

The University of Texas at Tyler  
Department of Construction Management

**CMGT: 3315**  
Construction Structural Systems **II**

**Course Syllabus (Fall 2023)**

**Date Class Begins:** 8/21/2023

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| Time & Venue | <p><b>11:15 to 12:10</b> PM Every Mon, Wen, Fri in Room RBN 3040</p> <p><b>Short building blocks</b> – not too much BUT no time to repeat material!</p> <p><u>NOTE:</u> Construction is a <i>service industry to an owner</i> of the project. The owner is our only “<i>concern</i>” to whom we owe “<u>excellent performance</u>” that requires our timely and “<u>professional competence</u>” in all of the duties required to meet all the required outcomes/goals of the project.</p> <p><b><u>The Management of Time is of supreme importance to any project.</u></b><br/>The professional standard is:</p> <ol style="list-style-type: none"><li>1. <b>NEVER be late</b> for any class. If you <i>must</i> be late OR if you <i>must</i> miss a lecture <b>you MUST</b> notify me at least 15 min. ahead of time. Any tardy attendance to class or submission of any graded material will be <b>graded as a ZERO.</b></li></ol> <p><b>Note:</b> Just like the real jobs that many of you have -- <u>We expect you to be on time and ready when class starts.</u> <u>IF you come late without prior permission:</u></p> <ol style="list-style-type: none"><li>1. <u>you will not be allowed into the class and interrupt the project underway for that day.</u></li><li>2. You must see me after the end of class and explain why you were late. You will get a ZERO for that class and exercise if you do not have a valid excuse for your tardiness.</li><li>3. Things do happen out of our control – some types of these events that could qualify for an excuse for being late would be death in family, urgent medical emergency needs validated by a doctor note, or some other validated significant act of God like a car accident.</li><li>4. Anything due for that class that is not turned in by start of class is late.</li><li>5. <b>Never miss a lecture</b> – there are no complete CM engineering professional textbooks – the material in the text is heavily augmented by me as we discuss the material in <u>each class</u> – <u>both the text and lecture sources are the material that will be used for all projects and exams in CMGT 3315.</u></li></ol> |
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| Instructor       | <p>Joe Boylan<br/> Office: RBS 1037<br/> Email: <a href="mailto:jboylan@uttyler.edu">jboylan@uttyler.edu</a><br/> Phone: (903) 565-5884<br/> Office hours: 0800:00 a.m. – 1700 p.m.</p> <p>I am <b>always available</b> for help in my office anytime I am not teaching. (See office hours outside of RBS 1037) To ensure you get your necessary help please email me ahead of time and we can get your visit locked into the schedule.</p>  |
| Prerequisite     | CMGT 3310  |
| Extra Help       | I am always available to <i>provide extra instruction and assistance</i> to any student needing extra help in 3315. Contact me by email or text any time for help if you need it.  |
| Course Website   | See UT Tyler’s CMGT 3315 Canvas Website -watch it daily!   |
| Course Objective | <p style="text-align: center;">Construction Structural Systems <b>//</b></p> <p>1. CMGT 3315 is a follow on core course that continues to look at the strength of materials and the principles of flexure, shear, and deflections that are key to the safe design and building of ALL construction projects. We will now apply these basic construction engineering principles to WOOD as the primary building material. This course will also introduce the application of Building Information Modeling BIM system that we started in 3305 and 3310.</p>   |
| Course Outcomes  | <p style="text-align: center;"><b>Construction Structural Systems // Course Objectives:</b></p> <p><b>A. Internal Stress</b></p> <ol style="list-style-type: none"> <li>1. Draw shear and moment diagrams for a wooden beam.</li> <li>2. Determine normal flexure stresses for a wooden beam.</li> <li>3. Determine the maximum elastic internal bending moment (<math>M_{ME}</math>) for a wooden beam.</li> <li>4. For inelastic conditions, determine the partially plastic internal bending moment (<math>M_{PP}</math>) and the fully-plastic internal bending moment (<math>M_{FP}</math>) for a wooden beam.</li> <li>5. Determine transverse shear stress at any point on a wooden beam it total cross section.</li> </ol> |

