & Meninges Lab Group A	Anatomy Faculty
Mon	Sep 9	10 AM	27	Brachial Plexus	Rachakatla
Mon	Sep 9	11 AM	28	Arm & Cubital Fossa	Peterson
Mon	Sep 9	1 PM	L4	AL4-Shoulder Region & Posterior Arm Lab Group B	Anatomy Faculty
Wed	Sep 11	10 AM	29	Anterior Forearm	Rachakatla
Wed	Sep 11	11 AM	30	Posterior Forearm & Dorsum of Hand	Peterson
Wed	Sep 11	1 PM	L5	AL5-Muscles of the Pectoral Region & Axilla Lab Group A	Anatomy Faculty
Mon	Sep 16	10 AM	31	Palmar Hand	Bowland
Mon	Sep 16	11 AM	32	Upper Limb Joints	Yoakum
Mon	Sep 16	1 PM	L6	AL6-Arm & Cubital Fossa & Flexor Region of the Forearm Lab Group B	Anatomy Faculty
Wed	Sep 18	1 PM	L7	AL7-Palm of the Hand, Extensor Region of the Forearm & Dorsum of Hand, & Joints of the Upper Limb Lab Group A	Anatomy Faculty
Wed	Sep 18	3 PM	L8	AL8-Palm of the Hand, Extensor Region of the Forearm & Dorsum of Hand, & Joints of the Upper Limb Lab Group B	Anatomy Faculty

Mon	Sep 23	10 AM		**Anatomy Block 2 Lecture Exam (Back & Upper Limb)**	
Mon	Sep 23	1 PM		**Anatomy Block 2 Lab Practical (Back & Upper Limb)**	
Wed	Sep 25	10 AM	33	Lower Limb Osteology, Posture & Gait	Guzik
Wed	Sep 25	11 AM	34	Gluteal Region	Yoakum
Mon	Sep 30	10 AM	35	Posterior Thigh & Popliteal Fossa	Bowland
Mon	Sep 30	11 AM	36	Anterior & Medial Thigh	Yoakum
Mon	Sep 30	1 PM	L9	AL9-Gluteal Region & Posterior Compartment of the Thigh & Popliteal Fossa Group A	Anatomy Faculty
Wed	Oct 2	10 AM	37	Leg	Rachakatla
Wed	Oct 2	11 AM	38	Plantar Foot	Bowland
Wed	Oct 2	1 PM	L10	AL10-Anterior Compartment & Medial Compartment of the Thigh Lab Group B	Anatomy Faculty
Mon	Oct 7	11 AM	39	Lower Limb Joints	Bowland
Mon	Oct 7	1 PM	L11	AL11-Posterior Compartment & Anterior Compartment of the Leg & Dorsum of the Foot Lab Group B	Anatomy Faculty
Wed	Oct 9	10 AM	40	Thoracic Wall	Yoakum
Wed	Oct 9	11 AM	41	Pleura & Lungs	Rachakatla
Wed	Oct 9	1 PM	L12	AL12-Sole of the Foot & Joints of the Lower Limb Lab Group A	Anatomy Faculty
Mon	Oct 14	10 AM	42	Heart I	Peterson
Mon	Oct 14	11 AM	43	Heart II	Peterson
Mon	Oct 14	1 PM	L13	AL13-Intercostal Space & Intercostal Muscles, Anterior Thoracic Wall & Pleural Cavitites, & Lungs Lab Group B	Anatomy Faculty
Wed	Oct 16	10 AM	44	Superior Mediastinum	Rachakatla
Wed	Oct 16	11 AM	45	Posterior & Anterior Mediastinum	Peterson
Wed	Oct 16	1 PM	L14	AL14-Mediastinum, External & Internal Features of the Heart, Superior, & Posterior Mediastinum Lab Group A	Anatomy Faculty
Mon	Oct 21	10 AM		**Anatomy Block 3 Lecture Exam (Lower Limb & Thorax)**	
Mon	Oct 21	1 PM		**Anatomy Block 3 Lab Practical (Lower Limb & Thorax)**	
Wed	Oct 23	10 AM	46	Anterolateral Abdominal Wall	Peterson
Wed	Oct 23	11 AM	47	Peritoneum & Peritoneal Cavity	Rachakatla
Mon	Oct 28	10 AM	48	Esophagus, Stomach & Spleen	Rachakatla
Mon	Oct 28	11 AM	49	Liver & Gall Bladder	Guzik
Mon	Oct 28	1 PM	L15	AL15-Superficial Fascia & Muscles of the Anterolateral Abdominal Wall, & Peritoneum & Peritoneal Cavity Lab Group A	Anatomy Faculty
Wed	Oct 30	10 AM	50	Small & Large Intestine	Peterson
Wed	Oct 30	11 AM	51	Posterior Abdominal Viscera: Pancreas, Kidneys, Ureters, & Suprarenal Glands	Yoakum

Wed	Oct 30	1 PM	L16	AL16-Celiac Trunk, Stomach, Spleen, Liver & Gallbladder, SMA & Small Intestine, IMA & Large Intestine, Duodenum, Pancreas & Hepatic Portal Vein, & Removal of GI Tract Lab Group B	Anatomy Faculty
Mon	Nov 4	10 AM	52	Posterior Abdominal Wall & Diaphragm	Bowland
Mon	Nov 4	11 AM	53	Male Perineum & External Genitalia	Rachakatla
Mon	Nov 4	1 PM	L17	AL17-Posterior Abdominal Viscera, Posterior Abdominal Wall & Diaphragm Lab Group A	Anatomy Faculty
Wed	Nov 6	10 AM	54	Female Perineum & External Genitalia	Yoakum
Wed	Nov 6	11 AM	55	Pelvic Peritoneum & Urinary Organs	Bowland
Wed	Nov 6	1 PM	L18	AL18-Anal Triangle, Ext. Genitalia, & UG Triangle Lab Group B	Anatomy Faculty
Mon	Nov 11	10 AM	56	Internal Genital Organs	Yoakum
Mon	Nov 11	11 AM	57	Pelvic Walls, Floor, Fascia, & Rectum	Bowland
Mon	Nov 11	1 PM	L19	AL19-Pelvic Cavity, Urinary Bladder, Rectum, & Anal Canal Lab Group A	Anatomy Faculty
Wed	Nov 13	10 AM	58	Pelvic Vasculature	Peterson
Wed	Nov 13	11 AM	59	Pelvic Nerves	Yoakum
Wed	Nov 13	1 PM	L20	AL20-Internal Iliac A, Sacral Plexus, & Pelvic Diaphragm Lab Group B	Anatomy Faculty
Mon	Nov 18	10 AM		**Anatomy Block 4 Lecture Exam (Abdomen & Pelvis & Perineum)**	
Mon	Nov 18	1 PM		**Anatomy Block 4 Lab Practical (Abdomen & Pelvis & Perineum)**	
Mon	Nov 25	1 PM	60	TBL: Ethics 2	Anatomy Faculty
Wed	Dec 4	1 PM		Evaluations Due	

ARKANSAS COLLEGE OF OSTEOPATHIC MEDICINE

Appendix:

FAS Fall 2024 Learning Objectives with *Core Competency:*

(Any changes to the below learning objectives will reflect on lecturers presentation slide)

0. Course Introduction

1. Anatomicomedical Terminology & Overview of Bodily Systems I; *MK*

1.1. Define and demonstrate the following terms relative to the anatomical position: medial, lateral, proximal, distal, superior, inferior, deep, superficial, palmar, plantar, anterior/ventral, posterior/ dorsal, rostral, caudal.

1.2. Describe the following anatomical planes: axial/transverse/horizontal, sagittal, and coronal.

1.3. Define and demonstrate the terms used to describe the movements of the limbs and vertebral column: flexion, extension, lateral flexion, pronation, supination, abduction, adduction, medial and lateral rotation, inversion, eversion, plantarflexion, dorsiflexion, protraction, retraction, and circumduction.

2. Anatomicomedical Terminology & Overview of Bodily Systems II; *MK*

2.1. Summarize salient features of each bodily system.

2.2. Identify bony landmarks (e.g., tubercle, trochanter).

2.3. Compare dermatomes with multisegmental sensory innervation.

2.4. Describe the formation of a spinal nerve, including fiber types found in each component.

2.5. Define the terms somatic and visceral when used to describe parts and systems (e.g., somatic and visceral motor systems) of the body.

3. Intro to Histology; *MK*

3.1. Identify the relationship of histology within the hierarchy of human structure.

3.2. Recall the four basic types of tissue.

3.3. Explain the tissue preparation steps (e.g., fixation), including their necessity, associated results, and potential artifacts.

3.4. Interpret various planes of histological sections (e.g., longitudinal and cross-section).

3.5. Compare common dyes (e.g., H&E, Masson's trichrome, and PAS) to cell components stained, including staining properties such as acidophilia, basophilia, and metachromasia.

3.6. Distinguish units of measurement used in light and electron microscopy.

3.7. Summarize the optical properties of light microscopy (i.e., magnification, resolution, contrast, and refractive index).

3.8. Analyze the utility of scanning and electron microscopy.

3.9. Evaluate the use of common histochemical techniques (e.g., in situ hybridization and immunocytochemistry) in localizing subcellular components.

3.10. Recognize that pathologists assist in diagnosing disease by examining histologic sections of tissue using light and electron microscopy.

4. Nucleus; *MK*

4.1. Recall the major components of the nucleus (e.g., nuclear envelope, nuclear pore), distinguish their roles, and identify each in light and electron micrographs as appropriate.

4.2. Summarize the cell cycle components and discriminate various phases in light micrographs.

5. Cytoplasm; *MK*

5.1. Describe the ultrastructural composition of the cell membrane and correlate with its general cellular functions.

5.2. Describe the ultrastructural morphologies of the three cytoskeletal fiber types and correlate with their molecular composition, stability, general intracellular locations and functions.

5.3. Compare the ultrastructural morphologies of the three different intracellular structures composed of microtubules (axoneme, centrosome/centriole, basal bodies).
5.4. Describe the ultrastructure of eukaryotic cell organelles and correlate with their locations, morphologies and functions.
5.5. Correlate the ultrastructure of the organelles involved in protein synthesis, modifications and trafficking with their morphologies, associated structures or key proteins and their functions.

6. Epithelium & Glands; *MK*

6.1. Recall the germ layers from which epithelium is derived.
6.2. Comprehend the general characteristics of all epithelial tissues.
6.3. Discriminate the appearance and function of the various types of simple and stratified epithelia.
6.4. Identify the two criteria by which all epithelial tissues are classified.
6.5. Explain the main structures and origins of the two types of basal lamina (i.e., basement membrane in light microscopy).
6.6. Summarize the structural components and functions of epithelial cell junctions and recognize each type of junction in transmission electron micrographs.
6.7. Distinguish the two kinds of epithelial-derived glands, including parts (i.e., secretory and ducts), modes of secretion (e.g., merocrine), and locations in the body.
6.8. Compare the structure and function of mucus, serous and mixed exocrine glands.
6.9. Distinguish metaplasia, carcinoma, adenocarcinoma, and papilloma.
6.10. Recognize the ability of epithelial tissue to regenerate is of practical importance following injury or surgical intervention.

7. Connective Tissue; *MK*

7.1. Recall the germ layer from which all connective tissues arise.
7.2. Identify the three major components of connective tissue (e.g., cells) and their subcomponents (e.g., types of cells are fixed and wandering).
7.3. Comprehend the components of and the functional significance of the extracellular matrix.
7.4. Summarize connective tissue types and subtypes based on amounts, classes, and arrangement of connective tissue elements, and be able to identify all connective tissue types and subtypes in light micrographs.
7.5. Explain collagen fiber synthesis and assembly into fibrils and fibers.
7.6. Recognize some prevalent types of collagens in the body, including their location and staining properties.

8. Skin Histology I; *MK*

8.1. Describe the structural composition and function of the epidermis, dermis, and hypodermis, and compare the differences between thick and thin skin.
8.2. Explain the composition of hair, hair follicles, and associated structures (e.g., sebaceous glands and arrector pili).

9. Skin Histology II; *MK*

9.1. Distinguish the histological structure, function, and location of eccrine and apocrine sweat glands.
9.2. Review the three modes of secretion for exocrine glands.
9.3. Evaluate the structure, function, and location of the following sensory structures: free nerve endings, Pacinian corpuscles, Meissner's corpuscles, Krause's end bulbs, Merkel's discs, and Ruffini's corpuscles; and indicate which are typically seen in H&E preparations.

9.4. Determine clinical manifestations of structural and functional problems associated with components of the integument system.

10. Bone & Cartilage Histology I; *MK*

10.1. Describe the general properties of cartilage (e.g., composition, ultrastructure, and perichondral layers).

10.2. Compare the three types of cartilage (e.g., appearance, functions, and location) and identify each type in light micrographs.

10.3. Explain chondrogenesis, two processes of cartilage growth, cartilage degeneration, and the regenerative capacity of cartilage.

11. Bone & Cartilage Histology II; *MK*

11.1. Summarize the structure and components of a Haversian system.

11.2. Explain the process of bone remodeling, including the cells involved.

11.3. Compare the two processes of bone formation (i.e., intramembranous and endochondral), including the type of bone resulting from each method.

11.4. Explain the histophysiology of fracture repair, calcium mobilization, and calcium deposition.

11.5. Evaluate the relationship of nutritional factors and hormones to bone growth and maintenance.

11.6. Distinguish osteoporosis, rickets, osteomalacia, and acromegaly.

12. Blood Cells; *MK*

12.1. Specific and characterize "formed elements" and the matrix of blood.

12.2. Describe an RBC at the microscopic and molecular levels and the role of RBCs in circulation.

12.3. Distinguish reticulocytes and mature RBCs and compare the average percentage of reticulocytes in circulating blood to conditions in which their presence would be elevated.

12.4. Understand why RBCs have a limited lifespan and the mechanism of senescent RBC removal from circulation.

12.5. List the two major categories of WBCs, including cell types for each category, and explain the role of WBCs in circulation.

12.6. Define the histological appearance of lymphocytes, their relative percentage in circulating blood, and their common subtypes.

12.7. Determine how lymphocytes are unique compared to other WBCs in terms of lifespan.

12.8. Interpret the histological appearance of monocytes their relative percentage in circulating blood and explain their immunological role.

13. Hemopoiesis; *MK*

13.1. Consider how the different granulocytes can be histologically distinguished and recognize the relative percentages and immunological role.

13.2. Derive the formation of platelets in the bone marrow and determine their appearance and function in circulating blood.

13.3. Explain hematopoiesis, hematopoietic stem cells (HSCs), and the role of HSCs in blood cell development and hormonal control and the site of hemopoiesis.

13.4. Name the cells as they progress through hematopoiesis and summarize changes in cell morphology during this process.

13.5. Explain why most cells in the bone marrow are granulocyte precursors while constituting a minor component of circulating blood cells.

14. Muscle Tissue; *MK*

14.1. Compare the structural and functional properties of a tendon and a ligament.

14.2. Recall the three types of muscle, including germ layer origin(s).

14.3. Summarize the process of myogenesis and the organization of skeletal muscle from the macroscopic level to the molecular level.
14.4. Recognize the connective tissue components of skeletal muscle.
14.5. Interpret the molecular basis of skeletal muscle striations, including proteins involved and length changes during contraction.
14.6. Recognize various methods of skeletal muscle fibers typing.
14.7. Assess proprioceptive properties of skeletal muscle.
14.8. Describe the appearance of a smooth muscle fiber, including the absence of striations, and list locations in the body where smooth muscle is located.
14.9. Explain the process of smooth muscle contraction and relaxation.

15. Nerve Tissue; *MK*

15.1. List the two overlapping pairs of subsystems based on location (CNS and PNS) and function (autonomic and somatic nervous systems), including the structural components (e.g., cranial nerves of PNS) and prominent roles (e.g., somatosensory perception of touch, heat, and temperature) of each.
15.2. Compare the two major cell types, including subtypes (e.g., oligodendrocytes and Schwann cells) that comprise nervous tissue in terms of structural components (e.g., dendrites, number of neurites), function, location, and histological appearance (where applicable in cross-section and longitudinally).
15.3. Distinguish basic terms that apply to nerve tissue in the CNS (e.g., nucleus, tract, neuropil, and white matter) and PNS (e.g., ganglia), including their histological appearance where appropriate.
15.4. Explain the structural and functional barrier protecting the CNS (i.e., blood-brain barrier or glial limitans).
15.5. Describe a synapse, its histological appearance, and structural classifications. Identify the function, location, and histological appearance of the choroid plexus.
15.6. Differentiate the connective tissue layers surrounding the brain and spinal cord and connective tissue layers of peripheral nerves.
15.7. Consider the process of myelination, including nodal gaps, in terms of its functional consequence.
15.8. Evaluate neural plasticity and regeneration.

16-18. TBL: Ethics 1

19. Vertebral Column; *MK*

19.1. Describe the main anatomical features of a typical vertebra.
19.2. Identify the atlas, axis, typical cervical, thoracic, lumbar vertebrae, and sacrum and recognize their characteristic features.
19.3. Describe the range of movement of the entire vertebral column and its regions.
19.4. Describe the anatomy of intervertebral facet joints and intervertebral discs.
19.5. Explain the role of the discs in weight-bearing by the vertebral column and give examples of common disc lesions and how they may impinge upon spinal nerve roots and the spinal cord.

20. Extrinsic Back Muscles; *MK*

20.1. Describe the superficial fascia and deep fascia of the back.
20.2. Compare the attachments and functions of the five superficial and two intermediate extrinsic back muscles.
20.3. Name the innervation and blood supply of the extrinsic back muscles.
20.4. Identify the boundaries of the triangle of auscultation.
20.5. Relate movements of the scapula to these muscles.

Lab 0 ***Intro to Anatomy Lab; Group A & B;*** *MK, ICS, PRO*

21. Intrinsic Back Muscles & Suboccipital Region; *MK*

21.1. Explain the embryological basics of intrinsic back muscles.
21.2. Recall the three primary muscle layers in the intrinsic back muscle groups.
21.3. Recognize the location of intrinsic muscles.
21.4. Analyze the relationship between these muscles and the actions on the vertebral column.
21.5. Describe the boundaries and contents of the sub-occipital triangle.
21.6. List the four pairs of sub-occipital muscles, including their attachments, innervation, and functions.

22. Medical Imaging Techniques; *MK*

22.1. Categorize different tissues from most to least opaque on x-ray, including bone, soft tissue, air, metal, and fat.
22.2. Compare and contrast the benefits and limitations of different radiologic modalities, including Plain film, CT, Ultrasound, MR, Nuclear medicine.
22.3. List risks associated with radiation exposure.
22.4. Distinguish between the different types of contrast used in imaging exams and the potential diagnostic benefits of each.
22.5. Discuss the potential complications of intravenous contrast administration for CT and MR exams and identify predisposing risk factors.
22.6. Summarize risks and contraindications unique to MR examinations.
22.7. Describe the specific circumstances in which a multiphase CT ("with and without contrast") may be applicable and list why this type of scan is not routinely performed.
22.8. List two imaging modalities with no proven risk to the fetus in a pregnant patient.

Lab 1 ***Superficial Muscles of the Back Lab; Group A*****;** *MK, ICS, PRO*

23. Spinal Canal Contents; *MK*

23.1. Explain the anatomy of a spinal nerve, including its origin from dorsal and ventral spinal roots, its main motor and sensory branches, and autonomic component.
23.2. Recognize the anatomical relationships of the meninges to the spinal cord, brain, and dorsal and ventral nerve roots.
23.3. Describe the anatomy associated with a lumbar puncture, root compression, and the placement of epidural and spinal injections.
23.4. Recognize the essential features of the vertebral canal's vascular supply and the effects of vascular compromise.

24. Shoulder Region; *MK*

24.1. Describe the main features of the surface anatomy and bones of the pectoral girdle and upper limb.
24.2. Summarize the attachments and functions of the scapulohumeral (intrinsic shoulder) muscles.
24.3. Explain how the four rotator muscles contribute to the stability of the glenohumeral (shoulder) joint.

Lab 2 ***Intermediate & Deep Muscles of the Back & Sub-Occipital Region Lab; Group B*****;** *MK, ICS, PRO*

25. Pectoral Region & Superficial Structures of the Upper Limb; *MK*

25.1. Distinguish the fascial components of the upper limb.
25.2. Comprehend the sensory nerve supply of the superficial structures of the upper limb.
25.3. Summarize the venous and lymphatic drainage of the superficial structures of the upper limb.

25.4. Identify muscles responsible for the pectoral girdle's movements and describe the pectoral girdle's actions.
25.5. Summarize the four pectoral region muscles' attachments, functions, and nerve supply.
25.6. Recognize and explain the clinical importance of the lymphovascular supply of the breast.
25.7. Describe the primary components of breast tissues and their associations with the chest wall and axilla.

26. Axilla; *MK*

26.1. Describe the boundaries of the axilla.
26.2. List the chief contents of the axillary region, including branches from the three parts of the axillary artery and vein.
26.3. Explain how axillary lymph nodes are involved in the spread of breast tumors.
26.4. Compare the major arteries' origin, course, and distribution and their branches that supply the shoulder, arm, and forearm with common injury sites.
26.5. Summarize the clinical significance of the arterial anastomoses associated with the shoulder region.

Lab 3 ***Vertebral Canal, Spinal Cord, & Meninges Lab; Group A*****;** *MK, ICS, PRO*

27. Brachial Plexus; *MK*

27.1. Describe the various levels of organization of the brachial plexus from rami in the neck to branches in the upper limb/
27.2. Describe and draw the origin and formation of the main components of the brachial plexus.
27.3. Summarize the origin, course, and motor and sensory distribution of the axillary, radial, musculocutaneous, median, and ulnar nerves in the arm, forearm, wrist, and hand.

28. Arm & Cubital Fossa; *MK*

28.1. Detail the brachial fascia, the derived septa, and the compartments of the arm these septa define.
28.2. Describe the attachments, actions, innervations, and spatial arrangements of the skeletal muscles within the anterior and posterior compartments of the arm.
28.3. Describe the arterial pattern to the arm.
28.4. Describe the courses of the prominent veins of the upper limb and classify and contrast the functions of the deep and superficial veins.
28.5. Explain how to test for motor and sensory nerve function for the arm.
28.6. Summarize the anatomical basis of tendon jerk testing of the biceps brachii.
28.7. Detail the structure, boundaries, and contents of the cubital fossa.

Lab 4 ***Shoulder Region & Posterior Arm Lab; Group B*****;** *MK, ICS, PRO*

29. Anterior Forearm; *MK*

29.1. Identify carpal bones in a plain radiograph.
29.2. Name and demonstrate the movements of the fingers and thumb brought about by anterior forearm muscles.
29.3. Describe the nerve supply and blood supply for the anterior forearm muscles.
29.4. Explain the function of the flexor retinacula of the wrist and the tendon sheaths of the anterior wrist.
29.5. Evaluate the anatomical basis of carpal tunnel syndrome and the spread of infection in tendon sheaths.

30. Posterior Forearm & Dorsum of Hand; *MK*

30.1. Identify the three functional groups and two structural groups of posterior forearm muscles.
30.2. Describe the mechanism by which extensor tendons are held in place.

30.3. List the innervation of the posterior forearm and dorsum of the hand.
30.4. Explain which structures would be involved with tennis elbow, synovial cysts of the wrist, and mallet or baseball finger.

Lab 5 ***Muscles of the Pectoral Region & Axilla Lab; Group A*****;** *MK, ICS, PRO*

31. Palmar Hand; *MK*

31.1. Name and demonstrate the movements of the fingers and thumb brought about by intrinsic hand muscles and list their innervation.
31.2. Describe the function of the tendon sheaths in the palmar hand and their role in the spread of infection.

32. Upper Limb Joint; *MK*

32.1. Describe the factors that contribute to the stability of the shoulder joint and explain the functional and possible pathological consequences of its dislocation.
32.2. Explain the anatomy of the elbow joint, including its movements and the muscles responsible for these movements.
32.3. Summarize the anatomy of the superior and inferior radio-ulnar joints and explain the movements of supination and pronation, identifying the muscles responsible for these movements.
32.4. Determine the anatomy of the wrist and hands and demonstrate movements at these joints.
32.5. Compare the utility of conventional radiography, CT, and MRI with upper limb imaging and identify various upper limb structures.

Lab 6 ***Arm & Cubital Fossa & Flexor Region of the Forearm Lab; Group B*****;** *MK, ICS, PRO*

Lab 7, 8 ***Palm of the Hand, Extensor Region of the Forearm & Dorsum of Hand & Joints of the Upper Limb Lab; Group A & B*****;** *MK, ICS, PRO*

33. Lower Limb Osteology, Posture & Gait;

33.1. Identify the arrangement of the bones in the lower limb.
33.2. Identify the bony landmarks found on the hip bone, femur, tibia, fibula, and foot bones.
33.3. Recognize the contributions of muscles while standing at ease and through each phase in the gait cycle.

34. Gluteal Region; *MK*

34.1. Recognize the significant features (muscles, bones, ligaments, gateways) and the pelvis's surface landmarks and demonstrate palpable and imaging landmarks.
34.2. Describe the topographic relations of bursae, blood vessels, nerves, and tendons in the gluteal region.
34.3. Summarize the origin, course, and branches of the major arteries that supply the gluteal region and the functional significance of anastomoses between branches of these arteries around the hip joint.
34.4. Outline the origin of the lumbosacral plexus and the formation of its major branches.
34.5. Describe the course of the sciatic nerve within the gluteal (buttock) region and explain how to avoid damage to the sciatic nerve when giving intramuscular injections.

35. Posterior Thigh & Popliteal Fossa; *MK*

35.1. Identify muscles in the posterior thigh, including innervation, attachments, and functions.
35.2. Demonstrate the origin, course, and branches of the major arteries that supply the posterior thigh and popliteal region and explain the functional significance of genicular anastomoses at the knee joint.
35.3. Explain the origin, course, and function of the sciatic, common fibular, tibial, and sural nerves, including their motor and sensory distribution.

35.4. List the boundaries and contents of the popliteal fossa.

36. Anterior & Medial Thigh; *MK*

36.1. Identify the muscles of the anterior and medial compartments of the thigh; know their origins, insertion, actions, relative locations, and innervation.
36.2. Identify the innervation and blood supply to the anterior compartment of the thigh.
36.3. Identify the innervation and blood supply to the medial compartment of the thigh.
36.4. Describe the femoral triangle, its boundaries, and its contents.
36.5. Describe the adductor canal, its boundaries, and its contents.
36.6. Describe the course and branches of the femoral artery in the thigh.

Lab 9 ***Gluteal Region & Posterior Compartment of the Thigh & Popliteal Fossa Lab; Group A*****;** *MK, ICS, PRO*

37. Leg; *MK*

37.1. Explain the organization of general structures/regions of the leg.
37.2. Identify and describe the arrangement of skin, fasciae, and their special modifications.
37.3. Explain the retinacula of the lower leg, including location, attachments, and contents.
37.4. Describe the compartments of the leg, including their formation and contents..
37.5. Explain the attachments, locations, and principal actions of the anterolateral leg muscles.
37.6. Explain the attachments, locations, and principal actions of the posterior leg muscles.
37.7. Describe the innervation of the leg via the tibial and fibular nerves, including their origin, course, branches, and distribution.
37.8. Define the pathway/relationships of the vasculature as it passes thru the leg.
37.9. Locate the superficial exposure of numerous bones, muscles, tendons, and neurovasculature of the leg.

38. Plantar Foot; *MK*

38.1. Recognize the foot's significant features and surface landmarks, demonstrating palpable and imaging landmarks.
38.2. Demonstrate the location at which the dorsalis pedis pulse can be felt.
38.3. Describe the lymphatic drainage of the lower limb, starting from the foot.
38.4. List the muscles within the four layers of the sole and their innervation.
38.5. Summarize the structure(s) involved with plantar fasciitis.

Lab 10 ***Anterior Compartment & Medial Compartment of the Thigh Lab; Group B*****;** *MK, ICS, PRO*

39. Lower Limb Joints; *MK*

39.1. Describe the structure and movements of the hip joint, summarizing the muscles responsible for these movements as well as their innervation and primary attachments.
39.2. Explain the structures responsible for the stability of the hip joint.
39.3. Predict the structures at risk from a fracture of the femoral neck or dislocation of the hip and explain the functional consequences of these injuries.
39.4. Describe the structure and movements of the knee joint, summarizing the muscles responsible for these movements as well as their innervation and primary attachments.
39.5. Explain the close relations of the knee joint, including major bursae and structures that may be injured by trauma.
39.6. Identify the factors responsible for maintaining the stability of the knee joint.
39.7. Summarize the anatomical basis of tests that assess the integrity of the cruciate ligaments.

39.8. Describe the anatomy of the ankle joint, including the movements of flexion, extension, plantarflexion, dorsiflexion, inversion, and eversion; and the muscles responsible for these movements, including their innervation and primary attachments.
39.9. List the factors responsible for the stability of the ankle joint, especially the lateral ligaments, and explain the anatomical basis of "sprain" injuries.
39.10. Describe the arches of the foot and the bony, ligamentous, and muscular factors that maintain them.

Lab 11 ***Posterior Compartment & Anterior Compartment of the Leg & Dorsum of the Foot Lab; Group B*****;** *MK, ICS, PRO*

40. Thoracic Wall; *MK*

40.1. Demonstrate the prominent anatomical landmarks of the thoracic vertebrae, ribs, and sternum.
40.2. Describe the anatomy of the joints between the ribs and vertebral column, the ribs and costal cartilages, and the costal cartilages and sternum.
40.3. Explain the movements made at various thoracic wall joints during ventilation and the differences between ventilatory movements in the upper and lower chest.
40.4. Indicate how the vertebrae, ribs, costal cartilages, and sternum form the thoracic inlet and outlet boundaries.
40.5. Compare the attachments and functions of the intercostal muscles.
40.6. Distinguish a neurovascular bundle in a typical intercostal space.

41. Pleura & Lungs; *MK*

41.1. Understand the subdivisions of the pleurae, the location of recesses, and the lines of pleural reflection.
41.2. Compare and contrast the neurovascular supply and lymphatic drainage of the pleural divisions. Illustrate the names, arrangement, and any special features of the hand bones.
41.3. Compare and contrast the left and right lungs relative to size and shape. Describe the various regions, surfaces, and borders of the lung and the arrangement of the root of the lung.
41.4. Compare and contrast the left and right lungs for lobes and fissures.
41.5. Describe the surface projections of the borders, fissures, and lobes.
41.6. Discuss the branching of the airways from the trachea to the alveoli, understanding the bronchopulmonary segments.
41.7. Explain the pulmonary (pulmonary arteries and veins) and systemic (bronchial arteries and veins) circulation of the lungs, including source/termination, patterns, and relationships.
41.8. Describe the lymphatic drainage of the lungs via superficial and deep plexuses into the efferent pathways to the venous system, including nodes.
41.9. Discuss the innervation of the lungs and distal trachea.
41.10. Understand the composition, pathways, and function of the pulmonary plexus, sympathetic, parasympathetic, and sensory systems.

Lab 12 ***Sole of the Foot & Joints of the Lower Limb Lab; Group A*****;** *MK, ICS, PRO*

42. Heart I; *MK*

42.1. Define the mediastinum and list the bony landmarks dividing them into superior and inferior components.
42.2. Interpret a normal cardiac shadow or silhouette as seen on frontal chest radiographs.
42.3. Distinguish the layers that form the pericardium and list its vasculature and innervation.
42.4. Summarize the development of the fibrous pericardium and relocation of the phrenic nerve.

42.5. Evaluate the relationship between pericarditis, pericardial effusion, cardiac tamponade, and pericardiocentesis.
42.6. Identify the major anatomical features of each heart chamber and explain their functional significance.
42.7. Demonstrate the surface markings of the heart and great vessels.
42.8. Describe the structure and position of the atrioventricular, pulmonary, and aortic valves and their role in preventing blood reflux.

43. Heart II; *MK*

43.1. Compare the origin, course, and main branches of the left and right coronary arteries and discuss the functional consequences of their obstruction.
43.2. Describe the components and pattern of coronary circulation, including the supply to the parts of the heart and variation in the coronary circulation.
43.3. Describe the components and pattern of venous drainage of the heart.
43.4. Explain the anatomical course of the spread of excitation through the chambers of the heart and the placement of ECG electrodes for its clinical assessment.
43.5. Briefly describe the innervation to the heart.
43.6. Summarize the mechanism of referred pain and where the pain is referred from thoracic organs.

Lab 13* *Intercostal Space & Intercostal Muscles, Anterior Thoracic Wall & Pleurae Cavitites & Lungs Lab; Group B*; *MK, ICS, PRO

44. Superior Mediastinum; *MK*

44.1. Recognize the course of the ascending aorta, the arch of the aorta, and the descending thoracic aorta, including their significant branches and the structures they supply.
44.2. Demonstrate the surface markings of the great vessels.
44.3. Describe the origins, course, and relationships of the brachiocephalic veins, inferior and superior venae cavae, and the azygos venous system.
44.4. Explain the origin, course, and distribution of the vagus nerve and its branches and the phrenic nerves on the right and left sides of the thorax.
44.5. Compare the course and significant relations of the esophagus to other thoracic structures.
44.6. Describe the course and significant relations of the thoracic duct and the other lymph systems within the thorax and explain their medical significance.

45. Posterior & Anterior Mediastinum; *MK*

45.1. Identify the three parts of the inferior mediastinum, including their contents.
45.2. Describe the basic procedure for mediastinoscopy, including its utility.
45.3. Explain how the pathological widening of the mediastinum is observed clinically.
45.4. Summarize the plan/layout of thoracic aorta branches.
45.5. Explain the clinical relevance of the impressions produced in the thoracic portion of the esophagus on adjacent structures.
45.6. Determine situations and reasons for the vulnerability of the thoracic duct.
45.7. Describe the azygos venous system.
45.8. List the composition and function of the sympathetic chains and splanchnic nerves.

Lab 14* *Mediastinum, External & Internal Features of the Heart, Superior & Posterior Mediastinum Lab; Group A*; *MK, ICS, PRO

46. Anterolateral Abdominal Wall; *MK*

46.1. Demonstrate the surface anatomy of bony and cartilaginous landmarks on abdominal examination.

46.2. Describe the quadrants and regions of the abdomen and common incision sites.
46.3. Explain the anatomy, innervation, and functions of the anterolateral abdominal wall muscles and their roles in posture, ventilation, and voiding.
46.4. Describe the anterolateral abdominal wall's fascial layers, structures, and neurovascular elements.
46.5. Regarding direct and indirect inguinal hernias, list the attachments of the inguinal ligament, the structures comprising the superficial and deep inguinal rings, and how the anterior abdominal wall muscles form the inguinal canal.
46.6. Indicate the contents of the inguinal canal in both males and females.
46.7. Explain the anatomy of the spermatic cord, testis, epididymis, scrotum, including muscular and fascial layers, and neurovascular elements.

47. Peritoneum & Peritoneal Cavity; *MK*
47.1. Explain the peritoneal associations of the liver, pancreas, spleen, kidneys, stomach, duodenum, jejunum, and ileum of the small intestine, caecum, appendix, ascending, transverse, descending, and sigmoid parts of the colon and the rectum.
47.2. Summarize the functional anatomy of the small bowel mesentery; its structure, location, vascular, lymphatic, and neural content.
47.3. Describe the organization of the parietal and visceral peritoneum; its lesser and greater sacs, mesenteries, and peritoneal 'ligaments.' Explain the significance of the variable attachment of the ascending and descending colon to the posterior abdominal wall.
47.4. Explain the nerve supply of the parietal and visceral peritoneum and the role of the visceral peritoneum in referred pain.

48. Esophagus, Stomach, & Spleen; *MK*
48.1. Describe the course of the esophagus and how its anatomy transitions from the pharynx to the abdomen.
48.2. List the sources of arterial blood to the esophagus; also list generally the venous systems to which it drains.
48.3. List the sensory and motor innervation of the esophagus.
48.4. Describe the functional anatomy of the stomach, its position, parts, sphincters, blood and nerve supply, and fundamental relations to other abdominal organs.
48.5. Describe the position and form of the spleen about the ribs and its palpation through the abdominal wall and its key anatomical relationships with other abdominal structures.
48.6. Diagram the major branches of the abdominal aorta that supply the stomach and spleen.
48.7. Differentiate the visceral afferent and efferent innervation of the stomach and spleen.

49. Liver & Gall Bladder; *MK*
49.1. Describe the position and form of the liver, the lobes of the liver, and their key anatomical relations.
49.2. Explain the peritoneal reflections of the liver and its movement during respiration.
49.3. Describe the position and form of the gall bladder and biliary tree, their relations in the abdomen, and their significance to gall bladder inflammation and biliary stones.
49.4. Diagram the major branches of the abdominal aorta that supply the liver and gall bladder.
49.5. Differentiate the visceral afferent and efferent innervation of the liver and gall bladder.

Lab 15* *Superficial Fascia & Muscles of the Anterolateral Abdominal Wall, Reflection of the Abdominal Wall & Peritoneum & Peritoneal Cavity Lab; Group A*; *MK, ICS, PRO

50. Small & Large Intestine; *MK*
50.1. Describe the regions of the small intestine.

50.2. Compare parts, position, secondary retroperitoneal attachment of the duodenum, and critical relations with other abdominal organs.
50.3. Differentiate the visceral afferent and efferent innervation of the small intestine.
50.4. Compare the components, peritoneal position, blood supply, venous drainage, and innervation of the large intestine.
50.5. Describe the anatomy of the lymph nodes involved in lymph drainage of the gastrointestinal tract and its significance concerning the spread of malignancy.

51. Posterior Abdominal Viscera: Pancreas, Kidneys, Ureters, & Suprarenal Glands; *MK*

51.1. Describe the position and form of the pancreas and its relationships to other abdominal organs, including the significance of these relationships to pancreatitis and biliary stone disease.
51.2. Describe the position and form of the kidneys and ureters and identify pertinent structures in medical images. Demonstrate their relationships to other abdominal and pelvic structures and discuss the significance of these relations to urinary stones.
51.3. Summarize the neurovasculature and lymphatics of the pancreas, kidney, and ureters.
51.4. Describe the relations of the suprarenal (adrenal) glands and their functional anatomy.

Lab 16 ***Celiac Trunk, Stomach, Spleen, Liver & Gallbladder, SMA & Small Intestine, IMA & Large Intestine, Duodenum, Pancreas & Hepatic Portal Vein & Removal of GI Tract Lab; Group B;*** *MK, ICS, PRO*

52. Posterior Abdominal Wall & Diaphragm; *MK*

52.1. Describe the skeletal boundaries of the posterior abdominal wall.
52.2. Describe the posterior abdominal wall muscles, including their attachments, innervation, and actions.
52.3. Describe the fascial layers within the posterior abdominal wall and their relationships to other structures.
52.4. Describe the abdominal aorta, its location and relationships, and its branches.
52.5. Describe the inferior vena cava, its location and relationships, and its tributaries.
52.6. Describe the lymphatic structures of the posterior abdominal wall, including the cisterna chyli.
52.7. Describe the nerves that course within the posterior abdominal wall.
52.8. Describe the lumbar plexus, the types of fibers it contains, the vertebral levels from which the branches arise, and their relationships to other structures.

53. Male Perineum & External Genitalia; *MK*

53.1. Define the boundaries and divisions of the perineum.
53.2. Explain the contents, spaces, and neurovascular of the anal triangle.
53.3. Define the components of the penis, including a description of the location and features of each.
53.4. Differentiate the various erectile tissues of the penis and associated structures of the penis (e.g., urethra, skin, fascia, etc.).
53.5. Explain the location, relationships, and functions of the superficial perineal muscles in the male.
53.6. Review the scrotum location and layers.
53.7. List the structures forming the boundaries, floor, and roof of the superficial and deep perineal pouches, including blood supply and innervation.
53.8. Compare the structure and function of contents within the superficial and deep perineal pouches of males.

Lab 17 ***Posterior Abdominal Viscera, Posterior Abdominal Wall & Diaphragm Lab; Group A;*** *MK, ICS, PRO*

54. Female Perineum & External Genitalia; *MK*

54.1. Define the boundaries and divisions of the female perineum into superficial and deep perineal pouches.

54.2. Describe structure and function of contents within the superficial and deep perineal pouches in females.

54.3. Identify external genitalia found in the vulva including function, neurovasculature and lymph drainage.

54.4. Explain the location, relationships, and functions of the superficial and deep perineal muscles in the female.

55. Pelvic Peritoneum & Urinary Organs; *MK*

55.1. Describe the anatomy of the bladder, its base, and ureteric openings.

55.2. Explain positional changes of the urinary bladder with filling and pregnancy and its relationship to the overlying peritoneum.

55.3. List the innervation/blood supply of the bladder and describe its sphincters and the mechanism of micturition.

55.4. Explain the neurovasculature of the ureter and urethra.

Lab 18 ***Anal Triangle, Ext. Genitalia, & UG Triangle Lab; Group B*****;** *MK, ICS, PRO*

56. Internal Genital Organs; *MK*

56.1. Describe the anatomy of the prostate gland, seminal and bulbourethral glands, ductus deferens, and ejaculatory ducts, as well as their anatomical relations.

56.2. Indicate the usual form of the prostate when examined per rectum and recognize its changes with hypertrophy and malignancy.

56.3. Describe the components of the nervous system associated with the male pelvic viscera.

56.4. Summarize the lymphatic drainage of the male pelvis.

56.5. Describe the anatomy of the ovary, uterine tubes, uterus, cervix, and vagina, and their anatomical relationships, including any peritoneal coverings.

56.6. Compare the origin, course, and relations of the uterine and ovarian arteries.

56.7. Describe the origin, course, and branches of the pudendal nerves and the sites of nerve block during childbirth.

56.8. Summarize the lymphatic drainage of the female pelvis.

57. Pelvic Walls, Floor, Fascia, & Rectum; *MK*

57.1. List the structures that comprise the pelvic diaphragm.

57.2. List the points of attachment for muscles forming the pelvic diaphragm.

57.3. Describe the functional importance of the pelvic floor musculature, urogenital hiatus, and the structures passing through in males and females.

57.4. Explain the structures associated with the peritoneum and fascia of the pelvis.

57.5. Describe the internal anatomy of the rectum.

57.6. Explain the importance of the pelvic diaphragm for the anorectal flexure.

57.7. Describe the significance of the muscular and neurovascular elements of the rectum.

Lab 19 ***Pelvic Cavity, Urinary Bladder, Rectum, & Anal Canal Lab; Group A*****;** *MK, ICS, PRO*

58. Pelvic Vasculature; *MK*

58.1. Summarize the origin, course, and distribution of internal iliac artery branches.

58.2. Differentiate the branching patterns of male versus female iliac arteries.

58.3. Identify the veins responsible for drainage of the pelvic region.

58.4. Explain the path of lymph drainage within the pelvic region.

59. Pelvic Nerves; *MK*

59.1. Summarize the origin, course, and distribution of somatic nerves from the sacral plexus.

59.2. Recognize the four routes for autonomic nerve innervation in the pelvis.

59.3. Identify the pelvic pain line and how visceral afferent innervation travels above and below this line.

Lab 20 ***Internal Iliac A, Sacral Plexus, & Pelvic Diaphragm Lab; Group B*****;** *MK, ICS, PRO*

TBL: Ethics 2; *MK*

ARKANSAS COLLEGE OF OSTEOPATHIC MEDICINE

Course Name: Foundations of Osteopathic Patient Care-1

Class of/Semester/Year: 2028/Fall/2024

Date Last Revised: June 4, 2024

Approved By: Shannon Ramsey Jimenez

Shannon Ramsey Jimenez, DO

Dean of ARCOM

Note: Final Approval. May be released to students. Schedule subject to change with advance notice.

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ARKANSAS COLLEGE OF OSTEOPATHIC MEDICINE

Arkansas Colleges of Health Education
Course Syllabus

Course Name:	Foundations of Osteopathic Patient Care 1 (FOPC1)
Class of/Semester/Year:	Class of 2028/Fall 2024
Course Designation:	COM 521
Term Dates:	July 19, 2024 – December 6, 2024
Course Dates:	July 19, 2024 – December 3, 2024
Total Contact Hours:	39 Lecture Hours; 13 Lab Hours
Credit Hours:	4 Credit Hours
Assessment/Grading:	Two Written Exams; One Skills Practical
Location:	Lecture Hall 2, OMM Lab, SIM Center, SP Center, Classroom 1, TBL Rooms, Virtual Teams
Course Director:	Kaitlin McNamara, DO
Office Hours:	By appointment

Syllabus is subject to change

ARKANSAS COLLEGE OF OSTEOPATHIC MEDICINE

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Course Description:
Foundations of Osteopathic Patient Care (FOPC I) is the first of four active participation courses during the first two years. It is designed to introduce clinical skills including the art of medical history taking and physical examination. It also introduces the student to the concept of medical professionalism and ethics, the physician's role and duties toward society and the profession, the concept of the physician-patient relationship and the obligations and rights of both the doctor and the patients they serve. The first year of the course places an emphasis on communication skills, medical history taking and physical examination skills. The second year of the course focuses on the development of the clinical acumen necessary to diagnose and treat the patient while developing problem-solving skills that are required of today's physicians.

The course places an emphasis on respect for individuals along with an understanding of the diversity of individuals and cultures. The ability to communicate with patients effectively, educate and motivate them to advance their own health and wellness, along with the ability to work collaboratively in a team environment, are essential tools for today's physician. These tools are developed during the course.

The course requires active participation and demonstrations of mastery of the core competencies expected of an osteopathic physician. The course utilizes computer-based educational content, lecture demonstration, small group case-based learning exercises, problem-solving exercises, clinical laboratory experiences, utilization of standardized patients and simulations as well as assigned reading to provide the knowledge and skills foundation expected by the faculty. The course is a first in a series of clinical skills courses that are integrated with the osteopathic principles and practice courses offered by the college and correlated with the systems courses taught in the curriculum.

The course teaches the basics of radiology. The student will be introduced to radiological imaging of the different systems as they are being taught.

Course Goals:
The following course goals reflect broad and enduring knowledge, skills, behaviors, and responsibilities that students should attain as a result of successfully completing the course:

1. Demonstrate an understanding of and apply the principles of professionalism and ethics in the clinical, educational, and professional settings.
2. Grasp the meaning and contexts of medical terminology within healthcare settings and utilize appropriate medical terminology effectively in both written and verbal communication.
3. Develop proficiency in the techniques required to conduct patient interviews and gather medical histories, particularly in brief encounters utilizing a problem-oriented approach.
4. Understand the importance of thoroughness and focus on physical examinations.
5. Demonstrate competence in utilizing the diagnostic equipment appropriately.

Course Expectations and Student Responsibilities:
Students should refer to the ARCOM Student Handbook & Clinical Training Manual, as well as the ACHE Student Handbook and ACHE Course Catalog for information regarding professional standards, acceptable conduct, dress code, and program requirements.

Video Capture of Educational Content:
Consistent with the policies surrounding video capture and posting of educational content, recordings of any learning activity are considered a supplemental resource to advance student understanding and for

reference at future stages of student education. Recorded materials should not be utilized to replace attendance in the classroom, laboratory, or clinical setting. ARCOM makes no guarantees of reliability for video capture and reserves the right to not allow the recording of learning activities. There is no substitute for class attendance, being actively engaged in the learning process, investing in the comprehension and application of course material, and interacting with instructors and colleagues. Becoming an osteopathic physician involves much more than the acquisition of knowledge and attainment of a professional title. Professionalism, ethics, problem solving, and communication are among the vital skills that are best developed in active and interactive settings. As such, ARCOM expects students to attend all learning activities and offers no guarantees or warranties as to the recording of educational classroom/laboratory content. There will be no video capture of in-class applications team-based learning (TBL), Foundations of Osteopathic Patient Care (FOPC), or Osteopathic Principles and Practice (OPP). Students are not permitted to render any audio and/or visual recordings of these in-class sessions.

Dress Code:
Students should refer to the ACHE Student Handbook (subheading "Professional Dress Guidelines"), as well as their course syllabi, for the dress code for campus and academic activities.

It is imperative for students to recall that they have acknowledged understanding the "Technical Standards" as a part of their admission to ARCOM. These standards emphasize the integral role of touch and palpation in the osteopathic approach to diagnosis and treatment. As part of their educational journey, ARCOM students must be will to both tolerate being touched and palpated, as well as engage in touching and palpating others in a professional and appropriate manner. This tactile interaction is essential for students to acquire and develop the necessary skills for conducting osteopathic examinations effectively.

During physical diagnosis and osteopathic manipulative medicine laboratory experiences, as well as other clinical laboratories where skills are honed, students are obligated to participate in the examination of any fellow student who may be partially disrobed. This may necessitate wearing attire such as shorts/sports bras and partially disrobing for certain laboratory exercises. It's vital to note that these requirements apply to all students, irrespective of cultural or religious beliefs, as they are essential for acquiring the skills essential for medical practice.

During lab lectures focused on physical examination skills, students must dress appropriately to facilitate the performance and reception of clinical examinations. It's essential for students to be able to perform and receive clinical examinations in these settings without hindrance.

For attire guidelines:

OMM Lab: Students may wear ARCOM shirts/shorts or ARCOM scrubs. However, it's essential that their clothing allows partners to move them appropriately for evaluation; therefore, tight-fitting clothing should be avoided.

- During certain palpation and auscultations labs, both male and female students will be expected to bare skin to facilitate examination, while maintaining modesty. This can be achieved through the use of appropriately fitted racerback sports bras or tank tops for the upper body. It's important to note that these requirements ensure the acquisition of essential skills for medical practice.

SP Encounters or Live Patient Encounters (excluding partners): Business casual attire, along with a white coat, are to be worn.

