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**Postgraduate Course Book**

**Department:** Biology

**College:** Education

**University:** Salahaddin University

**Subject:** Molecular Biology

**Course Book Level:** second semester

**Lecturer's name:** Dr.Zirak Faqe Ahmed

**Academic Year:** 2023/2024

**Course Book**

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| **1. Course name** | Molecular Biology | |
| **2. Lecturer in charge** | Dr.Zirak Faqe Ahmed Abdulrahman | |
| **3. Department/ College** | Biology /Education | |
| **4. Contact** | 07504607238 | |
| **5. Time (in hours) per week** | Theory: 2  Practical: | |
| **6. Office hours** | 30 hours | |
| **7. Course code** |  | |
| **8. Teacher's academic profile** | **1-** B.Sc. in Biology  2-M.Sc. in Microbiology  3- Ph.D. in Molecular biology  4- post doctorate in stem cells | |
| **9. Keywords** | DNA, RNA, Gene, Replication, Transcription, Translation, and Transposable element | |
| **10. Course overview:**  Molecular Biology course focuses on the structure and function of biologically important molecules, giving a range of theoretical knowledge and practical lab skills.  You will learn about DNA, RNA and proteins and the molecular events that govern cell function while exploring the relevant aspects of biochemistry, genetics and cell biology. | | |
| **11. Course objective:**  Molecular biology deals with nucleic acids and proteins and how these molecules interact within the cell to promote proper growth, division, and development. It is a large and ever-changing discipline. This course will emphasize the molecular mechanisms of DNA replication, repair, protein synthesis …. etc. | | |
| **12. Student's obligation**  A student has the right and is obliged to attend lessons regularly, fulfil their academic obligations, behave in accordance with the university regulations and making exam mhomework and reports stipulated by the law and the university general acts. | | |
| **13. Forms of teaching**  Teaching methods are the broader techniques used to help students achieve learning outcomes, while activities are the different ways of implementing these methods. Teaching methods help students: master the content of the course. learn how to apply the content in particular contexts. | | |
| **14. Assessment scheme**  assessment tasks include: in-class test; mid-term test; final exam; written assignment; project report; presentation  ‌ | | |
| **15. Student learning outcome:**  Molecular Biology gives you in-depth knowledge of biological and/or medicinal processes through the investigation of the underlying molecular mechanisms.  Student will gain an understanding of chemical and molecular processes that occur in and between cells. Your understanding will become such that you will be able to describe and explain processes and their meaning for the characteristics of living organisms. • student will gain insight into the most significant molecular and cell-based methods used today to expand our understanding of biology. | | |
| **16. Course Reading List and References:**   * Molecular Cell Biology - Lodish. ... * Molecular Biology Of The Cell - Bruce Albert et al. ... * Molecular biology of the gene - James Watson et al. ... * Molecular Biology - David Clark. ... * The Encyclopedia Of Molecular Biology - By Creighton. ... * Cell and Molecular Biology - Gerald Karp. ... * Lewin's GENES XI. ... * Essential Genes - Benjamin Lewin. | | |
| **17. Topics Program** | | Lecture’s  Name |
| **Week 1:**  **Steps of DNA transcription** | | Dr.Zirak |
| **Week 2: DNA transcription in Eukaryote** | | Dr.Zirak |
| **Week 3: Post transcription modification** | | Dr.Zirak |
| **Week 4: genes and their types** | | Dr.Zirak |
| **Week 5: Lactose operon** | | Dr.Zirak |
| **Week 6: Genetic code, cistron, open reading Frame** | | Dr.Zirak |
| **Week 7: Translation, initiation elongation and termination** | | Dr.Zirak |
| **Week 8: Post translation modification** | | Dr.Zirak |
| **Week 9: Differences between pro and euk in translation** | | Dr.Zirak |
| **Week 10: Gene regulation in prokaryote and eukaryote** | | Dr.Zirak |
| **Week 11: MicroRNA and their role in the cancer** | | Dr.Zirak |
| **Week 12: Transposable element** | | Dr.Zirak |
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| **18. Grading procedure**  **Grading will be through report, quiz, midterm and final exam.** | |  |
| **19. Examinations:**  **Examination will be in the form of short and long assay.**   1. **Write how the DNA replication are initiate** 2. **How the function of promoter and operator are regulated** 3. **Transcription can be terminated by two ways describe** 4. **What is the role of RHO in translation termination** | |  |
| **20. Extra notes:**  **No extra notes** | | |
| **21. Peer review \*** | | |

\* Must have permission of the Scientific and Higher Education Committee