TEMPLATE 8-B

COURSE CHANGE TEMPLATE

For new courses see New Course Template

Note: The version approved by Faculty Council follows at the end of this package. This was in a different format but contains the same information and more information about the proposed change.

Faculty: Engineering and Applied Science	
Course number: ENGR 2260U	**Current course title: Statics and Solid Mechanics**

COURSE CHANGES (check all that apply)

X	Course title	X	Credit weighting
X	Course description	X	Contact hours
X	Course number	X	Prerequisites
X	Course design		Co-requisites
X	Learning outcomes		Cross-listings
X	Mode of delivery		Credit restrictions
	Teaching and assessment methods		Credit exclusions

REASON FOR CHANGE

1. **The current single course (ENGR2260) is 4 hours long but it is usually taught as two separate courses (3 hours each) in most engineering schools in Canada. Student performance in the course has been very poor and the professor has been overwhelmed as he and the students had to use two text books. There was never time enough to professionally cover the material in the single 4 hour format. We are anticipating criticism from the CEAB regarding this format and therefore we would like to implement the change as soon as possible.**
2. **Both subjects of Statics and Solid Mechanics are essential and core courses for the Manufacturing, Automotive and Mechanical Engineering [MAME] programs. Each one of them presents a fundamental and basic knowledge that is important to all MAME students.**
3. **Presenting the combined two subjects of Statics and Solid Mechanics in one semester does not provide students with sufficient time to understand and practice the two subjects properly.**
4. **The knowledge of Statics is basically a prerequisite for Solid Mechanics course, as is practiced in many other universities and academic programs. Combining these two subjects in the form of one single course does not provide a chance to examine students' understanding and skills in Statics before asking to learn the detail contents of Solid Mechanics.**
5. **The workload for Statics and Solid Mechanics consists of 4 hours of lectures using two separate textbooks, 2 hours of tutorials and 2 hours of bi-weekly labs for 3 credits. Hence, the volume and variation of course contents and the consequent workload results in a gradient reduction in students' learning curve.**
6. **The one semester format of presenting all the materials in a single 4 hour course does not allow students to thoroughly understand the material, to do sufficient practice in the topics, to solve enough relevant problems and to examine enough case studies to solidify their understanding. The proposed two course, 6 hour format, solves these problems.**

CHANGE TO CALENDAR ENTRY

Current	**Proposed**

ENGR 2260U Statics and Solid Mechanics. This course provides fundamental engineering knowledge of static systems, bodies at rest, force and moment equilibrium of rigid bodies, and mechanics of materials and deformable bodies. Course topics include: forces; moments of forces; couples; resultant and equilibrium of force systems; distributed loads; equilibrium of particles and rigid bodies; analysis of structures including beams, trusses, frames and machines; mechanical joints; centric; moment of inertia; plane stress and strain; tension and compression test; Hooke's law; Poisson's ratio; axial load; principle of superposition; thermal stress; torsion of circular shafts; pure bending; transverse shear; shear stress in beams and thin-walled members; combined loading; stress and strain transformations; Mohr's circle; design of beams and shafts; deflections of beams and shafts; statically indeterminate beams and shafts; buckling of columns. 3 cr, 4 lec, 2 lab (biweekly), 2 tut. Prerequisites: MATH 1020U, PHY 1010U.	**ENGR2XXXU – Statics** This course provides fundamental engineering knowledge of static systems, bodies at rest, force and moment equilibrium of rigid bodies, and mechanics of materials and deformable bodies. Course topics include: forces; moments of forces; couples; resultant and equilibrium of force systems; distributed loads; equilibrium of particles and rigid bodies; analysis of structures including beams, structural analyses including trusses, frames and machines; mechanical joints, the concept of internal forces, shear and moment forces and diagrams, relations between distributed load, shear and moments; friction forces on mechanical components, centroid, moment of inertia, parallel axis theory, Mohr's circle for moment of inertia, concept of virtual work. 3 cr, 3 lec, 1 tut. Prerequisites: PHY 1010U, MATH 1020U. **ENGR 2YYYU - Solid Mechanics** This course provides the fundamental engineering knowledge of mechanics of solids including axial loading, plane stress and strain; tension and compression, elastic deformation and Hooke's law, Poisson's ratio, principle of superposition, thermal stress, torsion of circular shafts, pure bending, transverse shear, shear stress in beams and thin-walled members, combined loading, stress and strain transformations; Mohr's circle, deflections of beams and shafts, design of beams and shafts, statically indeterminate beams and shafts, buckling of columns, energy method. 3 cr, 3 lec, 2 lab (biweekly),1 tut. Prerequisite: ENGR2XXXU. Changes needed for the Prerequisites • Prerequisites for ENGR 2430U Dynamics are now changed to: ENGR 2XXXU or ENGR 2260U, MATH 1850U • Prerequisites for ENGR 3030U Computer-Aided Design are changed to: ENGR 2310U, ENGR 2YYYU or ENGR 2260U or ENGR 2420U • Prerequisites for ENGR 3220U Machine Design are changed to: ENGR 2310U, ENGR 3270U, ENGR 2YYYU or ENGR 2260U or ENGR 2420U

