INSTITUTION **FAST National University Computer and Emerging Sciences, Karachi Campus**

BE EVALUATED Bachelor of Computer Science

A. Course Description

Course Code	NS-1001
Course Title	Applied Physics
Credit Hours	3
Prerequisites by Course(s) and Topics	None
Assessment Instruments with Weights (homework, quizzes, midterms, final, programming assignments, lab work, etc.)	**Midterm** 30% **Class Quizzes** 10% **Assignments/ projects** 10% **Final Exam** 50% **Total** 100%
Course Coordinator	Rabia Tabassum
URL (if any)	
Current Catalog Description	**Part A:** Adding Vectors, Components of Vectors, Unit Vectors, Vector & Scalar Products, Position & Displacement (2/3 dimensions), Average/Instantaneous Velocity/Acceleration, Projectile Motion, Uniform Circular Motion, Newton Laws of Motion, Forces (1D/2D/3D): Gravitational, Friction, Tension, Weight. **Part B:** Simple Harmonic Motion, the Force Law for SHM, Angular SHM, Simple Pendulum, Damped SHM, Circular Motion & SHM, Types of Waves, Sinusoidal Waves, Wavelength and Frequency **Part C:** Electric Charge, Coulomb's Law, Electric Field, Electric Field Due To Point Charge, Due To Electric Dipole, Gauss' Law, Flux Of Electric Field, Cylindrical/Planar/Spherical Symmetries, Capacitance, Parallel Plate/Cylindrical/Spherical Capacitors, Capacitors In Parallel And In Series, Electric Current, Current Density, Drift Speed, Resistance & Resistivity, Ohm's Law, Magnetic Fields And Field Lines, Hall Effect, Circulating Charge Particles, Magnetic Force On Current Carrying Wire, Magnetic Field Due To Current, Ampere's Law, Magnetic Field Inside/Outside Wire/Between Parallel Wires
Textbook (or **Laboratory Manual** for Laboratory Courses)	**Title** ***Halliday & Resnick*** **Fundamentals of Physics (Extended 10th Edition)** **Author(s)** Jearl Walker

	Publisher © 2013 by John Wiley & Sons Inc.
Reference Material	**Title** **Physics for Scientists and Engineers with Modern Physics (6th Edition)** **Author(s)** Raymond A. Serway & John W. Jewett **Publisher** © 2004 Thomson books/cole US **Title** **Physics for Scientists and Engineers (6th Edition)** **Author(s)** Paul A Tipler and Gene Mosca **Publisher** W.H. Freeman and Company **Title** **Physics for Scientists and Engineers (3rd Edition)** **Author(s)** Fishbane, Gasiorowicz, Thornton **Publisher** Pearson Prentice Hall **Title** **Physics for Engineers & Scientists (3rd Edition Extended)**
Course Goals	To introduce the concepts of basic Physics topics of electricity & magnetism and digital systems to BS computer science students. To prepare CS students to take "Digital Logic Design" course in future
Topics Covered in the Course, with Number of Lectures on Each Topic (assume 15-week instruction and one-hour lectures)	

Date	Duration	Topics Covered	Evaluation Instruments used	Signature
Week 1	**3 hrs**	Adding Vectors, Components of Vectors, Unit Vectors, Vector & Scalar Products, Position & Displacement (2/3 dimensions), Numerical Problems		
Week 2	**3 hrs**	Average/Instantaneous Velocity/Acceleration, Uniform Circular Motion, Numerical Problems		
Week 3	**3 hrs**	Projectile Motion, horizontal/vertical motions, equation of the path and horizontal		

			range, Numerical Problems		
	Week 4	**3 hrs**	Newton Laws of Motion, Forces (1D/2D): Gravitational, Friction, Tension, Weight, Numerical Problems		
	Week 5	**3 hrs**	Simple Harmonic Motion, the Force Law for SHM, Angular SHM		
	Week 6	**3 hrs**	**Mid Term –I**		
	Week 7	**3 hrs**	Simple Pendulum, Damped SHM, Circular Motion & SHM, Numerical Problems		
	Week 8	**3 hrs**	Types of Waves, Sinusoidal Waves, Wavelength and Frequency		
	Week 9	**3 hrs**	Electric Charge, Coulomb's Law, Electric Field, Electric Field Due To Point Charge and Dipole, Numerical Problems		
	Week 10	**3 hrs**	Gauss' Law, Flux, Flux Of Electric Field, Gauss's Law, Equivalency of Gauss's Law And Coulombs' Law		
	Week 11	**3 hrs**	Cylindrical Symmetry, Planar Symmetry, Spherical Symmetry, Numerical Problems		
	Week 12	**3 hrs**	**Mid Term –II**		
	Week 13	**3 hrs**	Capacitance, Parallel Plate, Cylindrical & Spherical Capacitors, Capacitors In Parallel And In Series, Numerical Problems		
	Week 14	**3 hrs**	Electric Current, Current Density and Drift Speed, Resistance & Resistivity, Ohm's Law, Numerical Problems		

	Week 15	**3 hrs**	Magnetic Fields And Field Lines, Crossed Fields: Hall Effect, Circulating Charge Particles, Magnetic Force On Current Carrying Wire, Numerical Problems		
	Week 16	**3 hrs**	Magnetic Field Due To Current, Ampere's Law, Magnetic Field Inside/Outside Wire, Solenoids & Toroids & Between two Parallel Wires, Numerical Problems		

Laboratory Projects/Experiments Done in the Course				
Programming Assignments Done in the Course				
Class Time Spent on (in credit hours)	**Theory**	**Problem Analysis**	**Solution Design**	**Social and Ethical Issues**
	20	20	5	0
Oral and Written Communications	Every student is required to submit at least 3 written reports (assignments) of typically 5-7 pages. Include only material that is graded for grammar, spelling, style, and so forth, as well as for technical content, completeness, and accuracy.			

Instructor Name **Muhammad Adeel**

Instructor Signature _____

Date _____