- Shoulders and cleavage should be covered completely.
- Undergarments should not be visible.
    - **Men:** Shirt and tie, dress slacks, dress shoes and socks.
    - **Women:** Dresses, skirts, or dress slacks with blouse and/or sweater. Skirts, if adorned, must be no shorter than 3 inches above the knees, inclusive of any slits. Closed toe dress shoes.

SIM Labs: Students are required to wear scrubs and a white coat during SIM labs.

Regarding lecture attire:
If a lecture directly precedes the next FOPC-1 session, students are permitted to wear attire appropriate for the upcoming session.

If a lecture does not directly precede the next FOPC-1 event, students are expected to adhere to the dress code outlined in the ARCOM student Handbook.

Regarding long hair:
In addition to the dress code requirements, students with long hair are expected to keep it secured in a ponytail, bun, or other updos during laboratory sessions and clinical encounters. This measure ensures both professionalism and safety by preventing hair from obstructing vision or contaminating examination areas.

Regarding shoe-wear:
For safety and sanitation purposes, students are required to always wear closed-toed shoes during laboratory sessions and clinical encounters. This measure helps prevent accidents and ensures a clean environment conducive to learning and patient care.

Regarding other accessories:
No watches or personal timing devices are permitted to be worn or brought into these settings. This policy ensures an environment conducive to focused learning and clinical practice, where distractions are minimized, and attention remains dedicated to the task at hand.

Dangling jewelry must be restrained during patient encounters to ensure the safety of both the patient and the student.

- Dangling jewelry is prohibited in Standardized Patient (SP) encounters, and Simulation experiences.

Pagers, cell/smartphones, tablets, laptops, iPods, MPS players, manuals, or other clinical or electronic resources are strictly prohibited during Standardized Patient (SP) encounters. Additionally, while they may be permitted in class under certain circumstances, their use should be avoided to maintain focus and respect for the learning environment.

Regarding nail-care:
To ensure patient safety, nails must be kept short, and artificial nails are strictly prohibited.

Regarding perfumes/cologne:
In adherence to patient safety regulations, the wearing of perfumes and colognes is strictly prohibited. However, it is recommended that students utilize underarm deodorizer to uphold personal hygiene standards and ensure comfort during both class and clinical activities.

Professionalism:

- Students will conduct themselves professionally at all times, during all educational activities conducted on or off campus. This includes interactions with all faculty, staff, students, clinical faculty, guest lecturers, health care providers, patients, and any other member of the ARCOM community. Unprofessional behavior, conduct, or attire inconsistent with the ARCOM dress code will not be tolerated and will result in administrative action. Students are directed to the ARCOM Student Handbook & ACHE Course Catalog for a full definition of professionalism and list of expected professional behaviors.
- Any unauthorized recording of learning materials and activities used in connection with the ARCOM curriculum or reproduction, rendering, possession, or dissemination of these materials including assessment materials, is considered unprofessional behavior and a violation of copyright. Such behavior is subject to action by the Student Conduct Committee(SCC) for disciplinary action, which may include receiving a grade of "zero" for a graded assessment, course failure, probationary action, suspension, or dismissal from ARCOM.
- Computers, tablets, or notebooks should only be used during lectures to take notes or reference appropriate class topics and reference materials. Students should not be on the internet viewing social media sites, performing online shopping, or playing games, etc. Thisis disrespectful to the lecturer, inhibits peer learning, and is unprofessional behavior.
- **Any documentation in the SOAP note that reflects a portion of the physical examination that was NOT performed during a Standardized Patient Practical is considered unprofessional and is prohibited and may result in a referral to the Student Conduct Committee (SCC).**
- During practical assessments, any behavior, including bringing non-approved apparel into the testing center, that is deemed unprofessional or is prohibited, may result in a warning or ending the examination at that point. No grades will be given for any actions after you are told that your exam has ended.

Equipment for Standardized Patient or Simulation Experiences or Practicals

- **BRING STETHOSCOPES.**
  - If you possess a stethoscope different from the one provided in the doctor's bag, it must undergo inspection and approval by the faculty before use.
  - Stethoscopes with recording or communicating functions are prohibited.
- **Do not wear wristwatches or bring other personal timing devices to the examination**.
  - Clocks are located in each examination room and throughout the testing center.
  - Regular audio timing prompts also guide candidates through their tests.
- **Do not bring pagers, cell/smartphones, tablets, laptops, iPods, MPS players, manuals, or other clinical or electronic resources into the testing area.**
- **Likewise, do not bring valuables such as jewelry**.

Diversity, Equity, and Inclusion:

ACHE is committed to a campus environment that is inclusive, safe, and respectful for all persons, and fosters an environment free of harassment and discrimination. To that end, all course activities will be conducted in an atmosphere of friendly participation and interaction among colleagues, recognizing and appreciating the unique experiences, background, and point of view each student brings. Students are expected at all times to apply the highest academic standards to this course and to treat others with dignity and respect.

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Attendance Policy:

Osteopathic medical education prepares students for professional clinical practice. Lectures and labs include didactic material, case presentations, patient demonstrations, informal discussions, team-based learning, and the practice of psychomotor skills. Consistent and prompt class attendance is essential for the learner to benefit from the full educational experience.

Therefore, ARCOM Faculty have adopted the following attendance policy:

1. Attendance at all lecture sessions within a given course is strongly encouraged, but not required.
2. Attendance is required for all guest lecturers and team-based learning experiences. A pattern of absenteeism or tardiness for these sessions is considered unprofessional behavior and may result in a referral for disciplinary action for violations of the ACHE Student Code of Conduct consistent with the ACHE Student Misconduct Policy.
3. Since laboratory sessions are designed to develop the clinical and psychomotor skills necessary for success as an osteopathic physician, students are expected to attend all laboratory sessions (as outlined in the course syllabus) and all lectures tied to labs. If, for any reason, a student misses more than 10% of these required sessions for a given course, the student will receive 1% decrease in final average for each percentage missed over 10%.

   Example: A course with 20 laboratory sessions.

   A student who misses 3 laboratory sessions (15%) will receive a 5% reduction in his/her final average. A student who misses 4 laboratory sessions (20%) will receive a 10% reduction in his/her final average.
4. All simulated events, including standardized patient encounters, simulated patient encounters, and skills events are required, and an absence or tardiness will result in the loss of additional 2% of the final percentage per simulated event, or as otherwise stated by the course director.
5. This attendance policy does not override any assignments that require attendance to perform. Therefore, if a student misses an event that requires an assignment to be submitted based on the educational experience, the student will lose points for not successfully completing the assignment.
6. If a student misses an exam, he/she will receive a grade of zero. A make-up exam will only be administered on a case-by-case basis with the approval of the course director and/or the Dean of ARCOM.
7. Students considered academically "at-risk" may be held to a separate attendance policy administered by the Office of Academic Affairs.
8. Students must be physically present to receive credit for attendance. Virtual attendance of lectures does not count as in-person attendance.
9. Students must refer to the Outlook Live calendar for all course schedules and changes.
10. Students are responsible for all missed learning material/experiences.
11. As it is not possible to replicate lab experiences, faculty members are not obligated to provide makeup learning experiences.
12. There are no excused absences; however, extenuating circumstances (e.g. serious illness/injury, etc.) may be addressed on a case-by-case basis by the ARCOM Dean.
13. Absence from class to attend professional events, such as a state or national conference, may be approved on a case-by-case basis by the ARCOM Dean.
14. Absence from class due to planned events of a personal nature are not excused absences.
15. A pattern of tardiness is unacceptable. While Faculty understand there may be unavoidable instances, tardiness will not be tolerated on exam days or when guest speakers are in attendance. Admittance to the classroom may be prohibited and, in that circumstance, the student would be marked as absent.

This attendance policy will be strictly adhered to. It is expected that students will use good judgment when being absent, only doing so rarely and for legitimate or necessary reasons.

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Course Faculty:

Faculty Member	Office	Phone	Email
Donna Shipley, MD	209	479-308-2326	donna.shipley@achehealth.edu
Kaitlin McNamara, DO	215	479-308-2332	kaitlyn.mcnamara@achehealth.edu
Aubrey Ziegler, MD	217	479-308-2327	aubrey.ziegler@achehealth.edu
Monica Rojas, MD	211	479-308-2343	monica.rojas@achehealth.edu
Michael Gooden, MD	347B	N/A	michael.gooden@achehealth.edu
Louay Nassri, MD	216	479-308-2324	louay.nassri@achehealth.edu
Jozia McGowan, DO	208	479-308-2328	jozia.mcgowan@achehealth.edu
Jeanne Rupert, DO	219	479-308-2342	jeanne.rupert@achehealth.edu
Leslie Ziegler, MD	NA	GUEST	

Faculty Office Hours:
While faculty maintain an open-door policy, **it is strongly recommended that a student in need of a faculty member's time and attention reserve an appointment directly via e-mail** or telephone communication with the faculty member.

Additionally, the faculty ***may not be available*** to answer student questions ***24 hours prior*** to an examination due to test preparation obligations. Students should budget their time appropriately and set appointments with faculty members during their office hours well in advance of exams. Faculty **may have limited availability** to respond to emails during the evenings, weekends, holidays, or days in clinic, so students should plan accordingly.

Required Course Resources:

Title	Edition	Authors	ISBN-13
Bates' Guide to Physical Examination and History Taking	13th	Lynn S. Bickley	978-1496398178

https://research.ebsco.com/linkprocessor/plink?id=a863ad74-2124-38c0-b270-7c85b1115a1b

Recommended Course Resources:

Title	Edition	Authors	ISBN-13
Harrison's Principles of Internal Medicine (2022)	21st	Jameson et al.	978-1264268504
https://research.ebsco.com/linkprocessor/plink?id=a9e46178-76c6-3adc-8f45-35a4129b9a85			
Current Medical Diagnosis & Treatment (2023)		Papadakis et al.	978-1264687343
https://research.ebsco.com/linkprocessor/plink?id=0952d27d-8e33-3737-8edc-58dd1d4f314d			
USCD's Practical Guide to Clinical Medicine (online course)		Charlie Goldberg	https://meded.ucsd.edu/clinicalmed/introduction.html

Bates' Visual Guide to the Physical Examination, (online database) Rachel Whitney, 1542-4065
Bates' Visual Guide: https://library.achehealth.edu/bates-visual-guide

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Nelson Textbook of Pediatrics (2024)
Rittenhouse Information: https://www.rittenhouse.com/Rbd/Products/Book.aspx?sku=0323883052
Amazon Information: https://www.amazon.com/Nelson-Textbook-Pediatrics-2-Set/dp/0323883052/ref=sr_1_1?keywords=9780323883054&sr=8-1

Osteopathic Core Competencies:
The faculty and administration of ARCOM attest that Osteopathic Core Competencies are met in this course.

1. **Osteopathic Philosophy/Osteopathic Manipulative Medicine (OPP/OMM):** Demonstrate and apply knowledge of accepted standards in osteopathic manipulative treatment appropriate to the specialty. Remain dedicated to life-long learning and to practice habits in osteopathic philosophy and OMM.
2. **Medical Knowledge (MK):** Demonstrate and apply knowledge of accepted standards of clinical medicine in the respective area; remain current with new developments in medicine and participate in life-long learning activities.
3. **Patient Care (PC):** Demonstrate the ability to effectively treat patients and provide medical care that incorporates the osteopathic philosophy, patient empathy, awareness of behavioral issues, the incorporation of preventive medicine and health promotion.
4. **Interpersonal and Communication Skills (ICS):** Demonstrate interpersonal and communication skills that enable a physician to establish and maintain professional relationships with patients, families, and other members of health care teams.
5. **Professionalism (PRO):** Uphold the Osteopathic Oath in the conduct of one's professional activities that promotes advocacy of patient welfare, adherence to ethical principles, and collaboration with health professionals, life-long learning, and sensitivity to a diverse patient population; be cognizant of physical and mental health in order to effectively care for patients.
6. **Practice-Based Learning and Improvement (PBL):** Demonstrate the ability to critically evaluate methods of clinical practice; integrate evidence-based medicine into patient care; show an understanding of research methods; improve patient care practices.
7. **Systems-Based Practice (SBP):** Demonstrate an understanding of health care delivery systems; provide effective and qualitative patient care with the system; and practice cost effective medicine.

Grading Information:
Grading point values and scale are consistent with policies outlined in the ARCOM Student Handbook & ACHE Course Catalog. Students will receive a numerical grade (percentage) at the end of the course with 70% or greater required to pass.

Students are required to pass all components of each course to progress to the next semester. Practicals are given a pass/fail grade. Non-practical components must average a C (70%) or higher grade to pass. Components of this course are separated into practical and non-practical components.

Grade Determination and Scheduled Assignments:

Date	Assessment (CC)	Percentage of Final Grade
Friday, August 2, 2024 @9:00 AM	Quiz #1 (Canvas) *due 8/5/24 @ 8 AM*	10%
Friday, September 13, 2024 @8:30 AM - 10:30 AM	Written Exam #1	20%

Friday, September 27, 2024 @8:00 AM	Quiz #2 (Canvas) *due 9/30/24 @ 8 AM*	10%
Friday, October 18, 2024 @8:00 AM	Quiz #3 (Canvas) *due 10/21/24 @ 8 AM*	10%
Thursday, November 21, 2024 @8:30 AM - 10:30 AM	Written Exam #2	20%
Friday, November 22, 2024 @8:00 AM - 12:00 PM	SP Final Practical	20%
Throughout Semester	Assignments	10%
TOTAL:		**100%**

Examinations:
Written Examinations: There will be two written examinations. All written examinations may have questions from any lecture or lab that was presented at least 48 hours prior to the written examination.

Practicals: Throughout the semester, students will progressively engage in writing SOAP notes as they acquire knowledge and skills. These sessions will commence with students conducting History and Physical examinations on patient(s), gradually advancing to documenting the subjective and objective findings in SOAP notes for each patient encounter.

Quizzes: Thirty percent of the total grade will be attributed to quizzes, which will assess understanding and retention of course material.

Assignments: Ten percent of the grade will be allocated for miscellaneous tasks assigned during lab sessions. These assignments will primarily take the form of modules but many vary depending on the requirements.

Remediation:
See Course Director for specific policy.

Course content, sequencing, grading, and examination policies are subject to change by administration with the approval the Curriculum Committee. Students will be given advanced notice of any substantive changes by email and the ARCOM portal.

Course Specific Grading Information:
Computer-based examinations and laboratory practicals evaluate acquired medical scientific knowledge, whereas the quality of dissections assesses completion of assigned laboratory work. Grading percentages for all assessments used to calculate the final course grade are outlined in the syllabus.

Foundations of Osteopathic Patient Care 1 (FOPC1) Course Schedule:
Refer to the OUTLOOK Student Calendar for official (up to date) schedule

Day	Date	Time	Session #	Title	Instructor
Fri	Jul 19	8 AM	1	Medical Terminology (*Asynchronous*)	McNamara
Mon	Jul 22	1 PM	2	Introduction to FOPC	McNamara
Mon	Jul 22	2 PM	3	Introduction to Simulation, SPs, High-fidelity Mannequins, & Task Trainers	McNamara/ Sanders

Tue	Jul 23	1 PM	L1	Introduction to SP/SIM Center Walkthrough (Group B1)	SIM Dept
Tue	Jul 23	2 PM	L1	Introduction to SP/SIM Center Walkthrough (Group B2)	SIM Dept
Tue	Jul 23	3 PM	L1	Introduction to SP/SIM Center Walkthrough (Group A1)	SIM Dept
Tue	Jul 23	4 PM	L1	Introduction to SP/SIM Center Walkthrough (Group A2)	SIM Dept
Thu	Jul 25	8 AM	4	Medical Bag (*Asynchronous*)	McNamara
Thu	Jul 25	1 PM	L2	Introduction to Instruments of Medical Bag (Group A1)	FOPC Faculty
Thu	Jul 25	2 PM	L2	Introduction to Instruments of Medical Bag (Group A2)	FOPC Faculty
Thu	Jul 25	3 PM	L2	Introduction to Instruments of Medical Bag (Group B1)	FOPC Faculty
Thu	Jul 25	4 PM	L2	Introduction to Instruments of Medical Bag (Group B2)	FOPC Faculty
Fri	Jul 26	9 AM	5	Modules: Medical Terminology & Medical Bag (*Asynchronous*)	McNamara
Tue	Jul 30	9 AM	6	Medical Narrative	Rupert
Thu	Aug 1	10 AM	7	Vital Signs & Ergonomics	*L. Ziegler
Thu	Aug 1	1 PM	L3	Vital Signs Practice (Group A)	FOPC Faculty
Thu	Aug 1	2 PM	L3	Vital Signs Practice (Group B)	FOPC Faculty
Fri	Aug 2	9 AM		**FOPC 1 Quiz 1 (Canvas) - *Due Monday 8/5/2024 @ 8 AM***	Canvas
Tue	Aug 6	10 AM	8	Entering the Room & Collecting HPI	McNamara
Tue	Aug 6	1 PM	SG1	TBL Small Groups (SG): Collecting HPI (Group B1)	FOPC Faculty
Tue	Aug 6	2 PM	SG1	TBL Small Groups (SG): Collecting HPI (Group B2)	FOPC Faculty
Tue	Aug 6	3 PM	SG1	TBL Small Groups (SG): Collecting HPI (Group A1)	FOPC Faculty
Tue	Aug 6	4 PM	SG1	TBL Small Groups (SG): Collecting HPI (Group A2)	FOPC Faculty
Mon	Aug 12	8 AM	9	SP & SIM Encounter Professionalism	McNamara
Tue	Aug 13	1 PM	L4	SP Encounter #1: HPI Practice & SP Feedback (Group B1)	SP
Tue	Aug 13	3 PM	L4	SP Encounter #1: HPI Practice & SP Feedback (Group A1)	SP
Thu	Aug 15	1 PM	L4	SP Encounter #1: HPI Practice & SP Feedback (Group A2)	SP
Thu	Aug 15	3 PM	L4	SP Encounter #1: HPI Practice & SP Feedback (Group B2)	SP
Thu	Aug 15	1 PM	SG2	SP Encounter #1: Faculty Feedback (Group B1a)	FOPC Faculty
Thu	Aug 15	2 PM	SG2	SP Encounter #1: Faculty Feedback (Group B1b)	FOPC Faculty

Thu	Aug 15	3 PM	SG2	SP Encounter #1: Faculty Feedback (Group A1a)	FOPC Faculty
Thu	Aug 15	4 PM	SG2	SP Encounter #1: Faculty Feedback (Group A1b)	FOPC Faculty
Tue	Aug 20	1 PM	SG2	SP Encounter #1: Faculty Feedback (Group B2a)	FOPC Faculty
Tue	Aug 20	2 PM	SG2	SP Encounter #1: Faculty Feedback (Group B2b)	FOPC Faculty
Tue	Aug 20	3 PM	SG2	SP Encounter #1: Faculty Feedback (Group A2a)	FOPC Faculty
Tue	Aug 20	4 PM	SG2	SP Encounter #1: Faculty Feedback (Group A2b)	FOPC Faculty
Thu	Aug 22	11 AM	10	Rest of Subjective + ROS (without HPI & Social History)	McNamara
Thu	Aug 22	1 PM	SG3	TBL Small Groups (SG): ROS & Subjective (w/o HPI & SH) (Group B)	FOPC Faculty
Thu	Aug 22	3 PM	SG3	TBL Small Groups (SG): ROS & Subjective (w/o HPI & SH) (Group A)	FOPC Faculty
Tue	Aug 27	1 PM	L5	VS Check-Off (Group B1)	FOPC Faculty
Tue	Aug 27	2 PM	L5	VS Check-Off (Group B2)	FOPC Faculty
Tue	Aug 27	3 PM	L5	VS Check-Off (Group A1)	FOPC Faculty
Tue	Aug 27	4 PM	L5	VS Check-Off (Group A2)	FOPC Faculty
Thu	Aug 29	9 AM	11	Concept of Preventative Care	McNamara
Thu	Aug 29	10 AM	12	Intro to USPSTF, Screening Guidelines, Immunizations	McNamara
Thu	Aug 29	11 AM	13	Preventative Care Modules - Canvas (*Asynchronous)-Due 11/6/2024 1 PM*	McNamara
Thu	Sep 5	11 AM	14	Obtaining Social History	McNamara
Thu	Sep 5	1 PM	SG4	TBL Small Groups (SG): Obtaining a Social History (Group B)	FOPC Faculty
Thu	Sep 5	3 PM	SG4	TBL Small Groups (SG): Obtaining a Social History (Group A)	FOPC Faculty
Tue	Sep 10	8 AM	15	TBL: All of Subjective & Vital Signs (*Asynchronous* Cases)	McNamara
Fri	Sep 13	8:30 AM		**FOPC-1 Written Exam #1 (36-48 Questions)**	
Wed	Sep 18	10 AM	16	Intro to the Physical Examination	McNamara
Wed	Sep 18	11 AM	17	Intro to Documentation	McNamara
Tue	Sep 24	1 PM	L6	SP Encounter #2: Subjective & VS + SP Feedback (Group B1)	SP
Tue	Sep 24	3 PM	L6	SP Encounter #2: Subjective & VS + SP Feedback (Group A1)	SP
Thu	Sep 26	1 PM	L6	SP Encounter #2: Subjective & VS + SP Feedback (Group A2)	SP

Thu	Sep 26	3 PM	L6	SP Encounter #2: Subjective & VS + SP Feedback (Group B2)	SP
Thu	Sep 26	1 PM	SG5	SP Encounter #2: Faculty Feedback (Group B1a)	FOPC Faculty
Thu	Sep 26	2 PM	SG5	SP Encounter #2: Faculty Feedback (Group B1b)	FOPC Faculty
Thu	Sep 26	3 PM	SG5	SP Encounter #2: Faculty Feedback (Group A1a)	FOPC Faculty
Thu	Sep 26	4 PM	SG5	SP Encounter #2: Faculty Feedback (Group A1b)	FOPC Faculty
Fri	Sep 27	8 AM		**FOPC 1 Quiz 2 (Canvas) - *Due Monday 9/30/2024 @ 8 AM***	Canvas
Tue	Oct 1	1 PM	SG5	SP Encounter #2: Faculty Feedback (Group B2a)	FOPC Faculty
Tue	Oct 1	2 PM	SG5	SP Encounter #2: Faculty Feedback (Group B2b)	FOPC Faculty
Tue	Oct 1	3 PM	SG5	SP Encounter #2: Faculty Feedback (Group A2a)	FOPC Faculty
Tue	Oct 1	4 PM	SG5	SP Encounter #2: Faculty Feedback (Group A2b)	FOPC Faculty
Thu	Oct 3	9 AM	18	Physical Examination & Documentation of Skin, Hair, & Nails	*L. Ziegler
Thu	Oct 3	1 PM	L7	Physical Examination: Cumulative until now (VS, Gen, Integument & Practice Documentation) (Group B)	FOPC Faculty
Thu	Oct 3	3 PM	L7	Physical Examination: Cumulative until now (VS, Gen, Integument & Practice Documentation) (Group A)	FOPC Faculty
Tue	Oct 8	1 PM	SG6	TBL: S&O of SOAP Note (Group B2)	FOPC Faculty
Tue	Oct 8	2 PM	SG6	TBL: S&O of SOAP Note (Group B1)	FOPC Faculty
Tue	Oct 8	3 PM	SG6	TBL: S&O of SOAP Note (Group A2)	FOPC Faculty
Tue	Oct 8	4 PM	SG6	TBL: S&O of SOAP Note (Group A1)	FOPC Faculty
Thu	Oct 10	9 AM	19	TBL: Cumulative Review (Subjective, VS, GEN, Skin & Documentation) Cases	FOPC Faculty
Tue	Oct 15	1 PM	L8	SP Encounter #3: Case #1 (Group B1)	SP
Tue	Oct 15	3 PM	L8	SP Encounter #3: Case #1 (Group A1)	SP
Thu	Oct 17	1 PM	L8	SP Encounter #3: Case #1 (Group A2)	SP
Thu	Oct 17	3 PM	L8	SP Encounter #3: Case #1 (Group B2)	SP
Thu	Oct 17	1 PM	SG7	SP Encounter #3: Case 1: Faculty Feedback (Group B1a)	FOPC Faculty
Thu	Oct 17	2 PM	SG7	SP Encounter #3: Case 1: Faculty Feedback (Group B1b)	FOPC Faculty
Thu	Oct 17	3 PM	SG7	SP Encounter #3: Case 1: Faculty Feedback (Group A1a)	FOPC Faculty

Thu	Oct 17	4 PM	SG7	SP Encounter #3: Case 1: Faculty Feedback (Group A1b)	FOPC Faculty
Fri	Oct 18	8 AM		**FOPC 1 Quiz 3 (Canvas) - *Due Monday 10/21/2024 @ 8 AM***	Canvas
Tue	Oct 22	1 PM	SG7	SP Encounter #3: Case 1: Faculty Feedback (Group B2a)	FOPC Faculty
Tue	Oct 22	2 PM	SG7	SP Encounter #3: Case 1: Faculty Feedback (Group B2b)	FOPC Faculty
Tue	Oct 22	3 PM	SG7	SP Encounter #3: Case 1: Faculty Feedback (Group A2a)	FOPC Faculty
Tue	Oct 22	4 PM	SG7	SP Encounter #3: Case 1: Faculty Feedback (Group A2b)	FOPC Faculty
Fri	Oct 25	8 AM	20	Pediatric Cardiovascular System Physical Examination	Nassri
Mon	Oct 28	8 AM	21	Adult Cardiovascular System Physical Examination + Documentation	*L. Ziegler
Mon	Oct 28	9 AM	22	Introduction to (VERY BASIC) Normal ECG	*L. Ziegler
Fri	Nov 1	8 AM	23	Normal ECG Modules *Due 11/8/2024 1 PM*	McNamara
Thu	Nov 7	9 AM	24	Pediatric Pulmonary System Physical Examination	Nassri
Thu	Nov 7	1 PM	L9	Cardiovascular Physical Examination (Group B)	FOPC Faculty
Thu	Nov 7	3 PM	L9	Cardiovascular Physical Examination (Group A)	FOPC Faculty
Fri	Nov 8	10 AM	25	Adult Pulmonary System Physical Examination + Documentation	A. Ziegler
Fri	Nov 8	11 AM	26	Introduction to (VERY BASIC) Normal Lung Function/CXR	A. Ziegler
Thu	Nov 14	8 AM	L10	Pulmonary Physical Examination (Group A)	FOPC Faculty
Thu	Nov 14	10 AM	L10	Pulmonary Physical Examination (Group B)	FOPC Faculty
Thu	Nov 14	1 PM	SG8	SIM-CardioPulmonary	FOPC Faculty
Fri	Nov 15	8 AM	27	Integrated Concepts Cardiopulm (includes TBL: Review of Subjective/Objective of Cardio/Pulm Examination Cases)	Zieglers + Basic Science
Fri	Nov 15	1 PM	28	Normal PFT/CXR Modules (*Asynchronous*)-*Due 11/26/2024 8 AM*	McNamara
Tue	Nov 19	8 AM	29	Cumulative Review Q&A	McNamara
Thu	Nov 21	8:30 AM		**FOPC-1 Written Exam #2 (36-45) Q Exam**	
Fri	Nov 22	8 AM		**Skills Practical: VS, Gen, Skin, Cardiopulmonology Physical Exam & Documentation**	6 Stations
Mon	Dec 2	8 AM		Evaluations Due	
Mon	Dec 2	10 AM		***Skills Practical: Make-Up and Retakes***	

ARKANSAS COLLEGE OF OSTEOPATHIC MEDICINE

Appendix:

Foundations of Osteopathic Patient Care 1 (FOPC 1) Learning Objectives Fall 2024 with *Core Competency***:**

(Any changes to the learning objectives will reflect on lecturers presentation slide)

1. Medical Terminology *(Asynchronous)***;** *MK, PC, PBL*

1.1. Analyze unfamiliar terms using word roots, suffixes, and prefixes.

1.2. Apply knowledge of medical terminology to interpret and decipher common medical terms encountered in healthcare settings.

2. Introduction to FOPC; *MK, PC*

2.1. Learn about the structure and overview of the FOPC 1 course**.**

2.2. Understand the expectations that you will be held to.

3. Introduction to Simulation, SP's, High-Fidelity Mannequins, & Task Trainers; *MK, ICS, PRO, SBP*

3.1. Learn about the structure and overview of the SIM Center, SP Center, use of high-fidelity mannequins and task trainers.

3.2. Understand the expectations that you will be held to.

Lab 1 ***Introduction to SP/SIM Center Walkthrough;*** *MK, PC, ICS, PRO, SBP*

1.1.1. Navigate the SP and SIM center facilities confidently.

1.1.2. Demonstrate an understanding of the available resources, equipment, locations, and safety protocols.

1.1.3. Understand the expectations that you will be held to.

4. Medical Bag *(Asynchronous)***;** *MK, PC*

4.1. Identify essential equipment contained within the medical bag that students should have, including but not limited to stethoscope, blood pressure cuff, otoscope, ophthalmoscope, and reflex hammer.

4.2. Explain the basic function and purposes of each piece of equipment found in the medical bag.

Lab 2 ***Introduction to Instruments of Medical Bag;*** *MK, PC, PRO, ICS*

2.1.1. Recall and identify the primary instruments contained within the medical bag, including but not limited to stethoscope, sphygmomanometer, otoscope, ophthalmoscope, and reflex hammers.

2.1.2. Explain the rationale behind the usage of each instrument of the primary instruments discussed.

2.1.3. Demonstrate basic handling and utilization of select instruments during hands-on lab activities.

5. Modules: Medical Terminology & Medical Bag *(Asynchronous)***;** *MK, PC, PBL*

5.1. Recall and define key medical terminology components, including prefixes, suffixes, and root words, to accurately determine healthcare terms based on medical terminology principles.

5.2. Explain the relationships between medical terms and their components, demonstrating comprehension of how prefixes, suffixes, and root words combine to form healthcare terms..

5.3. Apply knowledge of medical terminology to correctly identify and interpret healthcare terms encountered in simulated clinical scenarios, demonstrating the ability to decipher and comprehend medical language.

5.4. Analyze the functions and purposes of instruments commonly found in a medical bag, discerning their roles in patient assessment, diagnosis, and treatment.

5.5. Synthesize knowledge of medical terminology and medical bag instruments to demonstrate proficiency in matching medical terms with their corresponding instruments and explaining the rationale behind their usage in clinical practice.

6. Medical Narrative; *MK, PC, ICS*

6.1. Analyze key components of the medical narrative, including pertinent patient history, symptoms, and contextual information.

6.2. Understand the importance of constructing a comprehensive patient history.

7. Vital Signs & Ergonomics; *MK, PC, ICS, PRO*

7.1. Define the primary vital signs: Height, Weight, Body Mass Index, Blood pressure, Temperature, Heart rate, Respiratory rate, O2 saturation %.

7.2. Explain the significance of monitoring vital signs in patient care.

7.3. Understand the importance of documenting vital signs accurately and comprehensively within the OBJECTIVE section of the SOAP note.

7.4. Explore proper examination table ergonomics to demonstrate correct positioning and adjustments for patients during physical assessments.

Lab 3 ***Vital Signs Practice;*** *MK, PC, ICS, PRO, SBP, PBL*

3.1.1. Recall the primary vital signs: Height, Weight, Body Mass Index, Blood pressure, Temperature, Heart rate, Respiratory rate, O2 saturation %.

3.1.2. Explain the significance of monitoring vital signs in patient care.

3.1.3. Demonstrate the correct techniques for obtaining each vital sign on a peer, including proper positioning, equipment use, and measurement procedures.

3.1.4. Analyze vital sign measurements obtained during practice session, identifying any discrepancies or irregularities.

3.1.5. Evaluate the quality and accuracy of vital sign assessments performed on peers, providing constructive feedback on technique, proficiency, and adherence to established protocols.

8. Entering the Room & Collecting HPI; *MK, ICS, PRO, SBP, PBL*

8.1. Understand professionalism expected in patient interactions, including appropriate greeting etiquette, patient identification protocols, and clarification of the student physician's role.

8.2. Explain the rationale behind specific greeting and patient identification practices in healthcare settings, understanding how these actions contribute to patient safety, trust-building, and effective communication.

8.3. Define the key components of the History of Present Illness (HPI), including the patient's chief complaint, onset, location, duration, characteristics, aggravating/alleviating factors, radiation, timing, severity, and any associated symptoms.

8.4. Understand the importance of gathering comprehensive information during patient history-taking.

8.5. Understand the importance of high-quality documentation of the HPI within the SUBJECTIVE section of the SOAP note.

SG1 - TBL Collecting HPI; *MK, PC, PRO, SBP, PBL*

1.1.1. Recall the key components of the History of Present Illness (HPI), including the patient's chief complaint, onset, location, duration, characteristics, aggravating/alleviating factors, radiation, timing, severity, and any associated symptoms.

1.1.2. Apply knowledge of effective HPI-taking techniques to engage in structure patient interviews within small group settings.

1.1.3. Analyze sample HPIs to identify the presence of key components and evaluate the effectiveness of the interview process in eliciting relevant information.

1.1.4. Evaluate the quality of HPI documentation within the SUBJECTIVE section of

the SOAP note.

9. SP & SIM Encounter Professionalism; *MK, PC, ICS, PRO, SBP, PBL*

9.1. Define key components of professionalism expected in encounters with standardized patients (SPs) and during simulated scenarios in the simulation center, including communication skills, respect for patient confidentiality, patient modesty, and adherence to ethical guidelines.

9.2. Understand how professionalism contributes to the authenticity of the learning experience, fosters trust between learners and SPs, and promotes effective communication and teamwork in simulated clinical environments.

Lab 4 ***SP Encounter #1: HPI Practice & SP Feedback;*** *MK, PC, ICS, PRO*

4.1.1. Perform a simulated patient encounter, demonstrating competence in obtaining a history, performing an appropriate physical examination, and demonstrating compassion, professionalism, and effective communication skills with the patient.

4.1.2. Appropriately document encounter in the SOAP format.

SG2 - SP Encounter #1: Faculty Feedback; *MK, PC, PRO, PBL, SBL*

2.1.1. Analyze the standardized patient encounter with peers and faculty, identifying strengths and weaknesses in communication, clinical reasoning, and professionalism demonstrated during the encounter.

2.1.2. Evaluate the overall performance in the simulated patient encounter, assessing the extent to which students demonstrated proficiency in applying clinical skills and provide constructive feedback to peers based on observed strengths and areas for improvement.

2.1.3. Synthesize insights gained from the simulated patient encounter and small group discussion to develop personalized strategies for enhancing clinical skills, communication techniques, and professional conduct in future patient interactions.

2.1.4. Recall and clarify key concepts related to clinical skills, professionalism, and patient interaction strategies explored during the simulated patient encounter and small group discussion, ensuring a shared understanding among peers and faculty members, and fostering collaborative learning and knowledge exchange.

10. Rest of Subjective + ROS (*without HPI & Social History*)**;** *MK, PC, ICS, PRO, SBP, PBL*

10.1. Define the components of the SUBJECTIVE section of the SOAP note following the HPI.

10.2. Explain the significance of collecting information on the review of systems (ROS) in patient assessment, understanding how it helps identify and evaluate symptoms affecting various body systems.

10.3. Understand the importance of high-quality documentation of the SUBJECTIVE section of the SOAP note.

SG3 - TBL ROS & Subjective *(without HPI & SH);* *MK, PC, ICS, PRO, PBL, SBL*

3.1.1. Recall the key components of the SUBJECTIVE portion of the SOAP note (w/o HPI and SH).

3.1.2. Apply knowledge of effective SUBJECTIVE history-taking techniques to engage in structure patient interviews within small group settings.

3.1.3. Analyze sample SUBJECTIVE portions of SOAP notes to identify the presence of key components and evaluate the effectiveness of the interview process in eliciting relevant information.

3.1.4. Evaluate the quality of SUBJECTIVE documentation within the SUBJECTIVE section of the SOAP note.

Lab 5 ***Vital Signs Check-Off;*** *MK, PC, PRO, PBL*

5.1.1. Demonstrate proficiency in using appropriate equipment to obtain vital signs, including

temperature, heart rate, respiration rate, oxygen saturation %, and blood pressure, on high-fidelity mannequins in the simulation center, adhering to established protocols and demonstrating correct technique.

11. Concept of Preventative Care; *OPP, MK, PC*

11.1. Understand the importance of guidelines and recommendations for primary preventative care, and how adherence to preventative care measures can reduce the risk of disease, improve health outcomes, and promote overall well-being.

11.2. Explore key components of established preventative care guidelines, such as those provided by organizations like the US Preventative Services Task Force (USPSTF) or the Centers for Disease Control and Prevention (CDC).

12. Intro to USPSTF, Screening Guidelines, Immunizations; *MK, PC*

12.1. Recall the mission and purpose of the US Preventative Services Task Force (USPSTF).

12.2. Explain the criteria and methodology used by the USPSTF to evaluate the effectiveness of screening tests and preventive intervention.

12.3. Understand how recommendations are graded based on the strength of evidence and balance of benefits and harms.

12.4. Demonstrate how to document physical exam findings that are demonstrated up to this point.

12.5. Understand the common screening guidelines for screening including blood pressure, colon cancer, breast cancer, lung cancer, and cervical cancer.

12.6. Understand common immunization schedules for adults including flu, COVID, pneumonia, and shingles vaccine.

13. Preventative Care Modules *(Canvas – Asynchronous)***;** *MK, PC, PBL*

13.1. Recall and identify key concepts, principles, and recommendations related to preventative care discussed in previous lectures.

13.2. Explain the rationale behind specific preventative care measures and interventions, understanding their importance in disease prevention, health promotion, and the overall well-being of individuals and populations.

13.3. Apply knowledge of preventative care guidelines and recommendations to analyze quiz questions and select appropriate answers based on real-world scenarios or hypothetical patient situations

14. Obtaining Social History; *MK, PC*

14.1. Explain the components of social history, including but not limited to factors such as: living situation, occupation, marital status, substance use, and social support network, understanding the significance of these factors in shaping a patient's health status, risk factors, and healthcare needs.

14.2. Explain the significance of collecting information of the social history in patient assessment, understanding how it helps identify and evaluate symptoms affecting various body systems.

14.3. Understand the importance of high-quality documentation of the SUBJECTIVE section of the SOAP note.

SG4 - TBL Obtaining a Social History; *MK, PC, ICS, PRO, SBL*

4.1.1. Recall the key components of the rest of the SUBJECTIVE (with focus on social history).

4.1.2. Apply knowledge of effective social history-taking techniques to engage in structure patient interviews within small group settings.

4.1.3. Analyze sample SUBJECTIVE portions of SOAP notes to identify the presence of key components and evaluate the effectiveness of the interview process in eliciting relevant information.

4.1.4. Evaluate the quality of SUBJECTIVE documentation within the SUBJECTIVE section of the SOAP note.

15. TBL: All of Subjective & Vital Signs *(Asynchronous Cases)***;** *MK, PC, PBL*

15.1. Recall and identify key concepts of the SUBJECTIVE section of the SOAP note.

15.2. Recall the primary vital signs: Height, Weight, Body Mass Index, Blood pressure, Temperature, Heart rate, Respiratory rate, O2 saturation %.

15.3. Explain the correct techniques for obtaining each vital sign on a peer, including proper positioning, equipment use, and measurement procedures.

15.4. Utilize understanding of vital signs, and their concepts, to analyze quiz questions and select appropriate answers based on real-world scenarios or hypothetical patient situations.

16. Intro to the Physical Examination; *MK, PC*

16.1. Explain the importance of the physical examination in healthcare, understanding its role in assessing patient health status, identifying signs of illness or disease, monitoring treatment effectiveness, and establishing rapport with patients.

16.2. Understand the significance of establishing a systematic approach to the physical examination to enhance diagnostic accuracy and facilitate communication among healthcare providers.

16.3. Explore the relevance of patient history and presenting symptoms guides the selection and prioritization of physical examination maneuvers.

17. Intro to Documentation; *MK, PC*

17.1. Explain the rationale behind the structured format of the SOAP note, understanding how it facilitates comprehensive documentation, promotes standardized communication among healthcare providers, and enhances patient care coordination and continuity.

17.2. Recall the components of the SUBJECTIVE section of documentation, demonstrating understanding of the comprehensive nature of patient history-taking in healthcare documentation.

17.3. Explain the distinction between SUBJECTIVE and OBJECTIVE documentation in the SOAP note, understanding how the subjective section captures patient-reported information, such as symptoms and medical history, while the objective section focuses on observable and measurable data, such as vital signs and physical examination findings.

17.4. Understand that the OBJECTIVE section should begin with vital signs, followed by diagnostic interpretations.

Lab 6 ***SP Encounter #2: Subjective & VS + SP Feedback;*** *MK, PC, ICS, PRO*

6.1.1. Perform a simulated patient encounter, demonstrating competence in obtaining a history, performing an appropriate physical examination, and demonstrating compassion, professionalism, and effective communication skills with the patient.

6.1.2. Appropriately document the encounter in the SOAP format.

SG5 - SP Encounter #2: Faculty Feedback; *MK, PC, ICS, PRO, SBL*

5.1.1. Analyze the standardized patient encounter with peers and faculty, identifying strengths and weaknesses in communication, clinical reasoning, and professionalism demonstrated during the encounter.

5.1.2. Evaluate the overall performance in the simulated patient encounter, assessing the extent to which students demonstrated proficiency in applying clinical skills and provide constructive feedback to peers based on observed strengths and areas for improvement.

5.1.3. Synthesize insights gained from the simulated patient encounter and small group discussion to develop personalized strategies for enhancing clinical skills, communication techniques, and professional conduct in future patient interactions.

5.1.4. Recall and clarify key concepts related to clinical skills, professionalism, and

patient interaction strategies explored during the simulated patient encounter and small group discussion, ensuring a shared understanding among peers and faculty members, and fostering collaborative learning and knowledge exchange.

18. Physical Examination & Documentation of Skin, Hair, & Nails; *MK, PC, ICS, PRO, SBL*

18.1. Understand the key components of the physical examination of skin, hair, and nails, including inspection techniques, palpation methods, and the assessment of color, texture, moisture, lesions, and abnormalities.

18.2. Describe the importance of conducting a comprehensive physical examination of the skin, hair, and nails in patient assessment, understanding how findings contribute to the identification of dermatological conditions, systemic diseases, and adverse drug reactions, and how they guide differential diagnosis and treatment planning.

18.3. Explain the placement of documentation related to the physical examination of skin, hair, and nails within the SOAP note, understanding its inclusion in the objective section alongside other observable and measurable data, such as vital signs and physical examination findings, to provide a comprehensive overview of the patient's clinical status.

18.4. Recall and define key medical terminology components, including prefixes, suffixes, and root words, to accurately determine healthcare terms based on medical terminology principles.

18.5. Apply knowledge of medical terminology components to understand appropriate dermatological terminology, and descriptive language to accurately describe observed characteristics, lesions, and abnormalities in a standardized format.

Lab 7 ***Physical Examination: Cumulative until now*** *(VS, Gen, Integument & Practice Documentation);* *MK, PC, ICS, PRO, SBL*

7.1.1. Recall the key components of vital signs, the general physical examination, as well as examination of the integumentary system (Skin, hair, nails) from previous lectures.

7.1.2. Demonstrate the correct techniques for obtaining each vital sign on a peer, including proper positioning, equipment use, and measurement procedures.

7.1.3. Perform the appropriate physical examination for GEN and INT systems accurately.

7.1.4. Appropriately document physical examination findings in SOAP note format.

SG6 - TBL S&O of SOAP Note; *MK, PC, ICS, PRO, SBL*

6.1.1. Recall the key components of the SUBJECTIVE and OBJECTIVE components of the SOAP note.

6.1.2. Apply knowledge of effective history-taking techniques to engage in structure patient interviews within small group settings.

6.1.3. Apply knowledge of effective physical examination techniques learned thus far to engage in structure patient interviews within small group settings.

6.1.4. Analyze sample SUBJECTIVE and OBJECTIVE portions of SOAP notes to identify the presence of key components and evaluate the effectiveness of the interview process in eliciting relevant information.

6.1.5. Evaluate the quality of SUBJECTIVE and OBJECTIVE documentation within the SOAP note.

19. TBL: Cumulative Review *(Subjective, VS, GEN, Skin & Documentation)* **Cases;** *MK, PC, ICS, PRO, SBL*

19.1. Recall and key components of the subjective history, vital signs assessment, examination of the general system, integumentary system examination, and documentation requirements in the SOAP note, demonstrating comprehension of each component's role in patient assessment and care.

19.2. Apply knowledge of subjective history-taking, vital signs assessment, and physical examination techniques to analyze and interpret various patient cases, demonstrating

proficiency in identifying relevant information, recognizing abnormal findings.

19.3. Synthesize information from subjective, objective, and documentation components of the SOAP note to develop comprehensive patient profiles for complex case scenarios, integrating findings from different systems and accurately documenting them in a structured and organized manner.

Lab 8 ***SP Encounter #3;*** *MK, PC, ICS, PRO*

8.1.1. Perform a simulated patient encounter, demonstrating competence in obtaining a history, performing an appropriate physical examination, and demonstrating compassion, professionalism, and effective communication skills with the patient.

8.1.2. Appropriately document the encounter in the SOAP format.

SG7 - SP Encounter #3: Faculty Feedback; *MKC, PC, ICS, PRO, SBL*

7.1.1. Analyze the standardized patient encounter with peers and faculty, identifying strengths and weaknesses in communication, clinical reasoning, and professionalism demonstrated during the encounter.

7.1.2. Evaluate the overall performance in the simulated patient encounter, assessing the extent to which students demonstrated proficiency in applying clinical skills and provide constructive feedback to peers based on observed strengths and areas for improvement.

7.1.3. Synthesize insights gained from the simulated patient encounter and small group discussion to develop personalized strategies for enhancing clinical skills, communication techniques, and professional conduct in future patient interactions.

7.1.4. Recall and clarify key concepts related to clinical skills, professionalism, and patient interaction strategies explored during the simulated patient encounter and small group discussion, ensuring a shared understanding among peers and faculty members, and fostering collaborative learning and knowledge exchange.

20. Pediatric Cardiovascular System Physical Examination; *MK, PC*

20.1. Understand the importance of a comprehensive cardiovascular system physical examination in assessing cardiac health and detecting potential abnormalities.

20.2. Understand the key components of the physical examination of the pediatric cardiovascular physical examination, including inspection, auscultation, palpation, and percussion techniques.

20.3. Identify age-appropriate techniques and modifications for conducting a comprehensive pediatric pulmonary examination, taking into account developmental considerations and communication strategies.

20.4. Recall and define key medical terminology components, including prefixes, suffixes, and root words, to accurately determine healthcare terms based on medical terminology principles.

20.5. Apply knowledge of medical terminology components to understand appropriate cardiovascular terminology, and descriptive language to accurately describe observed characteristics, lesions, and abnormalities in a standardized format.

21. Adult Cardiovascular System Physical Examination + Documentation; *MK, PC*

21.1. Understand the importance of a comprehensive cardiovascular system physical examination in assessing cardiac health and detecting potential abnormalities.

21.2. Identify the key components of the adult cardiovascular system physical examination, including inspection, palpation, percussion, and auscultation techniques.

21.3. Recall and define key medical terminology components, including prefixes, suffixes, and root words, to accurately determine healthcare terms based on medical terminology principles.

21.4. Apply knowledge of medical terminology components to understand appropriate

cardiovascular terminology, and descriptive language to accurately describe observed characteristics, lesions, and abnormalities in a standardized format.

22. Introduction to (VERY BASIC) Normal ECG; *MK, PC*

22.1. Define the purpose and significance of electrocardiography (ECG) in clinical practice for assessing cardiac electrical activity.

22.2. Understand the basic principles of ECG interpretation, including electrode placement and lead orientation.

22.3. Identify the components of a standard ECG waveform, including the P wave, QRS complex, and T wave, and their corresponding electrical events in the cardiac cycle.

22.4. Recognize the normal morphology and duration of ECG intervals, such as the PR interval, QRS duration, and QT interval.

22.5. Understand the significance of normal sinus rhythm and its characteristic features on the ECG, including regularity and normal heart rate.

22.6. Identify common variations in ECG patterns that may still represent normal cardiac function, such as sinus arrhythmia and sinus bradycardia.

22.7. Interpret normal ECG findings in the context of clinical assessment, distinguishing between benign variations and pathological conditions

23. Normal ECG Modules (*Due 11/8/24 @ 1 PM***);** *MK, PC, PBL*

23.1. Identify the basic principles of ECG interpretation, including electrode placement, lead orientation, and electrical axis determination.

23.2. Understand the components of a standard ECG waveform, including the P wave, QRS complex, and T wave, and their corresponding electrical events in the cardiac cycle.

23.3. Recognize normal ECG morphology and intervals, including normal sinus rhythm, PR interval, QRS duration, and QT interval.

23.4. Interpret normal variations in ECG patterns, such as sinus arrhythmia, sinus bradycardia, and sinus tachycardia, within the context of clinical assessment.

23.5. Apply knowledge of normal ECG findings to differentiate between benign variations and pathological conditions, such as atrial enlargement, ventricular hypertrophy, and conduction abnormalities.

24. Pediatric Pulmonary System Physical Examination; *MK, PC*

24.1. Understand the unique aspects and challenges of performing a pulmonary system physical examination in pediatric patients.

24.2. Identify age-appropriate techniques and modifications for conducting a comprehensive pediatric pulmonary examination, taking into account developmental considerations and communication strategies.

24.3. Identify the key components of the pediatric pulmonary system physical examination, including inspection, palpation, percussion, and auscultation techniques.

24.4. Understand why performing a systematic inspection of the pediatric chest, assessing for respiratory rate, chest wall movement, and signs of respiratory distress or retractions is important for patient care.

24.5. Recognize common variations in breath sounds and respiratory patterns in pediatric patients, such as transient wheezing or stridor, and interpret their clinical significance.

