

THREE RIVERS COMMUNITY COLLEGE
STRUCTURAL DESIGN CIV K222

Wednesday 6:00 - 8:45 PM

Professor: Professor Mark A. Comeau ▪ ARCHITECT, 860.215.9415, email MComeau@threeivers.edu

Credits: 3, Hours: 3

Grade: Projects 50% Exams/Assessments 40% Class Participation 10%

Course Objectives:

The names and functions of various statically-determined structural steel and concrete members and systems are discussed and analyzed including footings, columns, beams, slabs, trusses, and connections. Students will practice solving designs for shear, bending moment and deflection through analytic methods according to current specifications using appropriate design techniques, manuals, and theory, and practice graphical detailing of designs according to current practice.

Method: Lectures / Slide Lectures, Operations Demonstration, Theory Modeling & Testing

Resources: **Instructor Supplements:** Materials Available on Course Blackboard

(Note: Documentation appropriate to the scheduled lecture will be posted on Blackboard at the time of the lecture.)

Suggested Structural Design of Buildings, Smith, Paul, Wiley, ISBN: 978-1-118-83941-6

Resources: Basic Structures, Garrison, Philip, Wiley, ISBN: 978-1-118-95087-6

Unit 1 **Introduction**

“The Nature of Things”

Unit 9 **Site & Geology**

Subsurface Soil: Excavation & Trenches

Unit 2 **The History of Structures**

Shelter, Infrastructure & Towns

Unit 10 **Site & Geology**

Surface: Paths, Pavers & Pads

Unit 3 **Loads & Their Behavior**

Force, Stress, Equilibrium & Components

Unit 11 **Foundation Systems**

Concrete, Slabs & Piles

Unit 4 **Systems & Forms of Structure**

Post + Lintel, Arches

Unit 12 **Floor Systems**

Wood, Steel & Concrete

Unit 5 **Systems & Form of Structures**

Plates, Skeletal & Composites

Unit 13 **Wall Systems**

Wood, Steel & Concrete

Unit 6 **Systems & Forms of Structures**

Efficiency, Rigidity & Flexure

Unit 14 **Roof Systems**

Shape & Material

Unit 7 **Basic Design**

Material, Spacing, Spans, Height

Unit 15 **Fenestration**

Curtain Walls & Opening

Unit 8 **Advanced Design**

Sizing, Deflection, Safety-factor

Course Completion

Projects Recap and Assessment

LEARNING OUTCOMES

- Develop an understanding of natural forms of structure of nature’s built-in efficiencies using materials.
- Develop an understanding of the historical evolution of human-built structures over time.
- Practice the exploration of structural systems – their materials, assemblies and capabilities, through modeling and forced-failure in design.
- Demonstrate working knowledge of the properties and behavior of wood, timber, steel, and concrete in various structural modes.
- Demonstrate working knowledge basic structural mathematical computations.

ACADEMIC PERFORMANCE

Lecture Period:

Students shall respect the classroom environment. Professors invest valuable time in lecture preparation to make the course content organized, interesting, and understandable and to make the learning environment collegial. Unless specifically directed by the professor, students shall refrain from sending email and instant messages, or from engaging in other activities (reading non-course materials, engaging in private conversations and so on), that disrespect the classroom environment and learning conditions for others.

Access to the Internet can be a valuable aid to the classroom learning environment. Students are encouraged to use laptops, smart phones, and other devices in order to explore concepts related to course discussions and topics. Students are discouraged from using technology in ways that distract from the learning community (e.g. Facebook, texting, work for other classes, etc.) and if found doing so, will be asked to leave the classroom for the day and will not get credit for attendance that class period.

Assessment:

Assessment of your mastery of the Course's learning objectives may be administered through quizzes, exams, or essays which may be in the form of ground "hard-copy" or administered through BlackBoard. These are announced with ample preparation time and sometimes a study guide. Upon absence from a class in which an assessment is given, it is the student's responsibility to request, coordinate and schedule, a makeup date and time with the professor. Assessments not made up within one week from when initially given will result a three point reduction from the score earned, per class period lapse.

Online Learning Portfolio:

All students are required to maintain an online learning portfolio in Digication that uses the college template, in as much as it is pertinent and supported by outcome products of this course. Through this electronic tool students will have the opportunity to monitor their own growth in college-wide learning. The student will keep his/her learning portfolio and may continue to use the Digication account after graduation. A Three Rivers General Education Assessment Team will select and review random works to improve the college experience for all. Student work reviewed for assessment purposes will not include names and all student work will remain private and anonymous for college improvement purposes. Students will have the ability to integrate learning from the classroom, college, and life in general, which will provide additional learning opportunities. If desired, students will have the option to create multiple portfolios.

Integrity:

Any and all exams, papers or reports submitted by you and that bears your name is presumed to be your own original work that has not previously been submitted for credit in another course unless you obtain prior written approval to do so from your professor.

In all of your assignments, including homework or drafts of papers, you may use words or ideas written by other individuals in publications, web sites, or other sources but only with proper attribution. "Proper attribution" means that you have fully identified the original source and extent of your use of the words or ideas of others that you reproduce in your work for this course, usually in the form of a footnote or parenthesis.

As a general rule, if you are citing from a published source or from a web site and the quotation is short (up to a sentence or two), place it in quotation marks; if you employ a longer passage from a publication or web site, please indent it and use single spacing. In both cases, be sure to cite the original source in a footnote or in parentheses. (See http://www.plagiarism.org/plag_article_how_do_I_cite_sources.html for more information on citing.)

If you are uncertain about the expectations for completing an assignment or taking a test or examination, be sure to seek clarification from your professor beforehand.

Finally, you should keep in mind that as a member of the Three Rivers Community College community, you are expected to demonstrate integrity in all of your academic endeavors and will be evaluated on your own merits.

Be proud of your academic accomplishments and help to protect and promote academic integrity. The consequences of cheating and academic dishonesty may include a formal discipline file, possible loss of financial scholarship or employment opportunities, and denial of admission to a four year college.