	• Prerequisites for ENGR 4210U Advanced Solid Mechanics and Stress Analysis are changed to: ENGR 2YYYU or ENGR 2260U or ENGR 2420U • Prerequisites for ENGR 4250U Advanced Materials Engineering are changed to: ENGR 2220U, ENGR 2YYYU or ENGR 2260U or ENGR 2420U

CONSULTATION, WHERE APPROPRIATE

Proposed by the Automotive, Manufacturing and Mechanical Engineering Program Committee following extensive consultation with faculty involved.

APPROVAL DATES

Date of submission	
Curriculum Committee approval	**December 1, 2009**
Faculty Council approval	**December 4, 2009**

Automotive Engineering

Year	Course	Course	Course	Course	Course	Course	Course
1.1	**EDUC 1050U** Technical Communications	**ENGR 3200U** Engineering Graphics and Design	**MATH 1010U** Calculus I	**MATH 1850U** Linear Algebra for Engineers	**PHY 1010U** Physics I		
1.2	**CHEM 1800U** Chemistry for Engineers	**EDUC 1470U** Impact of Science and Technology on Society	**ENGR 1200U** Introduction to Programming for Engineers	**ENVS 1000U** Environmental Science	**MATH 1020U** Calculus II	**PHY 1020U** Physics II	
2.1	**BUSI 2000U** Collaborative Leadership	**ENGR 2XXXU Statics**	**ENGR 2220U** Structure and Properties of Materials	**ENGR 2310U** Concurrent Engineering and Design	**ENGR 2640U** Thermodynamics and Heat Transfer	**MATH 2860U** Differential Equations for Engineers	~~**ENGR 2260U Statics & Solid Mechanics**~~
2.2	**ENGR 2430U** Dynamics	**ENGR 2790U** Electric Circuits	**ENGR 2860U** Fluid Mechanics	**MATH 2070U** Numerical Methods	**STAT 2800U** Statistics and Probability for Engineers	**ENGR 2YYYU Solid Mechanics**	

Mechanical Engineering: Comprehensive program

Year	Course	Course	Course	Course	Course	Course
1.1	**EDUC 1050U** Technical Communications	**ENGR 3200U** Engineering Graphics and Design	**MATH 1010U** Calculus I	**MATH 1850U** Linear Algebra for Engineers	**PHY 1010U** Physics I	
1.2	**CHEM 1800U** Chemistry for Engineers	**EDUC 1470U** Impact of Science and Technology on Society	**ENGR 1200U** Introduction to Programming for Engineers	**ENVS 1000U** Environmental Science	**MATH 1020U** Calculus II	**PHY 1020U** Physics II
2.1	**ENGR 2XXXU Statics**	**ENGR 2220U** Structure and Properties of Materials	**ENGR 2310U** Concurrent Engineering and Design	**ENGR 2320U** Thermodynamics	**MATH 2860U** Differential Equations for Engineers	~~**ENGR 2260U Statics & Solid Mechanics**~~
2.2	**ENGR 2430U** Dynamics	**ENGR 2790U** Electric Circuits	**ENGR 2860U** Fluid Mechanics	**MATH 2070U** Numerical Methods	**STAT 2800U** Statistics and Probability for Engineers	**ENGR 2YYYU Solid Mechanics**

