El Paso Community College
Syllabus
Part II
Official Course Description

SUBJECT AREA	**Computer-Aided Design**
COURSE RUBRIC AND NUMBER	**ARCE 2344**
COURSE TITLE	**Statics and Strength of Materials**
COURSE HOURS	**3 2 : 4** **Credits Lec Lab**

I. Catalog Description

Studies internal effects of forces acting upon elastic bodies and the resulting changes in form and dimensions. Includes stress, shear, bending moments, and simple beam design. **Prerequisites: DFTG 1309 and MATH 1314. (2:4).**

II. Course Objectives

Upon satisfactory completion of this course, the student will be able to:

A. Unit I. Introduction

1. Identify statics as a part of mechanics of solids.
2. Describe the applications of statics.
3. Solve basic arithmetic, algebraic, geometric, and trigonometric problems related to statics.
4. Use graphical methods to solve problems related to statics.
5. Demonstrate dimensioning and annotation skills.

B. Unit II. Principles of Statics

1. Discuss the concept of equilibrium as a central concept of statics.
2. Discuss the classification and characteristics of forces and force systems.
3. Compute components of forces.

C. Unit III. Resultant of Coplanar Force Systems

1. Determine the parameters of the resultant for the coplanar concurrent force system using the parallelogram law.
2. Determine the parameters of the resultant of three or more concurrent forces using the methods of components.
3. Calculate the parameters of moments of concurrent forces using Varignon's Theorem.
4. Determine the resultant of the parallel vertical force system, acting on horizontal beam.
5. Determine the resultant of the coplanar nonconcurrent force system.

D. Unit IV. Equilibrium of Coplanar Force Systems

1. Establish the conditions a force system must satisfy in order to be in equilibrium.
2. Draw a free-body diagram.
3. Solve problems involving concurrent force systems, parallel force systems, and involving coplanar nonconcurrent force systems.

E. Unit V. Analysis of Structures

1. Determine types of trusses and identify the truss terminology, member behavior, and the forces in member's trusses.
2. Determine the truss reactions and the force in each member of truss using the method of joints.

F. Unit VI. Centroid and Center of Gravity

1. Determine centroid and centroidal axis.
2. Compute the centroidal axis of composite areas.

G. Unit VII. Area Moments of Inertia

1. Compute the moment of inertia of simple geometric shapes.
2. Compute the moment of inertia of composite areas.
3. Compute the radii of gyration for different type of areas.

H. Unit VIII. Stress

1. Determine properties of materials using stress-strain diagrams.
2. Determine actual and allowable stresses.
3. Determine stresses with applied safety factors.

I. Unit IX. Torque

1. Calculate torsional shearing stress.
2. Calculate angle of twist and power transmitted by shaft.

J. Unit X. Reaction

1. Calculate reactions shear.
2. Calculate bending in various types of beams loaded with a variety of loads.

K. Unit XI. Diagrams

1. Draw sheer and moment diagrams.
2. Draw maximum bending moment for a variety of beams and loads.

L. Unit XII. Deflection

1. Calculate deflection in common beams using a variety of methods.

III. THECB Learning Outcomes (WECM)

1. Calculate load and the effect of forces on structures.
2. Prepare moment and shear diagrams.
3. Analyze compression and tensile forces within structural elements.

IV. Evaluation

A. Challenge Exam

There is a challenge exam available for this course. Coordination for any challenge exam should be made through the Drafting Department Coordinator.

B. Post-assessment

1. The instructor will maintain a continuous record of each student's progress.
2. Students should be evaluated periodically throughout the semester.
3. The instructor will determine the weight of each graded assignment.
4. Instructors may require drawing assignments, quizzes, practical/written drawing exams, and formal exams.

C. Grading Scale

A = 92.5 - 100
B = 85.0 - 92.4
C = 75.0 - 84.9
D = 65.0 - 74.9
F = below 65
I = Incomplete
W = Withdrew or Withdrawn

For grade percentage of individual assignments and exams refer to the Syllabus - Instructor's Course Requirements.

V. Disability Statement (Americans with Disabilities Act [ADA])

EPCC offers a variety of services to persons with documented sensory, mental, physical, or temporary disabling conditions to promote success in classes. If you have a disability and believe you may need services, you are encouraged to contact the Center for Students with Disabilities to discuss your needs with a counselor. All discussions and documentation are kept confidential. Offices located: VV Rm C-112 (831-2426); TM Rm 1400 (831-5808); RG Rm B-201 (831-4198); NWC Rm M-54 (831-8815); and MDP Rm A-125 (831-7024).

VI. 6 Drop Rule

Students who began attending Texas public institutions of higher education for the first time during the Fall 2007 semester or later are subject to a 6-Drop limit for all undergraduate classes. Developmental, ESL, Dual Credit and Early College High School classes are exempt from this rule. All students should consult with their instructor before dropping a class. Academic assistance is available. Students are encouraged to see Counseling Services if dropping because exemptions may apply. Refer to the EPCC catalog and website for additional information.