**Annexure-1**



**COURSE OUTLINE**

**FACULTY & DEPARTMENT**

**Course Code: PHY-106**

**Course Title: Applied Physics**

**Semester I**

| Faculty: | Awais Ahmad |
| --- | --- |
| Credit Hours: | 3 |
| Semester | Fall 2022 |
| Program: | BS CS |
| Course Convenor:  WhatsApp  Email | Awais Ahmad  awais.ahmad@gift.edu.pk |
| LMS Link |  |
| Consultation Hours: | As per timetable |
| Pre-requisite: | NIL |
| Timing | As per time table |
| This document was last updated: | 07-01-2022 |

| **Course Description** |
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| Applied Physics is an introductory course covering basic concept of electricity and magnetism. Electromagnetism is one of the four fundamental forces of nature, and is at the basis of almost any kind of device that we use on a daily basis. The course introduces electrostatics, magnetostatic and Maxwell’s equations and their applications to physical problems. |

| **Course Goals** |
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| * **Gain deeper understanding of Electricity and Magnetism:** Consolidate the understanding of fundamental concepts in Electricity and Magnetism more rigorously as needed for further studies in physics, engineering and technology. * **Advance skills and capability for formulating and solving problems:** Expand and exercise the students’ physical intuition and thinking process through the understanding of the theory and application of this knowledge to the solution of practical problems. |

| **Learning Outcomes** |
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| Having successfully completed this course, students will be able to demonstrate knowledge and understanding of:   * the use of Coulomb's law and Gauss' law for the electrostatic force * the relationship between electrostatic field and electrostatic potential * the use of the Lorentz force law for the magnetic force * the use of Ampere's law to calculate magnetic fields * the use of Faraday's law in induction problems |

| **Reading Material** |
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| Recommended Books  1. Fundamentals of Physics (Extended), 10th edition, Resnick and Walker 2. Narciso Garcia, Arthur Damask, Steven Schwarz., “Physics for Computer Science Students”, Springer Verlag, 1998University Physics, Freedman. Young. 10th and higher editions.  Learning Material It shall be provided in each session in the form of   * Videos * Book chapter * Lecture videos * Links to webpages etc. |

| **Term Project (If any)** |
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**COURSE SCHEDULE & CONTENTS**

| Class Session | Topics To Cover | | Teaching Material  Reading Material  Reading Material/ \*Book | | Assessment Activities (Assignments, Quiz) |
| --- | --- | --- | --- | --- | --- |
|  | | | | | |
| 01 | | * Introduction: Online learning, LMS: Google Classroom * Course Motivation * Course description   Course outline, Course objectives, assignments and grading etc. | | Reference video  Course description document |  |
| 02 | | Electrostatics  Introduction  Electric Charge, Particles, Atoms, Removal of electrons  Conductors, semiconductors, insulators, Superconductors | | Lecture video  Lecture Slides PPT  Book chapter 21 |  |
|  | |  | |  | Practice Quiz  Assignment 01 |
| 03 | | Properties   * Conservation of charge and Examples * Charge quantization Examples   Coulombs Law | | Lecture video  Lecture Slides PPT  Book chapter 21 |  |
| 04 | | Properties  Examples and discussion | | Lecture video  Lecture Slides PPT  Book chapter 21 |  |
|  | |  | |  | Quiz  Assignment 02 |
| 05 | | Electric Field  Different charge configurations  Superposition principle | | Lecture Video  Lecture Slides PPT  Book chapter 22 |  |
| 06 | | Example Discussion | | Lecture Video  Lecture Slides PPT  Book chapter 22 |  |
|  | |  | |  | Quiz  Assignment 03 |
| 07 | | Electric Dipole  Examples | | Lecture Video  Lecture Slides PPT  Book chapter 22 |  |
| 08 | | Point charge and lines of force.  Ring of charge and related examples | | Lecture Video  Lecture Slides PPT  Book chapter 22 |  |
|  | |  | |  | Quiz  Assignment 04 |
| 09 | | **Flux and Gauss’s Law**   * The flux of vector field, * The flux of electric field, Gauss’ Law, | | Lecture Video  Lecture Slides PPT  Book chapter 23 |  |
| 10 | | Application of Gauss’ Law, related examples | | Lecture video  Lecture Slides PPT  Book chapter 23 |  |
|  | |  | |  | Quiz  Assignment 05 |
| 11 | | Application of Gauss’ Law,  Coulombs Law  related examples | | Lecture video  Lecture Slides PPT  Book chapter 23 |  |
| 12 | | Application of Gauss’ Law  Spherically symmetric charge distribution | | Lecture video  Lecture Slides PPT  Book chapter 23 |  |
|  | |  | |  | Quiz  Assignment 06 |
| 13 | | A charge isolated conductor related examples | | Reference video  Lecture Slides PPT  Lecture notes  Book chapter |  |
| 14 | | Electric potential energy  Electric potentials | | Lecture video  Lecture Slides PPT  Book chapter 24 |  |
| 15 | |  | | Previous lectures | Examples discussion Quiz 07 |
| 16 | | Electric potential  Conversions | | Lecture Slides PPT  Lecture videos  Book chapter 24 |  |
| 17 | | Calculating the potential from the field and related problem | | Lecture Slides PPT  Lecture video  Book chapter |  |
|  | |  | |  | Quiz  Assignment 08 |
| 18 | | Potential due to point and continuous charge distribution related problem | | Lecture Slides PPT  Lecture video  Book chapter |  |
| 19 | | Resistances and current   * Electric current * Current density * Drift Velocity | | Lecture Slides PPT  Lecture video  Book chapter 26 |  |
|  | |  | |  | Quiz  Assignment 09 |
| 20 | | Introduction to Resistance and Resistivity Relationship with Electric field and Current density | | Lecture Slides PPT  Lecture video  Book chapter 26 |  |
| 21 | | Ohm’s law and its applications with examples  Powers in electric circuits | | Lecture Slides PPT  Lecture notes  Book chapter |  |
|  | |  | |  | Quiz  Assignment 10 |
| 22 | | Magnetic Field  Introduction | | Lecture Slides PPT  Lecture notes  Book chapter 28 |  |
| 23 | | Electromagnetic Induction  Introduction to Faraday Law | | Lecture Slides PPT  Lecture notes  Book chapter |  |
|  | |  | |  | Quiz  Assignment 11 |
| 24 | | Faraday Law and examples | | Lecture Slides PPT  Lecture Video  Book chapter 28 |  |
| 25 | | Electromagnetic Waves | | Lecture Slides PPT  Lecture video  Book chapter |  |
|  | |  | |  | Quiz  Assignment 12 |
| 26 | | Maxwell’s equations | | Lecture Slides PPT  Lecture notes  Book chapter |  |
| 27 | | Reflection and refraction | | Lecture Slides PPT  Lecture notes  Book chapter |  |
|  | |  | |  | Quiz  Assignment 13 |
| 28 | | Total internal reflection | | Lecture Slides PPT  Lecture notes  Book chapter |  |
| 29 | | Wave theory light | | Lecture Slides PPT  Lecture video  Book chapter |  |
| END TERM EXAM | | | | | |