Mechanical Engineering: Mechatronics Engineering option

Year	Course	Course	Course	Course	Course	Course	Course
1.1	**EDUC 1050U** Technical Communications	**ENGR 3200U** Engineering Graphics and Design	**MATH 1010U** Calculus I	**MATH 1850U** Linear Algebra for Engineers	**PHY 1010U** Physics I		
1.2	**CHEM 1800U** Chemistry for Engineers	**EDUC 1470U** Impact of Science and Technology on Society	**ENGR 1200U** Introduction to Programming for Engineers	**ENVS 1000U** Environmental Science	**MATH 1020U** Calculus II	**PHY 1020U** Physics II	
2.1	**ENGR 2XXXU Statics**	**ENGR 2220U** Structure and Properties of Materials	**ENGR 2310U** Concurrent Engineering and Design	**ENGR 2640U** Thermodynamics and Heat Transfer	**ENGR 2710U** Software Design I	**MATH 2860U** Differential Equations for Engineers	~~**ENGR 2260U Statics & Solid Mechanics**~~
2.2	**ENGR 2430U** Dynamics	**ENGR 2790U** Electric Circuits	**ENGR 2860U** Fluid Mechanics	**MATH 2070U** Numerical Methods	**ENGR 2YYYU Solid Mechanics**	**STAT 2800U** Statistics and Probability for Engineers	
3.1	**ENGR 3030U** Computer-Aided Design	**ENGR 3190U** Manufacturing and Production Processes	**ENGR 3270U** Kinematics and Dynamics of Machines	**ENGR 3350U** Control Systems	**Liberal Studies Elective**		
3.2	**ENGR 3320U** Fluid Power Systems	**ENGR 3330U** Circuit Design	**ENGR 3390U** Mechatronics	**ENGR 3210U** Mechanical Vibrations	**ENGR 3220U** Machine Design	**ENGR 2720U Software Design II**	

Mechanical Engineering: Energy Engineering option

Year	Course	Course	Course	Course	Course	Course
1.1	**EDUC 1050U** Technical Communications	**ENGR 3200U** Engineering Graphics and Design	**MATH 1010U** Calculus I	**MATH 1850U** Linear Algebra for Engineers	**PHY 1010U** Physics I	
1.2	**CHEM 1800U** Chemistry for Engineers	**EDUC 1470U** Impact of Science and Technology on Society	**ENGR 1200U** Introduction to Programming for Engineers	**ENVS 1000U** Environmental Science	**MATH 1020U** Calculus II	**PHY 1020U** Physics II
2.1	**ENGR 2XXXU Statics**	**ENGR 2220U** Structure and Properties of Materials	**ENGR 2310U** Concurrent Engineering and Design	**ENGR 2320U** Thermodynamics	**MATH 2860U** Differential Equations for Engineers	~~**ENGR 2260U Statics & Solid Mechanics**~~
2.2	**ENGR 2430U** Dynamics	**ENGR 2790U** Electric Circuits	**ENGR 2860U** Fluid Mechanics	**MATH 2070U** Numerical Methods	**STAT 2800U** Statistics and Probability for Engineers	**ENGR 2YYYU Solid Mechanics**

Manufacturing Engineering

Year	Course	Course	Course	Course	Course	Course
1.1	**EDUC 1050U** Technical Communications	**ENGR 3200U** Engineering Graphics and Design	**MATH 1010U** Calculus I	**MATH 1850U** Linear Algebra for Engineers	**PHY 1010U** Physics I	
1.2	**CHEM 1800U** Chemistry for Engineers	**EDUC 1470U** Impact of Science and Technology on Society	**ENGR 1200U** Introduction to Programming for Engineers	**ENVS 1000U** Environmental Science	**MATH 1020U** Calculus II	**PHY 1020U** Physics II
2.1	**ENGR 2XXXU Statics**	**ENGR 2220U** Structure and Properties of Materials	**ENGR 2310U** Concurrent Engineering and Design	**ENGR 2640U** Thermodynamics and Heat Transfer	**MATH 2860U** Differential Equations for Engineers	~~**ENGR 2260U Statics & Solid Mechanics**~~
2.2	**ENGR 2430U** Dynamics	**ENGR 2790U** Electric Circuits	**ENGR 2860U** Fluid Mechanics	**MATH 2070U** Numerical Methods	**STAT 2800U** Statistics and Probability for Engineers	**ENGR 2YYYU Solid Mechanics**