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|  | <p>6. Design a <i>prismatic wooden</i> beam. ( A beam with a uniform cross sectional area)</p> <p><b>B. Beam, Deflections and Buckling</b></p> <ol style="list-style-type: none"> <li>1. Explain the elastic curve function for beam deflections.</li> <li>2. Calculate beam deflections.</li> <li>3. Calculate stresses in a member subjected to combined loading due to axial, torsional, internal pressure and/or bending forces in a loaded wooden beam.</li> <li>4. Analyze/design wooden columns.</li> <li>5. Design connections for wood structural elements with bolts and nails.</li> <li>6. Use applicable codes to design members (LFRD) to develop required design loads for wooden structural elements in a design.</li> </ol>   |
| <p>Note to Student About a Syllabus</p> <p>COVID Update Info</p> | <p><b><i>This syllabus is a statement of intent</i></b> about how the course will be taught this semester. It outlines what we will cover, what you will need to do in the course, and it explains what and when you must do these tasks to successfully complete the course and get a great final grade. This syllabus is intended to guide or mastery of the subject matter. Daily review of the course syllabus and course requirements on the Canvas web site will protect you from being unaware of major changes in course requirements and due dates if they are required –NOTE: <b><i>I reserve the right to make changes as necessary to the syllabus with announcement of changes.</i></b> As we learned during COVID there are many circumstances outside of our direct course control that may require changes to this syllabus in content and schedule. These will always be announced in advance and the syllabus will be updated on Canvas so all can be aware of the required changes.</p> <p><i>It is important to take the necessary precautions to ensure a healthy and successful year. UT Tyler continues to urge you to protect yourselves against the flu, COVID and any new threats that may be developing. Be diligent about preventive measures such as washing hands, covering sneezes/coughs, social distancing and vaccinations, which have proven to be successful in slowing the spread of viruses. Encourage those who don't feel well to stay home, and if they show symptoms, ask them to get tested for the flu or COVID. Self-isolation is important to reduce exposure (<a href="#">CDC quarantine/isolation guidelines</a>). Please work with your faculty members to maintain coursework and please consult <a href="#">existing campus resources</a> for support.</i></p> |

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| <p>Required Texts</p> | <p><i>1. Statics and Structural Strength of Materials for Architecture and Building Construction</i> (4<sup>th</sup> Ed.) by Barry Onouye and Kevin Kane (ISBN 978-0-13-507925-6)</p> <p><b><i>NOTE: Class slides in lecture are NOT complete information. You MUST read the chapters and all quizzes and exams will include information in the chapter in the text and may NOT have been included in class lecture slides!</i></b></p>   |
| <p>Grading</p>        | <p>Contributions towards final grade (out of 100%)</p> <p>10% Attending Weekly Lectures and Discussions</p> <ul style="list-style-type: none"> <li>• Attendance and preparedness for weekly lectures in 4335 are expected in order to receive full credit for this portion of your final grade.</li> <li>• Un-announced quizzes</li> </ul> <p>70% Exams 1- 4</p> <p>10% <b>Design of Canoe Shed Project</b> (Team Grade) = DEAN Proj.</p> <p>10% <b>Cardboard Bridge Contest/Project</b> (team Grade)</p> <p><b>10% Cardboard Canoe</b> -not in capstone</p> <p><i>Note: you have project time allocated in the semester schedule –use this wisely and plan accordingly – the outcomes expected for the quality and depth of work for the final results for the projects anticipates the use of this time – you don’t need to do all of the project work outside of class</i></p> <p>Letter grades will be assigned based on the final course grade:</p> <p style="margin-left: 40px;">A 90 and above<br/> B 80 to 89.99<br/> C 70 to 79.99<br/> D 69 to 65<br/> F 65 and below</p> <p><b><i>A grade of C in CMGT 3315 is required for CMGT 4315.<br/> A grade of 69 (D) or below will be a failure to complete the course for graduation in the department.</i></b></p> <p>No letter grade will be released until it is official on the University grade system.</p> |

