

## **Course Policies and Procedures** **BCN 2405C Construction Mechanics**

### **Prerequisites**

MAC 3233, PHY 2004, and PHY 2004L

### **Description**

Structural behavior of loads resisting members in buildings. Properties of structural materials. Primarily for Building Construction majors.

### **Objectives**

To study forces, materials and their strengths particular to construction, to include analysis for structural systems: beams, columns, frames, trusses. Students will also learn axial stress, strain, properties of materials, beam analysis, shear and moment diagrams, bending and shearing stress, deflection and design of typical building beams.

### **Required Texts**

Applied Statics and Strength of Materials, Fifth Edition, Spiegel and Limbrunner, Pearson Prentice Hall, 2009.

### **References**

Statics and Strength of Materials for Architecture and Building Construction, Barry Onouye & Kevin Kane, Prentice Hall, 1999 or 2001.

Adeeba will be teaching lab. classes on Fridays. Sakai website will be used for homework and exam grades, attendance grades, homework solutions, exam solutions and important announcements. Adeeba will maintain the Sakai website, grade homework assignments and help students with the assigned HW. Please contact her for discussing homework and exam grades as well.

### **Structures Teaching Assistant**

Rinker School also appoints another TA for help for structures courses (if funds are available). If additional TA is available, his name contact information and office hours will be announced in class.

### **Instructor**

Dr. Ajay Shanker, PE, RNK 331 Rinker Hall, 273-1162, [shanker@ufl.edu](mailto:shanker@ufl.edu).

<b>Grading</b>	<b>Points</b>
Best 5 Exams	500
Attendance	50
Homework	100
<b>Total</b>	<b>650</b>

Students are advised to adhere to highest norms of honesty as spelled out in the student honor code during exams. Students should also avoid any action that may even lead to perception of cheating or dishonesty in exams. Therefore, talking, exchanging books or notes, sitting close to another student in exams, wearing sunglasses or caps is strictly prohibited during exams. Instructor may assign seating to a specific student before or during an exam.

All exams are open books, open notes, multiple choice format and have equal weight. One extra

(make-up) exam is also scheduled for absences because of medical reasons, school-related activities, family issues, emergencies, work-related issues and other unforeseen circumstances. The sixth exam will be scheduled in the finals week. Best five exam grades out of possible six exam grades will be used for the final grade calculation. The dates of exams are listed in the course outline. To complete the course syllabus in time, exam solutions will be posted on the Internet. All matters about change of an exam grade should be settled within a week after the exams are returned and solutions are posted. Depending on raw scores instructor may choose to curve any or all exams.

All absences in exams will incur a zero. Students are, therefore, advised not to miss any exam especially during first five exams. If a student were to miss more than one exam for valid and well documented reasons, for example, taking part in school related activities or medical conditions etc., final exam grade will be used for missed exams as well.

An extra (makeup) exam is already scheduled; no additional makeup exam will be given to any student under any circumstance. Exams cannot be administered before or after the scheduled time.

### **Grading Scale**

0-389 <b>E</b> ;	390-410 <b>D-</b> ;	411-431 <b>D</b> ;	432-454 <b>D+</b> ;	455-475 <b>C-</b> ;	476-496 <b>C</b> ;
497-519 <b>C+</b> ;	520-540 <b>B-</b> ;	541-561 <b>B</b> ;	562-584 <b>B+</b> ;	585-616 <b>A-</b> ;	617-650 <b>A</b> .

### **Office Hours**

Many office-hour issues can be dealt by e-mail in a very efficient manner. Increasingly, I am spending more and more time answering students' e-mails. So please e-mail if you have any questions. Always write **BCN 2405C, Section Number, and your Name** in the subject line.

For help with lectures and homework please come during office hours after making an appointment day or two before by an e-mail. Please keep your appointment time to 15 minutes, (e.g., 12:45PM - 1:00PM). Also suggest one or two alternate times for scheduling other student requests. I will send you an e-mail about the appointed time. Office hours are given below: TBA

### **Scanner**

Documents can be scanned in all on-campus computer labs. Alternately, students may find it advisable to buy an 8.5 in. x 11in. sheet scanner or a flat-bed scanner. The prices have dropped significantly and many scanners for scanning 8.5in. X 11in. sheets are available between \$65 -\$80.

### **Homework**

- **Assigned homework should be uploaded to the Sakai website by 5PM every Tuesday.**
- In case the server is not working an e-mail with attachment (in pdf file format) to [adeebakas@ufl.edu](mailto:adeebakas@ufl.edu) can be sent.
- If TA's e-mail is not working then you may send the HW to [shanker@ufl.edu](mailto:shanker@ufl.edu)
- If you submit HW by e-mail, the subject line should be 'BCN 2405C, HW No. \_\_\_\_, and Your Name \_\_\_\_\_'

We will try to post the HW solutions before 9:00AM on Wednesday. Students are required to check

their HW and make any corrections themselves. The TA will assign HW grade to all submissions within a week. Because of this arrangement, late homework will not be accepted under any circumstances. Problems should be worked on the engineering paper with 0.5-mm pencil before scanning the HW as a pdf file. Please use not more than 300 dpi resolution to make small files. All sketches should be neatly drawn using a ruler. All answers should be underlined.

