1. **COURSE TITLE\*:** Engineering Mechanics: Statics
2. **CATALOG – PREFIX/COURSE NUMBER/COURSE SECTION\*:** ENDS 2201
3. **PREREQUISITE(S)\*:** PHYS 1117 or 2201 and MATH 1120 or higher **COREQUISITE(S)\*:**
4. **COURSE TIME/LOCATION/MODALITY: (*Course Syllabus – Individual Instructor Specific*)**
5. **CREDIT HOURS\*: 3 LECTURE HOURS\*: 3**

**LABORATORY HOURS\*: (contact hours) OBSERVATION HOURS\*:**

1. **FACULTY CONTACT INFORMATION: *(Course Syllabus – Individual Instructor Specific)***
2. **COURSE DESCRIPTION\*:**

In this course the student studies the principles of forces, as applied to trusses, frames, beams, walls, and machine parts. The student will gain experience by solving problems graphically and mathematically. The course covers the study of vectors, forces, resultants, and equilibrium.

1. **LEARNING OUTCOMES\*:**

The Student will:

Develop the ability to analyze any mechanics problem in a simple and logical manner and to apply to its solution a few, well-understood basic concepts and principles.

These will include:

1. The concept of vectors and the laws governing the addition and resolution of vectors. Break force vectors into component and combine forces into a Resultant.
2. The concept of Statics or particles.
3. The Principle of Equilibrium. Evaluate systems in force and moment static equilibrium.
4. The concept of Statics of rigid bodies.
5. The Principle of Transmissibility.
6. The concept of Moment of force. Compute moment and couples.
7. The concept of Friction.
8. **ADOPTED TEXT(S)\*:**

Mechanics for Engineers: Statics and Dynamics

4th ed.

Beer & Johnston

McGraw – Hill

ISBN: 0-07-004584-4

**9a: SUPPLEMENTAL TEXTS APPROVED BY FULL TIME DEPARTMENTAL FACULTY (INSTRUCTOR MUST NOTIFY THE BOOKSTORE BEFORE THE TEXTBOOK ORDERING DEADLINE DATE PRIOR TO ADOPTION) \*\*\*.**

1. **OTHER REQUIRED MATERIALS: (SEE APPENDIX C FOR TECHNOLOGY REQUEST FORM.)\*\***

Scientific calculator

Scale and Protractor

Graphing paper (1/4” squares)

4-3-pin paper binder for keeping correct solution of assigned problems.

Paper for solution of problems pre-printed with outline will be provided

Student will need an auxiliary storage device, flash drive or network home-drive.

1. **GRADING SCALE\*\*\*:**

Grading will follow the policy in the catalog. The scale is as follows:

Percentage% Points

A: 90 – 100% 900-1000

B: 80 – 89% 800-899

C: 70 – 79% 700-799

D: 60 – 69% 600-699

F: 0 – 59% 0-599

1. **GRADING PROCEDURES OR ASSESSMENTS: (*Course Syllabus – Individual Instructor Specific)***

Assignment count – 200 points (20%) of Final Grade

(3) Tests count – 600 points (60%) of Final Grade

Final counts – 200 points (20%) of Final Grade

Note well:

Class participation – it is your class, and your participation improves it.

Class attendance – text covers 50% of material, in-class the other 50%.

1. **COURSE METHODOLOGY: *(Course Syllabus – Individual Instructor Specific)***

May include but not limited to Lecture and problem solving, independent and group projects, in-class and home assignments, quizzes, and tests. Problem solving will use both graphical and mathematical methods.

Attendance is required.

