SOUTHEAST COMMUNITY COLLEGE
DIVISION OF ARTS AND SCIENCES
Mathematics
Revision Date: 07-01-19
Syllabus Statements

I. CATALOG DESCRIPTION

Course Number:	ENGR2020
Course Title:	Engineering Statics
Prerequisites:	A grade of "C" or higher in MATH1700 and PHYS2110.
Course Description:	Mechanics is the physical science which deals with the effects of forces on objects. The statics portion of mechanics is concerned with the equilibrium of bodies under action of forces. This is a 4.5 hour course (three semester credit hour) in basic engineering statics and is based on the existing UNL course MECH223 Engineering Statics.
Credit Hours:	3.0
Class Hours:	45
Lab Hours:	0
Total Contact Hours:	45

II. COURSE OBJECTIVES: *Course will:*

A. Teach students to use vectors and vector operations to represent and calculate forces and moments.
B. Teach students to draw free-body diagrams describing the forces and moments of static rigid bodies.
C. Teach students to translate free-body diagrams to force and moment equations.
D. Teach students to solve the static equilibrium equations describing a rigid body at rest.
E. Teach students to use calculus to calculate internal and distributed forces and moments.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES

A. Student Learning Outcomes**:** *Student will be able to:*
- **1**. To draw free body diagrams.
- **2**. Determine the point of action, direction, and magnitude of all external forces on a wide variety of physical objects and structures.
- **3**. Determine the resultant force necessary to maintain the object in equilibrium, and calculate the internal forces on a wide variety of structural objects, including trusses, frames, machines, and beams.
- **4**. Describe moments and how they work.
- **5**. Explain the friction in Statics problem.
- **6**. Explain the definition of Statics and how it is applied in everyday life.

B. General Education Learning Outcomes
- **1.** GELO #3: Critical Thinking & Problem Solving
  - Outcome: Synthesize information to arrive at reasoned solutions to problems.
  - Outcome: Evaluate the validity of arguments, alternatives, data, outcomes, and/or impacts of actions.
- **2**. GELO #5: Analytical, Quantitative, and Scientific Reasoning
  - Outcome: Apply mathematical and scientific methods to solve problems from an array of contexts and everyday situations.
  - Outcome: Understand and create logical arguments supported by quantitative and scientific evidence and communicate those arguments in a variety of formats.

Outcome: Effectively develop strategies, algorithms, or experiments (or performing experiments) to better describe the systems or to solve the problems.

Outcome: Manipulate formulas, data sets, graphs, tables, etc. in a way to produce a meaningful outcome.

IV. CONTENT/TOPICAL OUTLINE (*course outline may provide more detailed information*)

A. Vectors and vector operations.
B. Forces, moments, and couples.
C. Free-body diagrams.
D. Static equilibrium conditions.
E. Trusses.
F. Frames and machines.
G. Distributed forces.
H. Friction.
I. Moments of inertia.

V. INSTRUCTIONAL MATERIALS

A. Required Text(s):
1. Meriam, James L., Kraige, L. Glenn, *Engineering Mechanics: Statics,* Seventh Edition, John Wiley & Sons Inc., 2011. ISBN: 978-0470614730.
2. WebAssign Access Card
B. Other required resources: A Scientific Calculator

VI. METHODS OF INSTRUCTION

A. Methods of presentation typically include a combination of the following:
1. Lectures
2. Video Clips
3. Interactive Questions
4. Homework exercises
5. Demonstrations

VII. METHODS OF EVALUATION

A. Methods of evaluation typically include a combination of the following:

1.	Lecture	15%
2.	Homework	25%
3.	Exams	40%
4.	Final Exam	20%
5.	Reading Quizzes	up to 5% extra credit

B. SCC GRADING SCALE

A+	95-100	C+	75-79	F	59 or less
A	90-94	C	70-74		
B+	85-89	D+	65-69		
B	80-84	D	60-64		

VIII. SPECIFIC COURSE REQUIREMENTS

A. Reading Assignments: You are encouraged to read the appropriate sections of the textbook *before* each class meeting, as indicated on the attached reading assignment list.
1. Each lecture class will begin with a brief reading quiz. These quizzes are strictly extra credit and are to encourage you to do the reading.
2. You may not take the quiz if you arrive late.

B. Lecture: All students are expected to participate in the group work that will occur during each lecture class. Experience has shown that students who actively participate in these group activities learn more and earn higher grades.

1. Your lecture grade is partially based on answering concept questions during each class: full credit for each correct answer and half credit for each incorrect answer. The other portion of your lecture grade will be the completion of the assigned group activities.

2. You can make up a missed lecture by contacting your instructor. You will be assigned work to be done outside of class that must be turned in within one week of the missed lecture. No more than 2 lectures can be made up.

3. Your lowest *two* lecture scores will be dropped.

C. Homework**:** There will be 15 homework assignments, about one each week.

1. You will access the assignments and also submit your answers on the Internet. See the attached sheet explaining the details.

2. You are encouraged to work with your classmates and to seek help from either instructor.

3. Homework cannot be made up, but you can give yourself an extension for 24 hours from the original due date and time. *Be warned, however, that no extensions will be granted if you have already viewed the solutions.*

D. Exams: There will be three exams plus a comprehensive final.

1. Exams will cover material from *lecture class, homework assignments and reading assignments*.

2. If there is a compelling reason that you cannot make it to an exam, you must inform your instructor *before* the exam. In case of an emergency, inform your instructor as soon as possible.

3. Missed exams must be made up within two days of the original exam date; after that time the exam is scored as a zero. Students are responsible for making the arrangement with their instructor before the exam.

4. At end of the quarter, if you have taken all of the exams, your lowest exam score will be replaced with the score of your Final Exam, if it is higher.