COURSE NUMBER: Ve230	**COURSE TITLE:** Electromagnetics I
CREDIT: 4	**PREREQUISITES:** Vv255 or Vv285, Vp240 or Vp260, Ve215
TEXTBOOKS/REQUIRED MATERIAL: "Field and Wave Electromagnetics," 2nd edition, by David. K. Cheng	**INSTRUCTOR:** Xinen Zhu **DATE OF PREPARATION:** Oct. 09, 2012 **DATE OF UC APPROVAL:** Oct. 30, 2013
INSTRUCTOR(S): Xinen Zhu	**SCIENCE/DESIGN:** n/a
CATALOG DESCRIPTION: Vector calculus. Electrostatics. Magnetostatics. Time-varying fields: Faraday's Law and displacement current. Maxwell's equations in differential form. Traveling waves and phasors. Uniform plane waves. Reflection and transmission at normal incidence. Transmission lines. Laboratory segment may include experiments with transmission lines, the use of computer-simulation exercises, and classroom demonstrations.	**COURSE TOPICS:** 1. Vector calculus (4 hrs) 2. Electrostatics (10 hrs) 3. Magetostatics (10 hrs) 4. Time-verying fields (4.5 hrs) 5. Maxwell's equations (4.5 hrs) 6. Uniform plane waves (4 hrs) 7. Reflection and transmission at normal incidence (4 hrs)
COURSE STRUCTURE/SCHEDULE: Lecture: twice per week, 90 minutes each;	

COURSE OBJECTIVES [Course Outcomes in brackets]	1. To provide students with a basic understanding of electrostatics, magnetostatics; wave propagation; [1,2,3,4,5] 2. To teach students fundamentals of time-varying fields, Maxwell's equations and boundary conditions; [1,6] 3. To teach students fundamentals of uniform plane waves, transmission and reflections at normal incidence;[1,7] 4. To prepare students for follow-up courses in Electromagnetics area of Electrical and Computer Engineering program.[1,2,3,4,5,6,7]
COURSE OUTCOMES [Program Outcomes in brackets]	After completing Ve230, students should be able to: 1. Ability to perform vector calculus derivation and calculation, understand the physical meaning of gradient, divergence and curl;[a,e] 2. Ability to compute electrostatic field and electric potential due to point and distributed charges; [a,e] 3. Ability to compute magnetic field induced by current sources, and resulting forces and torques; [a,e] 4. Ability to compute capacitance of planes and cylinders, and inductance of solenoids and coaxs; [a,e] 5. Ability to use electrostatic & magnetostatic boundary conditions to relate fields in adjacent media; [a,e] 6. Ability to derive wave equations from Maxwell's equations, and to derive the solution to wave equations;[a,e] 7. Ability to compute reflection and transmission coefficients at normal incidence.[a,e]
ASSESSMENT TOOLS [Course Outcomes in brackets]	Homework [1,2,3,4,5,6,7] Final Exam [1,2,3,4,5,6,7] Quiz [1,2,3,4,5,6,7]