The teaching assistant appointed by the school for this course would be in-charge of the homework grade part of this course. As many students are enrolled in this class, students should realize the potential of errors or omissions on part of teaching assistant and resolve it directly with her by e-mail. Homework grade may be assigned based on overall attempt or detailed checking, therefore, full points on any homework does not imply that solution is correct. Students are responsible for reviewing correct homework solutions, exams and homework grades that are posted on the Internet.

### **Attendance and Discipline**

**Students are not allowed to use laptops, iPods or other electronic devices at all. All cell phones must be turned off during classes.** The attendance is compulsory. Students who are more than five minutes late will not be allowed to attend class. Attendance for lecture classes and labs will carry 50 points and will be based on the attendance record for the days instructors choose to take attendance.

### **Student Responsibilities**

Attend all classes and send-in homework when due. Be aware of all the announcements or changes in the course policies or coverage made by the instructor. Read the text assignment before the class and come prepared with questions. Work extra problems to understand each topic. Students are required to pick-up their exams within two weeks from the instructor after it is returned. Instructor will ask a student to leave the classroom if he is talking or engaging in other disruptive behavior in class. Food or drinks are not allowed in classes. Honor Code will be strictly enforced. Seek timely help if not making satisfactory progress. Students needing accommodations for learning differences and other physical conditions need authorization from appropriate UF offices and submit the paperwork to instructor at-least one-week prior to exams otherwise no accommodation will be provided. Tell instructor if you withdraw from this course or end your activity in this course. Be aware of the Honor System of University of Florida. All students in this course are subject to the requirements of the University of Florida's Honor Code. *We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.*

## BCN 2405C Course Outline

Week	Topics and Coverage	Reading Assignments
1	Introduction of Course; Introduction to Statics Force, Units, Types	1-1 thru 1-6 2-1 thru 2-4
2	Scalar and Vector Quantities Principle of Transmissibility, Force Systems Resultants & Components of Forces	2-5 2-6 thru 2-8
3	Resultant of Two Concurrent Forces Resultant of Three or More Forces Moment of Force & Varignon's Theorem Parallel Force Systems Couples & Non-concurrent Force Systems	3-1 3-2 3-3 thru 3-4 3-5 3-6 thru 3-7
4	Equilibrium of Concurrent Force Systems Equilibrium of Parallel & Non-concurrent Forces	4-1 thru 4-4 4-5 thru 4-6
5	Trusses, Types, Behavior and the Method of Joints The Method of Sections	5-1 thru 5-4 5-5
6	Analysis of Frames Center of Gravity Centroids and Centroidal Axes	5-6 7-1, 7-2 7-3
7	Centroids & Centroidal Axes of Composite Areas Moment of Inertia & Transfer Formula Moment of Inertia of Composite Areas	7-4 8-1 thru 8-3 8-4 thru 8-6
8	Tensile, Compressive, Shear Stresses & Deformations Hooke's Law, Tension Test & Factor of Safety	9-1 thru 9-4 9-6, 10-1 thru 10-7
9	Poisson's Ratio, Thermal Stresses Beams Types, Loads, Reactions	11-1, 11-2 13-1 thru 13-3
10	Introduction of Shear Force & Bending Moment Shear Force & Bending Moment Diagrams	13-4 thru 13-5 13-6
11	Sections of Max Moment Stresses due to Bending, Flexure Stresses due to Bending & General Shear Formulas	13-7, 13-7 14-1, 14-2 14-3 thru 14-7
12	Beam Analysis & Deflections Beam Deflections	14-7, 15-4 15-4
13	Design of Steel Beams Design of Timber Beams	16-1 thru 16-2 16-3

14 Columns: Intro., Ideal Columns & Effective Length  
Design of Columns

18-1 thru 18-4  
18-5 thru 18-8

Chapter 1 HW Problems due Tuesday August 28 (upload or E-mail by 5PM)

1-5, 1-7, 1-11, 1-13, 1-17, 1-19, 1-23, 1-25, 1-27, 1-29, 1-31, 1-35, 1-37, 1-39, 1-41

Chapter 2 HW Problems due Tuesday September 4 (upload or E-mail by 5PM)

2-1, 2-3, 2-5, 2-7, 2-11, 2-13, 2-15, 2-17, 2-19, 2-21, 2-23, 2-25, 2-27, 2-28 (Answers: 1.789K, 0.894K;  
3.58K, 1.789K)            2-29