# TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

## COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

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| 1. Teaching Institution | University of Baghdad / Alkhwarizmi College of Engineering |
| 2. University Department/Centre | Biomedical Engineering Department |
| 3. Course title/code | Physiology\ BME541 |
| 4. Programme(s) to which it contributes | B.Sc. Biomedical Engineering |
| 5. Modes of Attendance offered | Full Time |
| 6. Semester/Year | 2 Semesters |
| 7. Number of hours tuition (total) | 4 Hours weekly |
| 8. Date of production/revision of this specification | 2021 |
| **9. Aims of the Course** | |
| The goal of physiology is to explain the physical and chemical factors that are responsible for the origin, development and progression of life. Physiology course present tremendous challenges to both students& teachers for acquisition of the basic facts is essential to the study of physiology, but also important for students to develop the ability to solve practical, real life problems releated to the knowledge they have acquired. | |

## 10· Learning Outcomes, Teaching ,Learning and Assessment Method

### A- Knowledge and Understanding

Graduates will be able to:

**A2**. Apply their knowledge and understanding of physical and biological laws, mathematics and numerical analysis in order to model Biomedical Engineering and similar systems;

**A4**. Explain the role of Biomedical Engineers in society and the constraints within which their engineering judgment will be exercised.

### B. Subject-specific skills

**B2**. Design, from requirement, market need or specification, a biomedical engineering device implant or system, up to the preliminary design stage, and present this design via a series of poster, written and oral presentations from both group and individual work;

**B3**. Use laboratory and workshop equipment to generate data, including both engineering and physiological measurements, with appropriate rigor;

### Teaching and Learning Methods

Staff involved in the degree program utilize a wide range of teaching methods that they deem the most appropriate for a particular course. These include:

• Lectures where the students write information presented to them via slide show, overhead or written by the lecturer;
• Lectures where the students have some printed notes/handouts and may annotate, or expand these during a spoken lecture;
• Small group and large group tutorial sessions;
• Question and answer sessions during lectures or staff Office Hours;
• Laboratory sessions.

### Assessment methods

1. Seminar presented and discussed.

***Assessment Methods to be used are:***

• Written examinations (Summative assessment);
• Oral presentations of individual and group work;
• Individual written project report(s) of both individual and group projects;
• Homework;
• Take home exams;

• Practical skills will be assessed through laboratory experiments, write – ups, coursework reports, project reports and presentations;
• Experimental, research and design skills will be assessed through laboratory experiments write-ups, coursework reports, project reports and presentations;
• Presentation skills through group presentations and poster presentations.

Quizzes and exams.

**C. Thinking Skills**

**C2**. Analyze and solve engineering problems;
**C3**. Design a Biomedical Engineering system, component or process to meet a need;
**C4**. Integrate knowledge and understanding of other scientific, mathematical, computational or engineering disciplines in order to support their engineering specialization.

**Teaching and Learning Methods**

• External lectures from industry or clinicians;
• Feedback given to students during tutorials;
• Small group and large group tutorial sessions;
• Question and answer sessions during lectures or staff Office Hours;
• Guided reading of texts, journal articles etc., for individual and group projects;
• Completion of web-based exercises or computer based laboratory sessions;

**Assessment methods**

• Individual written project report(s) of both individual and group projects;
• Group written project report(s) of group projects;
• Interview of group project manager and assessment of group project minutes;
• Poster presentation of group project work;
• Practical skills will be assessed through laboratory experiments, write-ups, coursework reports, project reports and presentations;
• Experimental, research and design skills will be assessed through laboratory experiments write-ups, coursework reports, project reports and presentations;
• Presentation skills through group presentations and poster presentations.

D. General and Transferable Skills (other skills relevant to employability and personal development)

**D2**. Use appropriate multi-disciplinary skills to solve Biomedical Engineering problems, combining the biological and engineering knowledge gained through the degree;
**D3**. Demonstrate numeracy and literacy in written reports, project work and examinations;
**D4**. Learn effectively for the purpose of continuing professional development and in a wider context throughout their career.