24.6. Utilize appropriate medical terminology and standardized documentation formats in documenting findings from the pulmonary system physical examination, ensuring clarity, accuracy, and consistency in clinical communication.

Lab 9 ***Cardiovascular Physical Examination;*** *MK, PC, ICS, PRO, SBL*

9.1.1. Recall and appropriately demonstrate the key components of the adult cardiovascular system physical examination, including inspection, palpation, percussion, and auscultation techniques.

9.1.2. Demonstrate proficiency in performing a systematic inspection of the precordium and peripheral vascular system, assessing for signs of cardiac enlargement, pulsations, and peripheral edema.
9.1.3. Utilize palpation techniques to assess peripheral pulses, including radial, brachial, femoral, dorsalis pedis, and posterior tibial pulses, to evaluate arterial blood flow and peripheral perfusion.
9.1.4. Employ proper percussion technique to assess cardiac dullness and identify the cardiac borders, providing information about the size and position of the heart.
9.1.5. Auscultate cardiac and vascular sounds using appropriate stethoscope placement and listening techniques, distinguishing between normal and abnormal heart sounds, murmurs, and bruits.
9.1.6. Perform additional maneuvers, such as jugular venous pressure (JVP) assessment, hepatojugular reflux, and maneuvers to accentuate murmurs, to further evaluate cardiac function and hemodynamics.

25. Adult Pulmonary System Physical Examination + Documentation; *MK, PC*

25.1. Understand the importance of a comprehensive pulmonary system physical examination in assessing respiratory health and detecting potential abnormalities.
25.2. Identify the key components of the adult pulmonary system physical examination, including inspection, palpation, percussion, and auscultation techniques.
25.3. Recognize the clinical significance of common breath sounds and adventitious sounds encountered during auscultation, correlating findings with underlying pulmonary conditions.
25.4. Document findings from the pulmonary system physical examination accurately and thoroughly, including detailed descriptions of inspection, palpation, percussion, and auscultation findings.
25.5. Apply principles of SOAP note documentation to organize and structure information obtained from the pulmonary system physical examination, including subjective and objective data, assessment, and plan.
25.6. Utilize appropriate medical terminology and standardized documentation formats in documenting findings from the pulmonary system physical examination, ensuring clarity, accuracy, and consistency in clinical communication.

26. Introduction to (VERY BASIC) Normal Lung Function/CXR; *MK, PC, PBL*

26.1. Define the purpose and importance of assessing lung function and chest X-rays in clinical practice.
26.2. Recall the basic anatomy and physiology of the respiratory system, including the structures involved in gas exchange and ventilation.
26.3. Identify the key components of lung function tests, including spirometry, and their role in assessing respiratory health.
26.4. Explain the basic principles of spirometry and how it measures lung volumes and capacities, such as tidal volume, vital capacity, and total lung capacity.
26.5. Interpret normal spirometry values, including predicted values based on age, gender, and height, to assess lung function.
26.6. Introduce the concept of chest X-rays and their role in visualizing thoracic structures, including the lungs, heart, diaphragm, and mediastinum.
26.7. Recognize normal radiographic findings on chest X-rays, including lung fields, cardiac silhouette, and pleural spaces, to differentiate them from abnormal findings.
26.8. Discuss the limitations and potential pitfalls of interpreting chest X-rays, including technical factors and common artifacts.
26.9. Apply knowledge gained from the introduction to normal lung function and chest X-rays to clinical scenarios, emphasizing the importance of baseline assessments and early

detection of respiratory abnormalities.

Lab 10 ***Pulmonary Physical Examination;*** *MK, PC, ICS, PRO, SBL*

10.1.1. Recall and appropriately demonstrate the key components of the adult pulmonary system physical examination, including inspection, palpation, percussion, and auscultation techniques.

10.1.2. Identify and describe the anatomical landmarks and surface anatomy relevant to the pulmonary examination, including the thoracic cage, intercostal spaces, and lung fields.

10.1.3. Auscultate lung fields using appropriate stethoscope placement and listening techniques, distinguishing between normal and abnormal breath sounds, including vesicular, bronchial, crackles, wheezes, and pleural rubs.

10.1.4. Collaborate with peers in hands-on practice sessions, providing constructive feedback and peer review to enhance skill acquisition and proficiency in pulmonary examination techniques.

SG8 - SIM-CardioPulmonary; *MK, PC, ICS, PRO, SBL, PBL*

8.1.1. Enhance clinical skills including history-obtaining, physical examination, diagnostic ordering and interpretation, and procedural proficiency in a controlled, realistic environment.

8.1.2. Develop and demonstrate effective communication and teamwork among team-members (healthcare professionals), emphasizing the importance of clear communication, role clarity, and mutual respect in delivering patient-centered care.

8.1.3. Practice critical decision-making and prioritization of tasks in simulated high-stress scenarios in preparation for effectively responding in real-life emergencies.

8.1.4. Participate in a faculty directed debrief of the simulation, practicing self-reflection and peer feedback to promote continuous learning and improvement.

27. Integrated Concepts Cardiopulm *(includes TBL: Review of Subjective/Objective of Cardio/Pulm Examination Cases)***;** *OPP, MK, PC, ICS, PRO, SBP, PBL*

27.1. Analyze and interpret patient history, including relevant medical background, lifestyle factors, and presenting symptoms, to develop a differential diagnosis for cardiopulmonary conditions.

27.2. Apply knowledge of cardiovascular and pulmonary anatomy and physiology to understand the pathophysiology underlying the patient's symptoms and clinical presentation.

27.3. Demonstrate proficiency in performing a focused cardiopulmonary physical examination, including assessment of heart sounds, lung auscultation, and evaluation of peripheral perfusion.

27.4. Utilize critical thinking skills to prioritize diagnostic tests and investigations, such as ECG, chest X-ray, spirometry, and arterial blood gas analysis, based on the patient's clinical presentation and suspected diagnosis.

27.5. Interpret diagnostic test results accurately, integrating findings into the overall clinical picture to refine the differential diagnosis and guide further management.

27.6. Formulate a comprehensive management plan for the patient, incorporating evidence-based pharmacological and non-pharmacological interventions for the treatment of cardiopulmonary conditions.

27.7. Demonstrate effective communication skills in discussing the diagnosis, prognosis, and treatment options with the patient and their caregivers, ensuring informed decision-making and shared decision-making.

27.8. Apply principles of patient safety and quality improvement to monitor the patient's response to treatment, identify potential complications, and adjust the management plan accordingly.

27.9. Collaborate with interdisciplinary healthcare team members, including physicians, nurses, respiratory therapists, and pharmacists, to coordinate holistic care and optimize patient outcomes.

27.10. Reflect on the case study experience to consolidate learning and identify opportunities for further professional development in cardiopulmonary medicine and patient care.

28. Normal PFT/CXR Modules *(Asynchronous Due 11/26/24 @ 8 AM)**;** MK, PC*

28.1. Demonstrate proficiency in recognizing and interpreting normal PFT and CXR results through interactive online modules, case studies, and simulated patient scenarios.

28.2. Apply knowledge gained from normal PFT/CXR modules to clinical practice, including screening, diagnosis, and management of respiratory conditions, while adhering to evidence-based guidelines and best practices.

29. Cumulative Review Q&A; *OPP, MK, PC, ICS, PRO, SBP, PBL*

29.1. Recall and apply key medical terminology learned throughout the semester.

29.2. Demonstrate proficiency in conducting comprehensive history-taking sessions, including gathering relevant patient information and identifying pertinent medical history.

29.3. Be able to apply knowledge of systematic and thorough physical examinations of the skin, hair, nails, cardiovascular system, and pulmonary system, in the context of patient care scenarios.

29.4. Utilize critical thinking skills to interpret findings form history-taking and physical examination, identifying potential health issues or abnormalities.

ARKANSAS COLLEGE OF
OSTEOPATHIC MEDICINE

Course Name: Osteopathic Principles and Practice-1
Class of/Semester/Year: 2028/Fall/2024
Date Last Revised: June 20, 2024

Approved By: Shannon Ramsey Jimenez

Shannon Ramsey Jimenez, DO
Dean of ARCOM

Note: Final Approval. May be released to students. Schedule subject to change with advance notice.

Office of the Dean
479.308.2380 | PO Box 10366 | Fort Smith, AR 72917

ARKANSAS COLLEGE OF OSTEOPATHIC MEDICINE

Arkansas Colleges of Health Education
Course Syllabus

Course Name:	Osteopathic Principles and Practice1 (OPP1)
Class of/Semester/Year:	Class of 2028/Fall 2024
Course Designation:	COM 511
Term Dates:	July 19, 2024 – December 6, 2024
Course Dates:	July 19, 2024 – December 4, 2024
Total Contact Hours:	25 Lecture Hours; 35 Lab Hours
Credit Hours:	4 Credit Hours
Assessment/Grading:	Three Lecture Exams; Three Lab Practicals
Location:	Lecture Hall 2, OMM Lab
Course Director:	Joseph Queeney, DO
Office Hours:	By appointment

Syllabus is subject to change

ARKANSAS COLLEGE OF OSTEOPATHIC MEDICINE

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ARKANSAS COLLEGE OF OSTEOPATHIC MEDICINE

Course Description:
Osteopathic Principles and Practice-1 (OPP1) is designed to provide the student with a fundamental understanding of the history, principles, and philosophies of osteopathic medicine. During this course, the student will be introduced to the lexicon, foundational principles, and professional expectations upon which the profession was built. The faculty also works in conjunction with other departments to complement and integrate the knowledge received from the systems-based and clinical medicine courses. Whenever possible, the OPP-1 curriculum is designed to integrate with the basic science departments to help enhance your knowledge of structure-function relationships, particularly in the musculoskeletal, nervous, cardiopulmonary, GI, and GU systems, as they apply to osteopathic patient care. Additionally, the student will sequentially initiate training in the tactile and psychomotor skills necessary for the diagnostic palpation of and manipulative treatments for their future patients, regardless of the medical specialty chosen. This course will instruct the student in the philosophic and diagnostic underpinnings upon which they will continue to build their osteopathic knowledge, the structurally based examination, palpatory and clinical methods and modalities which will continually develop for the rest of their clinical careers. The OPP Course is cumulative over 4 semesters. Evaluation of concepts and skills will reflect cumulative knowledge.

Course Goals:
The following course goals reflect broad and enduring knowledge, skills, behaviors, and responsibilities that students should attain as a result of successfully completing the course:

1. Be conversant in the theories, history, principles, and tenets of osteopathy, as well as the five models of osteopathic care.
2. Begin to develop foundational palpation skills with an understanding of the theory and application:
3. Promote and integrate osteopathic principles as a method of improving the anatomic and physiologic functioning of the patient both as a stand-alone treatment and as a component of a treatment plan.
4. Apply knowledge of the biomedical sciences, such as functional anatomy, physiology, biochemistry, histology, pathology, and pharmacology to support the appropriate application of osteopathic principles and Osteopathic Manipulative Treatment (OMT).
5. Identify the association between organ systems, function, and structural findings.
6. Palpate, diagnose, and treat osteopathically the various regions of the body with both indirect and direct methods of OMT.
7. Continue to develop professionalism.
8. Continue to develop the professional skills, confidence, and rapport necessary to examine and palpate a patient regardless of age, sex, or body habitus.
9. Continue to develop appropriate medical documentation related to osteopathic findings and treatment.

Course Expectations and Student Responsibilities:
Students should refer to the ARCOM Student Handbook & Clinical Training Manual, as well as the ACHE Student Handbook and ACHE Course Catalog for information regarding professional standards, acceptable conduct, dress code, and program requirements.

OPP Laboratory Training Sessions:
Table assignments for the OPP Laboratory Training Sessions will be made by the OPP Course Director or OPP Coordinator. Students are not allowed to choose their own lab partners. Partners will be randomly assigned to enable the student to observe, examine, receive, and practice palpation and techniques with

people of different genders, different body sizes, and body types to prepare students for a variety of patient care experiences.

It is necessary to palpate and receive palpation from both genders. There are clear differences between genders in terms of skin characteristics (turgor, thickness, hair density, etc.), location of landmarks (e.g., PSIS location), and dealing with "sensitive areas" of palpation (anterior ribs on women and pubic tubercles on both genders). There is an ideal opportunity for the student to appreciate these differences in the OPP Laboratory when table trainers are readily available for assistance.

Video Capture of Educational Content:
Consistent with the policies surrounding video capture and posting of educational content, recordings of any learning activity are considered a supplemental resource to advance student understanding and for reference at future stages of student education. Recorded materials should not be utilized to replace attendance in the classroom, laboratory, or clinical setting. ARCOM makes no guarantees of reliability for video capture and reserves the right to not allow the recording of learning activities. There is no substitute for class attendance, being actively engaged in the learning process, investing in the comprehension and application of course material, and interacting with instructors and colleagues. Becoming an osteopathic physician involves much more than the acquisition of knowledge and attainment of a professional title. Professionalism, ethics, problem solving, and communication are among the vital skills that are best developed in active and interactive settings. As such, ARCOM expects students to attend all learning activities and offers no guarantees or warranties as to the recording of educational classroom/laboratory content. There will be no video capture of in-class applications team-based learning (TBL), Foundations of Osteopathic Patient Care (FOPC), or Osteopathic Principles and Practice (OPP). Students are not permitted to render any audio and/or visual recordings of these in-class sessions.

Dress Code:
Students should refer to the ACHE Student Handbook, as well as their course syallbi, for the dress code for campus and academic activities.

Students should arrive to all lab course activities in the required OMM uniform in accordance with the ARCOM Student Handbook & ACHE Course Catalog. In lecture, aspiring physicians should "dress to reflect" the professional behavior associated with serving patients and colleagues with respect and dignity.

The required OMM lab uniform is available for purchase at the ARCOM Campus Store. Lab uniforms are required for all didactic labs and practical assessment when students are required to act as "patients" for their lab partner in order to allow the best possible access to body structures. Full body lab dress requires the following:

1. Upper body – must allow for exposure of skin overlying the hands, elbows, shoulders, clavicles, scapula, spine, and posterior rib angles.
   - Men – modest T-shirt, or bare skin (when requested)
   - Women – modest T-shirt with modest sports bra
2. Lower body– must allow skin exposure of abdomen, spine, PSIS, knees, ankles, and feet.
   - Men and Women – modest lightweight shorts (No heavy canvas, denim, or cargo shorts).
3. Under Armour type clothing is not permitted. During cold weather, the student may wear light weight athletic jacket and pants (outer wear) with required uniform underneath.
4. Hats or head coverings (other than for religious purposes) are not permitted in lab.

5. Garments worn for religious reasons are acceptable dress in OMT laboratory experiences; however, they should be modified when necessary to allow visualization and palpation when they would obscure the immediate area to be examined or treated (e.g., head, neck, upper back, etc.). Modifications can include adjustment of the covering permitting unobstructed palpation beneath the covering or substitution of a thinner material that allows for adequate evaluation and treatment. If these modifications are not sufficient for proper exposure and examination, the student will be asked to remove the interfering garment(s) until the examination is complete. (Shoes and belts are NOT allowed on the OMT tables as they may rip the vinyl).
6. Observation, evaluation, and treatment will involve all external body surfaces except the genitalia, breasts, and rectum. Student doctors are required to fully participate in OPP labs as developing OMM palpatory skills will serve the student well in any field of medicine he or she chooses. It is necessary to both give and receive palpation from both genders in order to develop proper OMM skills. The body region being examined and the techniques that are being practiced require adequate exposure for observation and palpation. This requires a male to remove his shirt, and a female to wear a sports bra.

Professionalism:

- Students will conduct themselves professionally at all times, during all educational activities conducted on or off campus. This includes interactions with all faculty, staff, students, clinical faculty, guest lecturers, health care providers, patients, and any other member of the ARCOM community. Unprofessional behavior, conduct, or attire inconsistent with the ARCOM dress code will not be tolerated and will result in administrative action. Students aredirected to the ARCOM Student Handbook & ACHE Course Catalog for a full definition of professionalism and list of expected professional behaviors.
- Any unauthorized recording of learning materials and activities used in connection with the ARCOM curriculum or reproduction, rendering, possession, or dissemination of these materials including assessment materials, is considered unprofessional behavior and a violation of copyright. Such behavior is subject to action by the Student Conduct Committee(SCC) for disciplinary action, which may include receiving a grade of "zero" for a graded assessment, course failure, probationary action, suspension, or dismissal from ARCOM.
- Computers, tablets, or notebooks should only be used during lectures to take notes or reference appropriate class topics and reference materials. Students should not be on the internet viewing social media sites, performing online shopping, or playing games, etc. Thisis disrespectful to the lecturer, inhibits peer learning, and is unprofessional behavior.

Diversity, Equity, and Inclusion:

ACHE is committed to a campus environment that is inclusive, safe, and respectful for all persons, and fosters an environment free of harassment and discrimination. To that end, all course activities will be conducted in an atmosphere of friendly participation and interaction among colleagues, recognizing and appreciating the unique experiences, background, and point of view each student brings. Students are expected at all times to apply the highest academic standards to this course and to treat others with dignity and respect.

Attendance Policy:

Osteopathic medical education prepares students for professional clinical practice. Lectures and labs include didactic material, case presentations, patient demonstrations, informal discussions, team-based learning, and the practice of psychomotor skills. Consistent and prompt class attendance is essential for the learner to benefit from the full educational experience.

Therefore, ARCOM Faculty have adopted the following attendance policy:

1. Attendance at all lecture sessions within a given course is strongly encouraged, but not required.
2. Attendance is required for all guest lecturers and team-based learning experiences. A pattern of absenteeism or tardiness for these sessions is considered unprofessional behavior and may result in a referral for disciplinary action for violations of the ACHE Student Code of Conduct consistent with the ACHE Student Misconduct Policy.
3. Since laboratory sessions are designed to develop the clinical and psychomotor skills necessary for success as an osteopathic physician, students are expected to attend all laboratory sessions (as outlined in the course syllabus) and all lectures tied to labs. If, for any reason, a student misses more than 10% of these required sessions for a given course, the student will receive 1% decrease in final average for each percentage missed over 10%.

   Example: A course with 20 laboratory sessions.

   A student who misses 3 laboratory sessions (15%) will receive an 5% reduction in his/her final average. A student who misses 4 laboratory sessions (20%) will receive a 10% reduction in his/her final average.
4. All simulated events, including standardized patient encounters, simulated patient encounters, and skills events are required, and an absence or tardiness will result in the loss of additional 2% of the final percentage per simulated event, or as otherwise stated by the course director.
5. This attendance policy does not override any assignments that require attendance to perform. Therefore, if a student misses an event that requires an assignment to be submitted based on the educational experience, the student will lose points for not successfully completing the assignment.
6. If a student misses an exam, he/she will receive a grade of zero. A make-up exam will only be administered on a case-by-case basis with the approval of the course director and/or the Dean of ARCOM.
7. Students considered academically "at-risk" may be held to a separate attendance policy administered by the Office of Academic Affairs.
8. Students must be physically present to receive credit for attendance. Virtual attendance of lectures does not count as in-person attendance.
9. Students must refer to the Outlook Live calendar for all course schedules and changes.
10. Students are responsible for all missed learning material/experiences.
11. As it is not possible to replicate lab experiences, faculty members are not obligated to provide makeup learning experiences.
12. There are no excused absences; however, extenuating circumstances (e.g. serious illness/injury, etc.) may be addressed on a case-by-case basis by the ARCOM Dean.
13. Absence from class to attend professional events, such as a state or national conference, may be approved on a case-by-case basis by the ARCOM Dean.
14. Absence from class due to planned events of a personal nature are not excused absences.
15. A pattern of tardiness is unacceptable. While Faculty understand there may be unavoidable instances, tardiness will not be tolerated on exam days or when guest speakers are in attendance. Admittance to the classroom may be prohibited and, in that circumstance, the student would be marked as absent.

This attendance policy will be strictly adhered to. It is expected that students will use good judgment when being absent, only doing so rarely and for legitimate or necessary reasons.

ARKANSAS COLLEGE OF OSTEOPATHIC MEDICINE

Course Faculty:

Faculty Member	Office	Phone	Email
Joseph Queeney, DO	231	479-308-2337	joe.queeney@achehealth.edu
Jason Sneed, DO	233	479-308-2319	jason.sneed@achehealth.edu

Table Trainers:			
Kaitlin McNamara, DO	215	479-308-2332	kaitlin.mcnamara@achehealth.edu
Gurjit Nagra, MD PhD	266	479-308-2376	gurjit.nagra@achehealth.edu
Monica Rojas, MD	211	479-308-2343	monica.rojas@achehealth.edu
Jeanne Rupert, DO	219	479-308-2356	jeanne.rupert@achehealth.edu
James McNamara, DO	N/A	N/A	james.mcnamara@achehealth.edu
Józia McGowan, DO	208	479-308-2328	jozia.mcgowan@achehealth.edu
Sherry Turner, DO	271	479-308-2386	sherry.turner@achehealth.edu
Charles Craft, DO	N/A	N/A	charles.craft@achehealth.edu
Marshall Parker, DC	N/A	N/A	marshall.parker@achehealth.edu
Paige Parker, DC	N/A	N/A	paige.parker@achehealth.edu

Faculty Office Hours:
While faculty maintain an open-door policy, **it is strongly recommended that a student in need of a faculty member's time and attention reserve an appointment directly via e-mail** or telephone communication with the faculty member.

Required Course Resources:

Title	Edition	Authors	ISBN-13
Foundations of Osteopathic Medicine	4th	Seffinger, M	978-1496368324
Atlas of Osteopathic Techniques	4th	Nicholas, A. & Nicholas, E	978-1975127480
Osteopathic Approach to Diagnosis and Treatment	4th	DiGiovanna, E., Amen, D.J., Burns, D.K.	978-1496385994

Recommended Resources:

Title	Edition	Authors	ISBN-13
Outline of Osteopathic Manipulative Procedures: the Kimberly Manual	2008 Update	Kimberly, P. & Funk, S. Kirksville College of Osteopathic Medicine	978-0967133317
Atlas of Common Counterstrain Tender Points	1st	Snider, K. & Glover, J. Kirksville College of Osteopathic Medicine	978-0988262775
Greenman's Principles of Manual Medicine	5th	Destafano, L.	978-1451193909

The Pocket Manual of OMT	2nd	Beatty, D.	978-1608316571
Somatic Dysfunction in Osteopathic Medicine	2nd	Nelson, K. & Glonek, T	978-1451103052

Osteopathic Core Competencies:
The faculty and administration of ARCOM attest that Osteopathic Core Competencies are met in this course.

1. **Osteopathic Philosophy/Osteopathic Manipulative Medicine (OPP/OMM):** Demonstrate and apply knowledge of accepted standards in osteopathic manipulative treatment appropriate to the specialty. Remain dedicated to life-long learning and to practice habits in osteopathic philosophy and OMM.
2. **Medical Knowledge (MK):** Demonstrate and apply knowledge of accepted standards of clinical medicine in the respective area; remain current with new developments in medicine and participate in life-long learning activities.
3. **Patient Care (PC):** Demonstrate the ability to effectively treat patients and provide medical care that incorporates the osteopathic philosophy, patient empathy, awareness of behavioral issues, the incorporation of preventive medicine and health promotion.
4. **Interpersonal and Communication Skills (ICS):** Demonstrate interpersonal and communication skills that enable a physician to establish and maintain professional relationships with patients, families, and other members of health care teams.
5. **Professionalism (PRO):** Uphold the Osteopathic Oath in the conduct of one's professional activities that promotes advocacy of patient welfare, adherence to ethical principles, and collaboration with health professionals, life-long learning, and sensitivity to a diverse patient population; be cognizant of physical and mental health in order to effectively care for patients.
6. **Practice-Based Learning and Improvement (PBL):** Demonstrate the ability to critically evaluate methods of clinical practice; integrate evidence-based medicine into patient care; show an understanding of research methods; improve patient care practices.
7. **Systems-Based Practice (SBP):** Demonstrate an understanding of health care delivery systems; provide effective and qualitative patient care with the system; and practice cost effective medicine.

Grading Information:
Grading point values and scale are consistent with policies outlined in the ARCOM Student Handbook & ACHE Course Catalog. Students will receive a numerical grade (percentage) at the end of the course with 70% or greater required to pass.

Students are required to pass all components of each course with a C (70%) or better to progress to the next semester. To receive a 70% or better, a student must complete all requirements of the course as defined in the syllabus.

Grade Determination and Scheduled Assignments:

Date	Assessment (CC)	Percentage of Final Grade
Tuesday, September 3, 2024 @ 8:30 AM - 10:00 AM	Written Exam #1 (MK)	30%
Tuesday, September 3, 2024 @ 10:30 AM - 7:00 PM	Practical Exam #1	P/F

Thursday, October 24, 2024 @ 8:30 AM - 10:00 AM	Written Exam #2 (MK)	30%
Thursday, October 24, 2024 @ 10:30 AM - 7:00 PM	Practical Exam #2	P/F
Tuesday, November 26, 2024 @ 8:30 AM - 10:30 AM	Final Written Exam (MK)	40%
Tuesday, November 26 2024 @ 11:00 AM - 7:00 PM	Final Practical Exam	P/F
TOTAL:		**100%**

Examinations:
Assessment of acquired medical scientific knowledge will be evaluated by formative and summative examinations (written and practical). Assessment of technical competencies will be assessed by check-out assessments, faculty observation of students, peer feedback, and practical examinations. The principles of osteopathic medicine should pervasively integrate the educational process as medical knowledge is acquired and applied in all courses.
Additionally, the practice of medicine requires cumulative and comprehensive knowledge from multiple disciplines. **Therefore, information from other courses may be included on examinations when relevant to the material being assessed.** The integration of such content from other courses will be reflected in the learning objectives for the course.

There will be two written exams **and** a written final examination in the OPP1 course. Written exams will contain current material as well as cumulative material. These will assess student's biomedical knowledge and their ability to apply the information to solve patient problems within a clinical context. The assessments will emphasize clinical integration and application of course material commensurate with student training. Each of the three written assessments will include new material and up to 50% cumulative component of previous major concepts from any previously presented material from lecture, lab, or supplemental material. The format of any make up examinations that results from an excused absence is at the discretion of the course director (e.g. a similar exam over similar material with different questions, a comprehensive multiple-choice exam, essay questions, and/or an oral examination). An unexcused absence from a written examination will result in a grade of zero and no remediation for the given examination will be offered. The learning objectives for the course should guide student's learning, however, they are not intended to serve as an examination key. **All written examinations are cumulative.**

The weighted average of the two written exams and final written exam must be at least 70% to pass the OPP course. Additionally, the student must pass each practical exam to pass the course. If a student does not pass the course and remediation is offered through the Student Progress Committee, the type and style of remediation will be at the sole discretion of the course director. Remediation may take the form of a comprehensive written, oral or essay assessment. Remediation may or may not include a practical assessment as well.

OPP Practical Examinations:
Two OPP practical exams **and** an OPP final practical exam will occur during the semester. These will be administered during a lab session and are designed to keep students up to date with their palpatory skills. **The practical exams are P/F. To pass the course, the student must pass each practical.** A student who

fails a practical examination shall be required to remediate at a time of the department's choosing (outside of other lecture or lab hours and within faculty availability) and student availability.

Student will be allowed one attempt to remediate the practical examination. Retakes for the practical examination are to occur within ten days of the original test date or by the department's choosing. It shall be considered unprofessional behavior if the student does not appear for practical examination retake and the student will be referred to the SCC committee. **All practical examinations are cumulative.**

A failed practical exam **must** be retaken with a review of the material covered on the exam. If the student successfully passes the remediation, the score will be a **P**. If a student misses their initially scheduled practical time assignment due to an unexcused absence, they will receive an **F**. The student must retake the missed exam and be successful to receive a P.

Do not schedule other appointments on the day of a practical as you may be rescheduled at the last minute because of a student emergency or to serve as a "patient" for a student who does not have a partner.

Remediation:
If a student does not pass the course and remediation is offered through the Student Progress Committee, the type and style of remediation will be at the sole discretion of the course director to ensure the student has adequate knowledge of material and techniques presented.

Course content, sequencing, grading, and examination policies are subject to change by administration with the approval the Curriculum Committee. Students will be given advanced notice of any substantive changes by email and the ARCOM portal.

Osteopathic Principles and Practice-1 Course Schedule:
Refer to the OUTLOOK Student Calendar for official (up to date) schedule

Day	Date	Time	Session #	Title	Instructor
Fri	Jul 19	1 PM	1	Orientation	Queeney
Fri	Jul 19	2 PM	L1	Lab 1: Orientation Group A	Queeney
Fri	Jul 19	3 PM	L2	Lab 2: Orientation Group B	Queeney
Tue	Jul 23	10 AM	2	History of Osteopathic Medicine	Sneed
Tue	Jul 23	11 AM	3	Neuromusculoskeletal Medicine & OMM	Sneed
Tue	Jul 23	1 PM	L3	Lab 3: Upper Extremity Palpation Group A	Queeney
Tue	Jul 23	3 PM	L4	Lab 4: Upper Extremity Palpation Group B	Queeney
Tue	Jul 30	11 AM	4	Documenting Somatic Dysfunction & OMT	Queeney
Tue	Jul 30	1 PM	L5	Lab 5: Lower Extremity Palpation Group A	Sneed
Tue	Jul 30	3 PM	L6	Lab 6: Lower Extremity Palpation Group B	Sneed
Tue	Aug 6	11 AM	5	Axial Skeleton	Sneed
Tue	Aug 6	1 PM	L7	Lab 7: Axial Skeleton Group A	Sneed
Tue	Aug 6	3 PM	L8	Lab 8: Axial Skeleton Group B	Sneed
Tue	Aug 13	10 AM	6	Barrier Concepts	Queeney
Tue	Aug 13	11 AM	7	Somatic Dysfunction	Sneed
Tue	Aug 13	1 PM	L9	Lab 9: Palpation for Somatic Dysfunction Group A	Sneed

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Tue	Aug 13	3 PM	L10	Lab 10: Palpation for Somatic Dysfunction Group B	Sneed
Tue	Aug 20	10 AM	8	Introduction to Direct Modalities	Sneed
Tue	Aug 20	11 AM	9	Introduction to Indirect Modalities	Sneed
Tue	Aug 20	1 PM	L11	Lab 11: Indirect & Direct Modalities Group A	Sneed
Tue	Aug 20	3 PM	L12	Lab 12: Indirect & Direct Modalities Group B	Sneed
Tue	Aug 27	10 AM	10	Lymphatics & Diaphragms	Queeney
Tue	Aug 27	11 AM	11	Key Concepts Review	Queeney/ Sneed
Tue	Aug 27	1 PM	L13	Lab 13: Lymphatics & Diaphragms Group A	Queeney
Tue	Aug 27	3 PM	L14	Lab 14: Lymphatics & Diaphragms Group B	Queeney
Tue	Sep 3	8:30 AM		**Written Exam #1**	Faculty
Tue	Sep 3	10:30 AM		**Practical Exam #1**	Faculty
Tue	Sep 10	11 AM	12	Upper Extremity - Shoulder & Arm	Queeney
Tue	Sep 10	1 PM	L15	Lab 15: Evaluating & Treating the Shoulder & Arm Group A	Queeney
Tue	Sep 10	3 PM	L16	Lab 16: Evaluating & Treating the Shoulder & Arm Group B	Queeney
Wed	Sep 11	8 AM		**OPP1 Practical Make-Up & Retakes**	Faculty
Tue	Sep 17	11 AM	13	Upper Extremity - Elbow & Forearm	Queeney
Tue	Sep 17	1 PM	L17	Lab 17: Evaluating & Treating the Elbow & Forearm Group A	Queeney
Tue	Sep 17	3 PM	L18	Lab 18: Evaluating & Treating the Elbow & Forearm Group B	Queeney
Tue	Sep 24	10 AM	14	Upper Extremity - Wrist & Hand	Queeney
Tue	Sep 24	11 AM	15	Upper Extremity - Case Review	Sneed
Tue	Sep 24	1 PM	L19	Lab 19: Evaluating & Treating the Wrist & Hand Group A	Queeney
Tue	Sep 24	3 PM	L20	Lab 20: Evaluating & Treating the Wrist & Hand Group B	Queeney
Tue	Oct 1	11 AM	16	Lower Extremity - Hip & Thigh	Sneed
Tue	Oct 1	1 PM	L21	Lab 21: Evaluating & Treating the Hip & Thigh Group A	Sneed
Tue	Oct 1	3 PM	L22	Lab 22: Evaluating & Treating the Hip & Thigh Group B	Sneed
Tue	Oct 8	11 AM	17	Lower Extremity - Knee & Leg	Sneed
Tue	Oct 8	1 PM	L23	Lab 23: Evaluating & Treating the Knee & Leg Group A	Sneed
Tue	Oct 8	3 PM	L24	Lab 24: Evaluating & Treating the Knee & Leg Group B	Sneed
Tue	Oct 15	10 AM	18	Lower Extremity - Foot & Ankle	Sneed
Tue	Oct 15	11 AM	19	Lower Extremity - Case Review	Sneed
Tue	Oct 15	1 PM	L25	Lab 25: Evaluating & Treating the Foot & Ankle Group A	Sneed
Tue	Oct 15	3 PM	L26	Lab 26: Evaluating & Treating the Foot & Ankle Group B	Sneed
Tue	Oct 22	11 AM	20	Key Concepts Review: Blocks 1 & 2	Queeney/ Sneed
Thu	Oct 24	8:30 AM		**Written Exam #2**	Faculty
Thu	Oct 24	10:30 AM		**Practical Exam #2**	Faculty

Tue	Oct 29	11 AM	21	Ribcage 1	Queeney
Tue	Oct 29	1 PM	L27	Lab 27: Evaluating & Treating the Ribcage 1 Group A	Queeney
Tue	Oct 29	3 PM	L28	Lab 28: Evaluating & Treating the Ribcage 1 Group B	Queeney
Wed	Oct 30	8 AM		**OPP1 Practical Make-Up & Retakes**	Faculty
Tue	Nov 5	11 AM	22	Ribcage 2	Queeney
Tue	Nov 5	1 PM	L29	Lab 29: Evaluating & Treating the Ribcage 2 Group A	Queeney
Tue	Nov 5	3 PM	L30	Lab 30: Evaluating & Treating the Ribcage 2 Group B	Queeney
Tue	Nov 12	11 AM	23	Key Concepts Review: Blocks 3	Queeney/ Sneed
Tue	Nov 12	1 PM	L31	Lab 31: Evaluating & Treating the Ribcage 3 Group A	Queeney
Tue	Nov 12	3 PM	L32	Lab 32: Evaluating & Treating the Ribcage 3 Group B	Queeney
Tue	Nov 19	11 AM	24	Osteopathic Approach to Thoracic Outlet Syndrome	Sneed
Tue	Nov 19	1 PM	L33	Lab 33: Evaluating & Treating Thoracic Outlet Syndrome Group A	Sneed
Tue	Nov 19	3 PM	L34	Lab 34: Evaluating & Treating Thoracic Outlet Syndrome Group B	Sneed
Thu	Nov 21	11 AM	25	Osteopathic Approach to Treating Family-First Semester	Queeney
Thu	Nov 21	1 PM	L35	Lab 35: Treating Family Members Group A	Queeney
Thu	Nov 21	3 PM	L36	Lab 36: Treating Family Members Group B	Queeney
Tue	Nov 26	8:30 AM		**Final Written Exam #3**	Faculty
Tue	Nov 26	11 AM		**Final Practical Exam**	Faculty
Mon	Dec 2	9 AM		**OPP1 Practical Make-Up & Retakes**	Faculty

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Appendix:

OPP 1 Fall 2024 Learning Objectives with *Core Competency:*

(Any changes to the below learning objectives will reflect on lecturers presentation slide)

1. **Orientation;** *MK, OPP, PRO*
   - 1.1. Introduction to OMT and OMM.
   - 1.2. Define, describe, and interpret the Osteopathic Tenets and Philosophy.
   - 1.3. Define, describe, and interpret the Osteopathic Terminology and Abbreviations.
   - 1.4. Introduce the OPP course.
   - 1.5. Learn about the SAAO.

Labs 1-2 ***Orientation*** *(Groups A & B)****;*** *MK, OPP, PRO*

- 1.1.1. Discuss lab policies and procedures.
- 1.1.2. Review attendance policy.

2. **History of Osteopathic Medicine;** *MK, OPP, PRO*
   - 2.1. Identify when, how, and why Osteopathic evolved.
   - 2.2. Define, describe, and interpret the important historical aspects of osteopathic medicine.
   - 2.3. Define, describe, and interpret the four basic tenets of Osteopathy.
   - 2.4. Define, describe, and interpret somatic dysfunction.
   - 2.5. Define, describe, and interpret the osteopathic perspective of health vs. the allopathic view of health.
   - 2.6. Define, describe, and interpret the osteopathic role in health care today.
   - 2.7. Define, describe, and interpret the meaning of "Osteopathic Identity".
3. **Neuromusculoskeletal Medicine & OMM;** *MK, OPP, PRO*
   - 3.1. Define, describe, and interpret the various aspects of the specialty of Neuromusculoskeletal Medicine.
   - 3.2. Define and describe residency training requirements and the board certification process.
   - 3.3. Compare ONMM residency programs to other musculoskeletal programs.
   - 3.4. Define, describe, and interpret what is required to perform OMT in practice.
   - 3.5. Define, describe, interpret, and compare the research that relates to the utilization of OMT in practice.

Labs 3-4 ***Upper Extremity Palpation*** *(Groups A & B)****;*** *MK, OPP, PRO*

- 3.1.1. Define, describe, and interpret anatomy and pertinent clinical correlations of the upper extremity.
- 3.1.2. Safely locate and identify, using manual palpation, the bony structures of the upper extremity, the muscles of the upper extremity, and the soft tissues of the upper extremity with professionalism.

4. **Documenting Somatic Dysfunction & OMT;** *MK, OPP, PRO*
   - 4.1. Define, describe, and apply documentation requirements for OMT.
   - 4.2. Define, describe, and apply billing and coding for OMT (ICD 10 and CPT codes).
   - 4.3. Define and describe the concept of Relative Value Units (RVUs).

Labs 5-6 ***Lower Extremity Palpation*** *(Groups A & B)****;*** *MK, OPP, PRO*

- 5.1.1. Define, describe, and interpret anatomy and pertinent clinical correlations of the lower extremity.
- 5.1.2. Safely locate and identify, using manual palpation, the bony structures of the lower extremity, the muscles of the lower extremity, and the soft tissues of the lower extremity with professionalism.

5. **Axial Skeleton;** *MK, OPP, PRO*
   - 5.1. Define, describe, and interpret spinal curvatures both physiological and pathological.

5.2. Define, describe, and interpret tensegrity as applies to the axial skeleton.
5.3. Define, describe, and interpret the anatomy and related tissues of the axial skeleton.
5.4. Define, describe, interpret, and compare spinal mechanics both physiological and pathological.

Labs 7-8 ***Axial Skeleton*** *(Groups A & B);* *MK, OPP, PRO*

7.1.1. Define, describe, and interpret anatomy and pertinent clinical correlations of the axial skeleton.
7.1.2. Safely locate and identify, using manual palpation, the bony structures of the axial skeleton, the muscles of the axial skeleton, and the soft tissues of the axial skeleton with professionalism.

6. Barrier Concepts; *MK, OPP, PRO*

6.1. Define, describe, interpret, and compare barrier concepts: anatomic, physiologic, elastic, pathologic, and restrictive barriers.
6.2. Define, describe, interpret, and compare concept of both quantity and quality of motion: how to assess the "end feel" of joint motion.
6.3. Define, describe, interpret, and compare indirect and direct in regard to barriers.

7. Somatic Dysfunction; *MK, OPP, PRO*

7.1. Define, describe, and interpret somatic dysfunction.
7.2. Define, describe, and interpret the importance of the physical exam.
7.3. Define, describe, interpret, and compare the effects of dysfunction on different systems.
7.4. Define, describe, interpret, and compare TART criteria.
7.5. Define, describe, and interpret the concept of tensegrity.
7.6. Define, describe, interpret, and compare the "Five Model Concept" and how these models guide the osteopathic physician's diagnosis and treatment.
7.7. Define, describe, interpret, and compare the anatomy of the autonomic nervous system and its relevance in OPP.
7.8. Define, describe, interpret, and compare concepts of autonomic reflexes: viscerosomatic, somatovisceral, somatosomatic, and viscerovisceral reflexes.

Labs 9-10 ***Palpation for Somatic Dysfunction*** *(Groups A & B);* *MK, OPP, PRO*

9.1.1. Find and palpate key anatomic landmarks with professionalism.
9.1.2. Define, describe, interpret, and practice the concept of layered palpation.
9.1.3. Evaluate the tissue for acute and chronic TART changes.
9.1.4. Define, describe, and interpret effects of soft tissue techniques.
9.1.5. Define, describe, interpret, and perform the soft tissue techniques as described.

8. Introduction to Direct Modalities; *MK, OPP, PRO*

8.1. Define, describe, interpret, and compare the fundamentals and mechanisms of action of soft tissue, direct myofascial release, muscle energy, articulatory, and high velocity low amplitude techniques.

9. Introduction to Indirect Modalities; *MK, OPP, PRO*

9.1. Define, describe, interpret, and compare the fundamentals and mechanisms of action of indirect myofascial release and counterstrain modalities.

Labs 11-12 ***Indirect & Direct Modalities*** *(Groups A & B);* *MK, OPP, PRO*

11.1.1. Define, describe, interpret, and compare the fundamentals and mechanisms of common indirect and direct modalities.
11.1.2. Define, describe, interpret, and practice common and effective direct and indirect modalities.

10. Lymphatics & Diaphragms; *MK, OPP, PRO*

10.1. Define, describe, and interpret lymphatic flow throughout the body.

10.2. Define, describe, interpret, and compare the diaphragms of the body.
10.3. Define, describe, interpret, and compare how somatic dysfunction may affect lymphatic flow through the body.
10.4. Define, describe, interpret, and compare how the lymphatics and diaphragms relate to the five osteopathic models.

11. Key Concepts Review; *MK, OPP, PRO*
11.1. Review and clarify concepts from the first block.

Labs 13-14 ***Lymphatics & Diaphragms*** *(Groups A & B);* *MK, OPP, PRO*
13.1.1. Define, describe, interpret, and compare lymphatic flow treatments.
13.1.2. Define, describe, interpret, and perform lymphatic flow treatments with professionalism.
13.1.3. Define, describe, and interpret indications/contraindications to lymphatic flow treatments.

12. Upper Extremity - Shoulder & Arm; *MK, OPP, PRO*
12.1. Define, describe, and interpret the anatomy of the shoulder and arm.
12.2. Define, describe, and interpret clinical exam for the shoulder and arm.
12.3. Define, describe, interpret, and compare common orthopedic conditions related to the shoulder and arm.

Labs 15-16 ***Evaluating & Treating the Shoulder & Arm*** *(Groups A & B);* *MK, OPP, PRO*
15.1.1. Define, describe, interpret, compare, and practice techniques for evaluating and treating the shoulder and arm with professionalism.

13. Upper Extremity - Elbow & Forearm; *MK, OPP, PRO*
13.1. Define, describe, and interpret the anatomy of the elbow and forearm.
13.2. Define, describe, and interpret clinical exam for the elbow and forearm.
13.3. Define, describe, interpret, and compare common orthopedic conditions related to the elbow and forearm.

Labs 17-18 ***Evaluating & Treating the Elbow & Forearm*** *(Groups A & B);* *MK, OPP, PRO*
17.1.1. Define, describe, interpret, compare, and practice techniques for evaluating and treating the elbow and forearm with professionalism.

14. Upper Extremity - Wrist & Hand; *MK, OPP, PRO*
14.1. Define, describe, and interpret anatomy of the wrist and hand.
14.2. Define, describe, and interpret clinical exam for the wrist and hand.
14.3. Define, describe, interpret, and compare common orthopedic conditions related to the wrist and hand with professionalism.

15. Upper Extremity - Case Review; *MK, OPP, PRO*
15.1. Define, describe, and interpret upper extremity cases in which somatic dysfunction played a significant role.

Labs 19-20 ***Evaluating & Treating the Wrist & Hand*** *(Groups A & B);* *MK, OPP, PRO*
19.1.1. Define, describe, interpret, compare, and practice techniques for evaluating and treating the wrist and hand with professionalism.

16. Lower Extremity - Hip & Thigh; *MK, OPP, PRO*
16.1. Define, describe, and interpret anatomy of hip and thigh.
16.2. Define, describe, and interpret clinical exam for the hip and thigh.
16.3. Define, describe, interpret, and compare common orthopedic conditions related to hip and thigh.

Labs 21-22 ***Evaluating & Treating the Hip & Thigh*** *(Groups A & B);* *MK, OPP, PRO*
21.1.1. Define, describe, interpret, compare, and practice techniques for evaluating and treating the hip and thigh with professionalism.

17. Lower Extremity - Knee & Leg; *MK, OPP, PRO*
- 17.1. Define, describe, and interpret anatomy of knee and leg.
- 17.2. Define, describe, and interpret clinical exam for the knee and leg with professionalism.
- 17.3. Define, describe, interpret, and compare common orthopedic conditions related to knee and leg.

Labs 23-24 Evaluating & Treating the Knee & Leg *(Groups A & B);* ***MK, OPP, PRO***
- 23.1.1. Define, describe, interpret, compare, and practice techniques for evaluating and treating the knee and leg with professionalism.

18. Lower Extremity - Foot & Ankle; *MK, OPP, PRO*
- 18.1. Define, describe, and interpret anatomy of foot and ankle.
- 18.2. Define, describe, and interpret clinical exam for the foot and ankle.
- 18.3. Define, describe, interpret, and compare common orthopedic conditions related to the foot and ankle.

19. Lower Extremity - Case Review; *MK, OPP, PRO*
- 19.1. Define, describe, and interpret lower extremity cases in which somatic dysfunction played a significant role.

Labs 25-26 Evaluating & Treating the Foot & Ankle *(Groups A & B);* ***MK, OPP, PRO***
- 25.1.1. Define, describe, interpret, compare, and practice techniques for evaluating and treating the ankle and foot with professionalism.

20. Key Concepts Review: Blocks 1 & 2; *MK, OPP, PRO*
- 20.1. Review and clarify concepts from the first and second blocks.

21. Ribcage 1; *MK, OPP, PRO*
- 21.1. Define, describe, and interpret the anatomy of the ribcage.
- 21.2. Define, describe, and interpret physiologic motions of the ribcage.
- 21.3. Define, describe, interpret, and compare the manifestations of somatic dysfunction in the ribcage.

Labs 27-28 Evaluating & Treating the Ribcage 1 *(Groups A & B);* ***MK, OPP, PRO***
- 27.1.1. Define, describe, interpret, compare, and practice various techniques and modalities for treating the ribcage with professionalism.

22. Ribcage 2; *MK, OPP, PRO*
- 22.1. Define, describe, interpret, compare the manifestations of somatic dysfunction in the ribcage.
- 22.2. Define, describe, interpret, and compare the difference between inhalation and exhalation somatic dysfunction.

Labs 29-30 Evaluating & Treating the Ribcage 2 *(Groups A & B);* ***MK, OPP, PRO***
- 29.1.1. Define, describe, interpret, compare, and practice various techniques and modalities for treating the ribcage with professionalism.

23. Key Concepts Review: Block 3; *MK, OPP, PRO*
- 23.1. Review and clarify concepts from the third block.

Labs 31-32 Evaluating & Treating the Ribcage 3 *(Groups A & B);* ***MK, OPP, PRO***
- 31.1.1. Define, describe, interpret, compare, and practice various techniques and modalities for treating the ribcage with professionalism.

24. Osteopathic Approach to Thoracic Outlet Syndrome; *MK, OPP, PRO*
- 24.1. Define, describe, interpret, and compare the epidemiology, anatomy, pathophysiology, diagnosis, and management of thoracic outlet syndrome.
- 24.2. Define, describe, and interpret the concept of somatic dysfunction.
- 24.3. Define, describe, and interpret the clinical importance of somatic dysfunction in patient care.

Labs 33-34 ***Evaluating & Treating Thoracic Outlet Syndrome*** *(Groups A & B)****;*** *MK, OPP, PRO*

33.1.1. Define, describe, interpret, and compare locations of compression in thoracic outlet syndrome.

33.1.2. Define, describe, interpret, and compare physical exam tests for thoracic outlet syndrome with professionalism.

33.1.3. Define, describe, interpret, compare, and practice techniques that may be beneficial in a patient complaining in thoracic outlet syndrome with professionalism.

25. Osteopathic Approach to Treating Family-First Semester***;*** *MK, OPP, PRO*

25.1. Define, describe, interpret, and compare safe and effective approaches to utilizing OMT for family members.

25.2. Define, describe, interpret, and compare contraindications to treating family members with OMT.

25.3. Define, describe, interpret, and compare key elements of a physical examination necessary to perform OMT.

25.4. Define, describe, and interpret the limitations of your current training.

Labs 35-36 ***Treating Family Members*** *(Groups A & B)****;*** *MK, OPP, PRO*

35.1.1. Define, describe, interpret, compare, and practice common techniques for this stage of training.

ARKANSAS COLLEGE OF
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Course Name: Biomedical Essentials of Comprehensive Osteopathic Medicine-2
Class of/Semester/Year: 2026/Spring/2023
Date Last Revised: December 2, 2022

Approved By: Rance McClain, D.O.

Rance McClain, DO
Vice President of Clinical Education
& Dean of ARCOM

Note: Final Approval. May be released to students. Schedule subject to change.

