THE University of Vermont HEALTH NETWORK
Elizabethtown Community Hospital
PARAMEDIC PROGRAM

Paramedic Module 2- The Human Body and Systems

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Course Description- This is the second module introducing the students to the human anatomy and physiology. It is presented according to the body systems and how they integrate with one another. Topics will include: Human A&P Overview, Cells, The Skeletal System, The Musculoskeletal System, The Respiratory System, The Cardiovascular System, The lymphatic and Immune System, The Nervous System, The Integumentary System, The Gastrointestinal System, The Endocrine System, The urinary System, The Reproductive System and Human Genetics, Special Sensory Systems, Nutrition and Metabolism, Pathophysiology, and Life Span Development.

Prerequisites- All students must have and maintain current New York State Certification at the EMT or higher level. General program prerequisites can be found in the program handbook.

Book and Technology Requirements-
The UVMHN-ECH paramedic program utilizes a hybrid class format; therefore, students must have Internet access and a basic understanding web browsers, word, and email. This instructor relies almost exclusively on email when communicating with class members; therefore, student access to the Internet is a must. Books, materials, and technology used for this section may include the following:

-*Nancy Caroline's Emergency Care in the Streets. 8th Ed.* (Text, Workbook, and Navigate2 Package). Caroline, N. L., Pollak, A. N., Elling, B., & Smith, M. Sudbury, Mass.: Jones & Bartlett Learning.
-*Anatomy & Physiology for the Prehospital Provider. 2nd Ed.* (Text and Navigate2 Package). Elling, B. & Elling, K.
-iPad (issued with the program)
-FISDAP- All class sessions will be scheduled into the FISDAP scheduler as a lab session for the purpose of documenting lab skills and simulation that may occur in the classroom.

Course Expectation- Due to the hybrid class format, it is expected that the student will participate in all out- of class activities. The time allotted for these activities will be equal or greater to the time allotted for in-class sessions. All assigned homework (Chapter Lectures w/quiz, Discussion forums, Essays, Workbook pages, etc.) shall be done prior to class date. Students are assigned to one primary class location. All classes unless specifically mentioned shall occur at the designated class location (Queensbury- Mountain Lakes Regional EMS Office, 375 Bay Rd., Queensbury, NY; Malone- North Country Community College, 61 Williams St., Malone, NY; Lewis- Essex County Public Safety Building, 702 Stowersville Rd., Lewis, NY). If a course location is changed, notice shall be made with no less than 1 week prior. All classrooms are set-up to additionally be used for skills task training and simulation. This will be a routine part of the course. UVMHN-ECH uses the FISDAP program to track lab skills progression and clinical hours and skills. Students will be assigned lab shifts in FISDAP for each class period and all skills and data will be entered into FISDAP by the student within 48 hours of lab/clinical completion.

Failure to complete data entry will result in grade deductions. (See grading rubric for details). Students are expected to do their own work. Assistance with written assignments, such as proofreading or editing, is encouraged as long as the final concepts and product are those of the student. Information or materials (including ideas, quotes, data, procedures, etc.) from sources other than the student must be given proper credit through appropriate citation. Academic honesty and integrity is expected of all students. Cheating including but not limited to copying, talking to classmates during testing, using notes when prohibited by instructor, and plagiarism will not be tolerated.

Student Expectations- Students are expected to take ownership of their education. They must invest in the time to be adequately prepared for each class, on time, and ready to participate. You will act as part of a team, in both a team leader and team member roles

Attendance requirements- Part of professional accountability is the requirement that students attend all necessary class sessions, as will be expected for work as a paramedic. Attendance of all class sessions will provide the best learning opportunity for not only the individual student, but also their team and the class as a whole. Students must make accommodations as participants of this program to fulfil required work. Attendance is required for all classes unless the student is excused. It is the student's obligation to notify the instructional staff prior to the class session. Absences will be dealt with on an individual basis. Make-up for the missed session will include a meeting with the instructor and a plan developed based on the material missed in said session. Make-up work must be proposed or designed by the student and approved/amended by the instructor.

