Course Title:	***Applied Physics***
Course Code:	**CSC – 101**
Credit Hours Theory:	**3**
Credit Hours Lab (If Applicable):	1
Instructor Name with Qualification:	Sadia Ashraf – MS (Software Engineering)
Course Objectives:	1. Understanding of the fundamental concepts/laws in physics by explaining and discussing the physics as well as their relevance to everyday events and circumstances in a broad interdisciplinary context. 2. Demonstrate teamwork skills/ ability to collaborate by working in groups on a laboratory experiment 3. Reveal critical thinking/ analytical reasoning ability by setting up mathematical descriptions of physical systems and to calculate measurable quantities that provide an understanding of the physical environment in terms of the concepts listed in the course content. 4. Ability to apply knowledge/skills to real world settings
Learning Outcomes:	The students are able to apply principles and concepts to analyz problems within specific core areas, analyze and interpret quantitative results, to collect and appropriately analyze data working independently and in collaboration with others (experimentation, data collection, model-based computation, an literature research using basic and state-of-the-art technology), familiarity with current developments in physics.
Contents (Catalog Description):	1. <u>Introduction to Engineering Thermodynamics</u> 1.1 Systems and states 1.2 Temperature and thermal equilibrium 1.3 The Zeroth Law 2. <u>Temperature</u> 2.1 Ideal Gas Temperature & Absolute Temperature 2.2 Thermal Expansions 2.3 Laws of Thermodynamics 3. <u>Introduction to Electricity and Magnetism</u> 3.1 Electric charges and electric field 3.2 Coulomb's Law

	3.3 Static electricity and its applications 3.4 Motion of charged particle through electric field 4. Electric Potential 4.1 Electric potential 4.2 Electric potential due to continuous charge distributions 4.3 Electric potential due to a charged conductor 4.4 Electric flux 4.5 Gauss's Law 4.6 Applications of Gauss's Law 5. Electromotive Force 5.1 Electric current 5.2 Electrical resistance 5.3 Capacitance and dielectric 6. Electric Dipole 6.1 Ohm's Law 6.2 KCL & KVL 7. Magnetic Field 7.1 Field of moving charges 7.2 Magnetic force on a current carrying conductor 7.3 Electromagnetic induction 8. Laws 8.1 Faraday's Law and Lenz's Law 8.2 Ampere's Law 9. Introduction to Engineering Mechanics 9.1 Mechanics of Coplanar and Non-Coplanar forces 9.2 Torque and Principles of Moments 9.3 Equilibrium of Rigid Bodies in 2 and 3-dimensions 10. Kinematics 10.1 Kinematics and Kinetics of particles and rigid bodies in 2 and 3-dimensions 10.2. Static and Kinetic friction 11. Gravity 11.1 Gravity & Gravitational Potential 11.2 Impulse 12. Momentum 12.1 Conservation of Linear Momentum 12.2 Collisions and Impacts 12.3 Angular momentum and its Conservation 13. Introduction to Modern Physics 13.1 Einstein's Photoelectric Effect Law

	13.2 Planck's Black-body Radiation Law 14. Quantum Theory 14.1 Beginnings of Quantum Theory of Matter and Radiation 14.2 Atomic Structure of Atoms and Molecules 15. Quantum Mechanics 15.1 A brief introduction to the Principles of Quantum Mechanics 15.2 Quantum effects and Semi-conductors
Recommended Text Books:	Halliday, Resnick and Krane, "Physics", Volume 1 & 2.
Reference Books:	Young and Freedman, "University Physics".
Helping Web Sites:	None
General Instructions for students:	Attendance is mandatory. Every class is important. All deadlines are hard. Under normal circumstances late work will not be accepted. Students are required to take all the tests. No make up tests will be given under normal circumstances. Any form of cheating on exams/assignments/quizzes is subject to serious penalty. 75% attendance is mandatory. Latecomers will be marked as absent.
Sixteen Week Lesson Plan	Week # 1: Introduction to Engineering Thermodynamics • Systems and states • Temperature and thermal equilibrium • The Zeroth Law Week # 2: Temperature • Ideal Gas Temperature & Absolute Temperature • Thermal Expansions • Laws of Thermodynamics Week # 3: Introduction to Electricity and Magnetism • Electric charges and electric field • Coulomb's Law • Static electricity and its applications • Motion of charged particle through electric field Week # 4: Electric Potential • Electric potential • Electric potential due to continuous charge

	distributions • Electric potential due to a charged conductor • Electric flux • Gauss's Law • Applications of Gauss's Law Week # 5: Electromotive Force • Electric current • Electrical resistance • Capacitance and dielectric Week # 6: Electric Dipole • Ohm's Law • KCL & KVL Week # 7: Magnetic Field • Field of moving charges • Magnetic force on a current carrying conductor • Electromagnetic induction Week # 8: Laws • Faraday's Law and Lenz's Law • Ampere's Law **Week # 9 : Mids** Week # 10: Introduction to Engineering Mechanics • Mechanics of Coplanar and Non-Coplanar forces • Torque and Principles of Moments • Equilibrium of Rigid Bodies in 2 and 3-dimensions Week # 11: Kinematics • Kinematics and Kinetics of particles and rigid bodies in 2 and 3-dimensions • Static and Kinetic friction Week # 12: Gravity • Gravity & Gravitational Potential • Impulse Week # 13: Momentum • Conservation of Linear Momentum • Collisions and Impacts • Angular momentum and its Conservation Week # 14: Introduction to Modern Physics • Einstein's Photoelectric Effect Law • Planck's Black-body Radiation Law

	Week # 15: Quantum Theory • Beginnings of Quantum Theory of Matter and Radiation Atomic Structure of Atoms and Molecules Week # 16: Quantum Mechanics • A brief introduction to the Principles of Quantum Mechanics • Quantum effects and Semi-conductors Week # 17: Practice problems + Revision **Week # 18: Final**

Course Learning Outcomes mapping to Program Learning Objectives

CONTRIBUTION OF COURSE LEARNING OUTCOMES TO PROGRAMME LEARNING OUTCOMES													
SOFTWARE ENGINEERING		SOFTWARE PROJECT MANAGEMENT											
No.	Program Outcomes	Course Learning Outcomes											
		1	2	3	4	5	6	7	8	9	10	11	12
1	Engineering Knowledge				√								
2	Problem analysis	√											
3	Design/Development of solutions												
4	Investigation												
5	Modern tool usage			√									
6	Engineer and society												
7	Environment and sustainability												
8	Ethics		√										
9	Individual and Team work		√										
10	Communication												
11	Project Management												
12	Lifelong learning				√								