Office of the Dean
479.308.2380 | PO Box 10366 | Fort Smith, AR 72917

ARKANSAS COLLEGE OF OSTEOPATHIC MEDICINE

Arkansas Colleges of Health Education
Course Syllabus

Course Name:	Biomedical Essentials of Comprehensive Osteopathic Medicine-2 (BECOM-2)
Class of/Semester/Year:	2026/Spring/2023
Course Designation:	COM 552
Term Dates:	January 5, 2023 – May 19, 2023
Course Dates:	January 5, 2023 – May 15, 2023
Total Contact Hours:	181 Lecture Hours; 9 TBL Hours
Credit Hours:	15
Assessment/Grading:	Seven Lecture Exams (January 17, January 30, February 20, March 6, March 31, April 17, May 15)
Location:	Lecture Hall 2, TBL-Small Group Rooms, Anatomy Lab
Course Directors:	Barry Prior, PhD; Joanne Peterson, PhD
Office Hours:	By appointment

Syllabus is subject to change

ARKANSAS COLLEGE OF OSTEOPATHIC MEDICINE

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Course Description:
Biomedical Essentials of Comprehensive Osteopathic Medicine-2 (BECOM-2) continues foundation building for students by providing opportunity and instruction to further develop a growing understanding of important structure-function relationships normal health and in various disease states. Building upon knowledge from BECOM-1, BECOM-2 integrates fundamentals of traditional medical science disciplines (molecular and cellular biology, genetics, developmental biology, histology, anatomy, physiology, microbiology and immunology) across levels of organization of the human body: from molecules – to cells – to tissues – to organs – to organ systems – to the entire body. These biomedical principles and processes are considered in the context of the body's natural and designed ability to maintain homeostasis through self-regulation and self- healing mechanisms. Interdisciplinary, interdepartmental teams of College faculty engage with students in various learning activities aimed at an integrated approach to student learning. In BECOM-2, student learning, is organized around various activities, including but not limited to the following: large group classroom application activities; team-based learning (TBL) sessions, lectures employing audience response technology; computer-based modules; independent guided reading and study; Formative and summative assessments are typically, but not limited to, written/computer-based examinations.

In keeping with the mission, values, and goals of ARCOM, the BECOM-2 course emphasizes the importance of life-long learning, with an aim to support and foster the broader development of osteopathic medical competencies and to promote the best osteopathic patient-centered care possible.

Course Goals:
The following course goals reflect broad and enduring knowledge, skills, behaviors, and responsibilities that students should attain as a result of successfully completing the course:

1. Demonstrate a general knowledge of the basic medical sciences in the areas of molecular biology, cellular biology, biochemistry, pathology, physiology, microbiology, and immunology.
2. Apply basic medical science knowledge to clinical scenarios.
3. Exhibit professional behaviors through positive interactions with peers, faculty, and staff.
4. Cultivate interprofessional relationships through interprofessional experiences integrated intogroup application activities.
5. Apply relationship-building values and the principle of team dynamics to perform effectivelyin different team roles to deliver patient/population-centered care in a safe, timely, efficient, effective, and equitable manner.

Course Expectations and Student Responsibilities:
Students should refer to the Academic Policies and Regulations section in the ACHE and ARCOM Student Handbooks & the Academic Catalogue for information regarding expected professional behaviors, including conduct and dress code.

Video Capture of Educational Content:
Consistent with the policies surrounding video capture and posting of educational content, recordings of any learning activity are considered a supplemental resource to advance student

understanding and for reference at future stages of student education. Recorded materials should not be utilized to replace attendance in the classroom, laboratory, or clinical setting. ARCOM makes no guarantees of reliability for video capture and reserves the right to not allow the recording of learning activities. There is no substitute for class attendance, being actively engaged in the learning process, investing in the comprehension and application of course material, and interacting with instructors and colleagues. Becoming an osteopathic physician involves much more than the acquisition of knowledge and attainment of a professional title. Professionalism, ethics, problem solving, and communication are among the vital skills that are best developed in active and interactive settings. As such, ARCOM expects students to attend all learning activities and offers no guarantees or warranties as to the recording of educational classroom/laboratory content. There will be no video capture of in-class applications team-based learning (TBL), Foundations of Osteopathic Patient Care (FOPC), or Osteopathic Principles and Practice (OPP). Students are not permitted to render any audio and/or visual recordings of these in-class sessions.

Dress Code:
ARCOM Dress Code (refer to ARCOM Student Handbook & Academic Catalog subheading "Professional Dress Guidelines").

Professionalism:

- Students will conduct themselves professionally at all times, during all educational activities conducted on or off campus. This includes interactions with all faculty, staff, students, clinical faculty, guest lecturers, health care providers, patients, and any other member of the ARCOM community. Unprofessional behavior, conduct, or attire inconsistent with the ARCOM dress code will not be tolerated and will result in administrative action. Students are directed to the ARCOM Student Handbook & Academic Catalog for a full definition of professionalism and list of expected professional behaviors.
- Any unauthorized recording of learning materials and activities used in connection with the ARCOM curriculum or reproduction, rendering, possession, or dissemination of these materials including assessment materials, is considered unprofessional behavior and a violation of copyright. Such behavior is subject to action by the Student Conduct Committee (SCC) for disciplinary action, which may include receiving a grade of "zero" for a graded assessment, course failure, probationary action, suspension, or dismissal from ARCOM.
- Computers, tablets, or notebooks should only be used during lectures to take notes or reference appropriate class topics and reference materials. Students should not be on the internet viewing social media sites, performing online shopping, or playing games, etc. This is disrespectful to the lecturer, inhibits peer learning, and is unprofessional behavior.

Attendance Policy:

- Students are responsible for all information presented in the lecture as well as pre-reading or pre-viewing assignments posted to Canvas.
- Consistent with both ARCOM's standards and expectations for professional attitude and behavior and with the ARCOM Student Handbook & Academic Catalog, participation in all learning activities and curricular events is expected. Refer to the ARCOM Student Handbook & Academic Catalog for ARCOM's complete policy on attendance.

- Any student who plans to be absent from a lecture or examination for planned events (e.g., ARCOM travel, educational event) must contact the Office of Student Affairs (OSA) in writing prior to the date of the absence. Upon the student's return, he or she must contact the OSA to discuss remediation. Students are responsible for any assignments and lecture material missed during their absence. Students who miss a scheduled examination for such an event will be entitled to take the make-up examination.

Course Faculty:

Faculty Member	Office	Phone	Email
Aubrey Ziegler, MD	N/A	GUEST	azhawgs@gmail.com
Barry Prior, PhD	275	479-308-2352	barry.prior@achehealth.edu
Brandy Ree, PhD	279	479-308-2369	brandy.ree@achehealth.edu
Jeff Osborn, PhD	348C	479-308-2251	jeffrey.osborn@achehealth.edu
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Joshua Burns, PhD	273	479-308-2367	joshua.burns@achehealth.edu
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Meredith Akins, PhD	265	479-308-2336	meredith.akins@achehealth.edu
Heather Guzik, MA	245	479-308-2364	heather.guzik@achehealth.edu

Faculty Office Hours:

While faculty maintain an open-door policy, **it is strongly recommended that a student in need of a faculty member's time and attention reserve an appointment directly via e-mail** or telephone communication with the faculty member.

Required Course Resources:

Title	Edition	Authors	ISBN-13
Atlas of Human Anatomy (Netter's)	8th	Netter	978-0323680424
Berne & Levy Physiology	7th	Koeppen & Stanton	9780323393942
Grant's Dissector	17th	Detton	978-1975134600
Gray's Anatomy for Students (GAS)	4th	Drake, Vogl, and Mitchell	978-0-323-39304-1
Immunology for Medical Students	3rd	Helbert	978-0702068010
Lippincott Illustrated Reviews: Biochemistry	7th	Ferrier	978-1496344496
Mark's Basic Medical Biochemistry	5th	Lieberman and Peet	978-1496324818
Medical Genetics	6th	Jorde, Carey, and Bamshad	978-0323597371

Nolte's the Human Brain: An Introduction to Its Functional Anatomy (NHB)	8th	Vanderah and Gould	978-0323653985
Pathophysiology of Heart Disease	7th	Lilly	978-1451192759
Medical Microbiology	9th	Accessed via Library	
Textbook of Histology (TH)	5th	Gartner	978-0323672726
The Developing Human: Clinically Oriented Embryology (COE)	11th	Moore, Persaud, and Torchia	978-0323611541

*Req'd information: Title, Edition, ISBN-13 for non-international printed edition
The following is a good website for finding the ISBN-13 of a title and for learning about forthcoming new editions
– Rittenhouse Book Distributors website:
https://www.rittenhouse.com/rbd/Products/AdvancedSearch.aspx

Recommended Course Resources:
NOTE: The titles listed below are *additional* resources for the students. They are not required reading for the students. If a student does not understand a concept as presented in lecture, or in the primary reference text, the student is strongly encouraged to look up the concept in one of the titles listed below and read that concept in that text.

Title	Edition	Authors	ISBN-13
Molecular Biology of the Cell	4th	Alberts, B., et al.	https://www.ncbi.nlm.nih.gov/books/NBK21054/
Medical Physiology	3rd	Boron & Boulpaep	978-1455743773
Textbook of Medical Physiology	14th	Guyton & Hall	978-0323597128
Costanzo Physiology	7th	Costanzo, L	978-0323793339
Cardiovascular Physiology	9th	Mohrman & Heller	978-1260026115
Pulmonary Physiology	9th	Levitzky, M.G.	978-1260019339
West's Respiratory Physiology: The Essentials	11th	West & Luks	978-1975139186
Vander's Renal Physiology	9th	Eaton & Pooler	978-1260019377
Gastrointestinal Physiology	2nd	Barrett, K.E.	978-0071774017
Gastrointestinal Physiology	9th	Johnson, L.R.	978-0323595636
Endocrine Physiology	5th	Molina, P.E.	978-1260019353
Schaechter's Mechanisms of Microbial Disease	5th	Engleberg, DiRita, and Dermody	978-0781787444
The Immune System	5th	Parham, P	
Rapid Interpretation of EKG's	6th	Dubin, D	978-0912912066

ARKANSAS COLLEGE OF OSTEOPATHIC MEDICINE

Seven Osteopathic Core Competencies:

The faculty and administration of ARCOM attest that the following Osteopathic Core Competencies are met in this course.

1. **Osteopathic Philosophy/Osteopathic Manipulative Medicine (OPP/OMM):** Demonstrate and apply knowledge of accepted standards in osteopathic manipulative treatment appropriate to the specialty. Remain dedicated to life-long learning and to practice habits in osteopathic philosophy and OMM.
2. **Medical Knowledge (MK):** Demonstrate and apply knowledge of accepted standards of clinical medicine in the respective area; remain current with new developments in medicine and participate in life-long learning activities.
3. **Patient Care (PC):** Demonstrate the ability to effectively treat patients and provide medical care that incorporates the osteopathic philosophy, patient empathy, awareness of behavioral issues, the incorporation of preventive medicine and health promotion.
4. **Interpersonal and Communication Skills (ICS):** Demonstrate interpersonal and communication skills that enable a physician to establish and maintain professional relationships with patients, families, and other members of health care teams.
5. **Professionalism (PRO):** Uphold the Osteopathic Oath in the conduct of one's professional activities that promotes advocacy of patient welfare, adherence to ethical principles, and collaboration with health professionals, life-long learning, and sensitivity to a diverse patient population; be cognizant of physical and mental health in order to effectively care for patients.
6. **Practice-Based Learning and Improvement (PBL):** Demonstrate the ability to critically evaluate methods of clinical practice; integrate evidence-based medicine into patient care; show an understanding of research methods; improve patient care practices.
7. **Systems-Based Practice (SBP):** Demonstrate an understanding of health care delivery systems; provide effective and qualitative patient care with the system; and practice cost effective medicine.

Grading Information:

Grading point values and scale are consistent with policies outlined in the ARCOM Student Handbook & Academic Catalog. Students will receive a numerical grade (percentage) at the end of the course with 70% or greater required to pass.

Students are required to pass three (3) of the seven (7) exams in the course with a C (70%) or better to progress to the next semester. To receive a 70% or better, a student must completeall requirements of the course as defined in the syllabus.

Grade Determination and Scheduled Assignments:

Date	Assessment (CC)	Percentage of Final Grade
Tuesday, January 17, 2023 @8:00 - 10:00 AM	Exam #1	14%
Monday, January 30, 2023 @ 8:00 - 10:00 AM	Exam #2	14%

Monday, February 20, 2023 @ 8:00 - 11:00 AM	Exam #3	14%
Monday, March 6, 2023 @ 8:00 - 10:00 AM	Exam #4	14%
Friday, March 31, 2023 @8:00 - 10:30 AM	Exam #5	14%
Monday, April 17, 2023 @1:00 - 3:30 PM	Exam #6	14%
Monday, May 15, 2023 @8:00 - 11:00 AM	Exam #7	14%
TOTAL:		**100%**

Examinations:
There will be a total of seven (7) COMLEX-style exams (e.g. multiple choice, 82 seconds per question). To successfully pass the course, students must achieve BOTH:

1. Pass at least 3 of the seven exams.
2. Achieve at least a 70% average across all exams.

Make-up Examinations:
Should a student have an excused absence on an examination day and need to take a make-up examination, the make-up exam will cover the same material as the originally scheduled exam but may be of different format at the course directors' discretion. Said formats include fill in the blank, short answer, true/false, essay, oral, matching, and of course multiple choice. Multiple formats may also be employed for a single make-up examination.

If a student misses an examination but does not have an excused absence, that student will receive a zero (0) grade for the missed exam.

TBL Module Assignments:
Individual readiness assurance tests (iRAT) and team readiness assurance tests (tRAT) assignments will be given as part of the BECOM-2 TBL modules. These modules DO NOT CONTRIBUTE TO YOUR GRADE. **However, content from the TBL modules will tested on the subsequent BECOM exams.** The purpose of the TBL modules in BECOM 2 is to allow the students, via small groups, to employ content learned to understand core concepts further and apply said knowledge to some clinical scenarios. It is expected that a greater understanding of course content will be attained through collegial discussions with students and faculty. iRATs while not graded, are considered individual assignments. Any collaboration amongst students or use of any reference type material during the iRATs, will be considered cheating and dealt with according to the ACHE Policy Manual and Code of Student Conduct.

Course Remediation:
Students who do not pass the course, and are approved for remediation, will take a remediation exam covering only those exam blocks the student did not initially pass.

ARKANSAS COLLEGE OF OSTEOPATHIC MEDICINE

Course content, sequencing, grading, and examination policies are subject to change by administration with the approval the Curriculum Committee. Students will be given advanced notice of any substantive changes by email and the ARCOM portal.

Biomedical Essentials of Comprehensive Osteopathic Medicine-2 Course Schedule:
OMSI Class of 2026 CC=Core Competency

CC	Day	Date	Time	Session #	Title	Instructor	Reading Assignment
MK	Thu	Jan 5	8 AM	0	Introduction to BECOM 2	Prior/ Peterson	
MK	Thu	Jan 5	9 AM	1	CNS Development	Forshee	
MK	Thu	Jan 5	10 AM	2	Brain Topography	Guzik	
MK	Fri	Jan 6	9 AM	3	Internal Spinal Cord I	Peterson	
MK	Fri	Jan 6	11 AM	4	Internal Spinal Cord II	Peterson	
MK, PRO	Fri	Jan 6	1 PM	5	Neuro TBL Brain Topography Grp B	Anatomy Faculty	
MK, PRO	Fri	Jan 6	2 PM	6	Neuro TBL Brain Topography Grp A	Anatomy Faculty	
MK	Mon	Jan 9	10 AM	7	Medulla Oblongata	Rachakatla	
MK	Mon	Jan 9	11 AM	8	Pons	Forshee	
MK	Mon	Jan 9	1 PM	9	Cerebellum	Peterson	
MK	Mon	Jan 9	2 PM	10	Midbrain	Yoakum	
MK	Mon	Jan 9	3 PM	11	Diencephalon	Rachakatla	
MK	Tue	Jan 10	9 AM	12	Cranial Nerve Nuclei I	Rachakatla	
MK	Tue	Jan 10	10 AM	13	Cranial Nerve Nuclei II	Rachakatla	
MK	Wed	Jan 11	10 AM	14	Cerebrum	Forshee	
MK	Wed	Jan 11	11 AM	15	Histology of Eye	Peterson	
MK, PRO	Wed	Jan 11	1 PM	16	Neuro TBL Brainstem and Cerebellum Grp A	Anatomy Faculty	
MK, PRO	Wed	Jan 11	2 PM	17	Neuro TBL Brainstem and Cerebellum Grp B	Anatomy Faculty	
MK	Thu	Jan 12	9 AM	18	Somatosensory System I	Peterson	
MK	Thu	Jan 12	10 AM	19	Somatosensory System II	Peterson	
MK	Fri	Jan 13	8 AM	20	Visual System I	Rachakatla	
MK	Fri	Jan 13	9 AM	21	Visual System II	Rachakatla	
MK	Fri	Jan 13	10 AM	22	Eye Movement	Yoakum	
	Tue	Jan 17	8 AM		**EXAM #1 - NEUROSCIENCE 1**		
MK	Wed	Jan 18	10 AM	23	Histology of Ear	Forshee	
MK	Wed	Jan 18	11 AM	24	Auditory System	Yoakum	
MK	Wed	Jan 18	1 PM	25	Vestibular System	Yoakum	
MK	Wed	Jan 18	2 PM	26	Olfaction and Gustation	Guzik	

MK	Thu	Jan 19	8 AM	27	Motor System I	Forshee	
MK	Thu	Jan 19	9 AM	28	Motor System II	Forshee	
MK	Fri	Jan 20	9 AM	29	Cerebellar Circuity	Peterson	
MK	Fri	Jan 20	10 AM	30	Basal Ganglia I	Peterson	
MK	Fri	Jan 20	11 AM	31	Basal Ganglia II	Peterson	
MK	Mon	Jan 23	9 AM	32	Viscerosensory System	Yoakum	
MK	Mon	Jan 23	10 AM	33	Visceromotor System	Yoakum	
MK	Mon	Jan 23	11 AM	34	Hypothalamus	Forshee	
MK	Mon	Jan 23	1 PM	35	Thalamus	Yoakum	
MK	Tue	Jan 24	9 AM	36	Limbic System Function	Rachakatla	
MK	Wed	Jan 25	9 AM	37	Executive Function	Yoakum	
MK, PRO	Wed	Jan 25	10 AM	38	Neuro TBL Subcortical Cerebral Hemisphere Grp B	Anatomy Faculty	
MK, PRO	Wed	Jan 25	11 AM	39	Neuro TBL Subcortical Cerebral Hemisphere Grp A	Anatomy Faculty	
MK	Wed	Jan 25	3 PM	40	Principles of Microbiology & Infectious Disease	Burns	
MK	Thu	Jan 26	9 AM	41	Bacteria - Introduction	Burns	
MK	Thu	Jan 26	10 AM	42	Bacteria - Microbial Genetics	Burns	
MK	Fri	Jan 27	9 AM	43	Bacteria - Virulence Factors	Burns	
MK	Fri	Jan 27	10 AM	44	Bacteria - Gram Positive Cocci I	Burns	
MK	Fri	Jan 27	11 AM	45	Bacteria - Gram Positive Cocci II	Burns	
	Mon	Jan 30	8 AM		**EXAM #2 - NEUROSCIENCE 2**		
MK	Wed	Feb 1	10 AM	46	Heart Development I	Rachakatla	
MK	Wed	Feb 1	11 AM	47	Heart Development II	Rachakatla	
MK	Wed	Feb 1	1 PM	48	Bacteria - Gram Negative Bacilli I	Fuller	
MK	Wed	Feb 1	2 PM	49	Bacteria - Gram Negative Bacilli II	Fuller	
MK	Fri	Feb 3	9 AM	50	Cardiac Histology	Burns	
MK	Fri	Feb 3	10 AM	51	Autonomic Nervous System I	*Taylor	
MK	Fri	Feb 3	11 AM	52	Autonomic Nervous System II	*Taylor	
MK	Mon	Feb 6	10 AM	53	Cardiac Electrophysiology I	Prior	
MK	Mon	Feb 6	11 AM	54	Cardiac Electrophysiology II	Prior	
MK	Mon	Feb 6	1 PM	55	Bacteria - Other Gram Negative Bacteria	Fuller	
MK	Mon	Feb 6	2 PM	56	Electrocardiogram I	Prior	
MK	Tue	Feb 7	9 AM	57	Electrocardiogram II	Prior	
MK	Tue	Feb 7	10 AM	58	Electrocardiogram III	Prior	
MK	Wed	Feb 8	11 AM	59	Bacteria - Gram Positive Bacilli I	Burns	
MK	Wed	Feb 8	1 PM	60	Bacteria - Gram Positive Baccilli II	Burns	
MK	Wed	Feb 8	2 PM	61	Cardiac Cycle I	Prior	
MK	Wed	Feb 8	3 PM	62	Cardiac Cycle II	Prior	

MK	Fri	Feb 10	9 AM	63	Bacteria - Spirochetes	Burns	
MK	Fri	Feb 10	10 AM	64	Cardiac Output I	Prior	
MK	Fri	Feb 10	11 AM	65	Cardiac Output II	Prior	
MK	Mon	Feb 13	10 AM	66	Blood Pressure Regulation	Prior	
MK	Mon	Feb 13	11 AM	67	Arteries & Veins	Prior	
MK	Mon	Feb 13	1 PM	68	Bacteria - Zoonotic I	Burns	
MK	Mon	Feb 13	2 PM	69	Bacteria - Zoonotic II	Burns	
MK	Wed	Feb 15	9 AM	70	Coronary Circulation	Prior	
MK	Wed	Feb 15	10 AM	71	Hemodynamics and Capillary Circulation	Prior	
MK	Wed	Feb 15	11 AM	72	Clotting and Disruption of Blood Flow I	Prior	
MK	Wed	Feb 15	1 PM	73	Clotting and Disruption of Blood Flow II	Prior	
MK	Fri	Feb 17	9 AM	74	Bacteria - Mycobacteria	Burns	
MK	Fri	Feb 17	10 AM	75	Hemodynamics and Shock	Sullivan	
MK	Fri	Feb 17	11 AM	76	Genetic Disorders of the Cardiovascular System	Ree	
	Mon	Feb 20	8 AM		**Exam #3 - Cardiovascular Physiology**		
MK	Tue	Feb 21	8 AM	77	Histology of the Respiratory System	Yoakum	
MK	Tue	Feb 21	9 AM	78	Respiratory Development	Forshee	
MK	Wed	Feb 22	10 AM	79	Lung Volumes	Prior	
MK	Wed	Feb 22	11 AM	80	Introduction to Fungi and Viruses	Fuller	
MK	Wed	Feb 22	1 PM	81	DNA Viruses I	Fuller	
MK	Wed	Feb 22	2 PM	82	DNA Viruses II	Fuller	
MK	Wed	Feb 22	3 PM	83	Mechanics of Ventilation I	Prior	
MK	Thu	Feb 23	8 AM	84	Mechanics of Ventilation II	Prior	
MK	Thu	Feb 23	9 AM	85	RNA Positive Sense Viruses I	Fuller	
MK	Thu	Feb 23	10 AM	86	RNA Positive Sense Viruses II	Fuller	
MK	Fri	Feb 24	8 AM	87	RNA Negative Sense Viruses	Fuller	
MK	Fri	Feb 24	10 AM	88	Gas Exchange I	Prior	
MK	Fri	Feb 24	11 AM	89	Gas Exchange II	Prior	
MK	Mon	Feb 27	10 AM	90	COVID 19 and other Emerging Pathogens	Fuller	
MK	Mon	Feb 27	11 AM	91	Gas Transport	Prior	
MK	Mon	Feb 27	1 PM	92	Neuroregulation of Ventilation	Prior	
MK	Mon	Feb 27	2 PM	93	Fungi I: Primary Fungal Pathogens	Fuller	
MK	Mon	Feb 27	3 PM	94	Fungi II: Opportunistic Fungal Pathogens	Fuller	
MK	Tue	Feb 28	9 AM	95	Pulmonary Circulation I	Prior	
MK	Tue	Feb 28	10 AM	96	Pulmonary Circulation II	Prior	
MK	Wed	Mar 1	10 AM	97	Parasites I - Protozoan	Burns	
MK	Wed	Mar 1	11 AM	98	Parasites II - Helminths	Burns	
MK	Wed	Mar 1	1 PM	99	Respiratory Integration I	Prior	
MK	Wed	Mar 1	2 PM	100	Respiratory Integration II	Prior	

MK	Wed	Mar 1	3 PM	101	Genetic Disorders of the Respiratory System	Ree	
MK	Fri	Mar 3	9 AM	102	Microbiology Lab Diagnostics - Introduction	Burns	
MK	Fri	Mar 3	10 AM	103	Pulmonary Physiol	Prior	
MK	Fri	Mar 3	11 AM	104	Pulmonary Physiol	Prior	
	Mon	Mar 6	8 AM		**EXAM #4 - RESPIRATORY PHYSIOLOGY**		
MK	Tues	Mar 7	8 AM	105	Renal System Histology I	Peterson	
MK	Tues	Mar 7	9 AM	106	Renal System Histology II	Peterson	
MK	Fri	Mar 10	10 AM	107	Microbiology Lab Diagnostics - Microscopy	Burns	
MK	Fri	Mar 10	11 AM	108	Renal System Development	Yoakum	
MK	Mon	Mar 13	9 AM	109	Introduction to Renal Physiology	Osborn	
MK	Mon	Mar 13	10 AM	110	Glomerular Filtration and Renal Blood Flow I	Osborn	
MK	Mon	Mar 13	11 AM	111	Glomerular Filtration & Renal Blood Flow II	Osborn	
MK	Mon	Mar 13	1 PM	112	Micro - TBL	Burns/ Fuller	
MK	Mon	Mar 13	2 PM	113	Micro - TBL	Burns	
MK	Mon	Mar 13	3 PM	114	Micro - TBL	Burns	
MK	Tue	Mar 14	9 AM	115	Glomerular Filtration and Renal Blood Flow III	Osborn	
MK	Tue	Mar 14	10 AM	116	Microbiology Lab Diagnostics - Culture & Sensitivity	Burns	
MK	Wed	Mar 15	10 AM	117	Renal Blood Flow	Osborn	
MK	Wed	Mar 15	11 AM	118	Renal Physiology	Osborn	
MK	Wed	Mar 15	1 PM	119	The Burden of Infectious Disease & MDR	Burns	
MK	Wed	Mar 15	2 PM	120	Tubular Reabsorption & Secretion I	Osborn	
MK	Wed	Mar 15	3 PM	121	Tubular Reabsorption and Secretion II	Osborn	
MK	Thu	Mar 16	8 AM	122	Immunology: Introduction	Fuller	
MK	Thu	Mar 16	9 AM	123	Tubular Reabsorption and Secretion III	Osborn	
MK	Fri	Mar 17	10 AM	124	Tubular Reabsorption & Secretion IV	Osborn	
MK	Fri	Mar 17	11 AM	125	Cells of the Immune System	Fuller	
MK	Fri	Mar 17	1 PM	126	Renal Homeostasis I	Osborn	
MK	Fri	Mar 17	2 PM	127	Renal Homeostasis II	Osborn	
MK	Mon	Mar 20	1 PM	128	Metabolism of the Kidney/Renal Function Measures	Osborn	
MK	Mon	Mar 20	2 PM	129	Genetic Disorders of the Renal System	Ree	
MK	Mon	Mar 20	3 PM	130	Anatomy of the Immune System	Fuller	
MK	Mon	Mar 27	10 AM	131	Renal Acid Base Regulation	Osborn	
MK	Mon	Mar 27	11 AM	132	Renal Physiology	Osborn	
MK	Mon	Mar 27	1 PM	133	Innate Immunity	Burns	

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MK	Mon	Mar 27	2 PM	134	Inflammation	* A. Ziegler	
	Fri	Mar 31	8 AM		**EXAM #5 - RENAL PHYSIOLOGY**		
MK	Mon	Apr 3	9 AM	135	Histology - Alimentary Canal I	Forshee	
MK	Mon	Apr 3	10 AM	136	Histology - Alimentary Canal II	Rachakatla	
MK	Mon	Apr 3	11 AM	137	Histology - Alimentary Canal III	Rachakatla	
MK	Mon	Apr 3	1 PM	138	Histology - Alimentary Canal IV	Forshee	
MK	Wed	Apr 5	10 AM	139	Digestive System Development I	Forshee	
MK	Wed	Apr 5	11 AM	140	Digestive System Development II	Forshee	
MK	Wed	Apr 5	1 PM	141	Complement	* A. Ziegler	
MK	Wed	Apr 5	2 PM	142	Antibodies	* A. Ziegler	
MK	Thu	Apr 6	9 AM	143	Introduction to GI Physiology	Prior	
MK	Thu	Apr 6	10 AM	144	Neural Control of GI Function	Prior	
MK	Fri	Apr 7	9 AM	145	The Cephalic, Oral, and Esophageal Phases of the Integrated Response to a Meal	Prior	
MK	Fri	Apr 7	10 AM	146	Immunogenetics	Burns	
MK	Fri	Apr 7	11 AM	147	MHC	Burns	
MK	Mon	Apr 10	10 AM	148	The Gastric Phase of the Integrated Response to a Meal I	Prior	
MK	Mon	Apr 10	11 AM	149	The Gastric Phase of the Integrated Response to a Meal II	Prior	
MK	Mon	Apr 10	1 PM	150	The Small Intestinal Phase of the Integrated Response to a Meal Neural Regulation of GI Function I	Prior	
MK	Mon	Apr 10	2 PM	151	Antigen Presentation	Burns	
MK	Tue	Apr 11	9 AM	152	The Small Intestinal Phase of the Integrated Response to a Meal Neural Regulation of GI Function II	Prior	
MK	Tue	Apr 11	10 AM	153	The Small Intestinal Phase of the Integrated Response to a Meal Neural Regulation of GI Function III	Prior	
MK	Wed	Apr 12	9 AM	154	The Colonic Phase of the Integrated Response to a Meal	Prior	
MK	Wed	Apr 12	10 AM	155	GI Physiology	Prior	
MK	Wed	Apr 12	11 AM	156	Genetic Disorders of the GI System	Ree	
MK	Wed	Apr 12	1 PM	157	Antigen Recognition	Burns	
MK	Wed	Apr 12	2 PM	158	T Cell Development	Fuller	
	Mon	Apr 17	1 PM		**EXAM #6 - GI PHYSIOLOGY**		
MK	Wed	Apr 19	10 AM	159	B Cell Development	* A. Ziegler	
MK	Wed	Apr 19	11 AM	160	B Cell Responses and Immunodeficiency	* A. Ziegler	
MK	Wed	Apr 19	1 PM	161	Endocrine System Histology I	Peterson	

MK	Wed	Apr 19	2 PM	162	Endocrine System Histology II	Peterson	
MK	Thu	Apr 20	9 AM	163	Intro to Endocrine Physiology	Akins	
MK	Thu	Apr 20	10 AM	164	Anterior Pituitary	Akins	
MK	Fri	Apr 21	10 AM	165	T cell responses: cytokines and cooperation	Fuller	
MK	Fri	Apr 21	11 AM	166	Regulation of Immune Response	Burns	
MK	Mon	Apr 24	9 AM	167	Posterior Pituitary	Akins	
MK	Mon	Apr 24	10 AM	168	Hypersensitivity	* A. Ziegler	
MK	Mon	Apr 24	11 AM	169	Mechanisms of Inflammation	* A. Ziegler	
MK	Wed	Apr 26	10 AM	170	Adrenal Cortex and Medulla I	Akins	
MK	Wed	Apr 26	11 AM	171	Adrenal Cortex and Medulla II	Akins	
MK	Wed	Apr 26	1 PM	172	Vaccines	Fuller	
MK	Wed	Apr 26	2 PM	173	Transplant Immunology	Burns	
MK	Thu	Apr 27	9 AM	174	Thyroid	Akins	
MK	Thu	Apr 27	10 AM	175	Parathyroid and Calcium Regulation	Akins	
MK	Fri	Apr 28	8 AM	176	Reproductive System Development	Peterson	
MK	Fri	Apr 28	9 AM	177	Endocrine Pancreas and Energy Metabolism	Akins	
MK	Fri	Apr 28	10 AM	178	Histology - Male Reproductive System I	Rachakatla	
MK	Fri	Apr 28	11 AM	179	Histology - Male Reproductive System II	Rachakatla	
MK	Mon	May 1	9 AM	180	Histology - Female Reproductive System I	Yoakum	
MK	Mon	May 1	10 AM	181	Histology - Female Reproductive System II	Yoakum	
MK	Mon	May 1	11 AM	182	Male Reproductive System I	Akins	
MK	Tue	May 2	9 AM	183	Immune Response to Infection	Burns	
MK	Tue	May 2	10 AM	184	Autoimmunity	Burns	
MK	Fri	May 5	9 AM	185	Male Reproductive System II	Akins	
MK	Fri	May 5	10 AM	186	Female Reproductive System I	Akins	
MK	Fri	May 5	11 AM	187	Female Reproductive System II	Akins	
MK	Mon	May 8	9 AM	188	Tumor Immunity and Immunotherapy	Burns	
MK	Mon	May 8	10 AM	189	Pregnancy and Parturition	Akins	
MK	Mon	May 8	11 AM	190	Genetic Disorders of Reproductive Systems	Ree	
	Mon	May 15	8 AM		**EXAM #7 - ENDOCRINE PHYSIOLOGY**		

ARKANSAS COLLEGE OF OSTEOPATHIC MEDICINE

Biomedical Essentials of Comprehensive Osteopathic Medicine-2 Course Learning Objectives:

0 Introduction to BECOM 2

0.1 Introduction to the BECOM 2 course, how the course is structured, what is different this year, etc.

0.2 Basic introduction to the neuroscience, physiology & immuno/micro blocks

1 CNS Development

1.1 Describe the early aspects of CNS development, including formation of primary and secondary brain vesicles.

1.2 Explain how the spinal cord and brainstem are formed.

1.3 Compare how forebrain structures (e.g., diencephalon, basal ganglia, and limbic system) are formed.

1.4 Summarize how the ventricular system is formed and organized.

1.5 Differentiate how congenital malformations associated with abnormal development occur.

2 Brain Topography

2.1 Define the terms used in neuroanatomy.

2.2 Explain the terms grey and white matter, fasciculus, tract, commissure, pathway, chiasm, decussation, nucleus, ganglion, and cortex.

2.3 Describe the major divisions of the brain.

2.4 Identify the major sulci and gyri of the cerebral hemispheres and summarize the position of the lobes.

2.5 Compare the areas of cerebral cortex subserving major special functions and predict the manifestations of related disorders.

2.6 Name the major neural structures served by the anterior, middle and posterior cerebral arteries.

2.7 Describe the major vessels that supply the brain stem, cerebellum and spinal cord.

2.8 Summarize the origin, course and distribution of the internal carotid artery and its major branches.

2.9 Explain the major features of the arterial circle (Willis).

2.10 Identify the course of the vertebral arteries and their entrance through the foramen magnum.

3 Internal Spinal Cord I

3.1 Indicate the morphological differences among the different levels of spinal cord.

3.2 Describe the cytoarchitectural organization or cellular laminae of the spinal cord, which includes the major spinal cell groups or nuclei.

3.3 Explain the course of the afferent fibers to the spinal cord.

3.4 Summarize the locations and functions of the ascending and descending tracts in the spinal cord.

3.5 Compare the differences between the lower and upper motor neurons.

3.6 Analyze the effects of various spinal cord lesions, including dorsal and ventral roots.

3.7 Differentiate the afferent and efferent limbs of spinal reflexes.

4 Internal Spinal Cord II

4.1 See objectives for Session 3

5 TBL Brain Topography

5.1 Group B TBL See session 2 on brain topography.

6 TBL Brain Topography

6.1 Group A TBL See session 2 on brain topography.

7 Medulla Oblongata

7.1 Demonstrate a general understanding of the gross anatomical arrangement of the medulla.

7.2 Describe the internal organization of major fiber pathways that ascend and descend through the medulla.

7.3 Identify major cell groups at different levels of the medulla.

7.4 Compare syndromes associated with damage to the lateral aspect of the lower brainstem to the medial aspect of the lower brainstem.

8 Pons

8.1 Recall the gross anatomy relationship of metencephalon components.

8.2 Identify various components of the pons in cross section (basilar pons with pontine nuclei, corticospinal tracts, medial lemniscus, principal nucleus of CN V, motor nucleus of CN VI, motor nucleus of CN VII, and middle cerebellar peduncle).

8.3 Describe the organization and relationships of major fiber pathways that traverse the pons.

8.4 Explain the role(s) of major cells groups within the pons.

8.5 Summarize syndromes associated with different regions of the pons.

8.6 Distinguish the vascular regions of the pons and recognize the deficits that occur with occlusion of the arterial supply.

9 Cerebellum

9.1 Label the morphological features of the cerebellum.
9.2 List and compare the functional properties of afferent sources to the cerebellum from the spinal cord, brainstem, and cerebral cortex.
9.3 Explain the internal circuitry of the cerebellar cortex and how these neurons interact.
9.4 List the efferent projections of the cerebellum and describe their functional relationships.
9.5 Characterize the feedback pathways that linking the cerebellum with the spinal cord, motor regions of the brainstem, and motor regions of the cerebral cortex.
9.6 Describe the anatomical bases of cerebellar disorders, including why they are ipsilateral to the cerebellum.

10 Midbrain

10.1 Demonstrate a general understanding of the gross anatomical arrangement of the midbrain.
10.2 Identify major cell groups situated at the level of the inferior and superior colliculi.
10.3 Explain the organization and relationships of major fiber pathways that either arise from or traverse the midbrain.
10.4 Interpret the neural bases underlying syndromes associated with damage to different regions of the midbrain

11 Diencephalon

11.1 List the four parts of the diencephalon.
11.2 Describe the epithalamus and list its major nuclei.
11.3 Explain the relationship of the thalamus to the third ventricle, internal capsule and basal ganglia.
11.4 Define the internal medullary lamina of the thalamus.
11.5 Compare the four clusters of thalamic nuclei with respect to the internal medullary lamina.
11.6 Summarize the four types of thalamic nuclei: specific relay, non-specific relay, intralaminar and reticular.
11.7 Consider the connections of the VPL and VPM to the general sensory system.
11.8 Analyze the connections of the lateral geniculate nucleus, medial geniculate nucleus, ventral lateral and ventral anterior nuclei, anterior and mediodorsal nuclei, and centromedian and reticular nuclei.
11.9 Evaluate the arterial blood supply to the thalamus

12 Cranial Nerve Nuclei I

12.1 List the origin of the relevant cell bodies of the first-order, second order, and third order neurons (where appropriate) of the cranial nerves.
12.2 Explain the peripheral and central distributions of the cranial nerves.
12.3 Summarize the functions of the components of the cranial nerves.
12.4 Differentiate the dysfunctions associated with damage of the cranial nerves.

13 Cranial Nerve Nuclei II

13.1 See immediately above.

14 Cerebrum

14.1 Locate the lobes of the cerebral hemisphere.
14.2 Recognize the major gyri and sulci of the cerebral cortex.
14.3 Recognize the histological organization of the cortex.
14.4 Recognize the concept of Brodmann areas.
14.5 Identify the primary motor, primary somatosensory and association areas of the cortex.
14.6 Recognize the somatotropic organization of the somatosensory cortex.
14.7 Recognize the somatotropic organization of the primary motor cortex.
14.8 Locate the subcortical gray matter (basal ganglia).
14.9 Recognize the white matter fiber tracts that connect cortical areas.
14.10 Recognize the somatotropic organization of fibers traversing the internal capsule.
14.11 Group A TBL See Session 12 on Cerebrum.

15 Histology of Eye

15.1 List the three tunics of the eye and the subcomponents of each.

15.2 Draw the microanatomy of the five layers of the cornea, and assess the relationship of the cornea to LASIK, myopia, and hyperopia.
15.3 Interpret what causes differences in eye color.
15.4 Explain the function of the choroid.
15.5 Evaluate the outcome of either the reduction of drainage and/or production of aqueous humor.
15.6 Specify which structures bring about accommodation and assess opacity and age-related changes to the lens.
15.7 Diagram the ten layers of the retina, recognize the function of various retinal cells, distinguish regional specialization (e.g., macula lutea and fovea centralis), and evaluate common clinical manifestations (e.g., retinal detachment, retinitis pigmentosa, night and color blindness, macular degeneration).
15.8 Summarize the process of phototransduction, starting with the light path through the cornea and pupil.
15.9 Comprehend the structural and functional composition of the vitreous body and explain eye floaters (vitreous opacities).
15.10 Identify the microanatomy of accessory structures of the eye (i.e., conjunctiva, palpebrae, and lacrimal apparatus) and analyze commonly associated clinical conditions (e.g., conjunctivitis and styes).

16 TBL Brainstem and Cerebellum

16.1 Group A TBL See sessions 7-9, 11, & 12 on medulla oblongata, pons, cerebellum & cranial nerves.

17 TBL Brainstem and Cerebellum

17.1 Group B TBL See sessions 7-9, 11, & 12 on medulla oblongata, pons, cerebellum & cranial nerves.

18 Somatosensory System I

18.1 Describe and diagram the receptors, anatomical pathways, and physiological functions associated with tactile sensations (touch, pressure, and vibration).
18.2 Describe and diagram the receptors, anatomical pathways, and physiological functions associated with conscious proprioception (perception of joint position, joint movements, and direction and velocity of joint movements or kinesthesia).
18.3 Describe and diagram the receptors, anatomical pathways, and physiological functions associated with nonconscious proprioception (sensations mediated by muscle spindles and Golgi tendon organs).

19 Somatosensory System II

19.1 Describe and diagram the receptors, anatomical pathways, and physiological functions associated with pain and temperature.
19.2 Predict signs associated with lesions of the somatosensory system.

20 Visual System I

20.1 Describe and diagram the components of the eye.
20.2 List and explain the layers of the retina.
20.3 Summarize the structure and function of photoreceptors.
20.4 Summarize the process of phototransduction.
20.5 Describe the role of different retinal cells in relaying signals from the photoreceptors to the retinal ganglion cells.
20.6 Diagram visual pathways.
20.7 Explain visual reflexes.
20.8 Describe color vision. Predict visual field defects associated with lesions of different parts of the visual system.

21 Visual System II

21.1 See above.

22 Eye Movement

22.1 Explain the complex actions of the superior and inferior recti and oblique muscles relative to the medial and lateral recti muscles.
22.2 Compare the role and central machinery involved with fast, ballistic eye movements and slow, guided eye movements.
22.3 Describe the changes required for vergence eye movements.
22.4 Explain how the basal nuclei and cerebellum participate in eye movement control.

23 Histology of the Ear

23.1 Understand gross anatomical divisions of the ear and their general functions in hearing and balance
23.2 Know the histological features of the external, middle, and inner ears

23.3 Understand the structures and fluid-filled compartments (and their functions) that comprise the membranous vs. the bony labyrinth of the inner ear
23.4 Know the structures, locations, and specific cells of sensory areas within the membranous labyrinth (otolith organs, cristae ampullaris, and organ of Corti), and their different functions
23.5 Know the supporting and sensory hair cells. Know how they differ (in appearance and function) from neurons of the spiral ganglion
23.6 Be able to distinguish the auditory parts of the inner ear from those of the vestibular system and their roles in hearing and balance

24 Auditory System

24.1 Describe the mechanism of sound conduction.
24.2 Describe and diagram the ascending and descending auditory pathways.
24.3 Describe some common clinical disorders associated with the auditory system.

25 Vestibular System

25.1 Describe the vestibular apparatus including specific components and its basic functions.
25.2 Differentiate semicircular canals and otoliths.
25.3 Describe the structure, normal stimulus, transduction at the receptor level, and function of the otolith organs.
25.4 Describe the structure, normal stimulus, transduction at the receptor level, and function of the semicircular canals.
25.5 Describe how the detection of head orientation is mediated.
25.6 Explain how the vestibular system helps the body maintain equilibrium and detect angular acceleration.
25.7 Describe the vestibulosympathetic reflex and discuss how dysfunctions in this reflex may be part of the increased falls seen in elderly individuals.
25.8 Outline the steps of the optokinetic reflex and explain how optokinetic and vestibular nystagmus interact.
25.9 List the major types of eye movements and explain the spatial coordination of eye movements.
25.10 Differentiate the key oculomotor deficits based on their symptoms.

26 Olfaction and Gustation

26.1 Describe the stimuli that activate olfactory receptors and explain the anatomical components of olfactory receptors.
26.2 Describe the central pathways that mediate olfactory sensations.
26.3 Explain some clinical conditions that alter olfactory sensations.
26.4 Describe the stimuli that activate gustatory receptors and explain the anatomical components of gustatory receptors.
26.5 Describe the central pathways mediating gustation. 6. Explain some clinical conditions that alter gustatory sensations.

27 Motor System I

27.1 Describe and diagram the origin, distribution, and somatotopic organization of the corticospinal tract
27.2 List the functional mechanisms subserving voluntary control of movement
27.3 Explain some of the basic mechanisms underlying upper motor neuron paralysis involving the corticospinal system
27.4 Summarize the origin, distribution, and functions of the following descending brainstem pathways in the control of movement and posture: rubrospinal, medial and lateral vestibulospinal tracts, and medial and lateral reticulospinal tracts
27.5 Diagram and explain the origin, distribution and functions of corticobulbar tracts
27.6 Compare upper motor neuron and lower motor neuron and explain the signs associated with damage to each

28 Motor System II

28.1 See immediately above.

29 Cerebellar Circuitry

29.1 List the three functional divisions of the cerebellum, detailing the input and output connections of each.
29.2 Describe how these areas are integrated with the motor pathways.
29.3 Describe the circuitry of the cerebellar cortex and deep nuclei. Assign the functional role to each neuron type and give its synaptic action (excitatory or inhibitory).

29.4 Describe what is known about the role of the cerebellum in the regulation of skilled movement and in motor learning.
29.5 Correlate the function of each division with the output signals from that division.
29.6 Predict the neurological disturbances that can result from disease or damage in different regions of the cerebellum.

30 Basal Ganglia I

30.1 List the anatomical structures that comprise the basal nuclei and its overall functions.
30.2 List and describe the major interconnections between components within the basal ganglia and between the basal ganglia and the cerebral cortex. Identify the associated neurotransmitters.
30.3 Describe the overall function of the basal ganglia in the initiation and control of movement.
30.4 List the appropriate signs of rigidity, dyskinesia, akinesia, and tremor for Parkinson's disease, Huntington's chorea, and hemiballismus. Assign a likely lesion site or chemical system defect for each clinical syndrome.
30.5 Describe the rationale for treatment of Parkinson's disease with L-DOPA, NEU 248, pallidectomy, and deep brain stimulation.

31 Basal Ganglia II

31.1 See above.

32 Viscerosensory System

32.1 Describe and diagram the receptors, anatomical pathways, and physiological functions associated with tactile sensations (touch, pressure, and vibration)
32.2 Describe and diagram the receptors, anatomical pathways, and physiological functions associated with conscious proprioception (perception of joint position, joint movements, and direction and velocity of joint movements or kinesthesia)
32.3 Describe and diagram the receptors, anatomical pathways, and physiological functions associated with nonconscious proprioception (sensations mediated by muscle spindles and golgi tendon organs)
32.4 Describe and diagram the receptors, anatomical pathways, and physiological functions associated with pain and temperature
32.5 Predict signs associated with lesions of the somatosensory system

33 Visceromotor System

33.1 See immediately above.

34 Hypothalamus

34.1 Describe and diagram the organization of the hypothalamus.
34.2 List the primary afferent fiber connections of the hypothalamus.
34.3 List the primary efferent fiber connections of the hypothalamus.
34.4 Describe the basic functional properties of the hypothalamus, including control of endocrine functions, role in temperature regulation, regulation of cardiovascular function, regulation of feeding and drinking behavior, role in sexual behavior, regulation of aggression, rage, and related forms of emotional behavior, and role in sleep.
34.5 List some of the basic disorders associated with hypothalamic dysfunctions.

35 Thalamus

35.1 Describe and diagram the histological arrangement of the cerebral cortex and its columnar organization.
35.2 Identify the major afferent sources of the cerebral cortex.
35.3 Review the organization and functional properties of thalamic nuclei and projections from thalamic nuclei to the cerebral cortex and related regions of the forebrain.
35.4 Identify the afferent fibers that arise from the basal forebrain and monoaminergic afferent fibers that arise from the brainstem.
35.5 Review the motor functions of the cerebral cortex, including the descending motor projections.
35.6 Review the somatosensory, visual, auditory, and taste functions of the cerebral cortex.
35.7 Describe the functions of the prefrontal cortex and other regions of the cortex, including the process of cerebral dominance.
35.8 List and describe several of the key disorders of the cerebral cortex.
35.9 List and characterize disorders of language, learning, and memory.

36 Limbic System Function

36.1 Describe the main functions of the limbic system (LS) and associate them with one or more major anatomical structures of the LS.
36.2 Relate how the amygdala interacts with the cerebral cortex to produce cognitive emotional behaviors.
36.3 Describe the role of the olfactory system in LS.
36.4 Relate the interactive nature of the LS and the ANS and how changes in body homeostasis change with changes in emotion.
36.5 Predict how lesions of various components of the LS would cause specific symptoms in humans.

37 Executive Function

37.1 Differentiate the four general functional categories of the cerebral cortex for higher intellectual tasks (i.e., sensory, motor, unimodal association cortex, and multimodal association cortex).
37.2 Describe the underpinnings of the dominant hemisphere theory.
37.3 Compare the two classic types of central aphasia (i.e., Broca aphasia and Wernicke aphasia).
37.4 Define less common types of aphasia (e.g., conduction and global).
37.5 Summarize intellectual functions mediated in the parietal association cortex of the nondominant hemisphere, including contralateral neglect.
37.6 Predict the consequences of damage in areas of association cortex, producing higher level disorders of behavior (i.e., apraxia and agnosia).
37.7 Assess damage to the prefrontal association cortex to human intellectual traits such as judgment, foresight, purpose, responsibility, and social propriety.
37.8 Identify limbic areas for mediating emotional expression of behavior.