Student Learning Objectives- *At the completion of this module, the student will:*

1. Describe the levels of organization in the body, from the least complex to the most complex.
2. Discuss the chemical composition of the body, including key substances: carbohydrates, proteins, lipids, nucleic acids, trace elements, and enzymes.
3. Discuss the atomic composition of the body, including chemical bonds and chemical reactions.
4. Explain the concept of fluid balance, including the purpose and mechanisms for maintaining homeostasis.
5. Differentiate between anabolism and catabolism.
6. Describe the components of the cell, including the function of cellular structures.
7. Discuss the life cycle of a cell, including interphase, mitosis, cytokinesis, and differentiation.
8. Discuss aerobic and anaerobic cellular metabolism.
9. Identify the major fluid compartments of the body.
10. Discuss cell transport mechanisms, including diffusion, facilitated diffusion, osmosis, and active transport.
11. Define isotonic, hypotonic, and hypertonic.
12. Describe the types of tissues found in the body, including epithelial tissue, connective tissue, muscle tissue, neural tissue, and membranes.
13. Discuss how the body maintains homeostasis.
14. Describe the anatomy and physiology of the integumentary system, including function, layers of the skin, and other structures present in the skin.
15. Discuss the components of the skeletal system, including types of bones, composition, formation, and joints.
16. List the sections of the spine.
17. Discuss the anatomy and physiology of the muscular system, including gross and microscopic anatomy, actions of muscles, contraction of skeletal muscle fibers, and major muscles of the body.
18. List the divisions and subdivisions of the nervous system including their functions and the structures involved in conduction of electrical impulses.
19. Describe the basic anatomy of the sense organs and explain how they function.

20. Discuss the anatomy and physiology of the endocrine system, including endocrine and exocrine glands, chemistry of hormones, regulation of hormone secretion, and the roles of hormones in various processes in the body.
21. Discuss the anatomy and physiology of the circulatory system, including the composition and function of blood, the heart, the blood vessels, and the blood groups.
22. Discuss the concepts of cardiac output, stroke volume, preload, afterload, and systemic vascular resistance including the Frank-Starling mechanism.
23. Discuss the anatomy and physiology of the lymphatic and immune systems, including their primary structures.
24. Discuss the anatomy and physiology of the respiratory system, including the structure and function of the nasal cavities, pharynx, larynx, trachea, bronchial tree, alveoli, lungs, and pulmonary capillaries.
25. Differentiate between ventilation, oxygenation, and respiration.
26. Describe the process of gas exchange in the alveoli, transportation in the body, and exchange at the cellular level.
27. Discuss the mechanisms that regulate breathing.
28. Explain the anatomy and physiology of the digestive system, including general function, organs and structures involved in digestion, and the process of digestion.
29. Describe the anatomy and physiology of the urinary system, including its components, general function, the process of urine formation, and the role of the kidneys in regulating electrolyte balance, acid-base balance, and blood pressure.
30. Discuss the anatomy and physiology of the reproductive system, including the hormones and structures involved in reproduction, spermatogenesis and oogenesis, and the menstrual cycle.
31. Define pathophysiology, including its role in diagnosing and treating disease.
32. Compare atrophy, hypertrophy, hyperplasia, dysplasia, and metaplasia as means of cellular adaptation.
33. List factors that can affect or upset homeostasis.
34. Explain the causes, clinical manifestations, assessment, and management of various disease processes.
35. Explain the physiologic consequences of fluid deficits and electrolyte imbalances in sodium, potassium, calcium, phosphate, and magnesium.
36. Compare respiratory acidosis, respiratory alkalosis, metabolic acidosis, and metabolic alkalosis.
37. Outline how cellular injury occurs in patients with hypoxia, chemical exposures, infection (sepsis), immunologic exposures (hypersensitivity reactions), infl ammatory conditions, genetic disorders, nutritional imbalances, physical damage (mechanical injury), and other harmful exposures, such as extremes of hot and cold.
38. Define perfusion, including the physiologic consequences of hypoperfusion and the body's compensatory mechanisms..
39. Discuss the causes of central and peripheral shock, including cardiogenic, obstructive, hypovolemic, and distributive shock.
40. Describe multiple organ dysfunction syndrome.
41. Examine the body's three defense mechanisms against pathogens: anatomic barriers, the immune response, and the infl ammatory response.
42. Explain how plasma protein systems—the complement system, the coagulation (clotting) system, and the kinin system—modulate the inflammatory response.
43. Outline each of the four types of hypersensitivity reactions and mechanisms for immunologic injury.
44. Analyze the controllable and uncontrollable risk factors that intersect in order to cause disease.
45. Outline how incidence, prevalence, morbidity, and mortality data are used to analyze disease risk.
46. Analyze risk factors for cancer and cardiovascular disease.
47. Describe the major physiologic and psychosocial characteristics of an individual throught the complete lifespan from newborn to geriatric age groups.

Assessment- Daily quizzes based on the material assigned for that class and module exam at the conclusion of the module.

Activities- Chapter assignments based on the course schedule shall be viewed and the chapter quiz submitted prior to class. Discussion forums will include original posting and response postings as per the forum instructions. Class room activities will include, but are not limited to: Case studies, Small group exercises, teach-back exercises, skills task training, simulation training, problem mapping and decision tree diagraming.

