COURSE NUMBER: Vm412	**COURSE TITLE:** Advanced Strength of Materials
CREDIT: 3	**PREREQUISITES:** Vm 311
TEXTBOOKS/REQUIRED MATERIAL: J. R. Barber, Intermediate Mechanics of Materials, McGraw-Hill	**INSTRUCTOR:** Roberto Dugnani **DATE OF PREPARATION:** October 9, 2012 **DATE OF UC APPROVAL:** Oct. 30, 2013
INSTRUCTOR(S): Roberto Dugnani	**SCIENCE/DESIGN:** n/a
CATALOG DESCRIPTION: Review of energy methods; elastic, thermoelastic, and elastoplastic analysis of axisymmetric thick cylinders and rotating discs; bending of rectangular and circular plates, including asymmetric problems; beams on elastic foundations; axisymmetric bending of cylindrical shells; torsion of prismatic bars.	**COURSE TOPICS:** 1. Axisymmetric thick cylinders and rotating discs, thermoelastic and elastoplastic analyses 2. Beams on elastic foundations 3. Axisymmetric bending of cylindrical shells 4. Torsion of prismatic bars

COURSE STRUCTURE/SCHEDULE: Lecture twice per week, 90 minutes each;	

COURSE OBJECTIVES [Course Outcomes in brackets]	1. To teach students how to formulate problems involving axisymmetric thick cylinders and rotating discs [1, 2, 3, 4] 2. To teach students how to solve problems involving axisymmetric thick cylinders and rotating discs for different surface conditions and temperature distributions [1, 2, 3, 4] 3. To teach students how to determine the elastic and plastic response in axisymmetric thick cylinders and rotating discs [1, 2, 3, 4] 4. To teach students how to formulate and solve problems involving beams on an elastic foundation [1, 2, 3, 4] 5. To teach students how to formulate and solve problems involving axisymmetric bending of cylindrical shells [5] 6. To teach students how to formulate and solve the problem of the torsion of prismatic bars [6]
COURSE OUTCOMES [Program Outcomes in brackets]	After completing Vm411, students should be able to: 1. Formulate problems involving axisymmetric thick cylinders and rotating discs [a] 2. Determine stresses and displacements in axisymmetric thick cylinders and rotating discs for different conditions at the surfaces, or due to temperature changes [a] 3. Determine stresses associated with plastic yield in axisymmetric thick cylinders and rotating discs [a] 4. Determine deflections and stresses in beams on an elastic foundation [a] 5. Determine stresses and deformations due to axisymmetric bending of cylindrical shells [a] 6. Determine stresses and deformations due to torsion of prismatic bars [a]
ASSESSMENT TOOLS [Course Outcomes in brackets]	Homework [1-6] Project assignments [1-6] Final Exam [1-6]