38 TBL Subcortical Features of the Cerebral Hemispheres

38.1 Group B See Sessions 14, 30-31, 34 & 35 on cerebrum, basil ganglia, hypothalamus, and thalamus.

39 TBL Subcortical Features of the Cerebral Hemispheres

39.1 Group A See Sessions 14, 30-31, 34 & 35 on cerebrum, basil ganglia, hypothalamus, and thalamus.

40 Principles of Microbiology and Infectious Disease

40.1 Compare the number one cause of death by disease in the United States, the world, and Arkansas
40.2 Differentiate the terms: incidence, prevalence, outbreak, epidemic, and pandemic
40.3 Differentiate categories of symbiosis (commensalism, mutualism, and parasitism) and explain why their definitions are not absolute
40.4 Differentiate between modes of direct, indirect, vehicle, and vector associated transmission
40.5 Define accuracy and precision; If provided a 2x2 table containing true positive (TP), true negative (TN), false positive (FP) and false negative (FN) data, and identify which is impacted most by disease prevalence
40.5.1.1 explain the significance of SPPIN and SNNOUT

41 Bacteria: Introduction

41.1 Differentiate Gram-positive and Gram-negative bacteria in terms of major cell wall components, the number of layers (membrane, wall, etc.), the presence or absence of teichoic acid, and the presence or absence of LPS
41.2 Identify the component of LPS that is endotoxin, what triggers its release, and its effect on the body; recall the one Gram-positive organism that contains an LPS-like molecule
41.3 Discuss attributes associated with atypical membrane structure
41.4 Identify the major components of a typical bacterial cell wall and identify the genus of bacteria with non-typical cell wall organization
41.5 Interpret the mnemonic 'Some Pretty Bad Killers Have Pretty Nice Shiny Capsules' and what these organisms have in common
41.6 Assess the roles that unique external structures, cytoplasmic structures, and endospores have in bacteria
41.7 Recall the terms that describe temperature tolerance and aerotolerance
41.8 Recall the strict aerobes and anaerobes discussed in class including Gram-stain, morphology, and colony characteristics
41.9 Identify attributes of a bacterial growth curve.
41.10 Specifically identify the growth phase where antimicrobial agents are most effective

42 Bacteria: Microbial Genetics

- 42.1 Describe how DNA is transferred between bacteria using conjugation, transformation, transduction, and transposons
- 42.2 Discuss the difference between conjugation, high frequency recombinants, and site-specific recombination
- 42.3 Assess mechanisms of molecular information flow between bacteria and eukaryotes
- 42.4 Address specific differences in the role of DNA and RNA as handled in DNA replication, transcription, and translation in bacteria
- 42.5 Discuss bacterial transcriptional control mechanisms
- 42.6 Analyze the role of quorum sensing and virulence
- 42.7 Decipher the 'ABCDES' mnemonic as it relates to the list of toxins that are transferred by lysogenic phages in specialized transduction
- 42.8 Discuss how "omics" tools are important for our understanding of the human microbiome

43 Bacteria: Virulence Factors

- 43.1 List bacteria that form capsules, recognizing which capsules are not composed of polysaccharide, and which fungi produces a capsule
- 43.2 List and explain attributes of a microbe that can contribute to invasiveness
- 43.3 Compare/contrast LPS and LOS in terms of their source and biological activity and identify the component that is endotoxin
- 43.4 Explain the function of siderophores
- 43.5 Differentiate endotoxin from exotoxin and identify the mechanisms associated with each that harm the host during infection
- 43.6 Describe A-B toxin structure/function and β pore forming toxin structure/function
- 43.7 Discuss the difference in the role of A-B toxins and pore forming toxins in disease; compare the disease outcomes between bacteria that use these toxins as primary virulence factors
- 43.8 Describe the action of a superantigen
- 43.9 Describe a case of Toxic Shock Syndrome Toxin-1 (TSST-1), and its typical presentation

44 Bacteria: Gram Positive Cocci I

- 44.1 Describe the Gram stain morphology of staphylococci and streptococci.
- 44.2 Determine the identity of a Gram-positive cocci when given the results of the biochemical tests discussed in class
- 44.3 Recognize the increased pathogenesis of Sta. aureus vs Sta. epidermidis
- 44.4 Match Sta. aureus virulence factors with their function: protein A, exfoliatin, enterotoxin, toxic shock syndrome toxin (TSST), Panton-Valentine leukocidin
- 44.5 Explain how staphylococcal food poisoning differs from most other GI infections
- 44.6 Differentiate staphylococcal toxic shock syndrome from most other causes of sepsis in terms of its unique presentation
- 44.7 Identify which of the following skin infections: cellulitis; folliculitis, furuncles, and carbuncles; impetigo; erysipelas; scalded skin syndrome; and necrotizing fasciitis are caused by Sta. aureus, Grp. A strep, or both
- 44.8 Explain why cellulitis antimicrobial treatment should not only cover Gp A strep.
- 44.9 Explain how acute endocarditis differs from subacute endocarditis and what organism(s) is(are) most often associated with each
- 44.10 Identify the most common cause of osteomyelitis in children with sickle cell anemia
- 44.11 List the serious illnesses that may result from untreated strep throat; match the exotoxins of group A strep with their action
- 44.12 Identify the most common cause of pneumonia in adults and otitis media in children
- 44.13 Indicate what procedure needs to be performed first when a blood culture is positive for Str. gallolyticus/bovis

45 Bacteria: Gram Positive Cocci II

- 45.1 See previous lesson objectives

46 Heart Development I

- 46.1 Describe the early development of heart, including its five dilations.

46.2 Explain the partitioning of primordial heart into four chambers.
46.3 Summarize the changes in the sinus venosus.
46.4 Discuss the partitioning of the bulbus cordis and truncus arteriosus.
46.5 Analyze the development of different parts of the conducting system of heart.
46.6 Compare the developmental basis for common birth defects of heart.

47 Heart Development II

47.1 See above.

48 Bacteria: Gram Negative Bacilli I

48.1 Recall where the Enterobacteriaceae normally reside
48.2 Describe the appearance of lactose fermenters on MacConkey agar
48.3 Identify the rapid lactose fermenters and slow lactose fermenters
48.4 Describe Pseudomonas aeruginosa including: the oxidase reactivity, odor, and lactose utilization
48.5 Specifically address the appearance of P. aeruginosa on MacConkey agar
48.6 Explain why it is notorious and decipher the mnemonic 'BE PSEUDO'
48.7 Match commonly encountered GNRs with the following attributes: has a red pigment, forms purple colonies rapidly on MacConkey agar, smells like grapes, swarmer, currant jelly sputum, rose spots
48.8 Differentiate the anaerobic GNRs discussed in class: which target the throat, and which is most likely to involve the abdomen
48.9 Describe Lemierre's syndrome
48.10 Describe the classical presentation of Salmonella typhi and how it differs from infection with non-typhoidal strains of Salmonella
48.11 Recall the meaning of E. coli's O, H and K antigens
48.12 Explain the which antigen increases the risk of meningitis in a newborn
48.13 Explain how EHEC and EIEC differ from EPEC and ETEC
48.14 Recognize the strain of E. coli to which O157:H7 belongs and the triad of symptoms it causes
48.15 Predict which of the organisms discussed in class will yield a positive fecal leukocyte test
48.16 Differentiate Campylobacter, Vibrio cholerae and Yersinia enterocolitica in terms of source and presentation
48.17 Asses which of the above organisms can proceed to Guillain-Barre
48.18 Describe Guillain-Barre in terms of pathology, presentation, and CSF findings

49 Bacteria: Gram Negative Bacilli II

49.1 See previous lesson objectives

50 Cardiac Histology

50.1 Compare and contrast the microanatomy of cardiac & skeletal muscle, including stepwise components of intercalated discs in the former.
50.2 List the three layers of the heart and explain the structural composition of each.
50.3 Summarize the differences between atrial and ventricular myocytes.
50.4 Review the structure and functions of the cardiac skeleton.
50.5 Analyze and compare the structural composition of semilunar and atrioventricular valves.
50.6 Name the components of the cardiac conduction system from the SA node to Purkinje fibers, and compare their histologic appearance and location to non-conduction cardiac muscle cells.

51 Autonomic Nervous System I

51.1 Recognize anatomical distribution of the ANS.
51.2 Identify the autonomic neurotransmitters and receptors involved at the autonomic ganglia and the target organs of ANS.
51.3 Compare and contrast the physiological functions at end organs by activation of the ANS.
51.4 Describe the steps involved in the synthesis, release, and inactivation of acetylcholine/norepinephrine.
51.5 List the locations and effects of adrenergic receptors.
51.6 List the locations and effects of muscarinic and nicotinic receptors along with examples of agonists and antagonists.

52 Autonomic Nervous System II

52.1 See Autonomic Nervous System I above.

53 Cardiac Electrophysiology I

53.1 List the five (5) phases of the action potential of a cardiac contractile (non-nodal) cell and state the primary ion current(s) that influence each phase (review).
53.2 Characterize each phase of the action potential of a cardiac contractile (non-nodal) cell regarding the state of sodium, calcium, and potassium channel gating (review).
53.3 List the key ion channels responsible for each stage of the contractile and non-contractile cardiomyocyte action potential.
53.4 Define and explain the cellular basis for the absolute (effective) and relative refractory periods with respect to the cardiac action potential. Explain the changes in refractory period seen under ischemic conditions.
53.5 Describe the ion channels and support proteins involved in calcium ion influx during diastole and the regulatory mechanisms associated with its removal to the endoplasmic reticulum and the ECF.
53.6 List the phases and the ion currents that determine a nodal pacemaker action potential.
53.7 For an S.A. nodal pacemaker cell, describe the role of the "funny" (If) current and K+ current in determining the slope of the prepotential.
53.8 Describe the effect of a positive and negative chronotropic agent (e.g., acetylcholine) on the slope of the prepotential of an S.A. nodal cell and the mechanism of action for the change in the slope.
53.9 Describe the distribution of autonomic receptors in the heart and explain how an increase in the level of activation/agonism and antagonism (blocking the receptors) affects heart rate and conduction velocity.

54 Cardiac Electrophysiology II

54.1 Describe the sequence of depolarization of the heart (e.g., S.A. node → atrial muscle cells → internodal tracts, etc.).
54.2 Describe the function of the S-A node, A-V node, His bundle, and Purkinje fibers.
54.3 Explain why, under normal circumstances, the S.A. node, rather than the A.V. node paces the heart.
54.4 Explain the role of an ectopic focus as a "fail-safe" mechanism and the reason why ischemia tends to produce an ectopic focus during transient SA arrest.
54.5 Explain the mechanism by which hyperkalemia increases the chance of a fatal dysrhythmia.
54.6 Explain why a calcium channel blocker (rather than a fast sodium channel blocker) would be used to reduce the conduction velocity through the AV node.

55 Bacteria: Other Gram Negative

55.1 Differentiate Neisseria meningitidis and N. gonorrhoeae in terms of diseases they cause, the presence or absence of a significant capsule, and utilization of glucose and maltose
55.2 Compare/contrast LOS and LPS; recall the #1 cause of septic arthritis in a sexually active person, explain how a person can be re-infected with gonorrhea and identify its selective agar as discussed
55.3 Explain why Moraxella can be confused with Neisseria and how it can be differentiated from Neisseria
55.4 identify the 3 leading Moraxella-related illnesses
55.5 Assess Chlamydia
55.6 Describe how the cell wall differs from other Gram-negative organisms
55.7 List the illnesses caused by serotypes A-C; D-K; and L1-L3
55.8 Differentiate elementary bodies from reticulate bodies and identify which is visualized using a Giemsa stain
55.9 Identify the #1 cause of reactive arthritis (Reiter's Syndrome) and its classical triad of symptoms
55.10 Differentiate the chancre and degree of lymphadenopathy caused by syphilis, lymphogranuloma and that caused by H. ducreyi
55.11 Assess Haemophilus influenzae B (HiB)
55.12 Recall the growth factors required by Haemophilus influenzae B (HiB)
55.13 Describe the general presentation of epiglottitis and identify its cause
55.14 Identify the components of the Hib vaccine and explain why the Hib vaccine doesn't protect against Hib-induced otitis media
55.15 Describe the classical presentation of Legionnaire's disease, how it is transmitted and the preferred stain and growth media for Legionella
55.16 Identify the organism that causes whooping cough and describe its classical presentation

56 Electrocardiogram (EKG) I

56.1 Diagram and recognize an isoelectric line, a P-wave, a P-R interval, a P-R segment, a QRS complex, the components of the QRS complex, an S-T segment, a T-wave, a U-wave.
56.2 Identify the physiological correlates of a P-wave, P-R segment and interval, QRS complex and a T-wave. (e.g., The P-wave represents atrial depolarization.
56.3 List normal time intervals for P-wave, P-R segment, QRS complex, QT segment and be able to determine intervals from a sample EKG recording.
56.4 Determine heart rate (HR) from a sample EKG recording.
56.5 Describe the unipolar and bipolar limb leads (e.g., What lead records the ECG in the frontal plane along a line that bisects the angle made by Lead I and Lead III?)
56.6 Predict whether a P-wave and QRS complex will be positive or negative in limb leads based on the average vectors of atrial and ventricular depolarization.
56.7 Describe the ECG hexaxial reference system in the frontal plane.
56.8 Describe the causes and significance of normal R-wave transition in the pericardial leads.
56.9 Describe, using a diagram, what is meant by the following terms: normal axis, right axis deviation, left axis deviation.
56.10 From a given electrocardiogram, determine the approximate mean electrical axis in the frontal plane using two different methods (quadrant and iso- electric/equiphasic approaches).

57 EKG II

57.1 See EKG I.

58 EKG III

58.1 See EKG I.

59 Bacteria: Gram Positive Bacilli I

59.1 Compare and contrast actinomyces and nocardia in terms of common sites of infection, cell structure, oxygen status, acid-fastness and the presence or absence of sulfur granules
59.2 Recall the foods associated with listeriosis, explain why infection during pregnancy is of significant concern
59.3 Discuss the role of listeria related meningitis
59.4 Identify the bacterial agents and symptoms associated with Anthrax, Reheated Rice Syndrome, Diphtheria, Botulism, Tetanus, Gas gangrene, Pseudomembranous colitis
59.5 Recall which B. anthracis plasmid (pXO1 or pXO2) encodes for the capsule and virulence factors; state the function of the virulence factors, and identify the unique characteristic of its capsule
59.6 Differentiate the mechanisms of action and disease presentation of tetanus toxin and botulinum toxin

60 Bacteria: Gram Positive Bacilli II

60.1 See previous lesson objectives

61 Cardiac Cycle I

61.1 List the seven (7) periods of the cardiac cycle.
61.2 Characterize each period of the cardiac cycle as to whether the ventricles and atria are in diastole or systole.
61.3 Characterize each period of the cardiac cycle as to whether the A-V valves and the semilunar valves are open or closed.
61.4 Describe the relationship of the electrical activity of the heart (as recorded in the ECG) to the mechanical events of contraction and relaxation of the atria and ventricles.
61.5 Describe the pressure changes that could be recorded inside of the left ventricle and inside the aorta during the seven (7) periods of the cardiac cycle.
61.6 Describe the volume changes that occur in the left ventricle during the seven (7) periods of the cardiac cycle.
61.7 Calculate the stroke volume from the left ventricular end diastolic volume (LVEDV) and left ventricular end systolic volume (LVESV).
61.8 Diagram the relationship between left ventricular pressure and volume throughout a cardiac cycle (pressure volume loop).
61.9 Describe the distribution of autonomic receptors in the heart and explain how an increase in the level of activation/agonism and antagonism (blocking the receptors) affects heart rate, contractility and conduction velocity.

62 Cardiac Cycle II

62.1 Describe when in the cardiac cycle the first (S1), second (S2), third (S3), and fourth (S4) heart sounds are produced.
62.2 Explain how a murmur can be classified as systolic or diastolic by its timing in relation to S1 and S2.
62.3 Explain the mechanisms involved in the normal physiological, and pathological, splitting of the second heart sound.
62.4 Describe the mechanisms associated with accentuation an attenuation of heart sounds in various pathological conditions.
62.5 Explain why, from a physiologic perspective, asking patients to change their respiratory patterns can be helpful in diagnosing heart sounds.
62.6 Explain why left bundle branch block (LBBB) and severe hypertension may result in paradoxical splitting (reverse splitting) of S2.

63 Bacteria: Spirochetes

63.1 Of the 3 genera of spirochetes discussed in class, recall which can be visualized with Giemsa or Gram's stain
63.2 identify the spirochete that can only be visualized with dark field microscopy
63.3 Identify the vector for Lyme disease and how much time is needed to cause infection
63.4 Name and recognize the classical rash associated with Lyme disease
63.5 Predict the most likely type of cardiac event that can occur in secondary Lyme disease
63.6 Differentiate endemic and epidemic relapsing fever in terms of the organisms that cause each, which occurs in the US, and the mode of transmission
63.7 Explain why the fever is relapsing
63.8 Explain how leptospirosis is transmitted
63.9 Describe a classical case and explain the significance of conjunctival suffusion
63.10 Explain the significance of Weil's disease
63.11 Identify the 3 stages of untreated syphilis and the significance of chancres, a palmer rash, gummas, and Argyll-Robertson (AR) pupils
63.12 Differentiate between RPR/VDRL and FTA-ABS tests in terms of which is most sensitive and specific for syphilis
63.13 Explain why a Jarish-Herxheimer reaction occurs, when it is most often observed, and how it is treated

64 Cardiac Output

64.1 Explain how the Frank-Starling Mechanism (1) matches cardiac output to venous return, (2) matches the cardiac output of the right heart to the cardiac output of the left heart and (3) compensates for slight variations in heart rate under resting conditions.
64.2 Describe the three mechanisms involved in increasing the cardiac contractility in response to increased stretching (preload).
64.3 Explain why there are numerous Frank-Starling curves (Sarnoff Curves) depending on the level of sympathetic or parasympathetic stimulation.
64.4 Explain "inotropy" and what is meant by "negative inotropic" and "positive inotropic" and give two examples of positive inotropic agents.
64.5 List and define the determinants of cardiac output (stroke volume, end diastolic volume, end systolic volume, heart rate), explaining how preload, afterload and contractility affect these determinants at rest and during exercise.
64.6 Calculate cardiac output given determinant values.
64.7 Describe the autonomic nervous system influence (sympathetic and parasympathetic) on heart rate, contractility of cardiac muscle, membrane permeability to calcium, and glycogenolysis, and which neurotransmitters and receptors mediate these effects.
64.8 Describe changes in the cardiac (pressure-volume) loop secondary to normal physiological or pathological variations in preload, inotropy and afterload.
64.9 Relate mean systemic filling pressure (Psf) to venous return and cardiac output and explain these relationships under increased sympathetic stimulation or increased blood volume versus low blood volume or hemorrhage.
64.10 Describe the relationship between venous return, mean systemic filling pressure and right atrial pressure.

64.11 Explain the relationship between heart rate and filling time and what is meant by the "point of diminishing return" on cardiac output.

65 Cardiac Output II

65.1 See above

66 Blood Pressure Regulation

66.1 Diagram and label the aortic pressure pulse. Be able to identify the 1) dicrotic notch, 2) diastolic runoff, 3) systolic pressure, 4) diastolic pressure, and 5) the pulse pressure.

66.2 Be able to calculate estimated mean pressure given systolic and diastolic pressures.

66.3 Be able to define compliance and explain how compliance differs between arteries and veins and among levels of the arterial vascular tree.

66.4 Define the mechanisms which lead to systolic hypertension in older individuals.

66.5 Define pulse pressure and predict the way in which pulse pressure would change in response to changing stroke volume, compliance and sympathetic tone.

66.6 List the medullary centers (central integration centers) in sympathetic and parasympathetic reflex pathways and explain their role in controlling blood pressure and cardiovascular function.

66.7 Define which branches of the autonomic nervous system innervate the blood vessels, heart, kidney and adrenal medulla and identify corresponding neurotransmitters and autonomic receptors.

66.8 Be able to describe the reflex response to increasing or decreasing arterial blood pressure on the baroreceptor afferent, central integration, efferent and effector organ responses.

66.9 Compare the mechanisms involved in the short-term and long- term regulation of blood pressure.

67 Arteries & Veins

67.1 TBD

68 Bacteria: Zoonotic I

68.1 Review malaria and babesia in terms of their vectors, why they are often confused, and which is most likely to be encountered in the US today

68.2 Differentiate Ehrlichia and Anaplasma in terms of the wbc type that contains the morula of each

68.3 Recall which is transmitted by the same vector as that of Babesiosis and Lyme disease

68.4 Match the organism, disease name, and animal vector responsible for Bartonellosis, Brucellosis, Psittacosis, Q Fever, Tularemia, Pasteurellosis

68.4.1 Describe the typical exposure and presentation of a patient

68.5 Match the pathogens, vector, and illness name for the three rickettsia's discussed in class

68.6 list the triad of symptoms caused by rocky mountain spotted fever

68.7 Identify the cause of bubonic plague and its vector; assess attributes of Y. pestis virulence

68.7.1 Describe a Bubo

69 Bacteria: Zoonotic II

69.1 See previous lecture objectives

70 Coronary Circulation

70.1 Describe the changes in coronary blood flow throughout phases of the cardiac cycle.

70.2 Explain why coronary perfusion of the left ventricular myocardium is low during systolic periods and higher during diastolic periods.

70.3 Describe the effect of cardiac dilation on ventricular wall tension and myocardial perfusion.

70.4 Describe the various intrinsic chemical regulators of coronary blood flow (cardiac perfusion).

70.5 List the variables that influence coronary blood flow (CBF) and explain how changing these variables will alter CBF.

70.6 Describe the effects of increased heart rate on myocardial perfusion.

70.7 Describe the location of the most frequent myocardial infarctions and correlate the location with coronary perfusion.

70.8 Explain how ischemia results in destabilization of the cardiac electrical potential and water balance across the cardiomyocyte membranes.

70.9 Describe the effect of aortic regurgitation on myocardial perfusion, systolic pressure and diastolic pressure.

71 Hemodynamics and Capillary Circulation

71.1 Characterize and compare laminar blood flow and turbulent blood flow.

71.2 Using Poiseuille's Law, describe what factors influence blood flow and the effect of changing these variables has on blood flow.
71.3 Describe & understand the Law of LaPlace as applied vascular & heart chamber wall tension, pressure and radius.
71.4 Describe the approximate distribution of the volume of blood in each of the primary types of blood vessels and how this distribution changes with exercise, parasympathetic and sympathetic drive.
71.5 Describe the relationship between flow, velocity of flow, and surface area throughout the vascular system.
71.6 Explain why pressure and resistance in the pulmonary circulation is much lower than the systemic circulation.
71.7 List three factors which are important in controlling the opening and closing of precapillary sphincters, and the tissue bed where each factor is most effective.
71.8 Explain the primary mechanisms whereby blood flow increases to active skeletal muscle during exercise and how this is more advantageous than to force more blood through the same number of capillaries.
71.9 Explain how changes in hydrostatic & oncotic pressures favor filtration or absorption.

72 Clotting and Disruption of Blood Flow I

72.1 Explain the process and signaling involved in platelet aggregation.
72.2 Describe bleeding pathologies associated with abnormal platelet counts.
72.3 Describe the role of NO and prostacyclin in limiting the blood clot formation over healthy epithelium.
72.4 Explain the role of integrins and collagen in platelet activation and aggregation.
72.5 Discuss the vascular, cellular and humoral events involved in blood clotting, and provide examples of genetic or acquired factors that can lead to either excess clotting or bleeding.
72.6 Compare and contrast thrombosis in situ and thromboembolism with respect to sites of involvement, risk factors, and attendant pathologic and clinical consequences.
72.7 Compare and contrast the etiology and clinical consequences of different types of embolism.

73 Clotting and Disruption of Blood Flow II

73.1 Define and differentiate the intrinsic, extrinsic, and final common pathway for clotting.
73.2 Describe the importance of various clotting factors and underlying problems in the clotting cascade in the clotting disorders discussed (hemophilia, Vit K deficiency).
73.3 Explain how NSAIDs, Heparin, Xarelto, and Warfarin (Coumadin) work to cause anticoagulation.
73.4 Describe the mechanisms of clot retraction and fibrinolysis by tissue plasminogen activator (TPA).
73.5 Explain the hepatic role in hemostasis and why patients with extensive hepatic cirrhosis are often presented with abnormal bleeding tendencies.
73.6 Define prothrombin time, international normalized ratio (INR) and activated partial thromboplastin time and explain abnormal values in bleeding disorders.
73.7 Explain the role of chemo-attractants, mitogens and growth factors in wound retraction and tissue healing.

74 Bacteria: Mycobacteria

74.1 Recall the lipid substance unique to mycobacteria that confers "acid-fastness" and interpret an acid-fast smear
74.2 Explain how M. tb can overcome phagocytosis
74.3 Differentiate primary and secondary tuberculosis in terms of localization and the significance of a Ghon complex
74.4 Differentiate the TB skin test, IFN-gamma Release Assay, and QuantiFERON gold tests in terms of how each is performed and interpreted and if vaccination with BCG may cause a false positive TB test
74.5 Identify the hypersensitivity reaction associated with tuberculosis and recognize the two key cells involved in formation of a granuloma and/or a positive TB skin test
74.6 Identify the two mycobacteria discussed in class that form Mycobacterium avium complex (MAC), recall the CD4 threshold that puts someone with HIV at risk of MAC infection and explain why MAC is seldomly confused with TB
74.7 Assess Leprosy
74.8 Explain why culture is not used to diagnose leprosy

74.9 Differentiate lepromatous and tuberculoid leprosy in terms of severity of disease and the presence or absence of granulomas
74.10 Identify an animal reservoir for leprosy

75 Hemodynamics and Shock

75.1 Demonstrate a basic understanding of edema, congestion and shock as well as a basic understanding of the coagulation cascade to understand the pathogenesis of thromboembolic disorders.
75.2 List three conditions which may lead to edema, including examples of how edema can be produced as a result of changes in hydrostatic pressure or plasma oncotic pressure.
75.3 Explain the clinical, morphological, and physiological significance of hyperemia, congestion and hemorrhage.
75.4 Classify different types of shock according to etiology and compare and contrast the pathogenesis of these different types.

76 Genetic Disorders of the Cardiovascular System

76.1 Understand the association between a change in genotype and the resulting change in phenotype associated with the following (as well as any others mentioned during lecture): Inherited Cardiovascular Connective Tissue Disease (i.e., Marfan Syndrome, Vascular Ehlers Danlos Syndrome). Arrhythmogenic Right Ventricular Cardiomyopathy Brugada syndrome.
76.2 Know the frequency of the above-mentioned diseases/disorders among the general populations, as well as any specific populations in which it is particularly prevalent.

77 Histology of the Respiratory System

77.1 Compare the microscopic structure and functional characteristics of the conducting (e.g., larynx) and respiratory (respiratory bronchiole) portions of the respiratory system from the nasal cavity to alveoli, including cells (e.g., basal cells in the mucosa and Clara cells in terminal bronchioles) and layers (e.g., lamina propria).
77.2 Summarize the flow of air from the nasal cavity to the blood- air-barrier.
77.3 Describe the cellular makeup of the olfactory mucosa, including the appearance and function of Bowman's glands.
77.4 Draw a typical alveolus being certain to include alveolar type I and type II cells, dust cells (alveolar macrophages), capillary beds and alveolar pores, and summarize their relative abundance and basic functions in health and disease (e.g., respiratory distress syndrome).
77.5 Explain the functional significance of alveolar pores.
77.6 Distinguish the visceral and parietal pleura and their role in pleurisy and mesothelioma.
77.7 Evaluate the changes in respiratory epithelium of smokers.
77.8 Integrate what happens to the microanatomy of the respiratory system in patients with asthma.
77.9 Solve what happens microscopically with cystic fibrosis patients.
77.10 Determine what happens at the alveolar level with emphysema patients.

78 Respiratory Development

78.1 Discuss the development of the respiratory tree.
78.2 Characterize the partitioning of the coelom.
78.3 Summarize the formation of the diaphragm.

79 Lung Volumes

79.1 Describe how differences in pressure between the atmosphere and alveoli cause air to move in and out of the lungs.
79.2 Diagram how pleural pressure, alveolar pressure, airflow, and lung volume change during a normal quiet breathing cycle.
79.3 Define lung compliance and identify two common clinical conditions in which lung compliance is higher or lower than normal.
79.4 Describe the impact of negative intrapleural pressure on regional lung compliance.
79.5 Describe transmural pressures; and describe the equations that quantitatively assess transpulmonary and trans-airway pressures.
79.6 Draw a normal spirogram, labeling the four lung volumes and four capacities. Identify which volume and capacities cannot be measured by spirometry.
79.7 Describe the use of helium dilution and nitrogen washout as indirect assessment of the pulmonary residual volume.

79.8 Explain the cause and significance of the hysteresis in the compliance curves.
79.9 Describe, and explain the causes of the physiological regional variation of lung compliance and the effect of such differences on the regional ventilation of the lungs during various breathing patterns.
79.10 Draw the pressure-volume (compliance) curves for the lungs, chest wall, and respiratory system on the same set of axes. Show and explain the significance of the resting positions for each of these three structures.

80 Introduction to Fungi and Viruses

80.1 Differentiate fungi and bacteria in terms of the primary composition of their cell wall; eukaryote vs prokaryote; ribosome type; and the presence or absence of ergosterol in the cell membrane
80.2 Describe a yeast, mold, and dimorphic fungi; recall the fungal cell membrane component targeted by most antifungal drugs; explain how polyene antimycotics act and why they have significant toxicity
80.3 Define a primary fungal pathogen and list the four primary fungal pathogens discussed in class
80.4 Recall the #1 opportunistic fungi, the two fungi-like bacteria, and identify which one is partially acid-fast & confused with TB
80.5 Recall the types of viral nucleic acids, citing which type is most common; match the dsDNA viruses discussed in class with the select infections they cause
80.6 Determine if a viral infection is dermotropic, pneumotropic, neurotropic, or viscerotropic.
80.7 Describe viral replication in terms of latent and lytic cycles
80.8 Match the tumorigenic viruses discussed in class with the cancers they may cause

81 Viruses: DNA Viruses I

81.1 Recall the DNA families of viruses, identify the one that is single-stranded DNA, which one replicates in the cytoplasm, & which one utilizes reverse transcriptase
81.2 List the herpes virus family members
81.3 Differentiate a child's presentation of parvovirus from the presentation of parvovirus in an adult
81.4 Explain the mechanism of aplastic anemia, why fetuses and sickle cell patients are at high risk, and the risks of infection during pregnancy
81.5 Explain the role of reverse transcriptase in HBV infections
81.6 Identify the only HBV antibody that clears/neutralizes and the antibody that proves infection has occurred
81.7 Recognize the key illnesses caused by each of the herpes viruses
81.8 Differentiate HSV1 and HSV2 in terms of presentation and latency
81.9 Differentiate the inclusion bodies observed in HSV/VZV and CMV
81.10 Recognize the difference in presentation of herpes labialis lesions vs gingivostomatitis
81.11 Describe HSV keratitis, recognize the cause of herpes whitlow, and explain how herpes encephalitis differs from most other viral meningitis presentations
81.12 Describe the difference between VZV vesicles and smallpox lesions; differentiate the presentation of VZV in a child and an adult
81.13 Describe the normal presentation of mononucleosis
81.14 explain the significance of heterophile antibodies
81.15 recognize the hallmark lymphocyte type and description
81.16 explain the significance of an amoxicillin rash
81.17 identify the syphilis test that is likely falsely impacted by an infection with mononucleosis
81.18 list the lymphomas associated with mononucleosis in patients not infected with HIV
81.19 Identify the illness that looks like mononucleosis but has a negative monospot test
81.20 Differentiate fetal/neonatal CMV and rubella infections
81.21 Compare and contrast the typical presentation of HHV-6 and HHV-8
81.22 Describe Kaposi's sarcoma and discuss the role of HIV
81.23 Identify the most common cause of infectious conjunctivitis and recognize its potential role in GI complaints and hematuria in children
81.24 Recognize the significance of koilocytes observed on a Pap smear
81.25 Explain the significance of HPV genes EP6 and EP7 and the purpose of the original Gardisil containing antigens of HPV 6, 11, 16, and 18
81.26 Recall where variola viruses replicate

82 Viruses: DNA Viruses II

82.1 See previous lesson objectives

83 Mechanics of Ventilation I

83.1 Define the various factors that determine total lung capacity, functional residual capacity, and residual volume. Describe the mechanisms responsible for the changes in those volumes that occur in patients with emphysema and pulmonary fibrosis.

83.2 Define surface tension and describe how it applies to lung mechanics, including the effects of alveolar size and the role of surfactants (Law of LaPlace). Define atelectasis and the role of surfactants in preventing it.

83.3 Describe the principal components of pulmonary surfactant and explain the roles of each.

83.4 Based on Hagen-Poiseuille equation, describe the effects of airway diameter and turbulent flow on airway resistance.

83.5 Draw a spirogram resulting from a maximal expiratory effort.

83.6 Label the forced vital capacity (FVC), timed forced expiratory volumes (FEVs), and the maximal expiratory flow rate between 25-75% of FVC (FEF 25-75%).

83.7 Draw a normal maximal effort flow-volume curve, labeling the effort-dependent and -independent regions.

83.8 Use the concept of dynamic compression of airways to explain why each point in the effort-independent region of the curve represents a maximal flow rate that is uniquely dependent on lung volume and how that is altered in COPD.

83.9 Describe how and why the shape of the expiratory and inspiratory flow-volume curves (respiratory loop) is shifted in chronic obstructive lung disease (COPD) and can result in air trapping.

83.10 Differentiate between the two broad categories of restrictive and obstructive lung disease, including the spirometric abnormalities associated with each category.

84 Mechanics of Ventilation II

84.1 Describe the regional inequality in alveolar ventilation in healthy and diseased lungs and explain the basis for these differences.

84.2 Define and contrast the following terms: anatomic dead space, physiologic dead space, wasted (dead space) ventilation, total minute ventilation and alveolar minute ventilation.

84.3 Explain the role of venous admixture shunts in impacting the quality of the pulmonary vein blood gases.

84.4 Describe the concept by which physiological dead space can be measured.

84.5 Describe in quantitative terms how physiological dead space can be assessed using arterial values of CO2.

84.6 Define and contrast the relationships between alveolar ventilation and the arterial PCO2 and PO2.

84.7 Describe in quantitative terms the effect of ventilation on PaCO2 according to the alveolar ventilation equation.

84.8 Be able to estimate the alveolar oxygen partial pressure (PAO2) using the simplified form of the alveolar gas equation. Be able to use the equation to calculate the amount of supplemental O2 required to overcome a reduction in PAO2 caused by hypoventilation or high altitude.

84.9 Define the following terms: hypoventilation, hyperventilation, hypercapnia, eupnea, hypopnea, and hyperpnea.

85 Viruses: Positive-Sense RNA Viruses I

85.1 Compare/contrast West Nile virus, Eastern Equine Encephalitis virus and Western Equine Encephalitis virus in terms of how they are transmitted, the illnesses they cause, and the family of viruses to which they belong

85.2 List the flaviviruses and togaviruses discussed in class

85.3 Identify the flavivirus that is not transmitted by a mosquito

85.4 Assess the risk of Zika to a fetus

85.5 Recall the number of dengue virus strains and explain how a second dengue infection differs from a primary infection

85.6 Recall the most common cause of diarrhea in infants and children vs the most common cause of gastroenteritis in adults

85.7 List the enteroviruses and recall which one is not spread via the fecal oral route

85.8 Recall the family of viruses to which Hepatitis A belongs

85.9 Identify the two most common causes of the common cold
85.10 List the 2 virus families that cause 90% of the cases of aseptic meningitis
85.11 Describe the classical presentation of hand-foot-mouth disease
85.12 Explain why the Salk vaccine is preferred over the Sabin vaccine
85.13 List the classic triad of symptoms observed in rubella and explain why it is a paradoxical illness during pregnancy
85.14 Identify the presentation clues that help determine if deafness in a newborn is due to CMV or rubella
85.15 Describe the role of reverse transcriptase and identify the DNA and RNA viruses it is associated with

86 Viruses: Positive Sens RNA Viruses II

86.1 See previous lesson objectives

87 Viruses: Negative-Sense RNA Viruses

87.1 Name the negative sense RNA virus families and explain the function of RNA-dependent RNA polymerase
87.2 Identify the lethal viruses discussed in class, recognize where in the world they are encountered, how they are transmitted, and explain how they kill
87.3 List the orthomyxoviridae and paramyxoviridae viruses discussed in class
87.4 Recall the primary cause of croup
87.5 List the key symptoms of mumps and measles
87.6 Describe how the measles rash appears and disappears
87.7 Identify the virus family that contains Ebola, recognize its characteristic shape as seen using electron microscopy, and describe its normal presentation
87.8 Describe the rabies virus; recognize how it is transmitted, state how it is treated, and the time limit to start therapy

88 Gas Exchange I

88.1 State Dalton's Law of Partial Pressure and be able to calculate this variable for any gas given the pressure and % concentration.
88.2 Explain the influence of water vapor on partial pressures of other gasses in a mixture.
88.3 State Henry's Law and its importance in determining the rate of diffusion of gasses through tissues and fluids.
88.4 State Fick's law of gas diffusion and how the diffusion constant plays a role in the difference between diffused CO2 and O2 across the respiratory membrane.
88.5 Explain why at equilibrium of diffusion of gasses from air to fluid the partial pressures are equivalent while the chemical concentrations are not. Further explain why these values differ for oxygen, N2O, CO and CO2.
88.6 Describe what accounts for the difference in partial pressures and percentages of gas between atmospheric air, alveolar air and expired air.
88.7 Explain why it is physiologically important that the alveolar partial pressures change slowly over time in response to alveolar ventilation.
88.8 Describe how diffusing capacity for CO test is impacted in various physiological and pathological condition.
88.9 List the 4 primary variables that affect diffusion at the respiratory membrane and state the most common ways these are altered in physiologic and pathologic states.
88.10 Explain why the arterial PO2 is always lower than the alveolar PO2 while it is not the case for PCO2.

89 Gas Exchange II

89.1 See above.

90 COVID 19 and other emerging pathogens

90.1 TBD

91 Gas Transport

91.1 Define oxygen partial pressure (tension), oxygen content, and percent hemoglobin saturation as they pertain to blood; and compare the relative amounts of O2 carried bound to hemoglobin with the dissolved form.
91.2 Draw an oxyhemoglobin dissociation curve (hemoglobin oxygen equilibrium curve) showing the relationships between oxygen partial pressure, hemoglobin saturation, and blood oxygen content. On the same axes, draw the relationship between PO2 and dissolved plasma O2 content (Henry's Law).

91.3 State the Haldane and Bohr Effects and their importance in promoting oxygen delivery and CO2 release.
91.4 Show how the oxyhemoglobin dissociation curve is affected by changes in blood temperature, pH, PCO2, and 2,3-DPG, and describe a situation where such changes have important physiological consequences.
91.5 Describe how anemia and carbon monoxide poisoning affect the shape of the oxyhemoglobin dissociation curve, PaO2, and SaO2.
91.6 List the forms in which carbon dioxide is carried in the blood. Identify the percentage of total CO2 transported as each form.
91.7 Identify the enzyme that is essential to normal carbon dioxide transport by the blood and the importance of the chloride shift in this process.
91.8 Draw the carbon dioxide dissociation curves for oxy- and deoxyhemoglobin. Describe the interplay between CO2 and O2 binding on hemoglobin that causes the Haldane effect.
91.9 Define respiratory acidosis and alkalosis and describe the mechanism and function of respiratory acid base compensations.
91.10 Describe the RBCs role in the generation of plasma HCO-3 and the importance of the chloride (Hamburger) shift in supporting the function of the reticulocytes' carbonic anhydrase.

92 Neuroregulation of Ventilation

92.1 Identify the regions in the central nervous system that play important roles in the generation and control of cyclic breathing.
92.2 Draw a wiring diagram of the control of ventilation that includes peripheral and central input, higher brain centers, brainstem control and output to ventilatory muscles.
92.3 List and define the relationship between the primary respiratory centers in the brainstem (dorsal, ventral, pneumotaxic) and their control on ventilation.
92.4 State the purpose of the Hering-Breuer reflex.
92.5 Define J receptors in the lung and discuss their impact on respiration in heart failure patients.
92.6 Give three examples of reflexes involving pulmonary receptors that influence breathing frequency and tidal volume. Describe the receptors and neural pathways involved.
92.7 List the anatomical locations of chemoreceptors sensitive to changes in arterial PO2, PCO2, and pH that participate in the control of ventilation. Identify the relative importance of each in sensing alterations in blood gases.
92.8 Describe how changes in arterial PO2 and PCO2 alter alveolar ventilation, including the synergistic effects when both PO2 and PCO2 change.
92.9 Describe the physiological changes in respiratory drives during sleep, and is a patient is taking opioids or barbiturates.

93 Fungi I: Primary Fungal Pathogens

93.1 List the four true primary fungal pathogens discussed in class and recognize which one is not endemic to the US
93.2 Assess histoplasmosis and blastomycosis in terms of their geographical locations, which is a threat to spelunkers, which can cause pancytopenia, which most closely mimics TB, and which mimics bacterial pneumonia
93.3 Identify where coccidioidomycosis is endemic and explain why it is an atypical dimorphic fungus
93.4 Match the six tineas discussed in class with their common name and site of infection
93.5 Identify the three types of fungi responsible for most tineas
93.6 explain why Malassazia furfur is not a true dermatophyte; describe the skin lesions it causes and its unique microscopic appearance
93.7 Recall the cause and typical presentation of "Rose gardener's disease
93.8 Match the following descriptors with their associated fungi: spherules/endospores; Pilot's Wheel/Mickey Mouse; Spaghetti and Meat Balls; Broad-based budding yeast; Fungus ball; Erythema nodosum

94 Fungi II: Opportunistic Fungal Pathogens

94.1 Assess Candida
94.2 Explain the significance of germ tube formation in Candida albicans
94.3 Recall the various names for the superficial candida infections
94.4 Recognize the precipitating factors for infection

94.5 Describe the three most common forms of candidiasis
94.6 Assess Aspergillus
94.7 Recall the four diseases caused by Aspergillus
94.8 Describe an Aspergilloma and identify the organism that most often produces the cavity in which it grows
94.9 Describe the mechanism of Allergic Bronchopulmonary Aspergillosis (ABPA) and two common comorbidities
94.10 Identify the source of aflatoxin and the cancer it causes
94.11 Assess Cryptococcus
94.12 Describe the appearance of Cryptococcus neoformans when stained with India Ink, note its animal reservoir, and identify the predisposing health condition most often associated with cryptococcosis
94.13 Recall the two primary causes of mucormycosis, the relationship of this organism to diabetes, and its classical presentation
94.14 Differentiate the microscopic appearance of the fungi that cause aspergillosis vs those that cause mucormycosis
94.15 Identify the classical illness associated with Pneumocystis jiroveci (carinii) pneumonia/PCP and its appearance using a silver stain

95 Pulmonary Circulation I

95.1 Contrast the systemic and pulmonary circulations with respect to pressures, resistance to blood flow, and response to hypoxia.
95.2 Describe the regional differences in pulmonary blood flow in an upright person. Define the theoretical zones I, II, and III in the lung, with respect to pulmonary vascular pressure and alveolar pressure.
95.3 Describe pathological conditions that would render a lung segment to closely resemble zone 1 (dead space) or zone 3 (shunt).
95.4 Describe how pulmonary vascular resistance changes with alterations in cardiac output or pulmonary arterial pressure. Explain in terms of distention and recruitment of pulmonary vessels. Identify the zones in which these two mechanisms apply.
95.5 Describe how pulmonary vascular resistance changes with lung volume and explain the mechanism(s).
95.6 Explain the importance of ventilation perfusion coupling in the lungs.
95.7 Describe the consequence of hypoxic pulmonary vasoconstriction on the distribution of pulmonary blood flow.
95.8 Explain the development of pulmonary edema by a) increased hydrostatic pressure, b) increased permeability, c) impaired lymphatic outflow, d) increased central venous pressure and e) hemodilution.
95.9 Describe the major physiological functions of the bronchial circulation.
95.10 Explain why mechanical ventilation can increase areas of the pulmonary circulation that are underperfused.

96 Pulmonary Circulation II

96.1 See above.

97 Parasites I: Protozoa

97.1 Recall the general characteristics of phylum Protista and differentiate cysts and trophozoites in terms of motility, metabolic activity, and ability to reproduce
97.2 Differentiate the symptoms of diarrheal illness caused by Entamoeba histolytica, Giardia lamblia, and Cryptosporidium parvum
97.3 Recall which protozoa are diagnosed using a blood or bone marrow smear
97.4 Interpret a modified acid-fast stain of a fecal ova and parasite exam to differentiate Giardia, Cryptosporidium and Cyclospora
97.5 Differentiate babesiosis, leishmaniasis, and malaria in terms of vectors and symptoms; explain why Plasmodium falciparum is a medical emergency and why its fever cycle is unpredictable
97.6 Recall the significance of a “banana-shaped gametocyte”
97.7 Recall the protozoa that is commonly confused with malaria
97.8 Explain how a person is infected with Naegleria and why it can be lethal
97.9 Compare and contrast African vs South American trypanosomiasis in terms of the organism's name, geography, vector, and common presentations

97.10 Identify the toxoplasmosis definitive host and discuss the risks toxoplasmosis poses to a developing fetus

98 Parasites II: Helminths

98.1 Recall the helminths that enter via the skin and those that make their way to the lungs
98.2 Explain why Taenia solium is worse than T. saginata
98.3 Differentiate taeniasis vs cysticercosis
98.4 Name a fluke that causes gallbladder cancer and one that causes bladder cancer
98.5 Explain how Diphyllobothrium latum can cause macrocytic anemia
98.6 Identify the organism(s) that cause lymphatic filariasis
98.7 Differentiate Loa loa and Onchocerca volvulus in terms of their respective vectors, clinical presentation, and likelihood of causing vision loss
98.8 Describe the treatment for Dracunculus medininsis

99 Respiratory Integration I

99.1 Describe the respiratory drive in a COPD patient and predict the change in respiratory drive when oxygen is given to a COPD patient.
99.2 Describe the mechanisms for the shift in alveolar ventilation that occur immediately upon ascent to high altitude, after remaining at altitude for two weeks, and immediately upon return to sea level.
99.3 Describe the mechanisms for ventilator changes in acclimatization to high altitude.
99.4 Explain why acetazolamide can help tolerating some of the consequences of climbing to higher altitude.
99.5 Describe changes in respiration during pregnancy.
99.6 Describe the physiological basis of shallow water blackout during a breath-hold dive.

100 Respiratory Integration II

100.1 Describe the significance of the feedforward control of ventilation (central command) during exercise, and the effects of exercise on arterial and mixed venous PCO2, PO2, and pH.
100.2 State what factors are the primary controllers of ventilation during exercise, including the primary stimulus for the ventilatory threshold.
100.3 Describe the effects of heavy exercise on alveolar PO2, PCO2, mixed venous PCO2 and alveolar ventilation.
100.4 Describe the PCO2 ventilation relationship during exercise.
100.5 Explain how cardiorespiratory integration occurs at rest and how this changes during exercise. Include an explanation of neural and humoral factors that control the heart rate, ventilatory and blood pressure response to exercise.
100.6 Describe the implications of increasing pulmonary resistance on the cardiovascular system.
100.7 Describe the pulmonary role in the development of acute right sided heart failure.

101 Genetic Disorders of the Respiratory System

101.1 Understand the association between a change in genotype and the resulting change in phenotype associated with the following (as well as any others mentioned during lecture): Cystic Fibrosis Alpha-1-antitrypsin deficiency Small Cell Lung Carcinoma.
101.2 Know the frequency of the above-mentioned diseases/disorders among the general populations, as well as any specific populations in which it is particularly prevalent.

102 Microbiology Lab Diagnostics: Introduction

102.1 Apply your knowledge of the clinical laboratory to address the following:
102.2 Name the most common test performed in hematology
102.3 Name two chemistry tests used to check kidney function
102.4 Differentiate true liver function tests (LFTs) from liver damage tests
102.5 Identify the liver enzymes found most abundantly in hepatocytes
102.6 Explain the significance of a primary elevation in AST and ALT vs ALP and GG
102.7 Explain the utility of the CBC
102.8 Identify a normal WBC breakdown and assess dysfunction associated with abnormal values
102.9 Identify which antibody type (IgG or IgM) indicates a past (convalescent) infection
102.10 explain the significance of IgM, or a ≥ 4-fold change in IgG titer
102.11 Interpret a urinalysis to r/o a urinary tract infection

103 Pulmonary Physiology

104 Pulmonary Physiology

105 Renal System Histology I

105.1 Draw the macroscopic anatomy of the kidney in longitudinal section, labeling the cortex, medulla, renal columns, renal pyramids, major and minor calyxes, and renal pelvis.

105.2 Diagram a renal corpuscle, including Bowman's capsule (parietal and visceral layers), urinary space, glomerulus, efferent and afferent arterioles, podocytes, and mesangial cells.

105.3 Describe the structure and relationship between glomerular capillaries, podocytes and the visceral layer of Bowman's capsule, including the histology of the glomerular basement membrane and why it is often referred to as a "tri-laminar" basement membrane.

105.4 Distinguish the microscopic structure and function of nephron parts, including the PCT, loop of Henle, DCT, collecting tubule, efferent and afferent arterioles, peritubular capillaries, and vas recta.

105.5 Evaluate the structure and function of the juxtaglomerular apparatus (JGA), labeling the DCT, afferent arteriole, macula densa, JG cells, and mesangial cells.

