**Course Description Form**

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| 1. Course Name:
 |
| Cell biology |
| 1. Course Code:
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| **WBM-21-08** |
| 1. Semester / Year: 2024
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| Semester |
| 1. Description Preparation Date:
 |
| 2024-03-19 |
| 1. Available Attendance Forms:
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| presence in the classroom |
| 1. Number of Credit Hours (Total) / Number of Units (Total)
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| 60 Hours / 3Units |
| 1. Course administrator's name (mention all, if more than one name)
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| Name: Ali Kareem MohsinEmail: Ali.k@uowa.ed.iq |
| 1. Course Objectives
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| **Course Objectives** | - Cell biology is the study of cell structure and function, and it revolves around the concept that the cell is the fundamental unit of life. Focusing on the cell permits a detailed understanding of the tissues and organisms that cells compose. |
| 1. Teaching and Learning Strategies
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| **Strategy** | •The objectives of this course include teaching the student’s general cell biology, enabling them to distinguish between of cell structure and function, and it revolves around the concept that the cell is the fundamental unit of life. Focusing on the cell permits a detailed understanding of the tissues and organisms that cells compose. |
| 1. Course Structure
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| **Week** | **Hours**  | **Required Learning Outcomes**  | **Unit or subject name**  | **Learning method**  | **Evaluation method**  |
| 1 | 3 | Introduction to cell, Cell theory, Methods of study cells. | Introduction to cell, Cell theory, Methods of study cells.Introduction to cell, Cell theory ( classical and modern): Methods of study cellsElectron microscopes, Scanning Electron microscopes (SEM), Transmission electron microscopes (TEM), Fluorescence microscopy, Immunofluorescence microscopy, Cell Fractionation and Cell culture, Cell shape sand Cell Size | Lectures presented in PDF forma | Daily exams + homework assignments + monthly exams |
| 2 | 3 | Prokaryotic cells, Bacteria/Archaea | Definition of prokaryotic cells, Prokaryotes are the most diverse and numerous cells on earth The world of prokaryotes are divided into two domains, Bacteria/Archaea  | Lectures presented in PDF format | Daily exams + homework assignments + monthly exams |
| 3 | 3 | The Eukaryotic cell, organelles of eukaryotic cells, Yeasts as simple free-living eukaryotes | Definition of eukaryotic cells, Organelles of eukaryotic cells: Nucleus, Mitochondria generate usable energy from food to power the cell, Chloroplasts capture energy from sunlight, Internal membranes create intracellular compartments with different functions, The cytosol is a concentrated aqueous gel of large and small molecules, The cytoskeleton responsibility for Directed Cell | Lectures presented in PDF format | Daily exams + homework assignments + monthly exams |
| 4 | 3 | Viruses | Definition of Viruses,Viruses movement between cells and organisms, Shapes and sizes of viruses,Viruses that cause human diseases, Retroviruses reverse the normal flow of genetic information,The life cycle of a retrovirus.Wrist and Hand | Lectures presented in PDF format | Daily exams + homework assignments + monthly exams |
| 5 | 3 | Introduction to Cell junction plasma, membrane and Plasma membrane transport processes,Cell junction | Definition of Cell junction plasma membrane and Structure and function of plasma membrane,transport across plasma membrane, Specialized membrane transport proteins,Fluid mosaic model of the plasma membrane,Plasma membrane transport processes,Cell junction (cell-to-cell communication). Types of membrane receptors | Lectures presented in PDF format | Daily exams + homework assignments + monthly |
| 6,7 | 3 | Introduction to Cytoplasm and main structural components of Cytoplasm. | Definition of Cytoplasm, Cytosol , main structural components of Cytoplasm: organelles, Interactions among organelles,Definition of Cytoplasmic inclusion: Fat droplets, Glycogen granules, Lipofuscin, Hemosiderin.Definition of Cytoskeleton, Centrosome and cilia and flagella, Major structural elements of The cytoskeleton, Intermediate filaments, Microtubules, Types of microtubules that responsible for many functions in the cell, Actin filaments, Muscle contraction. | Lectures presented in PDF format | Daily exams + homework assignments + monthly |
| 8,9 | 3 | Introduction to Mitochondria, Lysosome and Peroxisome  | Definition of the Mitochondria, Lysosome and Peroxisome, Structure of mitochondria, Biogenesis of mitochondria, Synthesis of ATP, Mitochondria and disease, definition Peroxisomes /Peroxisomes forming. | Lectures presented in PDF format | Daily exams + homework assignments + monthly |
| 10 | 3 | Endoplasmic reticulum | Definition of the endoplasmic reticulum (ER), Overview of endoplasmic reticulum functions and organization, Endoplasmic reticulum–organelle contacts, Overview of Protein translocation Into the endoplasmic reticulum, Insertion of membrane proteins into the endoplasmic reticulum bilayer, Protein folding, Degradation in the endoplasmic reticulum, Diseases linked to protein folding in the ER.  | Lectures presented in PDF format | Daily exams + homework assignments + monthly |
| 11 | 3 | Introduction to Golgi apparatus | Golgi apparatus (secretory membrane system), Golgi apparatus series of membrane-bounded cisternae, The two faces of the Golgi stack, Two models account for the flow of lipids and proteins through the Golgi apparatus | Lectures presented in PDF format | Daily exams + homework assignments + monthly |
| 12 | 3 | The cell division cycle | The cell division cycle, Overview of the cell cycle, The eukaryotic cell cycle includes four phases, The cell-cycle control system, G1 phase, S Phase, M Phase, Mitosis, Cytokinesis, Control of cell numbers and cell size, Regulation of the cell cycle | Lectures presented in PDF format | Daily exams + homework assignments + monthly |
| 13 | 3 | Somatic cell division | Somatic cell division, Prophase, Pro-metaphase, Metaphase, Anaphase,Telophase, The mitotic spindle role during mitosis, Asymmetric cell division. | Lectures presented in PDF format | Daily exams + homework assignments + monthly |
| 14 | 3 | Reproductive cell division | Reproductive cell division, Sexual reproduction, Meiosis and fertilization, Genetics as an experimental tool, The life cycles of sexual organisms have diploid and haploid phases, Meiosis converts one diploid cell into four haploid cells, Meiosis I produces two haploid cells that have chromosomes composed of sister chromatids, Meiosis II resembles a mitotic division. | Lectures presented in PDF format | Daily exams + homework assignments + monthly |
| 15 | 3 | Protein synthesis (from gene to protein) | Definition, Protein synthesis (from gene to protein), Protein synthetic machinery, Messenger RNA, Transfer RNA, Ribosomes, Initiation phase, Elongation phase, Termination phase, Further features of protein synthesis, Spontaneous protein folding, Trigger factor. | Lectures presented in PDF format | Daily exams + homework assignments + monthly |
| 1. Course Evaluation
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|  Daily exams with practical and scientific questions. ‏ Participation scores for difficult competition questions among students Establishing grades for environmental duties and the reports assigned to them Semester exams for the curriculum, in addition to the mid-year exam and final exam |
| 1. Learning and Teaching Resources
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| Required textbooks (curricular books, if any) | Thomas D. Pollard MD, William C. Earnshaw |
| Main references (sources) | https://www.nature.com/scitable/ebooks/cntNm-14749010 |
| Recommended books and references (scientific journals, reports...) | https://www.makktaba.com/2011/02/medicine-alternative-medicine-books.html |