Communication expectations- E-mail will serve as the primary method for out-of class communication between the instructor and students. Therefore, students should check their preferred e-mail account at least once daily. The instructor will attempt to answer each student-generated message within 48 hours of dispatch.

Module 2 Schedule- All in-class sessions will occur on Fridays of the week unless specified by the instructor.

Week 1	The Human Body and Systems	Medical Terminology Human A &P overview, Cells, Skeletal System, Musculoskeletal System, Integumentary System
Week 2		Respiratory System, Cardiovascular System
Week 3		Lymphatic and Immune System, Nervous System, Sensory Systems
Week 4		GI System, Endocrine System, GU System, Reproductive Systems, Nutrition and Metabolism
Week 5		Pathophysiology- Disease Processes
Week 6		Life Span Development
Week 7	Module 2 Exam- The Human Body and Systems	

Grading Rubric-

Cognitive-

Module Exam- The Module exam will be given at the end of the module. This will be an exam based on all of the assigned chapters for that module. The exam will test the cognitive domain and evaluate the student's knowledge, comprehension, application, analysis, synthesis, and evaluation of the course material. The module exam is the culmination of the module. The student must pass the module exam with a minimum score of 70% to move on to the next module. The Module Exams represents 35% of the overall grade.

Quizzes- At the beginning of class sessions, students will in most cases take a quiz based on the chapter assignments for the week. The quiz will range from 10-20 questions. Quizzes are based on a graded based on 100 points. This will comprise 25% of the overall grade.

Chapter Assignments- Each week, chapter/s will be assigned. It is the student's responsibility to view the material prior to class and complete the on-line assessment. This activity must be completed prior to the class session. Chapter assignments are graded based on 100 points. This will comprise 10% of the overall grade.

Discussion Forums / Case Studies / Written Assignments- A discussion forum consist of an assigned topic for which the students will have to research and provide an opinion or presentation based on information found in acceptable media (ie: non-course text books, peer-reviewed journals, research papers, etc.). The forum will have an assigned due date and time. The specifics of the forum will be in the instructions for each week. Typically, forums will require the initial post to be done by Midnight on the Monday of that week and require at least 2 cited references. The students will then review and respond to at least 3 of their classmates. The response posts are typically due by Midnight on the Wednesday of that week. The reply posts should add to the discussion rather than restating information from the original post. Information can agree with the original poster's position as long as additional information is presented to enhance the original post, or a student may divert the discussion to an alternate pathway based on the information they post in their response. The student should have at least 1 cited reference. All posts and responses should be done in the APA format. Points for posting are: Original post is 25 points, each response post is 25 points for a total of 100 possible points. 5 points may be deducted for each late postings. Case studies will be assignments used to re-enforce knowledge through clinical experiences. The case will be presented by the student is if they were documenting the encounter in a patient care report. This will account for 50 points. The student will then present the learning point they perceived in this patient interaction and this will be worth 25 points. The last portion of this assignment will include a referenced article or study that further develops their understanding and knowledge of this experience and shall be worth 25 points for a total of 100 possible points per case study. Written assignments will consist of an assigned topic for which the patient will have to evaluated, discuss, or expand upon per the directions set forth in the assignment. These will often be grades as 100 points for submitted meeting the assigned requirements, or 0 for not submitted. These will comprise 10% of the overall grade.

Psychomotor-

Skills labs, simulation- Skills and task training, along with scenario based learning and simulation will occur as part of the team assignments grade, and the Behavioral / Affective score. All skills and simulation will be tracked in the skills tracking program and reviewed by the staff.

Behavior / Affective-

This student will be evaluated with input from instructional staff, clinical preceptors, field preceptors, fellow students, and patients when possible. We want to ensure that not only is the student a knowledgeable and skillful practitioner, but also demonstrates professionalism, and is a conscientious, compassionate, and empathetic student. Scoring will be based on professional presentation, ie: timeliness, appearance, interactions with team members and patients, etc. Although a mostly subjective

score, there will be criteria established through the points matrix as below. Any category score of 1, must follow up with a remediation and plan of correction. It will comprise 10% of the overall course grade.

	Competent	Borderline-inconsistent	Fails to Perform
Integrity	3	2	1
Empathy	3	2	1
Self-Motivation	3	2	1
Appearance and Personal Hygiene	3	2	1
Self-Confidence	3	2	1
Communications	3	2	1
Time Management	3	2	1
Teamwork and Diplomacy	3	2	1
Respect	3	2	1
Patient Advocacy	3	2	1
Careful delivery of service	3	2	1

Upon completion of this Module, the student will continue on to Module 3.

The instructor reserves the right to modify this syllabus during the course, if needed. The instructor also reserves the right to extend credit for alternative assignments, projects, or presentations.