105.6 Compare the histology of a ureter and bladder.

106 Renal System Histology II

106.1 See above.

107 Microbiology Lab Diagnostics: Microscopy

107.1 Explain the necessity of staining microorganisms

107.2 Outline the steps involved in performing a Gram stain and an acid-fast stain; interpret micrographs of each

107.3 Interpret special stains

107.4 Explain the significance of fecal leukocytes

107.5 Describe the utility of a thick smear for identifying parasites

107.6 Describe the utility of using an India Ink stain

107.7 Explain the primary purpose of a Tzanck smear

107.8 Interpret a cervical wet prep (description or image) do determine the presence of trichomonas, yeast, or bacterial vaginosis

107.9 Assess results generated via fluorescent staining techniques

108 Renal System Development

108.1 Identify the location & structures that emerge from the intermediate mesoderm.

108.2 Delineate the development of the mesonephric (Wolffian) duct.

108.3 Describe the formation & differentiation of mesonephric tubules and their linkage with a vascular supply.

108.4 Explain what happens to the mesonephric structures during development.

108.5 Follow the development of the metanephric structures. Explain its relationship to the cloaca.

108.6 Describe the developmental process that produces the permanent collecting system of the kidney. Describe the outgrowth & branching development of the ureteric bud. What structures in the adult kidney were derived from the ureteric bud?

108.7 Describe known events that result in development of the excretory system, including induction of the metanephrogenic blastema and differentiation of the nephron.

108.8 Explain how the excretory system works in the developing fetus prior to birth. What is the importance of the fetal kidneys producing urine?

108.9 Follow the ascent of the kidney as it moves from pelvic to abdominal regions. Explain the shifting vascular supply during this period as well as the shifting orientation of the hilum of the kidney.

108.10 Describe the development of the urogenital sinus. What structures are derived from the different parts?

109 Introduction to Renal Physiology

109.1 TBD

110 Glomerular Filtration and Blood Flow I

110.1 Based on the glomerulus location differentiate between cortical and juxtaglomerular medullary nephrons.

110.2 Describe the glomerular filtration barrier and the role of the endothelial pores, slit diaphragm proteins and the glomerular basement membrane in preventing proteinuria.

110.3 Define the processes of filtration, reabsorption, secretion and excretion.

110.4 Compare and contrast the capillary filtration and starling forces throughout the lengths of the systemic and glomerular capillaries.
110.5 Given whether a substance is filtered, reabsorbed and/or secreted, be able to predict whether it would appear only in the plasma, urine or both.
110.6 Give normal values for GFR and the normal composition of the filtrate. Explain the consequence of unilateral nephrectomy on GFR and how changes in GFR due to glomerular diseases can lead to azotemia.
110.7 Define Filtration Fraction and how it is impacted by changes in glomerular filtration and/or renal blood flow.
110.8 List the primary factors that influence filtration and specifically how they modulate GFR.
110.9 State the equation that defines net filtration pressure and those factors that either favor or oppose filtration.
110.10 Define the mathematical determinants of GFR.

111 Glomerular Filtration and Blood Flow II

111.1 Describe the states that alter and the effect of changes in Kf on GFR. Provide examples of diseases where the Kf is reduced.
111.2 Describe the 3 primary ways to change glomerular hydrostatic pressure.
111.3 Define renal clearance and describe the mathematical calculation of using inulin or creatinine clearance to estimate GFR.
111.4 State the limitations in using serum creatinine levels as the sole indicator for GFR.
111.5 Describe the relative resistances of the afferent and efferent arterioles and the effects on renal blood flow and GFR of selective changes in each.
111.6 Define renal blood flow, renal plasma flow, glomerular filtration rate, and filtration fraction and list their typical values.
111.7 Describe the effects of sympathetic stimulation and AngII on GFR and RBF and explain the mechanisms behind these effects.
111.8 Describe the processes of myogenic and tubuloglomerular feedback in the autoregulation of renal plasma flow and GFR

112 Micro TBL

112.1 Given

113 Micro TBL

114 Micro TBL

115 Glomerular Filtration and Blood Flow III

115.1 Predict the change in renal blood flow and glomerular filtration caused by increased a) angiotensin II, b) atrial natriuretic peptide, c) prostaglandin formation, d) sympathetic signaling and e) nitric oxide.
115.2 Predict the changes in renal blood flow and GFR caused by urinary tract obstruction, glomerulopathy, and hypoalbuminemia.
115.3 Explain how renin is released in the kidney including physiological stimuli and the associated mechanisms.
115.4 Describe the direct and indirect roles of angiotensin II on the systemic circulation and on renal functions.
115.5 Describe the effects of ANP on GFR, RPF and renal reabsorption of Na+.
115.6 Compare blood flow to, and oxygen consumption by, the kidneys with that of skeletal muscle and cardiac muscle.
115.7 Explain how kidney disease almost always leads to hypertension and why it is important not to treat renovascular hypertension with ACE inhibitors.
115.8 Describe why ANP can be useful in treating patients with renal hypoperfusion.
115.9 Explain the risk of using NSAIDs in patients with compromised renal perfusion or in patients taking ACE- inhibitors (triple whammy).

116 Microbiology Lab Diagnostics: Culture & Sensitivity

116.1 Recognize the limitations of culture in terms of time to results, appreciate that some organisms are non-culturable, and that bacteria, viruses, and fungi have different culture requirements
116.2 Differentiate minimal inhibitory concentration (MIC) and minimal bactericidal concentration (MBC).
116.3 Explain why Kirby-Bauer MIC method is least preferred over other methods

116.4 Identify the criteria for obtaining optimal blood culture results
116.5 Explain the rationale for drawing blood cultures distal to a port
116.6 Identify the most likely blood culture contaminant
116.7 Recall the primary utility of blood agar (BA), mannitol salt agar (MSA), MacConkey agar (Mac), and chocolate agar (CHOC)
116.8 BA: Differentiate alpha, beta, and gamma hemolysis
116.9 MSA: Differentiate Sta. aureus from coagulase negative staphylococci
116.10 MAC: Differentiate lactose fermenters from non-fermenters; recall the #1 lactose fermenter
116.11 Given a description of hemolysis, a gram-stain positive for gram positive cocci, catalase activity, coagulase activity, bacitracin sensitivity, CAMP results, or optochin sensitivity differentiate Sta. aureus from Sta. epidermidis; and Str. pyogenes (GAS) from Str. Agalactiae (GBS)

117 Renal Blood Flow

117.1 TBD

118 Renal Physiology

119 The Burden of Infectious Disease and Multi-Drug Resistant Infections

119.1 Identify the relationship between DALY, morbidity, and mortality
119.2 Assess the significance of the global burden of infectious disease, the impact of vaccine preventable disease, and antibiotic resistance using DALY
119.3 Compare the etiology and epidemiology of the 7th cholera pandemic, Ebola, and MERS
119.4 Assess the impact of respiratory and diarrheal diseases between nations with high and low sociodemographic indexes

120 Tubular Reabsorption and Secretion I

120.1 Describe the contribution of the major nephron segments to the reabsorption of the filtered solutes and water.
120.2 Describe the tubular transport maximum and be able to explain and quantitate the renal titration for substances that are a) reabsorbed and b) secreted.
120.3 Explain the cellular mechanisms for the transport of Na+, Cl-, K+, HCO3-, Ca2+, phosphate, organic solutes (e.g., glucose, amino acids, and urea), and water by the major tubular segments.
120.4 Describe the function of the following renal transporters and their predominant localization along the tubules in regard to nephron segment and apical versus basolateral membranes a) Transport ATPases (Na+/K+-ATPase, H+/K+-ATPase, H+- ATPase, and Ca2+ -ATPase) b) Ion and water channels (K+, ENaC, Cl-, Ca2+, aquaporins) c) Coupled transporters (Na+- glucose, Na+/H+-antiporter, Na+-K+-2Cl--symporter, Na+- phosphate symporter, Na+-Cl--symporter, Na+-HCO3-- symporter, Cl-/HCO3--antiporter).
120.5 Explain the mechanisms behind the appearance of glucose in the urine during hyperglycemic states or in patients using SGLT2 inhibitors.
120.6 Discuss the transport characteristics (what is reabsorbed, mechanisms, anatomical characteristics) of the proximal convoluted tubule, descending limb of the loop of Henle, ascending thin loop of Henle, ascending thick limb of the loop of Henle, early distal tubule, late distal tubule, collecting duct.

121 Tubular Reabsorption and Secretion II

121.1 Discuss the effect of aldosterone, angiotensin II, ANP, PTH, and AVP/ADH on renal transport mechanisms.
121.2 Discuss the pathological consequences of SIADH and diabetes insipidus on renal function.
121.3 Discuss the pathological consequences of excess and insufficient aldosterone release on renal function.
121.4 State the mechanism of action of loop, thiazide and K+ sparing diuretics, and including target transporters and possible side effects.
121.5 Explain Ca++ and Mg++ tubular reabsorption at various tubular segments and describe how Mg++ influences K+ excretion at the distal nephron.
121.6 Discuss the importance of carbonic anhydrase II at the various nephron segments and the natriuretic consequences of using acetazolamide (CA-II inhibitor).
121.7 Explain the role of ENaC in lithium-induced nephrogenic diabetes insipidus.
121.8 Explain the tubular consequences of excessive protein filtration at the glomerular membrane.
121.9 Explain why cortisol does not activate the MR receptors despite having equal affinity as that of aldosterone. Explain also why consumption of some herbal concoctions can cause hypertension.

122 Immunology: Introduction

122.1 Explain the basic principles of the immune system as they relate to effective immune function
122.2 Recognize what is necessary for 1) prevention of immunopathologies such as autoimmune diseases and allergies, 2) response to vaccinations, and 3) elimination of threats to the body
122.3 Contrast the key features (specificity, time to respond, diversity, specialization, & memory) of the adaptive arm with those of the innate arm of the immune system
122.4 Describe the general role of cytokines, chemokines, and adhesion molecules
122.5 Briefly describe several components of the innate (e.g., complement, granulocytes, macrophages, dendritic cells) & adaptive (e.g., antibodies, B cells, CD4+ T cells, CD8+ T cells) arms of the immune system
122.6 Contrast a primary immune response with a secondary immune response
122.7 Differentiate between passive and active immunization; list natural and artificial examples of each and recognize the intent behind vaccination

123 Tubular Reabsorption and Secretion III

123.1 Discuss the transport mechanisms leading to the generation of varying osmolarity of the filtrate along the different tubular segments.
123.2 Compare the role of ROMK channels at TAL to that at DCT2/collecting ducts.
123.3 Explain the impact of high filtrate flow rate and high K+ diet on distal nephron secretion of K+.
123.4 Discuss the role of Pendrin (apical Cl-/HCO3- exchanger) in pH balance.
123.5 Explain the mechanism of acquired resistance to furosemide (loop) diuretics by changes in the DCT transporters and epithelial structure.
123.6 Explain the roles of ANP on glomerular filtration and filtrate processing.
123.7 Explain the effects of activating or inactivating mutations to critical components of the tubular absorption/secretion.
123.8 List the important endocrine regulators of NCC and ENaC expression in the distal nephron.

124 Tubular Reabsorption IV

124.1

125 Immunology: Cells of the Immune System

125.1 Delineate the origin of leukocytes from the hematopoietic stem cell
125.2 Identify key molecules (e.g., ADA, γc, GM-CSF, G-CSF, M-CSF, and IL-5) involved in leukocyte differentiation & development
125.3 Identify how deficiencies in hematopoiesis relate to lymphocytes development
125.4 Describe & differentiate between lymphocytes based on their surface molecules
125.5 Describe & differentiate the granulocytes with respect to their general function and primary residence, i.e., circulation vs tissues
125.6 Describe and differentiate the monocytic myeloid cells (monocytes, MΦ, and DCs) with respect to their general function and residence

126 Renal Homeostasis I

126.1 List the 3 primary fluid compartments and state their normal volumes.
126.2 Understand the mathematical calculation of the plasma osmolality from knowing its Na+, glucose and urea content.
126.3 Explain changes in the fluid compartments following various fluid contraction (dehydration) or expansion (overhydration) scenarios.
126.4 State the ways in which input of fluid and output of fluid can vary and identify that which influences each of these the most (i.e. intake and output).
126.5 List the 4 major fluid regulating hormones, identify ways in which they are stimulated and/or inhibited their mechanism(s) of action to change fluid and electrolyte status.
126.6 Describe the mechanisms & conditions under which the kidneys excrete either a dilute or concentrated urine.
126.7 Explain how the countercurrent multiplier and exchanger allow concentration of the renal medullary interstitium and increases the osmolality of the renal cortex.
126.8 Explain how ADH allows excretion of small volumes of urine without disturbing plasma osmolality. Describe its regulation of expression and function of tubular transporters.

126.9 Identify the conditions under which AVP/ADH is increased and explain the mechanisms responsible for its release.
126.10 Describe the role of urea in maintaining high medullary osmotic pressure and explain the consequences of urea washout in athletes consuming large amounts of water before sport events.

127 Renal Homeostasis II

127.1 Describe the pathophysiology of disorders related to urine concentration, including mechanisms, signs and symptoms, and management.
127.2 Identify the homeostatic mechanisms responsible for maintaining sodium and potassium balance.
127.3 Given a scenario in which either osmolality and or volume (ECF and/or ICF) are disturbed identify how volume and/or osmolality would change and predict the homeostatic compensations that would occur in response to the scenario.
127.4 Describe the integrated cardiovascular, RAAS, renal and hypothalamic responses to changes in plasma, blood volume and osmolality during dehydration.
127.5 Describe the impact of estrogen, progesterone, aldosterone, ANP, aldosterone, ADH, and glucocorticoids on Na+ reabsorption.
127.6 Explain the mechanisms behind what is known as "aldosterone escape."
127.7 Explain why Na+ depletion does not lead to enhanced K+ excretion.
127.8 Define pressure natriuresis and describe how this process is altered in hypertension.
127.9 List non-renal modulation of plasma K+ levels.
127.10 Describe the renal role in maintaining plasma calcium levels.

128 Metabolism of the Kidney/Renal Function Measures

128.1 List the major sources for the renal gluconeogenesis and the importance of each substrate.
128.2 Describe the primary role of glutamine metabolism in facilitating proton excretion in the urine.
128.3 Explain how the kidney obtains glutamine and how it can be used as a metabolic fuel source.
128.4 Compare glucose synthesis vs. consumption at different renal regions and explain the reasons for such differences.
128.5 Explain hormonal regulation of renal gluconeogenesis.
128.6 Describe ammonia synthesis/transport at various segments of the renal nephron.
128.7 Describe the distinct chemical properties of NH3 and NH4+
128.8 Explain the effect of acidosis on renal glutamine uptake and ammonia genesis.
128.9 Quantitate GFR, clearance for given substances, PRF, EPRF.
128.10 Be able to calculate the Tm for substances that are secreted and absorbed at the PCT.

129 Genetic Disorders of the Renal System

129.1 Understand the association between a change in genotype and the resulting change in phenotype associated with the following (as well as any others mentioned during lecture): Polycystic Kidney Diseases, Adult and Infant Alport Syndrome Von-Hippel Lindau Syndrome.
129.2 Know the frequency of the above-mentioned diseases/disorders among the general populations, as well as any specific populations in which it is particularly prevalent.

130 Immunology: Anatomy of the Immune System

130.1 Differentiate the functions of the primary and secondary immune organs
130.2 Describe "antigen recognition" in general terms; recognize its significance in the development of an adaptive immune response
130.3 Describe how lymphocytes circulate (including into & out of lymphoid organs), where antigens are encountered, and how they travel to the site of antigenic insult
130.4 Identify B & T cell zones within secondary lymphoid organs; recognize potential implications of hyperplasia in either lymphoid follicles or the paracortex

131 Renal Acid Base Regulation

131.1 Describe the renal regulation of the CO2/HCO3- buffer system.
131.2 Distinguish between volatile and non-volatile acids and the normal amounts produced each day.
131.3 Describe the impact of diet on plasma H+ (sulfur containing amino acids also the ketone bodies from high-fat/low-carb diet).
131.4 Calculate the filtered load of HCO3- and identify the major sites of absorption (and secretion) along the nephron.
131.5 Describe the tubular handling of H+ / ammonia at each nephron segment.

131.6 Describe adjustments in filtered load and HCO3- reabsorption (H+ secretion) and understand how factors such as blood pH, ECF volume, sodium reabsorption, aldosterone and AngII can alter the process.

132 Renal Physiology

132.1 See sessions on renal physiology.

133 Immunology: Innate Immunity

133.1 Compare and contrast innate and adaptive immunity in terms of the relative lag period, targets, memory, self-tolerance

133.2 Differentiate neutrophils and macrophages in terms of function and the dual innate/adaptive roles of macrophages

133.3 Explain the role of Toll-like receptors (TLRs) in differentiating self from non-self, identify which TLR binds bacterial lipopolysaccharides (LPS/endotoxin), and identify the two mechanisms whereby TLRs kill phagocytized microbes

133.4 Recall that activated macrophages produce pro-inflammatory cytokines IL-1, IL-6, IL-8/CXCL, IL-12 and TNF-alpha, describing the local and systemic effects of TNF-alpha & IL-6

133.5 Identify the source and recognize the significance of elevated levels of C-reactive protein (CRP) and fibrinogen in the blood

134 Immunology: Inflammation

134.1 Differentiate between 3 types of immune responses: Th1 (cytotoxic); Th2 (weep & sweep); Th17 (pro-inflammatory) and response resolution (immune regulation)

134.2 Explain how certain cytokines (e.g. IFN-γ, IL-1, IL-2, IL-4, IL-5, IL-6, IL-8, TNF-α) and cell types (lymphocytes, Eos, & PMNs) generally fit with each type of immune response; list key functions for each

134.3 Apply your knowledge of effector cell functions towards the elimination of infectious organisms

134.4 Describe the 5 clinical signs of inflammation, the physiological etiology, and characteristics of the response

134.5 Describe the general role of eicosanoids and adhesion molecules

134.6 Integrate the factors of an immune response from the site of the antigenic insult including initial inflammation to that site, and building of an adaptive immune response within a lymph node

134.7 Recognize and explain the significance of deficiencies that result in impaired inflammation, e.g., CD18 (integrin β2), fucosylation, NADPH oxidase, and lysosomal trafficking (LYST)

134.8 Contrast clinical manifestations of leukocyte adhesion deficiencies, chronic granulomatous disease, and Chediak-Higashi syndrome

135 Histology – Alimentary Canal I

135.1 Describe the histological appearance of the lips (e.g., red margin and vermillion) and lining of the mouth and explain why keratinization is only found in some areas.

135.2 Draw filiform, fungiform, circumvallate and foliate papillae of the tongue, including the cellular composition of a taste bud (if present) and pores.

135.3 Summarize the arrangement of the four intrinsic tongue muscles groups.

135.4 Distinguish the histological differences between the three major salivary glands, including serous and/or mucous components.

135.5 Comprehend associated clinical correlates (e.g., ankyloglossia, sublingual absorption of drugs, mumps).

136 Histology – Alimentary Canal II

136.1 Diagram the basic layering organization of the tubular digestive system, including subcomponents of each (e.g., mucosa: epithelium, lamina propria, muscularis mucosa; and autonomic nerve plexuses), submucosa, muscularis externa (inner circular and outer longitudinal layers), including unique regional features (e.g., three layers of the stomach's muscularis externa); and explain associated functions.

136.2 Describe the sphincters found at the junctions of organs within the GI tract.

136.3 Distinguish the histological appearance of the esophagus, parts of the stomach (e.g., cardia), parts of the small intestine (e.g., Brunner's glands of the duodenum), and large intestine and summarize the corresponding roles of each.

137 Histology – Alimentary Canal III

137.1 Draw a typical gastric gland, including regions (e.g., gastric pit and isthmus) and cellular composition (e.g., chief cells) and function (e.g., HCL production).

137.2 Differentiate microvilli, villi, and plica circulares of the small intestines, and identify the cells that make up intestinal glands (crypts of Lieberkühn, e.g., Paneth cells) and their function.

137.3 Recognize the histological appearance of the appendix and its purported function.

137.4 Explain the functional difference between the mucous produced by the goblet cells of the large intestine from that produced in the small intestine.

137.5 Define the line of Hilton.

138 Histology – Alimentary Canal IV

138.1 Describe the histological appearance of the exocrine and endocrine portions of the pancreas, including distribution, cells and their secretory products.

138.2 Evaluate the ultrastructure and corresponding roles of hepatocytes.

138.3 Draw a hepatic lobule, including hepatic cords, central vein, portal triad (hepatic arteriole, portal venule, bile ductile), sinusoids and bile canaliculi; and indicate the directional flow of blood and bile.

138.4 Explain the purpose the discontinuous endothelium of hepatic sinusoids and diagram how bile canaliculi are formed.

138.5 Recall the location and function of Kupffer cells.

138.6 Distinguish the histological appearance of the gallbladder, including Rokitansky-Aschoff sinuses/crypts, and explain the function of epithelial cells lining the gallbladder.

139 Digestive System Development I

139.1 Describe the development of foregut structures, including the esophagus, stomach, duodenum (proximal to bile duct opening), liver and biliary apparatus (hepatic ducts, gallbladder, and bile duct), pancreas, and spleen.

139.2 Explain the development of midgut structures, including the small intestine, duodenum (distal to bile duct opening), cecum, appendix, ascending colon, and right one-half to two- thirds of transverse colon.

140 Digestive System Development II

140.1 Compare the development of hindgut structures, including the left one-third to one-half of transverse colon, descending colon, sigmoid colon, rectum, superior part of anal canal, epithelium of urinary bladder and most of the urethra.

140.2 Describe the embryological basis and clinical manifestations of common digestive system anomalies.

141 Immunology: Complement

141.1 Describe the classical pathway of complement activation

141.2 Describe the alternative pathway of complement activation

141.3 Describe the lectin pathway of complement activation

141.4 Compare and contrast the 3 pathways of complement activation

141.5 Assess the regulation of complement

141.6 Evaluate common complement deficiencies

142 Immunology: Antibodies

142.1 Describe isotype, allotype, idiotype, hypervariable region, & complementarity determining region

142.2 Define f(ab')2, fab, Fc, Vh, Vl, Ch, and Cl and explain how these fragments were generated and what functions they contribute to a complete immunoglobulin

142.3 Describe the basic structure of the five immunoglobulin (Ig) isotypes

142.4 Compare differences in size, binding sites, and polypeptide structure

142.5 Compare & contrast the major biological functions and unique features of the five classes of Ig.

142.6 Interpret the clinical implications of immunoglobulin levels

142.7 Explain why the spatial complementarity between Ag and Ab is a necessary condition for interaction

143 Introduction to GI Physiology

143.1 Define the basic processes performed by the digestive system (digestion, secretion, motility, absorption, and excretion).

143.2 Describe the functional anatomy of the GI tract and the common features in the overall organization of the GI tissues.

143.3 Understand the cellular specialization of the walls of the GI tube: mucosa, submucosa, muscle, and serosa.

143.4 Differentiate the role of endocrine, paracrine, and neurocrine regulators of GI function and provide examples of each.

144 Neural Regulation of GI Function

144.1 List and define the 2 levels of neural control of the GI tract; the extrinsic nervous system versus the intrinsic nervous system.
144.2 Describe the autonomic nervous innervation of the GI system and identify how this innervation works to alter GI function.
144.3 Identify the primary neurotransmitters involved in controlling GI function, where they are located (released from) and their primary effects.
144.4 Describe the role of sensory afferent control of GI function.
144.5 Differentiate between long and short loop reflexes.
144.6 Discuss the intrinsic nervous system
144.7 Differentiate the myenteric and submucosal plexus of the ENS, including primary role and effects on GI function when stimulated or inhibited.
144.8

145 The Cephalic, Oral, and Esophageal Phases of the Integrated Response to a Meal

145.1 Describe the structures of the functional anatomy of salivary glands, including their secretory elements.
145.2 Understand the cephalic and oral phases of the response to a meal.
145.3 Discuss the general principles of secretion along the gastrointestinal (GI) tract and the components of secretion vary with the gland or region of the GI tract.
145.4 Understand the correlation between the composition and functions of salivary secretion.
145.5 Describe how primary and secondary secretion within salivary glands generated and regulated.
145.6 Understand the sequence of events in swallowing.
145.7 Differentiate the stimulus and neural pathways generating primary and secondary esophageal peristalsis.
145.8 Discuss changes in gastric motility take place during swallowing and its significance.
145.9 Describe the major functions of the esophagus and associated structures in terms of protection and propulsion.

146 Immunology: Immunogenetics

146.1 Describe the rearrangement of Ig genes during lymphocyte development as facilitated by combinatorial diversity
146.2 Describe the utility of free light chain ratios in the diagnosis of certain lymphoid cancers and primary immunodeficiency diseases
146.3 Explain the difference between combinatorial and junctional diversity
146.4 Describe the utilization of P elements & N regions
146.5 Address mechanisms of Ig diversity generation including: the role of RNA splicing, somatic hypermutation (SHM), and isotype switching/class switch recombination (CSR)
146.6 Describe the molecular events underlying the expression of membrane vs secreted Ig
146.7 Interpret the clinical outcome caused by deficiencies in critical elements of immunoreceptor generation, e.g., RAG, TdT, DNA polymerase μ, Artemis, NHEJ machinery, and AID
146.8 Evaluate the role of allelic exclusion in clonal selection
146.9 Explain the difference between allelic exclusion and isotopic exclusion
146.10 Describe the organization of the Ig H + L chain genes and identify what portions of the completed proteins they encode

147 Immunology: MHC

147.1 Describe the major histocompatibility region of the genome with respect to its polymorphism, and interpret benefits of MHC polygenicity and co-dominant expression
147.2 Be able to recognize MHC class I and II molecules & identify what cells express which MHC molecules
147.3 Assess the difference between antigens presented via MHC class I and II
147.4 Describe the process and purpose of antigen presentation in MHC I molecules and assess the impact of a deficiency in (or inhibition of) critical components, e.g., TAP & β2 microglobulin
147.5 Evaluate the outcome of MHC class I and II deficiency

148 The Gastric Phase of the Integrated Response to a Meal I

148.1 Understand the major functions of the stomach.

148.2 Describe the gross functional regions of the stomach.
148.3 Discuss the role of the gastric epithelium in digestion and absorption.
148.4 Interpret the role of the proton pump in parietal cell function.
148.5 Understand the cellular mechanism of gastric acid secretion.
148.6 Describe some examples of how gastric acid secretion is regulated during the postprandial period.

149 The Gastric Phase of the Integrated Response to a Meal II

149.1 Understand the differences between gastric mucosal protection and defense.
149.2 Interpret the components of the functional anatomy of GI smooth muscle.
149.3 Describe the significance of gap junctions, interstitial cells of Cajal, and pacemaker cells in the functioning of GI smooth muscle.
149.4 Discuss the basic electrical rhythm (slow wave) generated, how is it regulated by chemical messengers (hormones, paracrine, neurotransmitters), and what causes contractions associated with the slow wave to occur.
149.5 Understand physiological events in gastric motility occur in the gastric phase.

150 The Small Intestinal Phase of the Integrated Response to a Meal Neural Regulation of GI Function I

150.1 Understand the basic components of a mixed meal digested and absorbed in the small intestine.
150.2 Describe how gastric emptying in the small intestinal phase takes place.
150.3 Understand the basics of pancreatic secretion.
150.4 Discuss characteristics and control of ductular secretion.
150.5 Describe the characteristics and control of acinar secretion.

151 Immunology: Antigen Presentation

151.1 Describe the process and purpose of antigen presentation in MHC II molecules and identify consequences of deficient class II expression due to CIITA (class II transactivator) deficiency
151.2 Explain the purpose of cross presentation
151.3 Articulate the importance of DAMPs/PAMPs in providing context to APCs
151.4 list 5 specific examples of pathogen- & damage-associated molecular patterns recognized by select pattern recognition receptors
151.5 Describe how B cells process and present antigen
151.6 Discuss germinal center interactions related to B cell maturation
151.7 Identify two mechanisms used by T cells to recognize and present non-protein-based antigens

152 The Small Intestinal Phase of the Integrated Response to a Meal Neural Regulation of GI Function II

152.1 Describe gall bladder and biliary secretion.
152.2 Understand carbohydrate assimilation.
152.3 Discuss the general principles of digestion of carbohydrates.
152.4 Understand the uptake of carbohydrates.
152.5 Discuss the general principles of digestion of proteins.
152.6 Understand the uptake of peptide and amino acids.

153 The Small Intestinal Phase of the Integrated Response to a Meal Neural Regulation of GI Function III

153.1 Understand lipid assimilation.
153.2 Discuss emulsification and solubilization of lipids.
153.3 Discuss the general principles of digestion of lipids.
153.4 Understand the uptake of lipids and subsequent handling.
153.5 Discuss the general principles of water and electrolyte secretion and absorption.
153.6 Understand the absorption of minerals and water-soluble vitamins.
153.7 Describe motor patterns of the small intestine.

154 The Colonic Phase of the Integrated Response to a Meal

154.1 Understand the structures of the anatomy of the colon and rectum, and what is the role of the large intestine in storing and desiccating the residues of a meal.
154.2 Describe the motility patterns of the colon that provide for its storage function, and what reflexes signal to the colon from more proximal portions of the GI tract.
154.3 Discuss the role of intestinal microorganisms in metabolism and host defense.
154.4 Interpret the mechanisms that provide for defecation, and how it can be delayed until convenient.

155 GI Physiology

155.1 Describe the pathway of fatty acid synthesis and the role of malonyl-CoA carboxylase and fatty acid synthase
155.2 Outline short-term and long-term regulation of fatty acid synthesis.
155.3 Summarize how lipids are digested and transported from the gut to the liver.
155.4 Describe the synthesis of triglycerides.
155.5 Describe the role of the liver in the glucose-alanine cycle
155.6 Explain the mechanism for the formation of ketone bodies and identify the physiological and pathological roles of those molecules.
155.7 Describe the mechanism by which hormonal activation of lipolysis in adipose tissue is coordinated with activation of gluconeogenesis in liver during fasting.
155.8 Briefly explain the role of liver metabolism in xenobiotic metabolism.

156 Genetic Disorders of the GI System

156.1 Understand the association between a change in genotype and the resulting change in phenotype associated with the following: Cystic Fibrosis Pancreatic Cancer Pancreatitis Glucose/Galactose Malabsorption Disorders of Metabolism.
156.2 Know the frequency of the above-mentioned diseases/disorders among the general populations, as well as any specific populations in which it is particularly prevalent.

157 Immunology: Antigen Recognition

157.1 Distinguish between B & T cell antigens & the mechanisms of antigen recognition they utilize
157.2 Explain the mechanisms by which TCRs & BCRs interact with their respective antigens
157.3 Describe the TCR & BCR complex that triggers intracellular signaling
157.4 Explain why co-stimulation is critical for activation of adaptive immune cells
157.5 List the sequence of interactions and the molecules involved for antigen, APCs, T cells, & B cells
157.6 List events that happen following activation of a lymphocyte clone
157.7 Recognize how superantigens circumvent the normal antigen recognition process and lead to unregulated immune activation
157.8 Differentiate between haptens & carriers with regard to general features & what TCRs and BCRs recognize

158 Immunology: T Cell Development

158.1 Describe the thymus, how it changes during development, where its cells come from and where they go
158.2 Describe the development and education of αβ T-cells in the thymus with respect to gene rearrangements, expression of CD4 & CD8, and MHC-restriction
158.3 Describe positive and negative selection, and what is meant by central tolerance
158.4 Describe the phenotype of T cells in the thymus and in the periphery, the difference between CD4+ and CD8+ αβ T cells
158.5 Differentiate DN, DP, and SP thymocytes, including the state of arrangement of TCR genes for β and α loci at each stage
158.6 Summarize the differences between α/β and γ/δ T cells
158.7 Explain the role of AIRE
158.8 Summarize how T cells circulate amongst 2° lymphoid organs, get into and out of the lymph node, and where they reside in the lymph node
158.9 Explain how CD4+ (Th) and CD8+ (CTL) cells recognize antigen, and the molecules involved in their activation
158.10 Describe Th and CTL functions and their contribution to the immune system as a whole
158.11 Recognize the impacts of a deficiency in T cells (Th, CTLs, or both) on the entire immune function of the host

159 Immunology: B Cell Development

159.1 Understand the process of B cell development in the bone marrow and describe the difference in early pro-B-cell, late pro-B-cell, and pre- B-cell precursors
159.2 Describe the role of positive and negative selection in B cells
159.3 Explain how immature B cells mature in the periphery
159.4 Summarize how immature B cells respond to cognate antigen

160 Immunology: B Cell Responses and Immunodeficiency

160.1 Match Chronic Granulomatous Disease, X-linked Agammaglobulinemia, Hyper-IgM Syndrome, Severe Combined Immunodeficiency, DiGeorge Syndrome and C1 Esterase Inhibitor Deficiency with the general type of immunodeficiency they cause, their etiology, the cells that express the mutation, and their common presentation flags

160.2 Explain the significance of a mutated T-helper CD40L (CD154) to antibody production and predict which antibody class(es) is/are most impacted; compare this to a Bruton tyrosine kinase mutation

160.3 Identify the cell type effected by a NADPH oxidase deficiency; explain the deficiency's significance; predict what type of recurrent skin infections are likely and identify the commonly responsible microorganism

160.4 Recognize the embryological impact of a 22q11.2 deletion and predict its impact to cell-mediated, antibody-mediated, and innate immunity

161 Endocrine System Histology I

161.1 Describe the capillaries and typical arrangements of secretory cells associated with endocrine glands.

161.2 Distinguish between protein secreting and steroid secreting cells based on their histological appearance and explain their staining properties.

161.3 Diagram the hypothalamus/pituitary portal system and consider its functional significance.

161.4 Compare the structural and function relationship between the posterior pituitary and hypothalamus.

161.5 Explain the differences between the adenohypophysis and neurohypophysis, including cell types, secretory products, and staining properties.

162 Endocrine System Histology II

162.1 Recognize the composition of the pars intermedia.

162.2 Draw the microanatomy of the thyroid gland, including the follicular cells, parafollicular cells, follicle and thyroglobulin; and indicate the role of each component.

162.3 Review the histological appearance of the parathyroid gland and indicate the function of chief and oxytrol (oxyphil) cells.

162.4 Summarize the histologic appearance of the three zones of the adrenal cortex and medulla and indicate the secretory product(s) of each.

163 Introduction to Endocrine Physiology

163.1 Name the major Endocrine organs and their hormone products.

163.2 Contrast the terms: endocrine, paracrine, and autocrine.

163.3 Explain the principles of positive and negative feedback mechanisms.

163.4 Categorize hormones as peptides, steroids or amines and understand their different pathways of action.

163.5 Contrast the location and pathways of membrane bound and intracellular hormone receptors and describe the process of activation, inactivation, up-regulation, down-regulation, sensitization, and desensitization of hormone receptors.

163.6 Explain the importance of patterns of hormone secretion such as pulsatile, diurnal, and menstrual, etc.

163.7 Explain the bases of hormone measurement and assessment of biological activity.

164 Anterior Pituitary

164.1 Describe the anterior pituitary with respect to the cell types, vascular supply, and anatomical function relative to the hypothalamus.

164.2 List the Releasing Hormone/ Inhibitory hormones of the hypothalamus and their actions

164.3 Describe the 3 major families of the anterior pituitary hormones and their biosynthetic and structural and signaling relationships.

164.4 Outline the downstream effects of ACTH, TSH, FSH, and LH

164.5 Describe the relationship between growth hormone and insulin like growth factors in the regulation of growth.

164.6 Understand the regulation of growth hormone secretion. Identify the roles of hypothalamic factors, glucose, and IGF-I.

164.7 Identify the target organs or cell types for insulin-like growth factors that account for longitudinal growth.

164.8 Describe the metabolic and growth promoting actions of growth hormone.

164.9 Describe the function and regulation of PRL synthesis and secretion including identifying stimulatory and inhibitory factors.

165 Immunology: T cell responses, Cytokines, and Cooperation

165.1 Consider the role of cytokines in the differentiation of Th subtypes
165.2 Describe Th cells and their subsets (Th1, Th2, Th17, Tfh, Treg) with respect to how each orchestrates different types of immune responses
165.3 Understand the general features of chemokines and what they do
165.4 Explain where activation vs effector activity occurs and how cytokines cross-talk between cells
165.5 Describe the basic effector functions of T cells in an immune response
165.6 Classify the major role(s) of the following cytokines with respect to cellular effect (i.e., proliferation, differentiation, effector): IL-1β, IL-2, IL-4, IL-6, IL-17, IL-10, IL-12, IL-13, TNF-α, TGF-β, IFN-α, IFN-β and IFN-γ

166 Immunology: Regulation of the Immune Response

166.1 Describe immune homeostasis utilizing the concepts of central and peripheral tolerance
166.2 Understand why portal of entry, dose, and normal flora are important considerations in immune system homeostasis
166.3 Differentiate clonal deletion, anergy, and ignorance
166.4 Describe Treg differentiation & function and the applications of this process to maintaining tolerance
166.5 recognize what happens when tolerance is broken
166.6 Explain the difference between autoimmunity and immunodeficiency
166.7 List several benefits of immunology to medicine (e.g., vaccines) and the role of normal flora

167 Posterior Pituitary

167.1 Describe the posterior pituitary cell types and hypothalamic origination
167.2 Describe the synthetic pathway for formation of the nonapeptides oxytocin and vasopressin.
167.3 Describe the primary actions, intracellular signaling mechanisms and factors that stimulate or inhibit release of oxytocin and vasopressin.
167.4 List the target organs and functional effects of oxytocin
167.5 Name the stimuli for oxytocin release in relation to its reproductive and lactation functions
167.6 List the target cells for vasopressin and explain why vasopressin is also known as antidiuretic hormone
167.7 Describe the stimuli and mechanisms that control vasopressin secretion

168 Immunology: Hypersensitivity

168.1 Describe and distinguish the four types of hypersensitivity mechanisms
168.2 Understand the biology of IgE and its regulation
168.3 Describe the properties of the mast cell and its chemical mediators
168.4 Explain the mechanisms responsible for mast cell activation and the release of chemical mediators
168.5 Discuss the features characteristic of immediate hypersensitivity reactions
168.6 Outline potential therapeutic options for diseases associated with immediate hypersensitivity reactions
168.7 Describe the immunopathology and immunotherapy of type II reactions, the Arthus reaction, and serum sickness
168.8 Discuss the factors affecting immune complex deposition and tissue localization
168.9 Discuss the mechanism of DTH reactions and the pathophysiology of allergic contact dermatitis

169 Immunology: Mechanisms of Inflammation

169.1 Demonstrate an understanding of acute and chronic patterns of inflammation, the cellular components, mediators involved, and systemic effects
169.2 Describe the time course of the vascular and cellular events responsible for the acute inflammatory response to injury and discuss the receptors and ligands that are responsible for these events
169.3 Describe phagocytosis and the molecular mechanisms of intracellular killing
169.4 Discuss the chemical mediators of inflammation, classifying them with respect to origins, targets, and mechanisms of action

170 Adrenal Cortex and Medulla I

170.1 Identify the functional zones of the adrenal glands and the principal hormones secreted from each zone.
170.2 Describe the biosynthesis of the adrenal steroid hormones (glucocorticoids, mineralocorticoids, and androgens) and their principal actions.
170.3 List the major mineralocorticoids and identify their biological actions and target organs or tissues.

170.4 Understand the cellular mechanism of action of adrenal cortical hormones.
170.5 Describe the components of the neuroendocrine axis that control glucocorticoid secretion.
170.6 Identify the causes and consequences of a) over-secretion and b) under-secretion of glucocorticoids and adrenal androgens.

171 Adrenal Cortex and Medulla II

171.1 See Above

172 Immunology: Vaccinations

172.1 Define R0 (Basic reproductive number) as it pertains to the spread of infectious agents; recall the overall percentage of people who need to be vaccinated to protect the population at large from a vaccine-preventable epidemic
172.2 Identify the vaccine that should be administered during pregnancy and explain why
172.3 List the vaccines that are administered to children before they start school, recognizing which ones are attenuated-live vaccines, and the difference between DTaP and Tdap in terms of relative concentrations of each antigen, and which is given to children
172.4 Describe a conjugate vaccine and why they are used to protect against encapsulated organisms
172.5 Apply hapten-carrier connections to vaccine development
172.6 Recognize 3 diseases that are preventable by conjugate vaccines

173 Immunology: Transplant Immunology

173.1 Explain MHC restriction
173.2 Describe the implications of the polygenic & polymorphic characteristics & co-dominant expression of MHC molecules to antigen presentation
173.3 Explain why it is difficult to find HLA identical donors for organ and tissue transplantation
173.4 Compare and contrast allograft rejection (host-vs-graft) with graft vs host disease
173.5 Differentiate hyperacute, acute, and chronic forms of transplant rejection
173.6 Explain the need for irradiation prior to bone marrow transplants
173.7 Describe the functional properties and the MHC-restricting elements on CD8+ and CD4+ T cells
173.8 Define donor, recipient, autologous, allogeneic, autograft, isograft, allograft, and xenograft (heterograft)
173.9 Recognize the role for immunosuppressive therapies and their consequences in transplant recipients

174 Thyroid

174.1 Identify the steps in the biosynthesis, storage, and secretion of tri-iodothyronine (T3) and thyroxine (T4) and their regulation.
174.2 Explain the importance of thyroid hormone binding in blood on free and total thyroid hormone levels
174.3 Understand the significance of the conversion of T4 to T3 and reverse T3 (rT3) in extra-thyroidal tissues.
174.4 Describe the physiologic effects and mechanisms of action of thyroid hormones.
174.5 Understand the causes and consequences of a) over-secretion and b) under-secretion of thyroid hormones. Explain what conditions can cause an enlargement of the thyroid gland
174.6 Distinguish between the various etiologies for hyper and hypothyroidism.
174.7 Explain the regulation of thyroid hormone production.

175 Parathyroid and Calcium regulation

175.1 Know the cells of origin for parathyroid hormone, its biosynthesis and degradation.
175.2 List the target organs and cell types for parathyroid hormone and describe its effects on each.
175.3 Describe the functions of the osteoblasts and the osteoclasts in bone remodeling and the factors that regulate their activities.
175.4 Describe the regulation of parathyroid hormone secretion and the role of the calcium-sensing receptor.
175.5 Understand the causes and consequences of a) over-secretion, and b) under-secretion of parathyroid hormone, as well as its therapeutic use.
175.6 Identify the sources of vitamin D and diagram the biosynthetic pathway and the organs involved in modifying it to the biologically active 1,25(OH2)D3 (1-25 dihydroxy cholecalciferol).
175.7 Identify the target organs and cellular mechanisms of action for vitamin D.
175.8 Describe the negative feedback relationship between parathyroid hormone and the biologically active form of vitamin D [1,25(OH2)D3].

175.9 Describe the consequences of vitamin D deficiency and vitamin D excess.
175.10 Name the stimuli that can promote secretion of calcitonin, its actions, and identify which (if any) are physiologically important.

176 Reproductive System Development

176.1 Explain why congenital defects of the urinary & genital system are frequently related.
176.2 Identify the male or female homolog of a given structure. Explain why a female phenotype is the default situation.
176.3 Begin at the indifferent stage and follow development of: mesonephros & mesonephric duct; paramesonephric duct; gonad (origin of germ cells & migration to gonadal ridge); gubernaculum.
176.4 Describe the migration of the primordial germ cells from the yolk sac to the gonads. Consider the consequences when events do not unfold as expected.
176.5 Describe the sexual differentiation of the urogenital ridge into a testis or ovary. Compare the development of the ovary with that of the testis.
176.6 Enumerate the adult derivatives of the mesonephric duct in females & males. In males, how do the developing seminiferous tubules become linked with the mesonephric duct?
176.7 Describe the adult derivatives of the paramesonephric duct in females & males.
176.8 Describe normal development of the uterus & vagina. What abnormalities can develop?
176.9 Explain descent of the ovary and formation and composition of the broad ligament.
176.10 Discuss the origin & descent of the testes. Compare & contrast their final location. Explain the role of the gubernaculum. Describe the development of the processus/tunica vaginalis. Explain the development of the spermatic cord & round ligament of the uterus as it relates to the descent of the respective gonad. Are the spermatic cord & round ligament of the uterus homologous structures? Follow the proliferation & differentiation of the urogenital sinus in both sexes focusing on the cranial vesical part, middle pelvic part, & caudal phallic part.

177 Endocrine Pancreas & Energy Metabolism

177.1 Identify the major hormones secreted from the endocrine pancreas, their cells of origin, and their chemical nature.
177.2 List the target organs or cell types for glucagon and describe its principal actions on each.
177.3 List the major target organs or cell types for insulin, the major effects of insulin on each, and the consequent changes in concentration of blood constituents.
177.4 Identify the time course for the onset and duration for the biological actions of insulin.
177.5 Understand the relationship between blood glucose concentrations and insulin secretion.
177.6 Describe the roles of neural input and gastrointestinal hormones on insulin secretion. List the factors that modulate the secretory response.
177.7 State the 2 primary factors regarding insulin's actions and explain how insulin has very specific action on different tissues (brain, muscle, adipose, liver) via different GLUT transporters.
177.8 Explain why exercise is considered a "natural insulin" and how exercise specifically leads to GLUT uptake in skeletal muscle during exercise.
177.9 Describe the control of glucagon secretion.
177.10 Identify disease states caused by: a) over-secretion, b) under-secretion of insulin, or c) decreased sensitivity to insulin, and describe the principal symptoms of each.

178 Histology – Male Reproductive System I

178.1 Name the connective tissue layer in the stroma of the testis and describe the boundary layer, including changes associated with age.
178.2 Compare the cells within the seminiferous tubules and explain the structure and purpose of the blood-testis barrier.
178.3 Recognize the histological appearance, location, secretory product of Leydig cells.
178.4 Describe the histological appearance of intratesticular tubules (e.g., tubuli recti and rete testis) and extratesticular tubules (e.g., efferent ductules and ductus epididymis), and summarize the pathway and changes to semen from the lumen of the seminiferous tubules through the spongy urethra.

179 Histology – Male Reproductive System II

179.1 Differentiate the histological appearance of the vas deferens and the three subdivisions of the male urethra.

179.2 Explain why different sections of the prostate gland can appear distinctly different under the microscope and indicate the luminal structures characteristic of the prostate.
179.3 Identify the two types of erectile columns within the penis, including their connective tissues capsules, and interpret their relationship to the process of erection.
179.4 List in order the epithelial changes of the male urethra beginning at the bladder.

180 Histology – Female Reproductive System I

180.1 Name the two components of the ovarian capsule and describe why the name, germinal epithelium is a misnomer.
180.2 Describe the components of a follicle and distinguish the microscopic structure of follicles at various stages of maturation (i.e., primordial follicle to a mature/Graafian follicle), including functional considerations of the zona pellucida, antrum, populations of granulosa cells, internal and external thecal layers.
180.3 Compare the histology and functionality of the corpus luteum and corpus albicans.
180.4 Assess the regional differences in the microscopic anatomy of the oviduct, including the two mucosal cell types.
180.5 Distinguish the salient structural features and functions of the three layers of the uterine wall (e.g., uterine glands in the two layers of the endometrium and the stratum vasculare of the myometrium).

181 Histology – Female Reproductive System II

181.1 Evaluate microscopic changes to the endometrium during the various phases of the menstrual cycle, including the relationship between ovarian and gonadotropin hormone secretion.
181.2 Explain the uniqueness of the mucosal lining of the cervical portion of the uterus and why vaginal mucosa cells appear empty in histological section.
181.3 Comprehend the mechanism by which the mucosa of the vagina becomes moistened during sexual arousal.
181.4 Summarize the histological difference between immature, mature, lactating and post-menopausal mammary glands, including the two connective tissue components found in mammary glands.

182 Male Reproductive System I

182.1 Describe the physiological functions of the major components of the male reproductive tract.
182.2 Describe spermatogenesis and the role of Sertoli cells, Leydig cells and the basement membrane in this process.
182.3 Describe the endocrine regulation of testicular function: the role of the GnRH pulse generator, FSH, LH, testosterone, and inhibin.
182.4 Describe the biosynthesis, mechanism of transport within the blood, metabolism and elimination of testosterone and related androgens.
182.5 List the major target organs and cell types for testosterone and other androgens.
182.6 Describe the actions and cellular mechanisms of testosterone and related androgens.
182.7 Describe the neural, vascular, and endocrine components of the erection and ejaculation response.
182.8 Identify the causes and consequences of over-secretion and under-secretion of testosterone for a) prepubertal and b) postpubescent males.
182.9 Understand aging- related changes in the hypothalamic-pituitary-gonadal axis that lead to puberty, reproductive maturity, and reproductive senescence (andropause).

183 Immune Response to Infection

183.1 TBD

184 Immunology: Autoimmunity

184.1 Distinguish autoimmune diseases caused by autoantibodies and/or autoreactive T cells
184.2 Describe the relationship between autoimmune diseases and the hypersensitivity reactions they exhibit
184.3 Identify HLA associations that have been established for selected autoimmune conditions
184.4 Give examples of tissue specific vs systemic autoimmune disease
184.5 Describe conventional and experimental treatments for autoimmune disease and understand where they intervene in the autoimmune process
184.6 Describe the following autoimmune conditions:
184.7 Autoimmune hemolytic anemia, Goodpasture syndrome, Graves', myasthenia gravis, lupus nephritis, rheumatoid arthritis, T1DM, Hashimoto's, Addison's, multiple sclerosis, psoriasis, Crohn's, celiac disease, and ankylosing spondylitis

185 Male Reproductive System II

185.1 See above

186 Female Reproductive System I

186.1 Describe oogenesis and its relationship to changes in the ovarian follicle. Explain the roles of FSH, LH, estradiol, and inhibin in oogenesis and follicular maturation.

186.2 Describe ovulation and the formation and decline of the corpus luteum and the roles of hormones in each of these processes.

186.3 Describe the hormonal regulation of estrogen and progesterone biosynthesis and secretion by the ovary. Identify the cells responsible for their biosynthesis, the mechanism of their transport in the blood, and how they are degraded and removed from the body.