**ASSESSMENT**

| Item | Assessment Task | Frequency | Weightage |
| --- | --- | --- | --- |
| 1. | Quizzes | 13 | 20 |
| 2. | Assignments | 13 | 20 |
| 3 | Mid Term Exam |  | -- |
| 4. | End-Term Exam | 1 | 30 |
| 5. | Term Project |  |  |
| 6. | Class Participation | yes | 10 |
| 7. | Any Other Presentation | 1 | 20 |

| Students must complete each component of the assessment to the satisfaction of the course instructor, and achieve an overall mark of **at least \_40\_\_%** in order to pass the course. All components of the above assessment are compulsory, and must be completed in order to obtain a pass grade. Students are expected to perform satisfactorily in each item. |
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| Course Policies and Rules |
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| General Policies  * Attendance is expected and failure to attend regularly will have an adverse impact on your grade. 100% attendance is strongly recommended for this course. * Every three session will be followed by a quiz and assignment related to the lectures and will be part of the course grade. * Interactive class sessions are preferred. Therefore, class participation will be much appreciated as well as graded.  Academic Dishonesty Academic dishonesty will not be tolerated. Copying materials from other sources (your peers, books, and internet) without proper referencing and acknowledgement of the source is a serious offense and will be dealt with severely. Assignments  * You are required to submit the homework as an individual. You will be graded also on degree of active, prepared participation, rather than problem-solving success only. * Assignments are important and deadlines will be strictly adhered to. |

| **Prepared By:** | **Awais Ahmad** |  |
| --- | --- | --- |
| **Reviewed By:** | **Dr. Nameeqa Firdous** |  |
| **Recommended By:** | **Dr. Ziad Nayyer** |  |
| **Approved By:** | **Dr. Qaiser Durrani** |  |
| **Reviewed by QEC:** | **Nadeem Mustafa** |  |
| **Final Approval By:** | **Dr. Qaiser Durrani** |  |

**Annexure - 2**

**Lecture Schedule & Notes**

**Department of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Spring 2020**

| **Course Code** | **CS237**  **Course Name Digital Logic and Design** | | | | **Faculty Member’s Name**  **Dr. Nameeqa Firdous** | |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | | | |  | |
| **Session No.** | | **Topic** | | | | **Date** |
|  | |  | | | |  |
|  | | | | | | |
| **Topics/Questions/**  **Activities** | | | **Allocated Time (Mins)** | **Notes/Answers/Definitions/Examples** | | |
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**Post Session Instructions:**

**Assignment:** For example, the students are required to submit online 2 page analysis of article (in (Pdf format)...… Due date and time

**Preparing for next session:** For example, Please read Chapter 2 of ……. and watch video " ………." and prepare to discuss ……