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| General Syllabus<br>Student Information<br>and Rights | <a href="#">General Syllabus Student Information and Rights .docx</a> |
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| <b>3315 Course Schedule (Subject to change as needed throughout the semester)</b> |        |                                   |                      |   |
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| Date  | Lesson | Topic for Class                   | Reading              | Assignment  |
| 8/21/2023   | 1      | Course Syllabus & Projects Review |                      | Canvas Homework #1 Sheet<br>Cardboard Canoe Project <b>DUE 10/21 **</b><br>Cardboard Beam Project <b>DUE 12/1</b> |
| 8/23/2023   | 2      | The "Arch"                        | CH 3<br>pg 164-172   | Prob 3.30 Also <i>Meet the Shed Owner</i>   |
| 8/25/2023   | 3      | Load Tracing                      | CH 4<br>pg 195 - 230 |   |
| 8/28/2023   | 4      | Idealized Framing and Bracing     | CH 4<br>pg 233-238   |   |
| 8/30/2023   | 5      | Stress and Strain                 | CH 4<br>pg 251 - 293 | 5.1, 5.4  |
| 9/1/2023  | 6      | Sec 5.2-5.3                       |                      | 5.11,12.13.14.15  |
| 9/6/2023  | 7      | Centroid and Moment of Inertia    | CH 6<br>pg 300 - 328 | Review ex 6.4 and 6.11<br>Do prob 6.7, 6.12   |
| 9/8/2023  | 8      | Bending and Shear in Beam         |                      | Prob 7.1, 7.3, 7.4  |
| 9/11/2023   | 9      | Bending and Shear in Beam         |                      | Prob 7.1, 7.3, 7.4  |
| 9/13/2023   | 10     | LRFD Equations                    | Sec 8.7              | Example prob 8.19 , 8.20  |
| 9/15/2023   | 11     | <b>EXAM # 1</b>                   | Ch 1-7               |   |
| 9/18/2023   | 12     | Cardboard Canoe Prep Time         |                      |   |
| 9/20/2023   | 13     | Cardboard Canoe Prep Time         |                      |   |
| 9/22/2023   | 14     | Cardboard Canoe Prep Time         |                      |   |
| 9/25/2023   | 15     | Shear and Bending Moment          | CH 8.1               | Prob 8.1 pg 371 and 8.4 pg 374  |
| 9/27/2023   | 16     | Elastic Bending II                | CH 8.2               | 8.2, 8.3,8.6 pg 379 and 8.9, 8.10   |
| 9/29/2023   | 17     | Inelastic Bending by Equilibrium  | CH 8.3-4<br>CH 8.5   | 8.11,.12,.13<br>8.14,.15 text and 8.15, .21,.22,.23   |

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|                    |           | and Deflection in Beams                                     |                          |                                       |
| 10/2/2023          | 18        | Lateral Buckling and Flexural Stresses & Design for Bending | Sec 8.6, 8.7 pg 427-430  | Text example 8.21                     |
| 10/4/2023          | 19        | Design for Bending  | 8.7 pg 430 - 435         | Text example 8.22, .23                |
| 10/6/2023          | 20        | <b>EXAM #2</b>  |                          | FOR GRADE                             |
| 10/9 and 10/11     | 21,22     | Cardboard Canoe Prep  |                          | Cardboard Canoe Project Time          |
| 10/13/2023         | 23        | Column Buckling, I  | CH 9.1,9.2 pg 438 to 455 | 9.1,.2,3,.4                           |
| 10/16/2023         | 24        | Column Buckling II  | CH 9.3 456 - 466         | 9.8,.10                               |
| 10/18/2023         | 25        | Column Design I   | CH 9 pg 467-472          | 9.12,.13                              |
| 10/20/2023         | 26        | Column Design II  | CH 9.4 pg 474 - 484      | 9.16                                  |
| 10/23/2023         | 27        | <b>Exam #3</b>  | Chp 9                    | For Grade                             |
| 10/25/2023         | 28        | Connections Bolts   | CH 10 pg 513 to page 518 | 10.1,.2,.3,.4,.5                      |
| 10/27/2023         | 29        | Connections Bolts   | CH 507 - 511             | Ex prob 10. ????? on                  |
| 10/30/2023         | 30        | Connections Bolts   |                          | Homework 10.1 - .5                    |
| 11/1/2023          | 31        | Framed Bolt Connections pg513                               |                          | 10.7, .8                              |
| 11/3/2023          | 32        | Welded Connections  | 10.2 pg 519 - 527        | Ex 10.7 – 10.9                        |
| 11/6/2023          | 33        | Eccentricity Welds  | Pg 528                   | Ex 10.10 Homework 10.9, .10, .11, .12 |
| 11/8/2023          | 34        |   |                          |                                       |
| 11/10/2023         | 35        | Steel Framing Details/Bracing                               | Pg 531 - 537             |                                       |
| 11/13/2023         | 36        | <b>Exam #4</b>  |                          | FOR GRADE                             |
| 11/15/2021         | 37        | Welding Shed Project Review                                 |                          |                                       |
| 11/17/2023         | 38        | Welding Shed Proj Presentation                              |                          | To Dean and Ed (Users)                |
| 11/20 – 24         |           |   |                          | Thanksgiving Break                    |
| <b>11/27-11/29</b> | 39 and 40 | Cardboard Bridge Proj Presentation Prep                     |                          |                                       |
| <b>12/21</b>       | <b>41</b> | <b>Cardboard Bridge Proj Presentation</b>                   |                          | <b>For Project Grade</b>              |