**11. Course Structure**

| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching Method | Assessment Method |
|---|---|---|---|---|---|
| 1 | 4 | | Introduction to human physiology, Levels of Structural Organization, interrelationships among body organ systems. | | |
| 2 | 4 | | Homeostasis,Feedback Mechanisms, Regulation of body system. | | |
| 3 | 4 | | Blood physiology, Blood Composition and Functions, Formed Elements, | | |
| 4 | 4 | | Bone marrow, Red blood cells, Erythropoietin. | | |
| 5 | 4 | | Production of Erythrocytes, formation of hemoglobin, anemia, polycythemia. Regulation and Requirements for Erythropoiesis | | |
| 6 | 4 | | Blood types, transfusion reactions resulting from mismatching, transplantation of tissue and organs. | | |
| 7 | 4 | | Muscle physiology, skeletal muscle, sarco-tubular system | | |
| 8 | 4 | | Excitation- contraction coupling, muscle twitch, muscle types, | | |

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| | | | Oxygen debt mechanism | | |
| 9 | 4 | | Examination | | |
| 10 | 4 | | Physiology of digestive system, digestion, saliva, gastric juice | | |
| 11 | 4 | | Bile juice, pancreatic juice, intestinal juice | | |
| 12 | 4 | | Absorption, Regulation of digestion. | | |
| 13 | 4 | | Introduction to Immunity, types of immunity, Immunization, Vaccine. | | |
| 14 | 4 | | Resistance of body to infection, Humoral immunity, classes of Antibodies.<br>Complement system, Cell-mediated immunity, types of t-cells | | |
| 15 | 4 | | Examination | | |
| 16 | 4 | | Physiology of urinary system | | |
| 17 | 4 | | Urine formation, GFR, Micturition | | |
| 18 | 4 | | RAASystem. Dialysis | | |
| 19 | 4 | | Physiology of Endocrine system, Cell signaling | | |
| 20 | 4 | | Hormonal System, Transmissions | | |
| 21 | 4 | | Chemical structure of Hormones. | | |
| 22 | 4 | | Mechanisms of hormonal action | | |
| 23 | 4 | | Physiology of Central nervous system, Neurotransmitters, classification of neurotransmitters,neuromodulators , action of neuromodulators | | |
| 24 | 4 | | Examination | | |
| 25 | 4 | | Receptors, classification , mechanism and developmentof receptors | | |
| 26 | 4 | | Reflexes, classification, reflex Arc, Knee-Jerk reflex, withdrawal reflex | | |
| 27 | 4 | | Sensations, somatosensory system, | | |
| 28 | 4 | | Pain, referred pain, analgesia system, gait control theory | | |
| 29 | 4 | | Memory, types of memory | | |
| 30 | 4 | | Term Exam | | |

| 12. Infrastructure | |
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| Required reading:<br>· CORE TEXTS<br>· COURSE MATERIALS<br>· OTHER | 1.C. Gytun.M. D. John (2010) Text book of medical physiology . 13 Edition.<br>2. D. U. Silverthon (2010) Human physiology. 5 Edition.<br>3. K.Sembulingam, Perma Sembulingam.Essential of medical physiology . 6th . edition. 2012<br>4- Elaine N. Marieb, Katja Hoehn. Human Antomy & Physiology, 9th edition. 2013.<br>5- Laralee Sherwood, Christopher ward. Human physiology from cell to system. 2013. |
| Special requirements (include for example workshops, periodicals, IT software, websites) | **1-** Hypothalamic damage in multiple sclerosis correlates with disease activity, disability, depression, and fatigue.<br><br>Kantorová E1, Poláček H2, Bittšanský M3, Baranovičová E3, Hnilicová P3, Čierny D4, Sivák Š1, Nosáľ V1, Zeleňák K5, Kurča E1.<br><br>**2-** Anemia modifies the prognostic value of glycated hemoglobin in patients with diabetic chronic kidney disease.<br><br>Kuo IC1,2, Lin HY1,3, Niu SW1,2, Lee JJ4, Chiu YW4,5, Hung CC4, Hwang SJ4,5, Chen HC4,5.<br><br>**3-** Breathing with neuromuscular disease: Does compensatory plasticity in the motor drive to breathe offer a potential therapeutic target in muscular dystrophy?<br><br>O'Halloran KD1, Burns DP2. |
| Community-based facilities (include for example, guest Lectures , internship , field studies) | |

| 13. Admissions | |
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| Pre-requisites | BME 541 |
| Minimum number of students | 20 |
| Maximum number of students | 30 |