STRUCTURE AND FUNCTION OF THE HUMAN BODY

General Information

MODULE DESCRIPTION
The Structure & Function module is a multidisciplinary approach to fully integrate the basic disciplines of Histology, Embryology, Gross Anatomy and Physiology of the human body. Development, structure, and function will be emphasized in the healthy state with clinical application to enforce relevance of fundamental principles, concepts, and techniques as they relate to patient care and preventive medicine. This instructional module builds upon the information in the Foundations module to understand the interaction and communication of cells to form tissues, the embryological development and differentiation of tissues into organ systems, the anatomical organization and function of tissues and organ systems, and the dynamic relationship between structure and physiological functions. Imaging techniques including x-ray, ultrasound, computerized tomography and magnetic resonance will be applied and compared with respect to the information they provide in the clinical analysis of structure function relationships and the consequences of abnormalities in health and disease.

MODULE OBJECTIVES
At the end of this module, students will be able to:

1. Identify the molecular components of cells, and relate the molecular organization and interaction to physiological functions of the tissue.

2. Compare and contrast different histological techniques regarding the quality and type of information obtained from these techniques.

3. Identify the different tissues of the human body at the cellular level, and relate the cellular organization and interaction to physiological functions of the tissue.

4. Describe the integration of various tissues into organs of the human body, and relate these structures to the unique physiological functions of the organs.

5. Describe and identify the essential features of normal human anatomy at the cellular, tissue, organ, and system levels.

6. Compare and contrast the gross morphology of various organs to their function in the human body.

7. Describe the mechanisms employed at the cellular, tissue, organ, and major systems level of the human body to maintain homeostasis.
8. Describe the embryological development of organs and organ systems and discuss the underlying defects in major congenital malformations.

9. Demonstrate the positional relationship, extent, and integrity of organs and systems in the intact body.

10. Compare and contrast different imaging techniques regarding the quality and type of information obtained from these techniques.

11. Identify normal anatomical parts and their relationships with neighboring structures through the different imaging techniques, including x-rays, ultrasound, CT and MRI scans.

12. Relate the position and extent of normal human body structures using medical imaging technologies to the intact body.

13. Describe how different organs are integrated in a group and work together to provide particular physiological functions as a system.

14. Describe how physiological functions of the human body are analyzed by functional imaging and diagnostic technologies.

15. Relate the physiological interactions among organ systems to the function of the human body as a whole.

16. Apply knowledge of normal human anatomy and physiology to recognize pathological conditions.

17. Identify potential sites of therapeutic intervention based on knowledge of structure and function.

18. Describe how nutrition and exercise can be used as preventive medicine.

19. Describe anatomical and physiological changes of the major functional systems associated with the various stages of life.

20. Describe the normal repair and regenerative process of the major functional systems of the human body.

**MODULE TEXTBOOKS / READINGS**

**Anatomy**
- Required Text(s) / Readings:
  - Moore, Agur, and Dalley, Essential Clinical Anatomy: 4e
- Supplemental Text(s) / Readings:

**Embryology**
- Required Text(s) / Readings:
- Supplemental Text(s) / Readings:
Histology
Required Text(s) / Readings:
Ross and Pawlina, Histology: A Text and Atlas, 6e
Supplemental Text(s) / Readings:

Physiology
Required Text(s) / Readings:
Guyton and Hall, Textbook of Medical Physiology, 12e
West, Respiratory Physiology: The Essentials, 9e
Supplemental Text(s) / Readings:
Boron and Boulpaep, Medical Physiology, 2e
Ganong’s, Review of Medical Physiology, 23e

Radiology
Required Text(s) / Readings:
Supplemental Text(s) / Readings:

MODULE ASSESSMENT METHODS
FORMATIVE ASSESSMENTS
Weekly Online Quizzes
Week 13-1 Online Quiz
Week 14-2 Online Quiz
Week 15-3 Online Quiz
Week 16-4 Online Quiz
Week 17-5 No Quiz – Short week – Thanksgiving Holiday
Week 18-6 Online Quiz
Week 19-7 Online Quiz
Week 20-8 Online Quiz
Week 21-9 No Quiz
Two –Week Break
Week 22-10 Online Quiz
Week 23-11 Online Quiz
Week 24-12 Online Quiz
Week 25-13 Online Quiz
Week 26-14 Online Quiz
Week 27-15 Online Quiz
Week 28-16 Online Quiz
Week 29-17 No Quiz

Clicker Questions
Throughout Course – Determined by presenter

Verbal Feedback
Throughout Course
### SUMMATIVE ASSESSMENTS

#### Written Exams

<table>
<thead>
<tr>
<th>Week</th>
<th>Exam Description</th>
<th>Points</th>
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<tbody>
<tr>
<td>18-9</td>
<td>Mid-Module Exam</td>
<td>150</td>
</tr>
<tr>
<td>27-17</td>
<td>End-Module Exam</td>
<td>150</td>
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#### Lab Practical Exams

<table>
<thead>
<tr>
<th>Week</th>
<th>Lab Practical Exam Description</th>
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</thead>
<tbody>
<tr>
<td>18-9</td>
<td>Histology Lab Practical</td>
<td>50</td>
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<tr>
<td></td>
<td>Anatomy Lab Practical</td>
<td>50</td>
</tr>
<tr>
<td>27-17</td>
<td>Histology Lab Practical</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Anatomy Lab Practical</td>
<td>50</td>
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</tbody>
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#### Student Presentations

- 100

#### Team-Based Learning

- Individual Readiness Exam: 100
- Group Readiness Exam: 100
- Small Group Participation: 100

### MODULE METHODS OF TEACHING