**14. COURSE OUTLINE: *(Course Syllabus – Individual Instructor Specific)***

***(Insert sample course outline with learning outcomes tied to assignments / topics.)***

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| --- | --- | --- | --- |
| Week | Topic | Assignment | Learning Outcomes |
| 1 | Introduction, definition of mechanics, Fundamental Principles and Concepts, units, conversion of units, Method of problem solution, introduction/review Calculus (differentiation). | Read Introduction and Chapter 1 | 1, 2 |
| 2 | Forces on a particle, resultants, addition of vectors, Graphical Method of addition. | Read 14-22, Work-Sample problems 2.1& 2  Work Problems 2.1-2.5 | 1, 2 |
| 3 | Resolution of force into components, rectangular components, addition of forces by summing components. | Work Problems 2.7-2.10, 2.13-2.15  Read 24-28, work sample 2.3, Problems 2.16-2.19, 2.24-2.29 | 1, 2 |
| 4 | Equilibrium of a particle, Newton’s First Law of Motion, Free-body diagram.  **Test One** | Read 31-35, work sample 2.4-6, Problems 2.34-41,48  Read 39-45, work sample 2.7-8, Problems 2.58, 2.64 | 1, 2, 3 |
| 5 | Rigid bodies in two dimensions, equivalent systems of forces, external and internal forces, Principle of Transmissibility. | Read 59-67, work sample 3.1-3, Problems 3.1-8  Read 70-76, work sample 3.4-5 | 1, 2, 3, 4, 5 |
| 6 | Equivalent forces. Two-dimensional structures. Moment of force about an axis. Varignon’s Theorem, Moment of a Couple. | Problems 3.19-22, 25  Read 80-83, work sample 3.6-7 | 1, 2, 3, 4, 5, 6 |
| 7 | Reduction of a system of forces, equivalent couples, addition of couples. | Problems 3.38-42  Read 87-97, work sample 3.8-12 | 1, 2, 3, 4, 5, 6 |
| 8 | Resolution of a given force, reduction of a system of forces, equivalent systems of coplanar forces.  **Test two** | Problems 3.55-60  Read 104-106, work sample 3.13, Problems 3.96-97 | 1, 2, 3, 4, 5, 6 |
| 9 | Equilibrium of rigid bodies, Free-Body Diagram, reactions at supports, two-force and three-force bodies in equilibrium. | Read chapter 4  Read the chapter- no problems | 1, 2, 3, 4, 5, 6 |
| 10 | Distributed forces, center of gravity, centroids of areas and lines, First Moments of area and lines, composite plates and wires. | Read 154-164, work sample 5.1-3  Problems 5.1-10 | 1, 2, 3, 4, 5, 6 |
| 11 | Distributed loads. Moments of Inertia. Center of Gravity. Composite bodies.  **Test three** | Read 170-184, work sample 5.9-10, Problems 5.72-73  Problems 5.74-81 | 1, 2, 3, 4, 5, 6 |
| 12 | Analysis of structures, Trusses, definition of a Truss, simple Trusses, analysis of a Truss by Method of Joints, analysis of Trusses by Method of Sections. | Read 206-217, work sample 6.1  Problems 6.1-5 | 1, 2, 3, 4, 5, 6 |
| 13 | Frames, Multi-force Member, Analysis of a Frame. Machines. Forces on a pulley. | Read 220-224, work sample 6.2-3  Problems 6.21-30 (odd) | 1, 2, 3, 4, 5, 6 |
| 14 | Beams. Forces in beams, internal forces in members, bending moment diagrams, relations among load, shear, and bending moment. | Read 228-234, work sample 6.4-6, Problems 6.49, 51  Read 243-245, work sample 6.7, Problems 6.97-98 | 1, 2, 3, 4, 5, 6 |
| 15 | Friction, the laws of dry friction, coefficients of friction, angles of friction. Wedges, screws, belt friction | Read 301-309, work sample 8.1-3 Problems 8.1-20 (odd)  Read 318- 337, work sample 8.4-8 Problems 8.60,62,84,106 | 1, 2, 3, 4, 5, 6, 7 |
| 16 | **Final Exam** |  | 1, 2, 3, 4, 5, 6, 7 |
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**15. SPECIFIC MANAGEMENT REQUIREMENTS\*\*\*:**

Note well:

All assignments and tests must be turned in on time. Students may work on their own time to complete the assignments. Some group work is encouraged on exercises and assignments. Assignments must be in 3-pin paper binder.

Examinations will include written and graphical components.

For credit, all assignments will be completed as scheduled.

No test may be taken late without prior approval of instructor.

No make-up tests. Read your student handbook.

**16. FERPA: \***

Students need to understand that their work may be seen by others. Others may see students’ work when being distributed, during group project work, or if it is chosen for demonstration purposes. Students also need to know that there is a strong possibility that their work may be submitted to other entities for the purpose of plagiarism checks.

**17. ACCOMMODATIONS: \***

Students requesting accommodations may contact Ryan Hall, Accessibility Coordinator at rhall21@sscc.edu or 937-393-3431, X 2604.

Students seeking a religious accommodation for absences permitted under Ohio’s Testing Your Faith Act must provide the instructor and the Academic Affairs office with written notice of the specific dates for which the student requires an accommodation and must do so no later than fourteen (14) days after the first day of instruction or fourteen (14) days before the dates of absence, whichever comes first. For more information about Religious Accommodations, contact Ryan Hall, Accessibility Coordinator at [rhall21@sscc.edu](mailto:rhall21@sscc.edu) or 937-393-3431 X 2604.

**18. OTHER INFORMATION\*\*\*:**

**SYLLABUS TEMPLATE KEY**

**\*** Item cannot be altered from that which is included in the master syllabus approved by the Curriculum Committee.

**\*\*** Any alteration or addition must be approved by the Curriculum Committee

**\*\*\*** Item should begin with language as approved in the master syllabus but may be added to at the discretion of the faculty member.