



**TRINITY VALLEY COMMUNITY COLLEGE  
ADMINISTRATIVE-MASTER SYLLABUS**

The Administrative- Master Syllabus is an administrative tool; it is **not intended to be distributed to students**. It is the intention of this Administrative-Master Syllabus to provide a general description of the course, outline the required elements of the course and to lay the foundation for course assessment for the improvement of student learning, as specified by the faculty of TVCC, regardless of who teaches the course, the timeframe by which it is instructed, or the instructional method by which the course is delivered. It is not intended to restrict the manner by which an individual faculty member teaches the course but to be an administrative tool to aid in the improvement of instruction. The Administrative-Master Syllabus will demonstrate that there is consistency and comparability in course offerings.

**Course Title**

Strength of Materials

**Course Prefix and Number**

ARCE 2344

**Department – Division**

Drafting – Vocational/Technical

**Course Type** – select from one of the following categories.

- Academic General Education Course (from ACGM – but not in TVCC Core)
- Academic TVCC Core Course
- WECM Courses

**Semester Credit Hours: Lecture Hours: Lab/other hours**

Semester Credit Hours	Lecture Hours	Lab/Other* Hours
3	3	0

Other hours include practicum, clinical or other types of non-lecture instruction. \*If other, please specify: \_\_\_\_\_

## **Course Catalog Description**

The study of internal effects of forces acting upon elastic bodies and the resulting changes in form and dimensions, including units of stress, shear, bending moments, and simple beam design. The student will specify loading and the effect of forces on structures. The student will prepare moment and shear diagrams and recognize compression and tensile forces within structural elements.

## **Prerequisites/co requisites**

ENGR 1304 Engineering Graphics I  
DFTG 1309 Basic Computer Aided Drafting

## **Topical Outline**

- 1) Introduction
  - a) Overview of course
  - b) Math review
    - i) Basic Algebra
    - ii) Trigonometry
- 2) Force Systems
  - a) Newton's Laws
  - b) Characteristics of force
  - c) Components of force
  - d) Moment of force
- 3) Stress and Strain
  - a) Shear
  - b) Tension and Compression
- 4) Equilibrium of Bodies
  - a) Free Body Diagram
  - b) Force Polygon
  - c) Equilibrium of shafts
- 5) Centroid of an Area
  - a) Centroid of simple area
  - b) Moment of simple area
  - c) Centroid of composite area
  - d) Moment of composite area
- 6) Moment of Inertia
  - a) Moment of inertia of simple area
  - b) Moment of inertia of composite area
- 7) Simple Beam Design
  - a) Flexural design
  - b) Moment design

<b>Course Learning Outcomes</b>
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Upon completion of this course, the student will be able to:

1. Define force, stress, strain, and equilibrium
2. Calculated tensile and compressive stresses, axial forces, and cross-sectional areas of different materials.
3. Calculated strain of different materials.
4. Calculated total length change due to forces.
5. Calculated total change due to temperature change.
6. Demonstrate an understanding of the construction techniques used and geometric element definitions presented.
7. Calculated shear stresses.
8. Utilize free body diagram and force polygon diagram
9. Determine Centroids of bodies
10. Determine Moments of inertia of bodies

<p><b>Relationship to General Education Outcomes</b> – In addition to the core competencies, Trinity Valley Community College has established ten general education goals which specify knowledge and skills that students should gain from completing courses in the various component areas of the core curriculum. Information regarding curriculum and assessment as a means for the improvement of student learning through the general education component. (Select all that apply.)</p>
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Mark with an "X"	General Education Outcome
	A. To communicate clearly and effectively in both oral and written English.
	B. To improve reading skills focused on comprehending, analyzing, interpreting, and evaluating printed materials.
X	C. To understand mathematical information and utilize mathematical skills.
X	D. To demonstrate qualitative and quantitative critical thinking skills.
	E. To understand and appreciate cultural and ethnic diversity.
	F. To utilize computer based technology in accessing information, solving problems, and communicating.
	G. To recognize and evaluate artistic achievements in the visual and performing arts.
	H. To improve basic understanding of political, economic, and social systems.
	I. To demonstrate knowledge of the physical universe and living systems.
	J. To develop skills and strategies to become an engaged learner.

**Required Text(s)**

Simplified Engineering for Architects and Builders  
James Ambrose, Patrick Tripeny  
*John Wiley and Sons, Inc.*  
ISBN: 0-471-67607-1

**Optional Text(s)**

NONE

**Material/Technology to be supplied by the student.**

NONE

**Course Requirements/Grading System** – describe any course specific requirements such as research papers or reading assignments and the generalized grading format for the course; not intended to restrict the individual nature by which each faculty member who teaches the course determines course requirements and final student performance, but should offer consistency within reason for all sections taught for those departments without a standardized format.

Practice assignments and exercises will be made following each days lecture. An engineering style notebook of assignments and exercises will be developed for future reference. Unit type exams will be administered 4 to 5 times throughout the semester. A comprehensive final exam will be administered. The grade will be computed as follows:

Unit Exams	80%
Engineering Notebook	10%
Final Exam	<u>10%</u>
	100%

***Approvals – the contents of this document have been reviewed and are found to be accurate.***

Prepared by	Signature	Date
Department Head	Signature	Date
Division Chair	Signature	Date
Vice President	Signature	Date