186.4 List the major target organs and cell types for estrogen action and describe its effects on each.

186.5 Describe the actions and cellular mechanisms of estrogen.

186.6 List the principal physiological actions of progesterone, its major target organs and cell types, and describe its effects on each and the importance of "estrogen priming."

186.7 Describe the actions and cellular mechanisms of progesterone and other progestins.

186.8 Graphically illustrate the timing of changes in blood levels of FSH, LH, estradiol, progesterone, and inhibin, and correlate these with structural changes in the endometrium and the ovary seen during the menstrual cycle.

186.9 Describe how the changes in ovarian steroids produce the proliferative and secretory phases of the uterine endometrium and menstruation and the changes in basal body temperature during the menstrual cycle.

186.10 Understand aging- related changes in the hypothalamo-pituitary-goandal axis that lead to puberty, reproductive maturity, and reproductive senescence (menopause).

187 Female Reproductive System II

187.1 See Above

188 Immunology: Tumor Immunity and Immunotherapy

188.1 Assess the cancer burden among US patients

188.2 Identify common associations associated with cancer development

188.3 Identify common attributes of cancer

188.4 Discuss the endogenous cells capable of targeting cancer cells; specifically address the role of NK cells and γδ T cells

188.5 Recognize the therapeutic impact of inducing expression of costimulatory molecules on tumor cells

188.6 Apply the influence of IFN-γ on antigen processing & MHC expression to viral & tumor immunity

189 Pregnancy and Parturition

189.1 Describe the process of fertilization, including capacitation and the acrosome reaction, and the movement of the blastocyst to the uterus.

189.2 Describe the process of implantation.

189.3 Describe the development and the major physiological functions of the placenta.

189.4 List the protein hormones secreted by the placenta and describe the role of human chorionic gonadotropin (hCG) in the rescue of the corpus luteum in maintaining pregnancy early post-implantation.

189.5 Describe the interactions between the placenta and the fetus in the pathway for production of estrogens during pregnancy.

189.6 Discuss the roles of sex steroids, oxytocin, relaxin, and prostaglandins in the initiation and maintenance of parturition.

189.7 Explain the role of hormones in mammary gland development during puberty, pregnancy, and lactation.

189.8 Explain the basis for the inhibition of milk secretion during pregnancy and the initiation of lactation after parturition.

189.9 Describe the neuroendocrine regulation of milk secretion and milk ejection.

189.10 Explain the physiological basis of steroid hormone contraception.

190 Genetic Disorders of Reproductive Systems

190.1 Understand the association between a change in genotype and the resulting change in phenotype associated with the following (as well as any others mentioned during lecture): BRCA1 and BRCA2 hereditary breast and ovarian cancer, Kallmann Syndrome, Precocious Puberty, Aneuploidy.

190.2 Know the frequency of the above-mentioned diseases/disorders among the general populations, as well as any specific populations in which it is particularly prevalent.

ARKANSAS COLLEGE OF
OSTEOPATHIC MEDICINE

Course Name: Foundations of Healthcare-1
Class of/Semester/Year: 2026/Spring/2023
Date Last Revised: December 2, 2022

Approved By: Rance McClain, D.O. _____

Rance McClain, DO
Vice President of Clinical Education
& Dean of ARCOM

Note: Final Approval. May be released to students. Schedule subject to change.

Office of the Dean
479.308.2380 | PO Box 10366 | Fort Smith, AR 72917

ARKANSAS COLLEGE OF OSTEOPATHIC MEDICINE

Arkansas Colleges of Health Education
Course Syllabus

Course Name:	Foundations of Healthcare-1 (FHC-1)
Class of/Semester/Year:	2026/Spring/2023
Course Designation:	COM 582
Term Dates:	January 5, 2023 – May 19, 2023
Course Dates:	January 10, 2023 – May 11, 2023
Total Contact Hours:	24
Credit Hours:	2
Assessment/Grading:	Three Written/Computer Based Exams, CITI Certificate Modules, 1 Article Interpretation Assignment
Location:	Lecture Hall 2
Course Directors:	Kenneth Hensley, PhD; Monica Rojas, MD
Office Hours:	By appointment

Syllabus is subject to change

ARKANSAS COLLEGE OF OSTEOPATHIC MEDICINE

Table of Contents

ARKANSAS COLLEGE OF OSTEOPATHIC MEDICINE

Course Description:
Foundations of Healthcare-1 (FHC-1) is a graded course designed to provide basic principles of continued medical professionalism, population-based medicine as compared to public health and individual care. This course will also provide an understanding of the Healthy People 2030, determinants of health, health disparities, and at-risk populations. We will explore contemporary topics in medical ethics and the role of physician empathy in quality patient care. We will utilize lectures, online tools, and modules to acquire information needed throughout this course. During this course you will also learn a basic introduction of epidemiology and biostatistics which will provide the essentials needed for undergraduate medicine board preparation and analysis of medical research literature. Students will learn about the Collaborative Institutional Training Initiative (CITI) and attain a CITI certificate for use in your future research activities.

Course Goals:
The following course goals reflect broad and enduring knowledge, skills, behaviors, and responsibilities that students should attain as a result of successfully completing the course:

1. Define Epidemiology, Calculate epidemiological measures, rates, and probabilities.
2. Learn the types of study designs, how to analyze studies, and research bias.
3. Master descriptive statistics: Understand normal distribution curves including mean median mode and standard deviation.
4. Understand the use of confidence interval and its relationship to relative risk.
5. Learn about hypothesis, hypothesis testing, errors, p-value, and power.
6. Properly use principles of Bayesian Theory to estimate relative probabilities.
7. Learn about population medicine, public health, ACE, the health goals of America, determinants of health, health disparities, and at-risk populations.
8. Attain a CITI Certificate.
9. Appreciate the importance of empathy and ethical mindfulness in modern healthcare practice.
10. Understand the role of other healthcare professionals and the importance of interprofessional work for the benefit of the patient.
11. Learn about medical ethics and legal issues.

Course Expectations and Student Responsibilities:
Students should refer to the Academic Policies and Regulations section in the ACHE and ARCOM Student Handbooks & the Academic Catalogue for information regarding expected professional behaviors, including conduct and dress code.

Video Capture of Educational Content:
Consistent with the policies surrounding video capture and posting of educational content, recordings of any learning activity are considered a supplemental resource to advance student understanding and for reference at future stages of student education. Recorded materials should not be utilized to replace attendance in the classroom, laboratory, or clinical setting. ARCOM makes no guarantees of reliability for video capture and reserves the right to not allow the

recording of learning activities. There is no substitute for class attendance, being actively engaged in the learning process, investing in the comprehension and application of course material, and interacting with instructors and colleagues. Becoming an osteopathic physician involves much more than the acquisition of knowledge and attainment of a professional title. Professionalism, ethics, problem solving, and communication are among the vital skills that are best developed in active and interactive settings. As such, ARCOM expects students to attend all learning activities and offers no guarantees or warranties as to the recording of educational classroom/laboratory content. There will be no video capture of in-class applications team-based learning (TBL), Foundations of Osteopathic Patient Care (FOPC), or Osteopathic Principles and Practice (OPP). Students are not permitted to render any audio and/or visual recordings of these in-class sessions.

Dress Code:
ARCOM Dress Code (refer to ARCOM Student Handbook & Academic Catalog subheading "Professional Dress Guidelines").

Professionalism:

- Students will conduct themselves professionally at all times, during all educational activities conducted on or off campus. This includes interactions with all faculty, staff, students, clinical faculty, guest lecturers, health care providers, patients, and any other member of the ARCOM community. Unprofessional behavior, conduct, or attire inconsistent with the ARCOM dress code will not be tolerated and will result in administrative action. Students are directed to the ARCOM Student Handbook & Academic Catalog for a full definition of professionalism and list of expected professional behaviors.
- Any unauthorized recording of learning materials and activities used in connection with the ARCOM curriculum or reproduction, rendering, possession, or dissemination of these materials including assessment materials, is considered unprofessional behavior and a violation of copyright. Such behavior is subject to action by the Student Conduct Committee (SCC) for disciplinary action, which may include receiving a grade of "zero" for a graded assessment, course failure, probationary action, suspension, or dismissal from ARCOM.
- Computers, tablets, or notebooks should only be used during lectures to take notes or reference appropriate class topics and reference materials. Students should not be on the internet viewing social media sites, performing online shopping, or playing games, etc. This is disrespectful to the lecturer, inhibits peer learning, and is unprofessional behavior.

Attendance Policy:
Osteopathic medical education prepares students for professional clinical practice. Lectures and labs include didactic material, case presentation, patient demonstrations, informal discussions, team-based learning, and the practice of psychomotor skills. Consistent and prompt class attendance is essential for the learner to benefit from the full educational experience provided. Therefore, ARCOM Faculty have adopted the following attendance policy:

1. Attendance at all lecture sessions within a given course is encouraged, but not required.
2. Attendance is required for guest lecturers and team-based learning experiences. A pattern of absenteeism or tardiness for these sessions is considered unprofessional behavior and will result in a referral to the Student Conduct Committee.

3. Since laboratory sessions are designed to develop clinical and psychomotor skills necessary for success as an osteopathic physician, students are expected to attend all labs, all lectures tied to labs, and all clinical training sessions. If, for any reason, a student misses more than 10% of these required sessions for a given course, the student will receive 1% decrease in final average for each percentage missed over 10%.

   Example: A course with 20 laboratory sessions. A student who misses 3 laboratory sessions (15%) will receive an 5% reduction in his/her final average. A student who misses 4 laboratory sessions (20%) will receive a 10% reduction in his/her final average.
4. If a student misses an exam, he/she will receive a grade of zero. A make-up exam will only be administered on a case-by-case basis with the approval of the course director and/or the Dean of ARCOM.
5. Students considered "at-risk" may be held to a separate attendance policy administered by the Office of Academic Affairs.
6. Students must be physically present to receive credit for attendance. Lectures attended virtually do not count as in-person attendance.
7. Students are responsible for all missed learning material/experiences.
8. It is not possible to replicate lab experiences; therefore, faculty members are not obligated to provide makeup learning experiences.
9. There are no excused absences; however, extenuating circumstances (serious illness/injury, etc.) will be addressed on a case-by-case basis.
10. Absence from class to attend professional events, such as a state or national conference, may be approved on a case-by-case basis.
11. Absence from class due to planned events of a personal nature are not excused absences.
12. A pattern of tardiness is unacceptable. Faculty understand there may be unavoidable instances however, tardiness will not be tolerated on exam days or when guest speakers are in attendance. Admittance to the classroom may not be allowed and the student will be marked as absent.

These attendance policies will be strictly adhered to. It is expected that students will use good judgment when taking an absence, doing so only for legitimate or necessary reasons.

Course Faculty:

Faculty Member	Office	Phone	Email
Kenneth Hensley, PhD	271	479-308-2361	kenneth.hensley@achehealth.edu
Monica Rojas, MD	211	479-308-2343	monica.rojas@achehealth.edu
Henry Lemke, PA	259	479-401-6060	henry.lemke@achehealth.edu
Tyler Farrar, JD	264	479-401-2279	tyler.farrar@achehealth.edu
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Julie Strickland	N/A	GUEST	julie.strickland@ihcgroup.com
Janie Ginocchio	N/A	GUEST	janieginocchio@yahoo.com
Nicholas Comninellis, MD, MPH	N/A	GUEST	nicholas@inmed.us
Lynn Korvick, RN	N/A	GUEST	N/A

ARKANSAS COLLEGE OF OSTEOPATHIC MEDICINE

Faculty Office Hours:
While faculty maintain an open-door policy, **it is strongly recommended that a student in need of a faculty member's time and attention reserve an appointment directly via e-mail** or telephone communication with the faculty member.

Required Course Resources:

Title	Edition	Authors	ISBN-13
First Aid for the USMLE Step 1 2021	31st	Tao Le, Vikas, Bhushan, Matthew Sochat	978-1260467529

Seven Osteopathic Core Competencies:
The faculty and administration of ARCOM attest that the following Osteopathic Core Competencies are met in this course.

1. **Osteopathic Philosophy/Osteopathic Manipulative Medicine (OPP/OMM):** Demonstrate and apply knowledge of accepted standards in osteopathic manipulative treatment appropriate to the specialty. Remain dedicated to life-long learning and to practice habits in osteopathic philosophy and OMM.
2. **Medical Knowledge (MK):** Demonstrate and apply knowledge of accepted standards of clinical medicine in the respective area; remain current with new developments in medicine and participate in life-long learning activities.
3. **Patient Care (PC):** Demonstrate the ability to effectively treat patients and provide medical care that incorporates the osteopathic philosophy, patient empathy, awareness of behavioral issues, the incorporation of preventive medicine and health promotion.
4. **Interpersonal and Communication Skills (ICS):** Demonstrate interpersonal and communication skills that enable a physician to establish and maintain professional relationships with patients, families, and other members of health care teams.
5. **Professionalism (PRO):** Uphold the Osteopathic Oath in the conduct of one's professional activities that promotes advocacy of patient welfare, adherence to ethical principles, and collaboration with health professionals, life-long learning, and sensitivity to a diverse patient population; be cognizant of physical and mental health in order to effectively care for patients.
6. **Practice-Based Learning and Improvement (PBL):** Demonstrate the ability to critically evaluate methods of clinical practice; integrate evidence-based medicine into patient care; show an understanding of research methods; improve patient care practices.
7. **Systems-Based Practice (SBP):** Demonstrate an understanding of health care delivery systems; provide effective and qualitative patient care with the system; and practice cost effective medicine.

Grading Information:
Grading point values and scale are consistent with policies outlined in the ARCOM Student Handbook & Academic Catalog. Students will receive a numerical grade (percentage) at the end of the course with 70% orgreater required to pass.

Students are required to pass all components of each course with a C (70%) or better to progress to the next semester. In order to receive a 70% or better, a student must complete all requirements of the course as defined in the syllabus.

Grade Determination and Scheduled Assignments:

Date	Assessment (CC)	Percentage of Final Grade
Tuesday, February 14, 2023 @ 8:00 - 11:00 AM	EXAM #1	25%
Tuesday, March 21, 2023 @ 8:00 - 11:00 AM	EXAM #2	25%
Friday, April 7, 2023 @ 11:59 PM- Due Date	CITI Certificate Assignment	20%
Monday, May 1, 2023 @ 11:59 PM-Due Date	Article Interpretation Assignment	5%
Thursday, May 11, 2023 @ 8:30 - 12:00 PM	EXAM #3	25%
TOTAL:		**100%**

Examinations:
There will be a total of 3 written summative examinations. In order to pass the course, your 2 summative examination totals must average 70% or greater as well as your overall grade for all components must also average 70% or greater.

Course content, sequencing, grading, and examination policies are subject to change by administration with the approval the Curriculum Committee. Students will be given advanced notice of any substantive changes by email and the ARCOM portal.

ARKANSAS COLLEGE OF OSTEOPATHIC MEDICINE

Foundations of Healthcare-1 Course Schedule:
OMSI Class of 2026

CC	Day	Date	Time	Session #	Title	Instructor	Reading Assignment
IPCS, PC, MK	Tue	Jan 10	8 AM	1	Course Overview	Rojas	
PRO, PC, SBP, IPCS	Wed	Jan 11	9 AM	2	Philosophy of Science	Hensley	
MK, PBLI, PC	Wed	Jan 18	9 AM	3	Components of Research Manuscript	Hensley	
MK, PBLI, PC	Wed	Jan 25	8 AM	4	Types of Study Designs and Bias	Hensley	
MK, PBLI	Tue	Jan 31	8 AM	5	Epidemiological Measures	Hensley	
MK, PBLI	Wed	Feb 1	9 AM	6	How to Interpret Screening Test	Hensley	
PRO, PC	Tue	Feb 7	8 AM	7	Life in US as Compared to Arkansas	Hensley	
	Tue	Feb 14	8 AM		**EXAM #1 (Sessions 1-7)**		
MK, PRO, PC, SBP, IPCS	Fri	Feb 24	9 AM	8	CITI Certification	Hensley	
MK, PBLI, SB, PRO	Tue	Feb 28	8 AM	9	Social Determinants of Health and Health Disparities	Rojas	Covid-19 Pandemic and the Social Determinants of Health. BMJ 2021;372:n129
MK, SBP	Fri	Mar 10	9 AM	10	Introduction to Adverse Childhood Experiences (ACEs)	*Ginocchio	The Wisdom of Trauma Companion Booklet
MK, PBLI, SB, PRO	Tue	Mar 14	8 AM	11	Introduction to Population Medicine	Rojas	
MK, SBP	Wed	Mar 15	9 AM	12	Rural Health	Rojas	

MK, PRO, PC, SBP, IPCS	Fri	Mar 17	8 AM	13	Community Health Workers	Rojas	Wightman, P., McCue, K., Sabo, S. et al. *Community health worker intervention improves early childhood vaccination rates: results from a propensity-score matching evaluation.* **BMC Public Health 22, 1854 (2022).** https://doi.org/10.1186/s12889-022-14239-w
MK, PRO, PC, SBP, IPCS	Fri	Mar 17	9 AM	14	Cultural Humility	Rojas	
	Tue	Mar 21	8 AM		**EXAM #2 (Sessions 8-14)**		
MK, PBLI, SB, PRO	Mon	Mar 27	9 AM	15	Health Leadership for Low Resource Communities	*Comninellis	
MK, PRO, PC, SBP, IPCS	Wed	Apr 5	9 AM	16	End of Life Care	*Strickland	

MK, PRO, PC, SBP, IPCS	Tue	Apr 11	8 AM	17	Biomedical Literature and Statistical Data Retrieval	Manning	
MK, PBLI	Wed	Apr 12	8 AM	18	Biostatistics: Probability	Hensley	
MK, PBLI	Tue	Apr 18	9 AM	19	Biostatistics: Descriptive Statistics	Hensley	
MK, PBLI	Tue	Apr 18	10 AM	20	Biostatistics: Inferential Statistics	Hensley	
MK, PBLI	Tue	Apr 25	9 AM	21	Biostatistics: Scales and Test in Statistics	Hensley	
MK, SBP	Wed	Apr 26	9 AM	22	Medical Malpractice	Farrar	
MK, PRO, PC	Mon	May 1	1 PM	23	Interprofessional Presentation: Physician Assistant	H. Lemke	
MK, PRO, PC	Tue	May 2	8 AM	24	Interprofessional Presentation: Nursing	*Korvick	
	Thu	May 11	8 AM		**EXAM #3 (Sessions 15-24)**		

ARKANSAS COLLEGE OF OSTEOPATHIC MEDICINE

Foundations of Healthcare-1 Course Learning Objectives:

1 Course Overview
- 1.1 Know the components of the US healthcare systems
- 1.2 Understand the concept of Healthcare Influencers
- 1.3 Discuss the different types of payer systems and healthcare delivery systems.

2 Philosophy of Science
- 2.1 Be able to learn organization of scientific process.
- 2.2 Understand the important role of mentorship in building the scientific knowledge (skill learning, acquire the right tools, avoid problems).
- 2.3 Describe the nature of science, what are the different types of science projects.
- 2.4 Learn how to develop and test a newly developed hypothesis? What types of questions should one ask?
- 2.5 Where do you find a good hypothesis? Does a good hunch suffice for a scientific foundation to pursue a hypothesis?
- 2.6 Be able to understand the difference between deductive and inductive reasoning.
- 2.7 Be able to understand the difference between sound and valid scientific arguments.

3 Components of Research Manuscript
- 3.1 Research Article Interpretation Assignments posted in Canvas.
- 3.2 Recognize the parts of a research manuscript.

4 Types of Study Designs and Bias
- 4.1 Identify and understand the different types of study designs and bias of research.
- 4.2 Understand the difference between clinical trials and observational studies and which data analysis to use for each type.
- 4.3 Discuss the application to patient care.

5 Epidemiological Measures
- 5.1 Calculate and understand the relationship of incidence and prevalence.
- 5.2 Know the types of mortality rates.

6 How to Interpret Screening Test
- 6.1 Utilize probability rules to calculate probability in independent and mutually exclusive events.

7 Life in US as Compared to Arkansas
- 7.1 Recognize the role socioeconomic status has health status.
- 7.2 Review data of Marriage, Divorce, Suicide, health care utilization.
- 7.3 Discuss the epidemiology of Mental Health and HIV.
- 7.4 Review and discuss.
- 7.5 Incidence, Prevalence, Morbidity, and Mortality with sample data and maps.

8 CITI Certification
- 8.1 Understand what the CITI certificate is, what it is for, and why it is necessary for research.

9 Social Determinants of Health and Health Disparities
- 9.1 Discuss a general overview of determinants of health.
- 9.2 Describe the social determinants of health and analyze how they impact health outcomes.
- 9.3 Discuss and Identify health disparities and vulnerable populations.

10 Introduction to Adverse Childhood Experiences (ACEs)
- 10.1 Describe the adverse childhood and community experiences (ACE'S) and how they impact the individual development.
- 10.2 Calculate individual ACE score as compared to the average population.
- 10.3 Discuss resilience and its association to ACES

11 Introduction to Population Medicine
- 11.1 Discuss and define Health as described by the World Health Organization (WHO).
- 11.2 Discuss and Define Population Health vs. Public Health.
- 11.3 Discuss Population Health Management.
- 11.4 Describe the Patient Centered Medical Home (PCMH).

12 Rural Health
- 12.1 Define Rural Health.

12.2 Discuss the challenges found in providing rural health care including barriers to care.

13 Community Health Workers

13.1 Review the history of CHW and their importance in a community.
13.2 Understand the role of the CHW.
13.3 Differentiate between CHW in US compare to other countries.

14 Cultural Humility

14.1 Define Cultural Humility.
14.2 Discuss the importance of "Cultural Humility" in healthcare and the impact in physician-patient relationship.

15 Health Leadership for Low Resource Communities

15.1 Describe the importance of Health leaders in limited-resource communities.
15.2 Define "Healthy System" when designing implementing effective interventions based on health needs and on available resources.
15.3 Describe and understand the three-step process to implement a healthy system.
15.4 Recognized the four levels of intervention: population-oriented, disease oriented, primary care, and hospital care.

16 End of Life Care

16.1 Discuss end of life care.
16.2 Define and discuss hospice care.
16.3 Discuss the necessity of interacting and caring for the family of the patient.

17 Biomedical Literature and Statistical Data Retrieval

17.1 Utilize library and free resources to find biomedical literature and statistics.

18 Biostatistics: Probability

18.1 Calculate probability utilizing probability rules in independent and mutually exclusive events.

19 Biostatistics: Descriptive Statistics

19.1 Summarize data through calculating mean, median, and mode.
19.2 Describe the data skewed distribution curve.
19.3 Discuss and calculate standard deviation from a normal distribution curve.

20 Biostatistics: Inferential Statistics

20.1 Calculate Confidence Interval.
20.2 Interpret results of confidence interval to determine clinical significance and associated relative risk.
20.3 Understand hypothesis and significance of the p value
20.4 Identify type 1 and II errors.

21 Biostatistics: Scales and Test in Statistics

21.1 Differentiate between the scales of statistics and understand which are most used.
21.2 Describe statistical test and discuss when to utilize each type of statistical test.

22 Medical Malpractice

22.1 Discuss and define the “physician-patient” relationship.
22.2 Discuss and review the statutory elements of Medical Malpractice.
22.3 Discuss the concept of “consent,” including “informed consent” within the context of Medical Malpractice law.
22.4 Discuss the physician’s Standard of Care within the context of Medical Malpractice law.

23 Interprofessional Presentation: Physician Assistant

23.1 Discuss the roles and responsibilities of other health professionals.
23.2 Recognize the importance of interprofessional teams to optimize health outcomes.
23.3 Discuss the necessity of effective communication with mutual respect and shared values.

24 Interprofessional Presentation: Nursing

24.1 Discuss the education requirements, health team roles and responsibilities of other health professionals.
24.2 Recognize the importance of interprofessional teams to optimize health outcomes.
24.3 Discuss the necessity of effective communication with mutual respect and shared values.

ARKANSAS COLLEGE OF
OSTEOPATHIC MEDICINE

Course Name: Foundations of Osteopathic Patient Care-2
Class of/Semester/Year: 2026/Spring/2023
Date Last Revised: December 5, 2022

Approved By: Rance McClain, D.O. _____

Rance McClain, DO
Vice President of Clinical Education
& Dean of ARCOM

Note: Final Approval. May be released to students. Schedule subject to change

Office of the Dean
479.308.2380 | PO Box 10366 | Fort Smith, AR 72917

ARKANSAS COLLEGE OF OSTEOPATHIC MEDICINE

Arkansas Colleges of Health Education
Course Syllabus

Course Name:	Foundations of Osteopathic Patient Care-2 (FOPC-2)
Class of/Semester/Year:	2026/Spring/2023
Course Designation:	COM 522
Term Dates:	January 5, 2023 – May 19, 2023
Course Dates:	January 5, 2023 – May 11, 2023
Total Contact Hours:	42 Lecture Hours; 58 Lab Hours
Credit Hours:	6 Credit Hours
Assessment/Grading:	Two Lab Practical Exams (March 9, 2023; May 3, & 4, 2023) Three Written Exams (February 14, 2023; March 21, 2023; May 11, 2023) Skills, Lab Quizzes, Miscellaneous as assigned.
Location:	Lecture Hall 2, OMM Lab, SIM Center, SP Center, Classroom 1 TBL Rooms, Virtual Teams
Course Directors:	Andrew Ryals, DO; Donna Shipley, MD
Office Hours:	By appointment

Syllabus is subject to change

ARKANSAS COLLEGE OF OSTEOPATHIC MEDICINE

Table of Contents

ARKANSAS COLLEGE OF OSTEOPATHIC MEDICINE

Course Description:
Foundations of Osteopathic Patient Care (FOPC-2) is the second of four active participation courses during the first two years. It provides 6 credit hours and is designed to introduce clinical skills including the art of medical history taking and physical examination. It also introduces the student to the concept of medical professionalism and ethics, the physician's role and duties toward society and the profession, the concept of the physician-patient relationship and the obligations and rights of both the doctor and the patients they serve. The first year of the course places an emphasis on communication skills, medical history taking and physical examination skills. The second year of the course focuses on the development of the clinical acumen necessary to diagnose and treat the patient while developing problem-solving skills that are required of physicians.

The course places an emphasis on respect for individuals along with an understanding of the diversity of individuals and cultures. The ability to communicate with patients effectively, educate and motivate them to advance their own health and wellness, along with the ability to work collaboratively in a team environment, are essential tools for the physician. These tools are developed during the course.

The course requires active participation and demonstrations of mastery of the core competencies expected of an osteopathic physician. The course utilizes computer-based educational content, lectures, small group case-based learning exercises, problem-solving exercises, clinical laboratory experiences, utilization of standardized patients and simulations as well as assigned reading to provide the basis for the knowledge base and skills foundation expected by our faculty. This course integrates osteopathic principles and practice and correlates with the systems courses taught in the curriculum.

Course Goals:
The following course goals reflect broad and enduring knowledge, skills, behaviors, and responsibilities that students should attain as a result of successfully completing the course:

1. Demonstrate an understanding of and apply the principles of professionalism and ethics in the clinical, educational, and professional settings.
2. Demonstrate the ability to interview a patient and obtain the medical history for both a brief encounter (problem-oriented approach) and a complete medical history.
3. Demonstrate the skills required to perform a pertinent physical examination.
4. Demonstrate the appropriate usage of diagnostic equipment.
5. Demonstrate knowledge of the appropriate medical terminology related to the body systems and properly use them in written and verbal communication.
6. Demonstrate ability to work in an interprofessional team.

Course Expectations and Student Responsibilities:
Students should refer to the Academic Policies and Regulations section in the ACHE and ARCOM Student Handbooks & the Academic Catalogue for information regarding expected professional behaviors, including conduct and dress code.

Video Capture of Educational Content:
Consistent with the policies surrounding video capture and posting of educational content, recordings of any learning activity are considered a supplemental resource to advance student understanding and for reference at future stages of student education. Recorded materials should not be utilized to replace attendance in the classroom, laboratory, or clinical setting. ARCOM makes no guarantees of reliability for video capture and reserves the right to not allow the recording of learning activities. There is no substitute for class attendance, being actively engaged in the learning process, investing in the comprehension and application of course material, and interacting with instructors and colleagues. Becoming an osteopathic physician involves much more than the acquisition of knowledge and attainment of a professional title. Professionalism, ethics, problem solving, and communication are among the vital skills that are best developed in active and interactive settings. As such, ARCOM expects students to attend all learning activities and offers no guarantees or warranties as to the recording of educational classroom/laboratory content. There will be no video capture of in-class applications team-based learning (TBL), Foundations of Osteopathic Patient Care (FOPC), or Osteopathic Principles and Practice (OPP). Students are not permitted to render any audio and/or visual recordings of these in-class sessions.

Dress Code:
ARCOM Dress Code (refer to ARCOM Student Handbook & Academic Catalog subheading "Professional Dress Guidelines"). During lab Lectures where physical examination skills are taught, students must dress in a manner that facilitates a physical examination to be performed on them. Students are expected to perform and receive clinical examinations in laboratory Lectures. In order to minimize interference in learning the physical examination techniques, students must dress in a manner such that their partner will be allowed the best possible access to the body structures.

Full body lab dress requires the following:

- Upper body – must allow for exposure of skin overlying the hands, elbows, shoulders, clavicles, scapula, spine, and most posterior rib angles.
- Men - Modest ARCOM T-shirt, scrub top, or bare skin (when requested)
- Women – Modest AROCM T-shirt or scrub top with modest sports bra or tank top
- Lower body– must allow skin exposure of abdomen, spine, PSIS, knees, ankles, and feet.
- Men and Women – Modest lightweight ARCOM shorts, scrub bottoms or exercise pants. No heavy canvas, denim, or cargo shorts.
- Garments worn for religious reasons are acceptable dress in clinical skill laboratory experiences; however, they should be modified or removed, when necessary, to allow palpation when they would obscure the immediate area to be examined or treated (e.g., head, neck, upper back). Modifications can include adjustment of the covering permitting unobstructed palpation beneath the covering; or substitution of a thinner material that allows for adequate evaluation and treatment. If these modifications are not sufficient for proper exposure and examination, the student will be asked to remove their head covering. Once the examination is completed, the student can replace their head covering.
- Shoes and belts are NOT allowed on the examination tables, as they may rip the vinyl.

Observation, evaluation, and treatment will involve all external body surfaces except the genitalia, breasts, and rectum.

Student doctors are required to fully participate in clinical skill labs. It is necessary to both perform physical examinations and serve as a patient for your partner regardless of gender. The body region being examined and the techniques that are being practiced require adequate exposure for observation, palpation, and auscultation. This requires a male to remove his shirt, and a female to wear a sports bra.

Professionalism:

- Students will conduct themselves professionally at all times, during all educational activities conducted on or off campus. This includes interactions with all faculty, staff, students, clinical faculty, guest lecturers, health care providers, patients, and any other member of the ARCOM community. Unprofessional behavior, conduct, or attire inconsistent with the ARCOM dress code will not be tolerated and will result in administrative action. Students are directed to the ARCOM Student Handbook & Academic Catalog for a full definition of professionalism and list of expected professional behaviors.
- Any unauthorized recording of learning materials and activities used in connection with the ARCOM curriculum or reproduction, rendering, possession, or dissemination of these materials including assessment materials, is considered unprofessional behavior and a violation of copyright. Such behavior is subject to action by the Student Conduct Committee (SCC) for disciplinary action, which may include receiving a grade of "zero" for a graded assessment, course failure, probationary action, suspension, or dismissal from ARCOM.
- Computers, tablets, or notebooks should only be used during lectures to take notes or reference appropriate class topics and reference materials. Students should not be on the internet viewing social media sites, performing online shopping, or playing games, etc. This is disrespectful to the lecturer, inhibits peer learning, and is unprofessional behavior.

During **STANDARDIZED PATIENT OR SIMULATION EXERCISES** students MUST dress appropriately to participate in the examination. Attire should be professional in nature, as described in the student handbook, and in particular for patient (SP included) encounters:

- Men: Shirt and tie, dress slacks, dress shoes and socks
- Women: Dresses, skirts, or dress slacks with blouse and/or sweater. Skirts must be no shorter than 3 inches above knees, inclusive of any slits. Shoulders and cleavage should be covered completely. Undergarments should not be visible. Closed toe dress shoes. Nails must be short to avoid harm to the patient. Due to patient safety regulations, **NO** artificial nails or perfumes may be worn during Standardized Patient encounters.

For practical examinations: ALL STUDENTS MUST WEAR THEIR WHITE LAB COATS AND HAVE THEIR STUDENT ID.

BRING STETHOSCOPES. Amplified stethoscopes, any similar device that may mimic a recording or communicating device, and any attachments to a standard stethoscope (e.g., light source) are prohibited.

Do not wear wrist watches or bring other personal timing devices to the examination. Clocks are in each examination room and throughout the testing center. Regular audio timing prompts also guide candidates through their tests.

Do not bring pagers, cell/smartphones, tablets, laptops, iPods, MP3 players, manuals, or other clinical or electronic resources into the testing area. Likewise, do not bring valuables such as jewelry.

Any documentation in the SOAP note that reflects a portion of the physical examination that was NOT performed during the Practical is considered unprofessional and is prohibited and may result in a referral to the Student Conduct Committee.

Any conduct, including bringing non-approved apparel into the testing center, that is deemed unprofessional or is prohibited, may result in a warning or ending the examination at that point. No grades will be given for any actions after you are told that your exam has ended.

Attendance Policy:

Osteopathic medical education prepares students for professional clinical practice. Lectures and labs include didactic material, case presentation, patient demonstrations, informal discussions, team-based learning, and the practice of psychomotor skills. Consistent and prompt class attendance is essential for the learner to benefit from the full educational experience provided. Therefore, ARCOM Faculty have adopted the following attendance policy:

1. Attendance at all lecture sessions within a given course is encouraged, but not required.
2. Attendance is required for guest lecturers and team-based learning experiences. A pattern of absenteeism or tardiness for these sessions is considered unprofessional behavior and will result in a referral to the Student Conduct Committee.
3. Since laboratory sessions are designed to develop clinical and psychomotor skills necessary for success as an osteopathic physician, students are expected to attend all labs, all lectures tied to labs, and all clinical training sessions. If, for any reason, a student misses more than 10% of these required sessions for a given course, the student will receive 1% decrease in final average for each percentage missed over 10%.

   Example: A course with 20 laboratory sessions.
   A student who misses 3 laboratory sessions (15%) will receive an 5% reduction in his/her final average. A student who misses 4 laboratory sessions (20%) will receive a 10% reduction in his/her final average.
4. If a student misses an exam, he/she will receive a grade of zero. A make-up exam will only be administered on a case-by-case basis with the approval of the course director and/or the Dean of ARCOM.
5. Students considered "at-risk" may be held to a separate attendance policy administered by the Office of Academic Affairs.
6. Students must be physically present to receive credit for attendance. Lectures attended virtually do not count as in-person attendance.
7. Students are responsible for all missed learning material/experiences.
8. It is not possible to replicate lab experiences; therefore, faculty members are not obligated to provide makeup learning experiences.

9. There are no excused absences; however, extenuating circumstances (serious illness/injury, etc.) will be addressed on a case-by-case basis.
10. Absence from class to attend professional events, such as a state or national conference, may be approved on a case-by-case basis.
11. Absence from class due to planned events of a personal nature are not excused absences.
12. A pattern of tardiness is unacceptable. Faculty understand there may be unavoidable instances however, tardiness will not be tolerated on exam days or when guest speakers are in attendance. Admittance to the classroom may not be allowed and the student will be marked as absent.

These attendance policies will be strictly adhered to. It is expected that students will use good judgment when taking an absence, doing so only for legitimate or necessary reasons.

Course Faculty:

Faculty Member	Office	Phone	Email
Andrew Ryals, DO	210	479-308-2335	andrew.ryals@achehealth.edu
Kaitlin McNamara, DO	215	479-308-2332	kaitlin.mcnamara@achehealth.edu
Donna Shipley, MD	209	479-308-2326	donna.shipley@achehealth.edu
Patty Pettway, DO	CoHS 313	N/A	patty.pettway@achehealth.edu
Roger Bise, MD	CoHS 313	479-308-2342	roger.bise@achehealth.edu
Monica Rojas, MD	211	479-308-2343	monica.rojas@achehealth.edu
Leslie Ziegler, MD	219	479-308-2333	leslie.ziegler@achehealth.edu
Joseph Queeney, DO	231	479-308-2337	joe.queeney@achehealth.edu
Dan Lynch, DO	233	479-308-2331	dan.lynch@achehealth.edu
Mike Gooden, MD	213	N/A	michael.gooden@achehealth.edu
Ryan Sullivan, DO	213	N/A	ryan.sullivan@achehealth.edu

Faculty Office Hours:

While faculty maintain an open-door policy, **it is strongly recommended that a student in need of a faculty member's time and attention reserve an appointment directly via e-mail** or telephone communication with the faculty member.

Additionally, the faculty ***may not be available*** to answer student questions ***24 hours prior*** to an examination due to test preparation obligations. Students should budget their time appropriately and set appointments with faculty members during their office hours well in advance of exams. Faculty **may have limited availability** to respond to emails during the evenings, weekends, holidays, or days in clinic, so students should plan accordingly.

ARKANSAS COLLEGE OF OSTEOPATHIC MEDICINE

Required Course Resources:

Title	Edition	Authors	ISBN-13
Bates Guide to Physical Examination and History Taking	13th	Lynn S. Bickley	978-1496398178

Recommended Course Resources:
USCD's Practical Guide to Clinical Medicine, Charlie Goldberg, (online course)
www.meded.ucsd.edu/clinicalmed

Access Medicine: Auscultation Classroom, (online database)

Bates' Visual Guide to the Physical Examination, (online database)
http://ache.idm.oclc.org/login?url=https://batesvisualguide.com/multimedia.aspx?categoryID=21787#21768

Robbins and Cotran Pathologic Basis of Disease, 10th ed., 2020, Kumar et al., ISBN (hdbk) 9780323531139

Harrison's Principles of Internal Medicine, 20th ed., 2018, Jameson et al., ISBN (hdbk) 9781259644030

Seven Osteopathic Core Competencies:
The faculty and administration of ARCOM attest that the following Osteopathic Core Competencies are met in this course.

1. **Osteopathic Philosophy/Osteopathic Manipulative Medicine (OPP/OMM):** Demonstrate and apply knowledge of accepted standards in osteopathic manipulative treatment appropriate to the specialty. Remain dedicated to life-long learning and to practice habits in osteopathic philosophy and OMM.
2. **Medical Knowledge (MK):** Demonstrate and apply knowledge of accepted standards of clinical medicine in the respective area; remain current with new developments in medicine and participate in life-long learning activities.
3. **Patient Care (PC):** Demonstrate the ability to effectively treat patients and provide medical care that incorporates the osteopathic philosophy, patient empathy, awareness of behavioral issues, the incorporation of preventive medicine and health promotion.
4. **Interpersonal and Communication Skills (ICS):** Demonstrate interpersonal and communication skills that enable a physician to establish and maintain professional relationships with patients, families, and other members of health care teams.
5. **Professionalism (PRO):** Uphold the Osteopathic Oath in the conduct of one's professional activities that promotes advocacy of patient welfare, adherence to ethical principles, and collaboration with health professionals, life-long learning, and sensitivity to a diverse patient population; be cognizant of physical and mental health in order to effectively care for patients.
6. **Practice-Based Learning and Improvement (PBL):** Demonstrate the ability to critically evaluate methods of clinical practice; integrate evidence-based medicine into patient care; show an understanding of research methods; improve patient care practices.

7. **Systems-Based Practice (SBP):** Demonstrate an understanding of health care delivery systems; provide effective and qualitative patient care with the system; and practice cost effective medicine.

Grading Information:
Grading point values and scale are consistent with policies outlined in the ARCOM Student Handbook & Academic Catalog. Students will receive a numerical grade (percentage) at the end of the course with 70% orgreater required to pass.

In order to pass the course, the student must pass each practical, and achieve an average of 70% or above on the written exams. Quizzes, reading assignments, check-offs, and other projects or activities may be assigned as the Course Director deems appropriate.

Grade Determination and Scheduled Assignments:

Date	Assessment (CC)	Percentage of Final Grade
Tuesday, February 14, 2023 @ 8:00 - 11:00 AM	Written Exam #1	**25%**
Thursday, March 9, 2023 @ 8:00 - 5:00 PM	US Practical #1	**Pass/Fail**
Tuesday, March 21, 2023 @ 8:00 - 11:00 AM	Written Exam #2	**25%**
Wednesday, May 3, 2023 @ 8:00 - 7:00 PM Thursday, May 4, 2023 @ 8:00 - 7:00 PM	SP Practical #1	**Pass/Fail**
Thursday, May 11, 2023 @ 8:30 - 12:00 PM	Written Exam #3	**35%**
Throughout the semester	Additional Assignments	**15%**
TOTAL:		**100%**

Examinations:
There will be two standardized patient practicals and three written examinations.

Practicals: Practicals will require the students to perform a History and Physical on a patient(s) and write SOAP notes on each patient that they encounter. A passing grade is making a Satisfactory or above on **2 out of 3 portions** of the SP Encounter, and a Satisfactory or above on **3 out of 4 elements** on the SOAP note.

Assignments: Assignments will be given periodically throughout the semester. Unless otherwise notified, you will be required to have assignments completed within one week after they are given. Assignments may include anything from modules in Canvas to turning in SOAP notes, or creating cases.

Written examinations: There will be a total of 3 written examinations which include the final examination. All written examinations may have questions from any lecture or lab that was presented at least 48 hours prior to the written examination.

Assessment of core competencies is accomplished by observation of the faculty, evaluations, demonstrations, performance and presentations in small group, laboratory, standardized patient, and simulation setting and cases. The principles of osteopathic medicine should pervasively integrate with your education as you acquire and apply the medical knowledge gained from your studies in all courses. Additionally, the practice of medicine does require cumulative and comprehensive knowledge from multiple disciplines. Resultantly, information from other courses and previous semesters may be included on the examinations when relevant to the material presented. The integration of such content from other courses will be reflected in the learning objectives for the course.

Course content, sequencing, grading, and examination policies are subject to change by administration with the approval the Curriculum Committee. Students will be given advanced notice of any substantive changes by email and the ARCOM portal.

Foundations of Osteopathic Care-2:
OMSI Class of 2026
CC=*All sessions will include all 7 Core Competency

CC	Day	Date	Time	Session #	Title	Instructor	Reading Assignment
*	Thu	Jan 5	11 AM	1	IV starts Lecture	Ryals	
*	Thu	Jan 5	1 PM	L1	IV Starts Lab – Group B	Ryals	
*	Thu	Jan 12	11 AM	2	Assessment and Plan	Shipley	
*	Thu	Jan 12	1 PM	L2	IV Starts Lab – Group A	Ryals	
*	Fri	Jan 13	11 AM	3	Ophthalmology	Greer	
*	Fri	Jan 13	1 PM	L3	Ophthalmology Lab	Greer	
*	Thu	Jan 19	10 AM	4	Neuro Imaging	Queeney	
*	Thu	Jan 19	11 AM	5	Neuro Exam	Queeney	
*	Thu	Jan 19	1 PM	L4	Neuro Exam Lab	Queeney/ Ryals	
*	Fri	Jan 20	1 PM	L5	Applied Medicine	All as Assigned	
*	Mon	Jan 23	8 AM	6	SP debriefing	Panel	
*	Mon	Jan 23	2 PM	7	Developmental Milestones	Nassri	
*	Thu	Jan 26	11 AM	8	Female Breast Exam	Shipley	
*	Thu	Jan 26	1 PM	L6	Female Breast Exam	Panel	
*	Fri	Jan 27	1 PM	9	Mammogram and Breast Imaging	Ihmeidan/ Bise	

*	Thu	Feb 2	10 AM	10	Concussions	McClain	
*	Thu	Feb 2	11 AM	11	Exercise Recommendations	McClain	
*	Thu	Feb 2	1 PM	L7	Sports Physicals	McClain	
*	Thu	Feb 9	10 AM	12	EKG 1	Adjei	
*	Thu	Feb 9	11 AM	13	EKG 2	Adjei	
*	Thu	Feb 9	1 PM	L8	Applied Medicine	All as Assigned	
*	Fri	Feb 10	1 PM	L9	EKG Modules - VIRTUAL	TBD	
	Tue	Feb 14	8 AM		**Written Exam #1**		
*	Thu	Feb 16	10 AM	14	Differential Building	Ziegler	
*	Thu	Feb 16	11 AM	15	Congenital Heart Disease	Nassri	
*	Thu	Feb 16	1 PM	L10	Applied Medicine	All as Assigned	
*	Fri	Feb 17	1 PM	16	Integrated Concepts	Panel	
*	Thu	Feb 23	11 AM	17	Documentation Review	McNamara	
*	Thu	Feb 23	1 PM	L11	SP Practice	Ryals	
*	Fri	Feb 24	1 PM	L12	SP Practice	Ryals	
*	Thu	Mar 2	8 AM	L13	Bladder/Kidney US	Ryals	
*	Thu	Mar 2	1 PM	18	SP debriefing	Panel	
*	Fri	Mar 3	1 PM	19	Integrated Concepts	Panel	
*	Wed	Mar 8	9 AM	20	Renal	McNamara	
*	Wed	Mar 8	10 AM	21	Urology	McNamara	
*	Wed	Mar 8	11 AM	L14	US Review	Panel	
	Thu	Mar 9	8 AM		**US Practical Exam #1**		
*	Thu	Mar 16	10 AM	22	Abdominopelvic Imaging	Ihmeidan	
*	Thu	Mar 16	11 AM	23	Congenital Renal/Urological Conditions	Nassri	
*	Thu	Mar 16	1 PM	L15	Applied Medicine	All as Assigned	
	Tue	Mar 21	8 AM		**Written Exam #2**		
*	Wed	Mar 29	9 AM	24	Integrated Concepts	Panel	
*	Thu	Mar 30	11 AM	25	Taking a History through an Interpreter	Rojas	
*	Thu	Mar 30	1 PM	L16	SP Practice	Ryals	
*	Fri	Mar 31	1 PM	L17	SP Practice	Ryals	
*	Thu	Apr 6	11 AM	26	SP debriefing	Panel	
*	Thu	Apr 6	1 PM	L18	Casecraft 1	All as Assigned	
*	Fri	Apr 7	1 PM	L19	Casecraft 2	All as Assigned	

*	Thu	Apr 13	10 AM	27	GI problems in the pediatric patient (Upper GI) - VIRTUAL	Nassri	
*	Thu	Apr 13	11 PM	28	GI problems in the pediatric patient (Lower GI) - VIRTUAL	Nassri	
*	Thu	Apr 13	1 PM	L20	SP Practice	Ryals	
*	Fri	Apr 14	1 PM	L21	SP Practice	Ryals	
*	Thu	Apr 20	11 AM	29	Complications/Treatments for Obesity	Ryals	
*	Thu	Apr 20	1 PM	30	SP debriefing (small groups)	Panel	
*	Fri	Apr 21	1 PM	L22	Advanced EKG review modules	Panel	
	Thu	Apr 27	8 AM		VR Modules Completion Due Date		
*	Thu	Apr 27	11 AM	31	Prenatal Care	Shipley	
*	Thu	Apr 27	1 PM	32	OPP Integration	McNamara	
*	Fri	Apr 28	1 PM	33	VR Modules debriefing	McNamara	
*	Tue	May 2	8 AM		Case Writeups Due Date		
	Wed	May 3	8 AM		**SP Practical Exam #2**		
	Thu	May 4	8 AM		**SP Practical Exam #2**		
*	Mon	May 8	2 PM	34	Integrated Concepts	Panel	
*	Wed	May 10	8 AM	L23	Patient Safety	Ryals	
*	Wed	May 10	1 PM	35	Debriefing	Panel	
	Thu	May 11	8 AM		**Written Exam #3**		
					Additional Assignments		

Peer feedback: After practicals, students will be expected to view others encounters and SOAP notes and provide constructive feedback about the performance of students assigned to their group. They are not providing the grade for other students, only providing feedback in order to help each other improve upon their performances.

Assessment of core competencies is accomplished by observation of the faculty, evaluations, demonstrations, performance and presentations in small group, laboratory, standardized patient and simulation setting and cases. The principles of osteopathic medicine should pervasively integrate with your education as you acquire and apply the medical knowledge gained from your studies in all courses. Additionally, *the practice of medicine does require cumulative and comprehensive knowledge from multiple disciplines*. Resultantly, information from other courses may be included on the examinations when relevant to the material presented. The integration of such content from other courses will be reflected in the learning objectives for the course.

