BIRZEIT UNIVERSITY

PHYSICS DEPARTMENT

Second Semester 2019/2020 Physics 232: Modern Physics

*Instructor:* Professor Henry Jaqaman Office: SCI 210

Office Hours: Monday and Wednesday 10:45 - 12:00

*Schedule:* Monday 12:50 – 14:05 (SCI 114) and Wednesday 12:50 – 14:05 (Aggad 315)

*Text book:* MODERN PHYSICS, by SERWAY, MOSES and MOYER, 3rd Edition (2005).

*References:* you are advised to refer to some other excellent textbooks on Modern Physics like:

1. Weidner and Sells, Elementary Modern Physics (1980)
2. Ohanian, Modern Physics (1995)
3. Krane, Modern Physics (1983)
4. Tipler, Modern Physics (1978)
5. Becchi and D’Elia, Introduction to the Concepts of Modern Physics (2007, electronic)
6. Walecka, Introduction to Modern Physics (2008)

*General Course Description:* This course exposes the students to the new ideas and concepts that revolutionized physics in the early twentieth century. These include relativity, quantum physics and wave-particle duality. Some applications and later developments from statistical physics, tunneling phenomena, atomic and nuclear structure and elementary particle physics will also be discussed

*Evaluation:* Your total grade will be computed according to the following weights:

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| --- | --- | --- | --- | --- |
| Hour Exams | Homework  | Term paper | Final Exam | Total |
| 45% | 15% | 5% | 35% | 100% |

*Course content:* We will cover the following chapters from the assigned textbook. There will be a problem-solving session at the end of every chapter.

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| Chapter | Chapter Title | Discussion Problems |
| 2 | Relativistic Dynamics (Quick Review) | 11, 14, 15, 17, 19, 21, 22, 23 |
| 3 | The Quantum Theory of Light | 3, 4, 12, 13, 14, 15, 23, 24, 25, 27, 29, 30, 37, 38 |
| 4 | The Particle Nature of Matter | Q3, Q5, 9, 11, 16, 17, 22, 25, 37, 38  |
| 5 | Matter Waves | 6, 7, 9, 11, 19, 20, 22, 28, 29 |
| 6 | Quantum Mechanics in One Dimension | 1, 2, 5, 6, 7, 13, 23, 24 |
| 7 | Tunneling Phenomena | 1, 2, 5 |
| 8 | Quantum Mechanics in Three Dimensions | 1, 4, 5, 10, 12, 22,  |
| 9 | Atomic Structure | 3, 4, 5, 7, 10, 11, 12, 15, 16 |
| 10 | Statistical Physics | 1, 2, 10 |
| 13 | Nuclear Structure | 1, 2, 3, 10, 11, 12, 17 |
| 15 | Elementary Particles | 3, 5, 6, 7, 8, 13 |

Dates of hour exams: Wednesday 4/3/2019, Monday 6/4/2019 and Wednesday 6/5/2019

*Note:* Dates of hour exams will not be changed. In case the exam cannot be held for reasons beyond our control (like a snowstorm or general strike) the exam will be held in the next class.

No make-up exams will be held. If you miss an examination without an acceptable excuse you will get a zero for that examination.