ARKANSAS COLLEGE OF OSTEOPATHIC MEDICINE

Foundations of Osteopathic Care-2 Course Learning Objectives:

1. **IV Starts and Phlebotomy**
   - 1.1. Discuss reasons to place IV
   - 1.2. Discuss types of equipment and identify needle sizes and types
   - 1.3. Discuss common mistakes/infections
   - 1.4. Review and discuss common lab tests that are performed in the clinic
   - 1.5. Discuss how to document procedures
   - 1.6. Review how to document lab results within the SOAP note
     - 1.6.1. ***Lab 1 Group B IV Starts***
       - 1.6.1.1. Demonstrate the ability to perform venipuncture and IV starts
2. **Assessment and Pan**
   - 2.1. Review the components of a SOAP note
   - 2.2. Describe what goes into an assessment and plan
   - 2.3. Describe how to order the assessment
   - 2.4. Describe the parts of a plan that should be included (medications, testing diet/lifestyle/activity modifications, education, counseling, OMT, follow-up)
     - 2.4.1. ***Lab 2 Group A IV Starts***
       - 2.4.1.1. Demonstrate the ability to perform venipuncture and IV starts
3. **Ophthalmology**
   - 3.1. Review anatomy of the eye
   - 3.2. Discuss common clinical presentations, how to diagnose and treat
   - 3.3. Discuss clinical treatments and when to refer
     - 3.3.1. ***Lab 3 Ophthalmology***
       - 3.3.1.1. Demonstrate the ability to perform a basic, but thorough, clinical eye exam
4. **Neuro Imaging**
   - 4.1. Identify characteristics and components of the CNS
   - 4.2. Demonstrate the ability to obtain and appropriate history for CNS complaints
   - 4.3. Describe the cranial nerve exam and the function and pathology associated with each of the components
   - 4.4. Describe the motor exam and explain how it relates to the CNS
   - 4.5. Describe UMN and LMN signs
   - 4.6. Discuss the studies and images used in diagnosing CNS diseases
   - 4.7. Document CNS findings in SOP note format
5. **Neuro Exam**
   - 5.1. Discuss different types of brain imaging (CT/CTA, MRI)
   - 5.2. Discuss when to order imaging, and what type to order
   - 5.3. Review images and brain anatomy
     - 5.3.1. ***Lab 4 Neuro Exam***
       - 5.3.1.1. Learn the Osteopathic Principles related to the CNS
       - 5.3.1.2. Perform a neurological examination of the central nervous system
       - 5.3.1.3. Perform a cranial nerve exam
     - 5.3.2. ***Lab 5 Applied Medicine***
6. **SP Debriefing**
7. **Developmental Milestones**
   - 7.1. Identify stages of child development
   - 7.2. Understand factors that affect development (physical, intellectual, emotional, and social)
   - 7.3. Compare between normal and abnormal
8. **Female Breast Exam**
   - 8.1. Review normal breast development and discuss common anatomic variants
   - 8.2. Describe general breast cancer epidemiology, risk factors, and screening recommendations
   - 8.3. Identify risk factors for benign breast disease
   - 8.4. Discuss when it would be appropriate to perform a clinical breast exam
   - 8.5. Understand and demonstrate how to elicit a breast history, breast exam, and properly document findings within the SOAP note

8.5.1. ***Lab 6 Female Breast Exam***
- 8.5.1.1. Using task trainers: palpate, describe, document, and explain different breast lesions
- 8.5.1.2. Demonstrate competence in imaging breast cysts, nodules, and solid mases utilizing US
- 8.5.1.3. Define worrisome physical exam findings as they relate to the breast: discharge, depression or inversion of the nipple, discoloration, dermatologic changes, deviation, Virchow nodes

9. Mammogram and Breast Imaging
- 9.1. Describe when a mammogram would be used for screening for breast cancer
- 9.2. Identify common findings seen on mammogram
- 9.3. Identify worrisome lesions when presented with a mammogram image

10. Concussions
- 10.1. Determine when it is safe to return to sports after a concussion
- 10.2. Discuss return to play after various injuries
- 10.3. Discuss how to determine warning signs that an athlete is unable to safely compete

11. Exercise Recommendations
- 11.1. Discuss recommendations for exercise in patients with different goals in mind (weight loss, build strength, be health)
  - 11.1.1. ***Lab 7 Sports Physicals***
    - 11.1.1.1. Demonstrate how to perform a school sports physical

12. EKG 1
- 12.1. Review the basics of how to read an EKG
- 12.2. Recognize the physiology behind the EKG
- 12.3. Demonstrate the ability to recognize basic cardiac rhythms

13. EKG 2
- 13.1. Demonstrate mastery of basic EKG rhythms
- 13.2. Recognize more advanced rhythms, including blocks, hemi-blocks, conduction abnormalities, junctional rhythms
- 13.3. Review treatment options
  - 13.3.1. ***Lab 8 Applied Medicine***
  - 13.3.2. ***Lab 9 EKG Modules***
    - 13.3.2.1. Demonstrate the ability to read EKs with online interactive modules that review and reinforce EKG rhythms, common dysrhythmias, and treatment

14. Differential Building
- 14.1. Continue to sharpen skills in developing the differential diagnosis based on the patient' history, physical and diagnostic work-up
- 14.2. Demonstrate knowledge of computerized data bases to assist in developing the differential diagnosis

15. Congenital Heart Disease
- 15.1. Review embryologic origin of the heart
- 15.2. Discuss common congenital cardiac abnormalities
- 15.3. Discuss clinical implications of common cardiac abnormalities
- 15.4. Discuss appropriate medical and surgical management of patient with common congenital cardiac abnormalities
  - 15.4.1. ***Lab 10 Applied Medicine***

16. Integrated Concepts
- 16.1. Review, discuss, demonstrate comprehensive skills and techniques learned to safely, effectively, and efficiently diagnose and treat patients

17. Documentation Review
- 17.1. Understand the elements of the SOAP note, emphasizing the components of the HPI, History, PE documentation, findings, and documentation results, the Ddx, and the treatment plan
  - 17.1.1. ***Lab 11 SP Practice***
    - 17.1.1.1. Demonstrate the ability to perform a history and physical on a patient
  - 17.1.2. ***Lab 12 SP Practice***

17.1.3. ***Lab 13 Bladder/Kidney US***
17.1.3.1. Demonstrate how to listen to the renal arteries for bruits
17.1.3.2. Differentiate enlarged left kidney vs. spleen
17.1.3.3. Demonstrate how to illicit CVA tenderness
17.1.3.4. Using US, visualize kidneys and bladder and recognize common findings when given imaging
17.1.3.5. Describe common disorders and physical exam findings that provide clues to kidney and urinary system in pediatrics, including congenital abnormalities such as: duplicate collecting system, horseshoe kidney, solitary kidney, hydronephrosis, Wilms tumor, neuroblastomas
17.1.3.6. Accurately document renal system findings within the SOAP note

18. SP Debriefing
18.1. Develop competence in patient encounters through review and development of an improvement plan
18.2. Review SOAP documentation for completeness and accuracy and develop an improvement plan

19. Integrated Concepts
19.1. Review, discuss, demonstrate comprehensive skills and techniques learned to safely, effectively, and efficiently diagnose and treat patients

20. Renal
20.1. Define common terms related to the kidney, including azotemia (pre-/post-renal), post streptococcal glomerulonephritis, nephrotic syndrome, nephritic syndrome, oliguria, anuria, glomerulonephritis
20.2. Demonstrate medical history questions needed to assess renal function and volume status
20.3. Describe ROS questions and focus PE for kidney/GU complaints, such as: dysuria, UTI, pyelonephritis, kidney stone, volume status, edema

21. Urology
21.1. Describe components of UA and how it relates to renal pathology. This includes urine dip, and microscopic findings of various types of casts, cells, and electrolytes
21.1.1. ***Lab 14 US Review***
21.1.1.1. Demonstrate the ability to utilize the ultrasound to find certain anatomical structures

22. Abdominopelvic Imaging
22.1. Review abdominopelvic anatomy
22.2. Discuss optional imaging techniques for abdominopelvic region
22.3. Discuss common clinical presentation that would likely require abdominopelvic imaging, and how to choose imaging modality

23. Congenital Renal/Urological Conditions
23.1. Give general overview of common congenital renal anomalies
23.2. Discuss impacts of these anomalies in childhood and into adulthood
23.3. Review renal imaging techniques and what modalities to choose
23.3.1. ***Lab 15 Applied Medicine***

24. Integrated Concepts
24.1. Review, discuss, demonstrate comprehensive skills and techniques learned to safely, effectively, and efficiently diagnose and treat patients

25. Taking a History Through an Interpreter
25.1. Discuss how to provide equality/equitable care to patients despite language barriers
25.2. Demonstrate how to communicate with patients through interpreter (whether in person or via phone)
25.2.1. ***Lab 16 SP Practice***
25.2.2. ***Lab 17 SP Practice***

26. SP Debriefing
26.1. Develop competence in patient encounters through review and development of an improvement plan
26.2. Review SOAP documentation for completeness and accuracy and develop an improvement plan
26.2.1. ***Lab 18 Casecraft 1***
26.2.1.1. Students develop full patient encounters as this will require comprehensive, and well "crafted' clinical knowledge for a case that is complete and clinically correct
26.2.2. ***Lab 19 Casecraft 2***

26.2.2.1. Students develop full patient encounters as this will require comprehensive, and well "crafted' clinical knowledge for a case that is complete and clinically correct

27. GI Problems in the Pediatric Patient (Upper GI)
- 27.1. Review common upper GI problems in pediatric population
- 27.2. Discuss risk factors associated with upper GI disorders
- 27.3. Discuss clinical decision making in evaluation/management of these common disorders

28. GI Problems in the Pediatric Patient (Lower GI)
- 28.1. Review common lower GI problems in pediatric population
- 28.2. Discuss risk factors associated with lower GI disorders
- 28.3. Discuss clinical decision making in evaluation/management of these common disorders
  - 28.3.1. ***Lab 20 SP Practice***
  - 28.3.2. ***Lab 21 SP Practice***

29. Complications/Treatments for Obesity
- 29.1. Define obesity and its subclassifications
- 29.2. Discuss risk and complications of obesity and children and adults
- 29.3. Discuss prevention and management of obesity in pediatric and adult populations

30. SP debriefing (small groups)
- 30.1.1. ***Lab 22 Advanced EKG Review Modules***
  - 30.1.1.1. Demonstrate the ability to read EKs with online interactive modules that review and reinforce EKG rhythms, advanced dysrhythmias, and treatment

31. Prenatal Care
- 31.1. Discuss common testing performed in the prenatal period
- 31.2. Discuss TORCHES and how these diseases may affect pregnancy/newborn
- 31.3. Discuss when amniocentesis is warranted
- 31.4. Demonstrate knowledge of when to start checking fetal heart tones
- 31.5. Discuss the significance of fundal height
- 31.6. Discuss symptoms to review in pregnancy

32. OPP Integration
- 32.1. Review and discuss Osteopathic Principles as they pertain to the comprehensive patient encounter

33. VR Modules Debriefing
- 33.1. Develop competence in patient encounters, through VR modules, by reviewing and development of an improvement plan
- 33.2. Review SOAP documentation for completeness and accuracy and develop an improvement plan

34. Integrated Concepts
- 34.1. Review, discuss, demonstrate comprehensive skills and techniques learned to diagnose and treat patients safely, effectively, and efficiently
  - 34.1.1. ***Lab 23 Patient Safety***
    - 34.1.1.1. Recognize and understand different safety hazards within the medical setting

35. Debriefing
- 35.1. Develop competence in patient encounters through review and development of an improvement plan
- 35.2. Review SOAP documentation for completeness and accuracy and develop an improvement plan

ARKANSAS COLLEGE OF
OSTEOPATHIC MEDICINE

Course Name: Osteopathic Principles and Practice-2
Class of/Semester/Year: 2026/Spring/2023
Date Last Revised: December 5, 2022

Approved By: Rance McClain, D.O.

Rance McClain, DO
Vice President of Clinical Education
& Dean of ARCOM

Note: Final Approval. May be released to students. Schedule subject to change.

Office of the Dean
479.308.2380 | PO Box 10366 | Fort Smith, AR 72917

ARKANSAS COLLEGE OF OSTEOPATHIC MEDICINE

Arkansas Colleges of Health Education
Course Syllabus

Course Name:	Osteopathic Principles and Practice-2 (OPP-2)
Class of/Semester/Year:	2026/Spring/2023
Course Designation:	COM 512
Term Dates:	January 5, 2023 – May 19, 2023
Course Dates:	January 10, 2023 – May 11, 2023
Total Contact Hours:	20 Lecture Hours; 44 Lab Hours
Credit Hours:	4 Credit Hours
Assessment/Grading:	Three Lecture Exams (February 14, March 21, May 11) Three Lab Practicals (February 14, March 21, May 11)
Location:	Lecture Hall 2, OMM Lab
Course Director:	Joseph Queeney, DO
Office Hours:	By appointment

Syllabus is subject to change

ARKANSAS COLLEGE OF OSTEOPATHIC MEDICINE

Table of Contents

Course Description:
Osteopathic Principles and Practice-2 (OPP-2) is designed to provide the student with a fundamental understanding of the history, principles, and philosophies of osteopathic medicine. During this course, the student will be introduced to the lexicon, foundational principles, and professional expectations upon which the profession was built. The faculty also works in conjunction with other departments to complement and integrate the knowledge received from the systems-based and clinical medicine courses. Whenever possible, the OPP-2 curriculum is designed to integrate with the basic science departments to help enhance your knowledge of structure-function relationships, particularly in the musculoskeletal, nervous, cardiopulmonary, GI, and GU systems, as they apply to osteopathic patient care.

Additionally, the student will sequentially initiate training in the tactile and psychomotor skills necessary for the diagnostic palpation of and manipulative treatments for their future patients, regardless of the medical specialty chosen. This course will instruct the student in the philosophic and diagnostic underpinnings upon which they will continue to build their osteopathic knowledge, the structurally based examination, palpatory and clinical methods and modalities which will continually develop for the rest of their clinical careers.

The OPP Course is cumulative over 4 semesters. Evaluation of concepts and skills will reflect cumulative knowledge.

Course Goals:
The following course goals reflect broad and enduring knowledge, skills, behaviors, and responsibilities that students should attain as a result of successfully completing the course:

1. Be conversant in the theories, history, principles, and tenets of osteopathy, as well as the five models of osteopathic care.
2. Continue to develop foundational palpation skills with an understanding of the theory and application of the following:
   - **a.** Barrier Concept
   - **b.** TART changes
   - **c.** Somatic Dysfunction
   - **d.** Bony Landmarks
   - **e.** Lower Extremity
   - **f.** Upper Extremity
   - **g.** Rib Cage
   - **h.** Lymphatics
   - **i.** Etc.
3. Promote and integrate osteopathic principles as a method of improving the anatomic and physiologic functioning of the patient both as a stand-alone treatment and as a component of a treatment plan.
4. Apply knowledge of the biomedical sciences, such as functional anatomy, physiology, biochemistry, histology, pathology, and pharmacology to support the appropriate application of osteopathic principles and Osteopathic Manipulative Treatment (OMT).

5. Identify the association between organ systems, function, and structural findings.
6. Palpate, diagnose, and treat osteopathically the various regions of the body with both indirect and direct methods of OMT.
7. Continue to develop professionalism.
8. Continue to develop the professional skills, confidence, and rapport necessary to examine and palpate a patient regardless of age, sex, or body habitus.
9. Continue to develop appropriate medical documentation related to osteopathic findings and treatment.

Course Expectations and Student Responsibilities:
Students should refer to the Academic Policies and Regulations section in the ACHE and ARCOM Student Handbooks & the Academic Catalogue for information regarding expected professional behaviors, including conduct and dress code.

OPP Laboratory Training Sessions:
Table assignments for the OPP Laboratory Training Sessions will be made by the OPP Course Director or OPP Coordinator. Students are not allowed to choose their own lab partners. Partners will be randomly assigned to enable the student to observe, examine, receive, and practice palpation and techniques with people of different genders, different body sizes, and body types to prepare students for a variety of patient care experiences.

It is necessary to palpate and receive palpation from both genders. There are clear differences between genders in terms of skin characteristics (turgor, thickness, hair density, etc.), location of landmarks (e.g., PSIS location), and dealing with "sensitive areas" of palpation (anterior ribs on women and pubic tubercles on both genders). There is an ideal opportunity for the student to appreciate these differences in the OPP Laboratory when table trainers are readily available for assistance.

Video Capture of Educational Content:
Consistent with the policies surrounding video capture and posting of educational content, recordings of any learning activity are considered a supplemental resource to advance student understanding and for reference at future stages of student education. Recorded materials should not be utilized to replace attendance in the classroom, laboratory, or clinical setting. ARCOM makes no guarantees of reliability for video capture and reserves the right to not allow the recording of learning activities. There is no substitute for class attendance, being actively engaged in the learning process, investing in the comprehension and application of course material, and interacting with instructors and colleagues. Becoming an osteopathic physician involves much more than the acquisition of knowledge and attainment of a professional title. Professionalism, ethics, problem solving, and communication are among the vital skills that are best developed in active and interactive settings. As such, ARCOM expects students to attend all learning activities and offers no guarantees or warranties as to the recording of educational classroom/laboratory content. There will be no video capture of in-class applications team-based learning (TBL),

Foundations of Osteopathic Patient Care (FOPC), or Osteopathic Principles and Practice (OPP). Students are not permitted to render any audio and/or visual recordings of these in-class sessions.

Dress Code:
ARCOM Dress Code (refer to ARCOM Student Handbook & Academic Catalog subheading "Professional Dress Guidelines").

Students should arrive to all lab course activities in the required OMM uniform in accordance with the ARCOM Student Handbook & Academic Catalog. In lecture, aspiring physicians should "dress to reflect" the professional behavior associated with serving patients and colleagues with respect and dignity.

The required OMM lab uniform is available for purchase at the ARCOM Campus Store. Lab uniforms are required for all didactic labs and practical assessment when students are required to act as "patients" for their lab partner in order to allow the best possible access to body structures. Full body lab dress requires the following:

1. Upper body – must allow for exposure of skin overlying the hands, elbows, shoulders, clavicles, scapula, spine, and posterior rib angles.
   - Men – modest T-shirt, or bare skin (when requested)
   - Women – modest T-shirt with modest sports bra
2. Lower body– must allow skin exposure of abdomen, spine, PSIS, knees, ankles, and feet.
   - Men and Women – modest lightweight shorts (No heavy canvas, denim, or cargo shorts).
3. Under Armour type clothing is not permitted. During cold weather, the student may wear light weight athletic jacket and pants (outer wear) with required uniform underneath.
4. Hats or head coverings (other than for religious purposes) are not permitted in lab.
5. Garments worn for religious reasons are acceptable dress in OMT laboratory experiences; however, they should be modified when necessary to allow visualization and palpation when they would obscure the immediate area to be examined or treated (e.g., head, neck, upper back, etc.). Modifications can include adjustment of the covering permitting unobstructed palpation beneath the covering or substitution of a thinner material that allows for adequate evaluation and treatment. If these modifications are not sufficient for proper exposure and examination, the student will be asked to remove the interfering garment(s) until the examination is complete. (Shoes and belts are NOT allowed on the OMT tables as they may rip the vinyl).
6. Observation, evaluation, and treatment will involve all external body surfaces except the genitalia, breasts, and rectum. Student doctors are required to fully participate in OPP labs as developing OMM palpatory skills will serve the student well in any field of medicine he or she chooses. It is necessary to both give and receive palpation from both genders in order to develop proper OMM skills. The body region being examined and the techniques that are being practiced require adequate exposure for observation and palpation. This requires a male to remove his shirt, and a female to wear a sports bra.

Professionalism:

- Students will conduct themselves professionally at all times, during all educational activities conducted on or off campus. This includes interactions with all faculty, staff, students, clinical faculty, guest lecturers, health care providers, patients, and any other member of the ARCOM community. Unprofessional behavior, conduct, or attire inconsistent with the ARCOM dress code will not be tolerated and will result in administrative action. Students are directed to the ARCOM Student Handbook & Academic Catalog for a full definition of professionalism and list of expected professional behaviors.
- Any unauthorized recording of learning materials and activities used in connection with the ARCOM curriculum or reproduction, rendering, possession, or dissemination of these materials including assessment materials, is considered unprofessional behavior and a violation of copyright. Such behavior is subject to action by the Student Conduct Committee (SCC) for disciplinary action, which may include receiving a grade of "zero" for a graded assessment, course failure, probationary action, suspension, or dismissal from ARCOM.
- Computers, tablets, or notebooks should only be used during lectures to take notes or reference appropriate class topics and reference materials. Students should not be on the internet viewing social media sites, performing online shopping, or playing games, etc. This is disrespectful to the lecturer, inhibits peer learning, and is unprofessional behavior.

Attendance Policy:

Osteopathic medical education prepares students for professional clinical practice. Lectures and labs include didactic material, case presentation, patient demonstrations, informal discussions, team-based learning, and the practice of psychomotor skills. Consistent and prompt class attendance is essential for the learner to benefit from the full educational experience provided. Therefore, ARCOM Faculty have adopted the following attendance policy:

1. Attendance at all lecture sessions within a given course is encouraged, but not required.
2. Attendance is required for guest lecturers and team-based learning experiences. A pattern of absenteeism or tardiness for these sessions is considered unprofessional behavior and will result in a referral to the Student Conduct Committee.
3. Since laboratory sessions are designed to develop clinical and psychomotor skills necessary for success as an osteopathic physician, students are expected to attend all labs, all lectures tied to labs, and all clinical training sessions. If, for any reason, a student misses more than 10% of these required sessions for a given course, the student will receive 1% decrease in final average for each percentage missed over 10%.

   Example: A course with 20 laboratory sessions.
   A student who misses 3 laboratory sessions (15%) will receive an 5% reduction in his/her final average. A student who misses 4 laboratory sessions (20%) will receive a 10% reduction in his/her final average.
4. If a student misses an exam, he/she will receive a grade of zero. A make-up exam will only be administered on a case-by-case basis with the approval of the course director and/or the Dean of ARCOM.
5. Students considered "at-risk" may be held to a separate attendance policy administered by the Office of Academic Affairs.

6. Students must be physically present to receive credit for attendance. Lectures attended virtually do not count as in-person attendance.
7. Students are responsible for all missed learning material/experiences.
8. It is not possible to replicate lab experiences; therefore, faculty members are not obligated to provide makeup learning experiences.
9. There are no excused absences; however, extenuating circumstances (serious illness/injury, etc.) will be addressed on a case-by-case basis.
10. Absence from class to attend professional events, such as a state or national conference, may be approved on a case-by-case basis.
11. Absence from class due to planned events of a personal nature are not excused absences.
12. A pattern of tardiness is unacceptable. Faculty understand there may be unavoidable instances however, tardiness will not be tolerated on exam days or when guest speakers are in attendance. Admittance to the classroom may not be allowed and the student will be marked as absent.

These attendance policies will be strictly adhered to. It is expected that students will use good judgment when taking an absence, doing so only for legitimate or necessary reasons.

Course Faculty:

Faculty Member	Office	Phone	Email
Rance McClain, DO	281	479-308-2382	rance.mcclain@achehealth.edu
Dan Lynch, DO	233	479-308-2331	dan.lynch@achehealth.edu
Joseph Queeney, DO	231	479-308-2337	joe.queeney@achehealth.edu
Andrew Ryals, DO	210	479-308-2335	andrew.ryals@achehealth.edu
Kaitlin McNamara, DO	215	479-308-2332	kaitlin.mcnamara@achehealth.edu
Charles Craft, DO	N/A	N/A	charles.craft@achehealth.edu
Marshall Parker, DC	N/A	N/A	mashall.parker@achehealth.edu
Paige Parker, DC	N/A	N/A	paige.parker@achehealth.edu

Faculty Office Hours:

While faculty maintain an open-door policy, **it is strongly recommended that a student in need of a faculty member's time and attention reserve an appointment directly via e-mail** or telephone communication with the faculty member.

Required Course Resources:

Title	Edition	Authors	ISBN-13
Foundations of Osteopathic Medicine	4th	Seffinger, M	978-1496368324
Atlas of Osteopathic Techniques	4th	Nicholas, A. & Nicholas, E	978-1975127480
Osteopathic Approach to Diagnosis and Treatment	4th	DiGiovanna, E., Amen, D.J., Burns, D.K.	978-1496385994

ARKANSAS COLLEGE OF OSTEOPATHIC MEDICINE

Recommended Course Resources:

Title	Edition	Authors	ISBN-13
Outline of Osteopathic Manipulative Procedures: the Kimberly Manual	2008 Update	Kimberly, P. & Funk, S. Kirksville College of Osteopathic Medicine	978-0967133317
Atlas of Common Counterstrain Tender Points	1st	Snider, K. & Glover, J. Kirksville College of Osteopathic Medicine	978-0988262775
Greenman's Principles of Manual Medicine	5th	Destafano, L.	978-1451193909
The Pocket Manual of OMT	2nd	Beatty, D.	978-1608316571
Somatic Dysfunction in Osteopathic Medicine	2nd	Nelson, K. & Glonek, T	978-1451103052

Seven Osteopathic Core Competencies:

The faculty and administration of ARCOM attest that the following Osteopathic Core Competencies are met in this course.

1. **Osteopathic Philosophy/Osteopathic Manipulative Medicine (OPP/OMM):** Demonstrate and apply knowledge of accepted standards in osteopathic manipulative treatment appropriate to the specialty. Remain dedicated to life-long learning and to practice habits in osteopathic philosophy and OMM.
2. **Medical Knowledge (MK):** Demonstrate and apply knowledge of accepted standards of clinical medicine in the respective area; remain current with new developments in medicine and participate in life-long learning activities.
3. **Patient Care (PC):** Demonstrate the ability to effectively treat patients and provide medical care that incorporates the osteopathic philosophy, patient empathy, awareness of behavioral issues, the incorporation of preventive medicine and health promotion.
4. **Interpersonal and Communication Skills (ICS):** Demonstrate interpersonal and communication skills that enable a physician to establish and maintain professional relationships with
5. patients, families, and other members of health care teams.
6. **Professionalism (PRO):** Uphold the Osteopathic Oath in the conduct of one's professional activities that promotes advocacy of patient welfare, adherence to ethical principles, and collaboration with health professionals, life-long learning, and sensitivity to a diverse patient population; be cognizant of physical and mental health in order to effectively care for patients.
7. **Practice-Based Learning and Improvement (PBL):** Demonstrate the ability to critically evaluate methods of clinical practice; integrate evidence-based medicine into patient care; show an understanding of research methods; improve patient care practices.
8. **Systems-Based Practice (SBP):** Demonstrate an understanding of health care delivery systems; provide effective and qualitative patient care with the system; and practice cost effective medicine.

Grading Information:

Grading point values and scale are consistent with policies outlined in the ARCOM Student Handbook & Academic Catalog. Students will receive a numerical grade (percentage) at the end of the course with 70% or greater required to pass.

Students are required to pass all components of each course with a C (70%) or better to progress to the next semester. To receive a 70% or better, a student must complete all requirements of the course as defined in the syllabus.

Grade Determination and Scheduled Assignments:

Date	Assessment (CC)	Percentage of Final Grade
Tuesday, February 14, 2023 @ 8:00 - 11:00 AM	Written Exam #1 (MK)	**30%**
Tuesday, February 14, 2023 @ 12:00 - 7:00 PM	Practical Exam #1 (MK)	**P/F**
Tuesday, March 21, 2023 @ 8:00 - 11:00 AM	Written Exam #2 (MK)	**30%**
Tuesday, March 21, 2023 @ 12:30 - 7:00 PM	Practical Exam #2 (MK)	**P/F**
Thursday, May 11, 2023 @ 8:30 - 12:00 PM	Final Written Exam (MK)	**40%**
Thursday, May 11, 2023 @ 12:30 - 7:00 PM	Final Practical Exam (MK)	**P/F**
TOTAL:		**100%**

Examinations:

Assessment of acquired medical scientific knowledge will be evaluated by formative and summative examinations (written and practical). Assessment of technical competencies will be assessed by check-out assessments, faculty observation of students, peer feedback, and practical examinations. The principles of osteopathic medicine should pervasively integrate the educational process as medical knowledge is acquired and applied in all courses.

Additionally, the practice of medicine requires cumulative and comprehensive knowledge from multiple disciplines. **Therefore, information from other courses may be included on examinations when relevant to the material being assessed.** The integration of such content from other courses will be reflected in the learning objectives for the course.

There will be two written exams **and** a written final examination in the OPP 2 course. Written exams will contain current material as well as cumulative material. These will assess student's biomedical knowledge and their ability to apply the information to solve patient problems within a clinical context. The assessments will emphasize clinical integration and application of course material commensurate with student training. Each of the three written assessments will include new material and up to 50% cumulative component of previous major concepts from any

previously presented material from lecture, lab, or supplemental material. The format of any make up examinations that results from an excused absence is at the discretion of the course director (e.g. a similar exam over similar material with different questions, a comprehensive multiple-choice exam, essay questions, and/or an oral examination). An unexcused absence from a written examination will result in a grade of zero and no remediation for the given examination will be offered. The learning objectives for the course should guide student's learning, however, they are not intended to serve as an examination key. **All written examinations are cumulative.**

The weighted average of the two written exams and final written exam must be at least 70% to pass the OPP course. Additionally, the student must pass each practical exam to pass the course. If a student does not pass the course and remediation is offered through the Student Progress Committee, the type and style of remediation will be at the sole discretion of the course director. Remediation may take the form of a comprehensive written, oral or essay assessment. Remediation may or may not include a practical assessment as well.

OPP Practical Examinations:
Two OPP practical exams and an OPP final practical exam will occur during the semester. These will be administered during a lab session and are designed to keep students up to date with their palpatory skills. **The practical exams are P/F. To pass the course, the student must pass each practical.** A student who fails a practical examination shall be required to remediate at a time of the department's choosing (outside of other lecture or lab hours and within faculty availability) and student availability.

Student will be allowed one attempt to remediate the practical examination. Remediation and retesting for the practical examination are to take place within ten days of the original test date or by the department's choosing. It shall be considered unprofessional behavior if the student does not appear for remediation and the student will be referred to the SCC committee. **All practical examinations are cumulative.**

A failed practical exam **must** be remediated with a review of the material covered on the exam. If the student successfully passes the remediation, the score will be a **P**. If a student misses their initially scheduled practical time assignment due to an unexcused absence, they will receive an **F**. The student must retake the missed exam and be successful to receive a P.

Do not schedule other appointments on the day of a practical as you may be rescheduled at the last minute because of a student emergency or to serve as a "patient" for a student who does not have a partner.

Course content, sequencing, grading, and examination policies are subject to change by administration with the approval the Curriculum Committee. Students will be given advanced notice of any substantive changes by email and the ARCOM portal.

ARKANSAS COLLEGE OF OSTEOPATHIC MEDICINE

Osteopathic Principles and Practice-2 Course Schedule:
OMSI Class of 2026
CC=Core Competency

CC	Day	Date	Time	Session #	Title	Instructor	Reading Assignment
MK, OPP, PRO	Tue	Jan 10	11 AM	1	Thoracic 1	Queeney	
MK, OPP, PRO, ICS	Tue	Jan 10	1 PM	L1	Lab 1 Group B Thoracic 1	Queeney	
MK, OPP, PRO, ICS	Tue	Jan 10	3 PM	L2	Lab 2 Group A Thoracic 2	Queeney	
MK, OPP, PRO, ICS	Thu	Jan 12	1 PM	L3	Lab 3 Group B Build A Technique (BAT Lab)	All Faculty	
MK, OPP, PRO, ICS	Thu	Jan 12	3 PM	L4	Lab 4 Group A Build A Technique (BAT Lab)	All Faculty	
MK, OPP, PRO	Tue	Jan 17	11 AM	2	Thoracic 2	Queeney	
MK, OPP, PRO, ICS	Tue	Jan 17	1 PM	L5	Lab 5 Group B Thoracic 2	Queeney	
MK, OPP, PRO, ICS	Tue	Jan 17	3 PM	L6	Lab 6 Group A Thoracic 2	Queeney	
MK, OPP, PRO	Tue	Jan 24	10 AM	3	Thoracic 3	Lynch	
MK, OPP, PRO	Tue	Jan 24	11 AM	4	Thoracic Review with Practice Questions	Lynch	

MK, OPP, PRO, ICS	Tue	Jan 24	1 PM	L7	Lab 7 Group B Thoracic 3	Lynch	
MK, OPP, PRO, ICS	Tue	Jan 24	3 PM	L8	Lab 8 Group A Thoracic 3	Lynch	
MK, OPP, PRO	Tue	Jan 31	11 AM	5	Lumbar 1	Queeney	
MK, OPP, PRO, ICS	Tue	Jan 31	1 PM	L9	Lab 9 Group B Lumbar 1	Queeney	
MK, OPP, PRO, ICS	Tue	Jan 31	3 PM	L10	Lab 10 Group A Lumbar 1	Queeney	
MK, OPP, PRO	Tue	Feb 7	11 AM	6	Lumbar 2	Queeney	
MK, OPP, PRO, ICS	Tue	Feb 7	1 PM	L11	Lab 11 Group B Lumbar 2	Queeney	
MK, OPP, PRO, ICS	Tue	Feb 7	3 PM	L12	Lab 12 Group A Lumbar 2	Queeney	
MK, OPP, PRO, ICS	Fri	Feb 10	1 PM	L13	Lab 13 Group B Axial Skeletal Ultrasound	Lynch	
MK, OPP, PRO, ICS	Fri	Feb 10	3 PM	L14	Lab 14 Group A Axial Skeletal Ultrasound	Lynch	
	Tue	Feb 14	8 AM		**Written Exam #1 (Cumulative)**	All Faculty	
	Tue	Feb 14	12 PM		**Practical Exam #1 (Cumulative)**	All Faculty	

MK, OPP, PRO, ICS	Mon	Feb 20	1 PM	L15	Lab 15 Group B BAT Lab	All Faculty	
MK, OPP, PRO, ICS	Mon	Feb 20	3 PM	L16	Lab 16 Group A BAT Lab	All Faculty	
MK, OPP, PRO	Tue	Feb 21	10 AM	7	Autonomics	Lynch	
MK, OPP, PRO	Tue	Feb 21	11 AM	8	Thoracic and Lumbar Case Review	Lynch / Queeney	
MK, OPP, PRO, ICS	Tue	Feb 21	1 PM	L17	Lab 17 Group B Lumbar 3	Queeney	
MK, OPP, PRO, ICS	Tue	Feb 21	3 PM	L18	Lab 18 Group A Lumbar 3	Queeney	
MK, OPP, PRO	Tue	Feb 28	11 AM	9	Pelvis 1	Lynch	
MK, OPP, PRO, ICS	Tue	Feb 28	1 PM	L19	Lab 19 Group B Pelvis 1	Lynch	
MK, OPP, PRO, ICS	Tue	Feb 28	3 PM	L20	Lab 20 Group A Pelvis 1	Lynch	
MK, OPP, PRO	Tue	Mar 7	10 AM	10	Pelvis 2	Lynch	
MK, OPP, PRO	Tue	Mar 7	11 AM	11	Pelvis Review	Lynch	

MK, OPP, PRO, ICS	Tue	Mar 7	1 PM	L21	Lab 21 Group B Pelvis 2	Lynch	
MK, OPP, PRO, ICS	Tue	Mar 7	3 PM	L22	Lab 22 Group A Pelvis 2	Lynch	
MK, OPP, PRO	Tue	Mar 14	11 AM	12	Documentation Review	Ryals	
MK, OPP, PRO, ICS	Tue	Mar 14	1 PM	L23	Lab 23 Group B Practice OMM H&P	Ryals	
MK, OPP, PRO, ICS	Tue	Mar 14	3 PM	L24	Lab 24 Group A Practice OMM H&P	Ryals	
MK, OPP, PRO, ICS	Mon	Mar 20	8 AM	L25	Lab 25 Group B Historical Technique	All Faculty	
MK, OPP, PRO, ICS	Mon	Mar 20	10 AM	L26	Lab 26 Group A Historical Technique	All Faculty	
	Tue	Mar 21	8 AM		**Written Exam #2 (Cumulative)**	All Faculty	
	Tue	Mar 21	12:30 PM		**Practical Exam #2 (Cumulative)**	All Faculty	
MK, OPP, PRO	Tue	Mar 28	11 AM	13	Sacrum 1	Lynch	
MK, OPP, PRO, ICS	Tue	Mar 28	1 PM	L27	Lab 27 Group B Sacrum 1	Lynch	
MK, OPP, PRO, ICS	Tue	Mar 28	3 PM	L28	Lab 28 Group A Sacrum 1	Lynch	

MK, OPP, PRO	Tue	Apr 4	10 AM	14	Sacrum 2	Lynch	
MK, OPP, PRO	Tue	Apr 4	11 AM	15	Sacrum Review	Lynch	
MK, OPP, PRO, ICS	Tue	Apr 4	1 PM	L29	Lab 29 Group B Sacrum 2	Lynch	
MK, OPP, PRO, ICS	Tue	Apr 4	3 PM	L30	Lab 30 Group A Sacrum 2	Lynch	
MK, OPP, PRO	Tue	Apr 11	11 AM	16	Cervical Spine 1	Queeney	
MK, OPP, PRO, ICS	Tue	Apr 11	1 PM	L31	Lab 31 Group B Cervical Spine 1	Queeney	
MK, OPP, PRO, ICS	Tue	Apr 11	3 PM	L32	Lab 32 Group A Cervical Spine 1	Queeney	
MK, OPP, PRO	Fri	Apr 14	8 AM	L33	Lab 33 Group B OMM Practice Experience	All Faculty	
MK, OPP, PRO, ICS	Fri	Apr 14	10 AM	L34	Lab 34 Group A OMM Practice Experience	All Faculty	
MK, OPP, PRO, ICS	Tue	Apr 18	11 AM	17	Cervical Spine 2	Queeney	
MK, OPP, PRO, ICS	Tue	Apr 18	1 PM	L35	Lab 35 Group B Cervical Spine 2	Queeney	

MK, OPP, PRO, ICS	Tue	Apr 18	3 PM	L36	Lab 36 Group A Cervical Spine 2	Queeney	
MK, OPP, PRO, ICS	Mon	Apr 24	1 PM	L37	Lab 37 Group B BAT Lab	All Faculty	
MK, OPP, PRO, ICS	Mon	Apr 24	3 PM	L38	Lab 38 Group A BAT Lab	All Faculty	
MK, OPP, PRO	Tue	Apr 25	10 AM	18	**Debrief with questions and answers**	**All Faculty**	
MK, OPP, PRO	Tue	Apr 25	11 AM	19	Cervical Spine 3	Queeney	
MK, OPP, PRO, ICS	Tue	Apr 25	1 PM	L39	Lab 39 Group B Cervical Spine 3	Queeney	
MK, OPP, PRO, ICS	Tue	Apr 25	3 PM	L40	Lab 40 Group A Cervical Spine 3	Queeney	
MK, OPP, PRO	Tue	May 2	11 AM	20	Comprehensive Review	All Faculty	
MK, OPP, PRO, ICS	Tue	May 2	1 PM	L41	Lab 41 Group B Cervical Spine 4	Lynch	
MK, OPP, PRO, ICS	Tue	May 2	3 PM	L42	Lab 42 Group A Cervical Spine 4	Lynch	
MK, OPP, PRO, ICS	Tue	May 9	8 AM	L43	Lab 43 Group B OMM Practice Experience	All Faculty	

MK, OPP, PRO, ICS	Tue	May 9	10 AM	L44	Lab 44 Group A OMM Practice Experience	All Faculty	
	Thu	May 11	8 AM		**Final Written Exam #3 (Cumulative)**	All Faculty	
	Thu	May 11	12:30 PM		**Final Practical Exam #3 (Cumulative)**	All Faculty	

ARKANSAS COLLEGE OF OSTEOPATHIC MEDICINE

Osteopathic Principles and Practice-2 Course Learning Objectives:

1 Thoracic 1

- 1.1 Describe the thoracic regional anatomy and innervation
- 1.2 Relate the functions of the thoracic spine with other regions of the body
- 1.3 Discuss the basic biomechanical functioning of the thoracic spine
- 1.4 Differentiate autonomic levels associated with thoracic and lumbar spine and the organs and vessels to which they are related
- 1.5 Discuss how a patient presents with thoracic somatic dysfunction
  - 1.5.1 ***Lab 1, 2 Thoracic 1 Lab***
    - 1.5.1.1 Screen for and diagnoses tissue texture abnormalities and tender points
    - 1.5.1.2 Discuss the technique principle and classification of soft tissue, MFR, and counterstrain
    - 1.5.1.3 Perform soft tissue, MFR, and counterstrain treatments of the thoracic spine
  - 1.5.2 ***Lab 3, 4 Build A Technique (BAT Lab)***
    - 1.5.2.1 Practice applying fundamentals of OMT when specific technique is unknown

2 Thoracic 2

- 2.1 Review 3 principles of spinal mechanics
- 2.2 Differentiate between neutral and nonneutral dysfunctions
- 2.3 Briefly review diagnosis of the thoracic and lumbar spine using principles of spinal mechanics
  - 2.3.1 ***Lab 5, 6 Thoracic 2 Lab***
    - 2.3.1.1 Screen for and diagnose the thoracic spine for articular restrictions and segmental dysfunction
    - 2.3.1.2 Review the technique principles of articulatory and muscle energy techniques
    - 2.3.1.3 Perform articulatory and muscle energy techniques of the thoracic spine region

3 Thoracic 3

- 3.1 Discuss the evaluation and management of a patient osteopathically
- 3.2 Introduce and discuss potential complexities of diagnosing the thoracic spine
- 3.3 Review clinical conditions of the thoracic

4 Thoracic Review with Practice Questions

- 4.1 Review previous thoracic spine concepts
- 4.2 Present practice questions regarding thoracic spine
  - 4.2.1 ***Lab 7, 8 Thoracic 3 Lab***
    - 4.2.1.1 Screen for and diagnose the thoracic spine for articular restrictions and segmental dysfunction
    - 4.2.1.2 Review the technique principles of HVLA techniques
    - 4.2.1.3 Perform HVLA techniques of the thoracic spine region

5 Lumbar I

- 5.1 Review lumbar regional anatomy and innervation.
- 5.2 Discuss anatomical abnormalities in the lumbar spine
- 5.3 Review the diagnosis of lumbar somatic dysfunction
- 5.4 Describe physical and diagnostic tests for the lumbar region
- 5.5 Discuss clinical presentations related to the lumbar region
  - 5.5.1 ***Lab 9, 10 Lumbar 1 Lab***
    - 5.5.1.1 Screen for and diagnose tissue texture abnormalities and tender points
    - 5.5.1.2 Discuss the technique principle and classification of soft tissue, MFR, and counterstrain
    - 5.5.1.3 Perform soft tissue, MFR, and counterstrain treatments of the lumbar spine region

6 Lumbar 2

- 6.1 Discuss the evaluation and management of a patient osteopathically
- 6.2 Introduce and discuss potential complexities of diagnosing the lumbar spine
- 6.3 Discuss the extensive differential diagnosis of back pain
- 6.4 Review clinical conditions of the lumbar spine
- 6.5 Discuss the concepts of Spondylosis, Spondylolysis, Spondylolisthesis, Spondylitis
  - 6.5.1 ***Lab 11, 12 Lumbar 2 Lab***

- 6.5.1.1 Screen for and diagnose the lumbar spine for articular restrictions and segmental dysfunction
- 6.5.1.2 Review the technique principles of Articulatory and muscle energy techniques
- 6.5.1.3 Perform articulatory and muscle energy techniques of the lumbar spine region
- 6.5.2 ***Lab 13, 14 Axial Skeletal Ultrasound***
  - 6.5.2.1 Practice identifying various structures of the axial skeleton using ultrasound
- 6.5.3 ***Lab 15, 16 Build A Technique (BAT Lab)***
  - 6.5.3.1 Practice applying fundamentals of OMT when specific technique is unknown

7 Autonomics

- 7.1 Review the concepts of viscerosomatic, somatovisceral reflexes, and introduce chapman reflexes
- 7.2 Introduce the concept of the facilitated segment
- 7.3 Understand the difference between patient's presenting with somatovisceral reflexes and viscerosomatic reflexes
- 7.4 Review the approach to treating patients with viscerosomatic and somatovisceral reflexes

8 Thoracic and Lumbar Case Review

- 8.1 Discuss cases of patients presenting with thoracic and lumbar spine issues
  - 8.1.1 ***Lab 17, 18 Lumbar 3 Lab***
    - 8.1.1.1 Screen for and diagnose the lumbar spine for articular restrictions and segmental dysfunction
    - 8.1.1.2 Review the technique principles of HVLA techniques
    - 8.1.1.3 Perform HVLA techniques of the lumbar spine region

9 Pelvis I

- 9.1 Recall the structural anatomy of the sacrum and pelvis and structural relationships to the lumbar spine and lower extremity
- 9.2 Describe the functional anatomy of the sacrum and pelvis
- 9.3 Describe and differentiate iliosacral and sacroiliac motion
- 9.4 Introduce clinical concepts and pelvic dysfunction
  - 9.4.1 ***Lab 19, 20 Pelvis Lab 1***
    - 9.4.1.1 Review landmarks relevant to diagnosis of pelvic dysfunctions
    - 9.4.1.2 Screen for and diagnoses pelvic somatic dysfunction

10 Pelvis 2

- 10.1 Review pelvis techniques not covered in lab

11 Pelvis Review

- 11.1 Review previous pelvis concepts
- 11.2 Practice questions regarding innominate diagnosis
  - 11.2.1 ***Lab 21, 22 Pelvis Lab 2***
    - 11.2.1.1 Diagnose for innominate somatic dysfunction
    - 11.2.1.2 Demonstrate and describe muscle energy of the following innominate and pubic dysfunctions
      - 11.2.1.2.1 Innominate Rotations
      - 11.2.1.2.2 Innominate Shears
      - 11.2.1.2.3 Innominate Flares
      - 11.2.1.2.4 Pubic Shears
      - 11.2.1.2.5 Pubic Compressions

12 Documentation Review

- 12.1 Review different parts of the SOAP note
- 12.2 Review documentation of somatic dysfunction and OMT
  - 12.2.1 ***Lab 23, 24 Practice OMM H&P***
    - 12.2.1.1 Take a brief history of a complaint
    - 12.2.1.2 Assess area of concern and adjacent areas for somatic dysfunction
    - 12.2.1.3 Practice OMT techniques on somatic dysfunctions found
    - 12.2.1.4 Document findings in SOAP note format
  - 12.2.2 ***Lab 25, 26 Historical Technique***
    - 12.2.2.1 Recreate techniques from the early days of osteopathy

13 Sacrum 1
- 13.1 Discuss relevant sacral anatomical landmarks, axes of motion, and biomechanics
- 13.2 Differentiate neutral vs. nonneutral sacral biomechanics
- 13.3 Discuss the motion of the sacrum relative to an L5 somatic dysfunction
  - 13.3.1 ***Lab 27, 28 Sacrum Lab 1***
    - 13.3.1.1 Review landmarks relevant to diagnosis of sacral dysfunctions
    - 13.3.1.2 Screen for and diagnose sacral somatic dysfunction

14 Sacrum 2
- 14.1 Review the sacrum techniques not covered in lab

15 Sacrum Review
- 15.1 Review previous Sacrum information
- 15.2 Present practice questions regarding sacral diagnosis and treatment
  - 15.2.1 ***Lab 29, 30 Sacrum Lab 2***
    - 15.2.1.1 Diagnose for sacral somatic dysfunction
    - 15.2.1.2 Demonstrate and describe muscle energy of the following sacral dysfunctions
      - 15.2.1.2.1 Forward Sacral Torsions
      - 15.2.1.2.2 Backward Sacral Torsions
      - 15.2.1.2.3 Unilateral Sacral Flexion
      - 15.2.1.2.4 Unilateral Sacral Extension
      - 15.2.1.2.5 Bilateral Sacral Flexion
      - 15.2.1.2.6 Bilateral Sacral Extension

16 Cervical Spine 1
- 16.1 Describe the cervical regional anatomy
- 16.2 Relate the functions of the cervical spine with other regions of the body
- 16.3 D Discuss the basic biomechanical functioning of the cervical spine
- 16.4 Discuss how a patient presents with cervical somatic dysfunction
  - 16.4.1 ***Lab 31, 32 Cervical Spine Lab 1***
    - 16.4.1.1 Screen for and Diagnose tissue texture abnormalities and articular restrictions of the cervical spine
    - 16.4.1.2 Review the technique principles and classification of soft tissue and articulatory techniques
    - 16.4.1.3 Practice soft tissue and articulatory techniques for the cervical spine region
  - 16.4.2 ***Lab 33, 34 OMM Practice Experience***
    - 16.4.2.1 Practice taking history from volunteer
    - 16.4.2.2 Evaluate volunteer for somatic dysfunction
    - 16.4.2.3 Perform OMT on volunteer under guidance of faculty

17 Cervical Spine 2
- 17.1 Review facet orientation and ROM of Cervical spine
- 17.2 Review cervical spine mechanics and triplanar diagnosis
- 17.3 Review neuro exam for cervical spine
- 17.4 Review key cervical muscles
- 17.5 Review cervical counterstrain points and treatments
- 17.6 Clinical correlation and review basic spinal pathology
  - 17.6.1 ***Lab 35, 36 Cervical Spine Lab 2***
    - 17.6.1.1 Screen for and diagnose the cervical spine using triplanar diagnostic methods
    - 17.6.1.2 Screen for tissue texture abnormalities and counterstrain tenderpoints in the cervical spine
    - 17.6.1.3 Practice counterstrain for common tender points of the cervical spine (anterior and posterior)
  - 17.6.2 ***Lab 37, 38 Build A Technique (BAT Lab)***
    - 17.6.2.1 Practice applying fundamentals of OMT when specific technique is unknown.

18 Debrief with Questions and Answers

19 Cervical Spine 3
- 19.1 Discuss risk factors of cervical manipulation and vertebral artery dissection

19.1.1 ***Lab 39, 40 Cervical Spine Lab 3***

19.1.1.1 Screen for and diagnose the cervical spine for articular restrictions and segmental dysfunction

19.1.1.2 Review the technique principles of muscle energy techniques

19.1.1.3 Practice muscle energy techniques on the cervical spine region

20 Comprehensive Review

20.1.1 ***Lab 41, 42 Cervical Spine Lab 4***

20.1.1.1 Screen for and diagnose the cervical spine for articular restrictions and segmental dysfunction

20.1.1.2 Review the technique principles of HVLA techniques

20.1.1.3 Perform HVLA techniques of the cervical spine region

20.1.2 ***Lab 43, 44 OMM Practice Experience***

20.1.2.1 Practice taking history from volunteer

20.1.2.2 Evaluate volunteer for somatic dysfunction

20.1.2.3 Perform OMT on volunteer under guidance of faculty