Introduction to Unmanned Aerial Systems ENGR 4390.001
Mechanical Engineering
Spring 2016

A. COURSE INFORMATION

Course number/section: ENGR 4390.001
Class meeting time: 10:00-11:00 am MWF
Class location: IH 162
Course Website: https://bb9.tamucc.edu/webapps/login/

B. INSTRUCTOR INFORMATION

Instructor: David Bridges
Office location: EN 222E
Office hours: 3:30 – 5:00 pm M&W, 10:00 – 12:00 T&R, others as available or by appointment
Telephone: 361-825-2181
e-mail: david.bridges@tamucc.edu
Appointments: Direct contact, phone call, or e-mail

C. COURSE DESCRIPTION

Catalog Course Description (future)
(3 sem. hrs. 3:0) Overview of unmanned aerial systems: history, platforms, operations, command and control, sensor systems, payloads, regulations, policy. Current developments in unmanned aerial systems. Prerequisite: Junior-level standing.

Extended Course Description
In this course, students will be provided an overview of unmanned aerial systems (UAS): what they are, how they are operated and controlled, and the purposes for which they are used. Students will also gain a basic understanding of the relevant FAA regulations and policies that govern the operation of UAS, and will be exposed to current developments in the field.

D. PREREQUISITES AND COREQUISITES

Prerequisites
Junior-level standing.

Corequisites
None.

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES

Optional Textbook(s) or Other References:  None
Supplies:  None.

F.  STUDENT LEARNING OUTCOMES AND ASSESSMENT

Assessment is a process used by instructors to help improve learning. Assessment is essential for effective learning because it provides feedback to both students and instructors. A critical step in this process is making clear the course’s student learning outcomes that describe what students are expected to learn to be successful in the course. The student learning outcomes for this course are listed below. By collecting data and sharing it with students on how well they are accomplishing these learning outcomes students can more efficiently and effectively focus their learning efforts. This information can also help instructors identify challenging areas for students and adjust their teaching approach to facilitate learning.

By the end of this course, students should be able to:

1. Demonstrate a basic understanding of the components of unmanned aerial systems.
2. Demonstrate a basic understanding of the control and operation of unmanned aerial systems.
3. Demonstrate a basic understanding of the sensors and payloads used in unmanned aerial systems.
4. Demonstrate a basic understanding of the regulations and policies governing the operation of unmanned aerial systems.
5. Demonstrate an improvement in their ability to read and interpret a technical document and to communicate their understanding to others.

G.  INSTRUCTIONAL METHODS AND ACTIVITIES

Course will be based primarily on lecture, homework, tests, and the final exam. Class projects may also be assigned.

H.  MAJOR COURSE REQUIREMENTS AND GRADING

Three in-class tests will be given and these will count 65% of the final course grade. Assigned and graded homework (which may include projects and writing assignments) will count 15%, and the comprehensive final exam will count for 20% of the final course grade.

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>% of FINAL GRADE</th>
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<tbody>
<tr>
<td>Tests</td>
<td>65</td>
</tr>
<tr>
<td>Homework</td>
<td>15</td>
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<tr>
<td>Final Exam</td>
<td>20</td>
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I. **COURSE CONTENT/SCHEDULE**

(dates for tests are tentative, subject to change)

<table>
<thead>
<tr>
<th>DATE (BY DAY OR WEEK)</th>
<th>TOPIC</th>
<th>CHAPTER(S)</th>
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<tbody>
<tr>
<td>20 Jan 2016</td>
<td>First day of class</td>
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<tr>
<td></td>
<td>History of Unmanned Aerial Systems</td>
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<td></td>
<td>Elements of UAS</td>
<td>2</td>
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<tr>
<td></td>
<td>Detailed discussions of aircraft, ground control stations, command and control / autopilots, communications data links, launch and recovery systems, operations</td>
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<tr>
<td>17 Feb 2016</td>
<td><strong>Test No. 1</strong></td>
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<tr>
<td></td>
<td>Regulations and Policies</td>
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<tr>
<td></td>
<td>Operations (overview, introduction to regulatory system)</td>
<td>5</td>
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<tr>
<td></td>
<td>Regulatory system</td>
<td>3</td>
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<tr>
<td></td>
<td>Certificate of Authorization</td>
<td>4</td>
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<tr>
<td></td>
<td>Safety assessment</td>
<td>8</td>
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<tr>
<td>14-18 Mar 2016</td>
<td><strong>Spring Break</strong></td>
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<tr>
<td>25 Mar 2016</td>
<td><strong>Test No. 2</strong></td>
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<tr>
<td></td>
<td>Sensors and Payloads</td>
<td></td>
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<td></td>
<td>Relation to regulatory system</td>
<td>10</td>
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<tr>
<td></td>
<td>UAS for Geospatial Data – applications of UAS data acquisition</td>
<td>6</td>
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<tr>
<td></td>
<td>Detect / sense and avoid systems</td>
<td>9</td>
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<tr>
<td>8 Apr 2016</td>
<td><strong>Last day to drop a class</strong></td>
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<td>29 Apr 2016</td>
<td><strong>Test No. 3</strong></td>
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<td></td>
<td>Current topics (as time allows)</td>
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<tr>
<td>9 May 2016</td>
<td><strong>Final exam:</strong> Monday, 8:00-10:30 am</td>
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Note: Changes in this course schedule may be necessary and will be announced to the class by the Instructor and posted to the class Blackboard site. The assignments and exams shown are directly related to the Student Learning Outcomes described in Section F.
J. **COURSE POLICIES**

**Attendance/Tardiness**
Attendance will be taken on a daily basis. Students are expected to arrive on time for the beginning of the class. **Each student is responsible for what takes place in class each day, whether or not the student is present.**

**Late Work and Make-up Exams**
The only graded exercises in the class will be the in-class quizzes, the three tests, and the final exam. No make-up quizzes will be given; quizzes missed due to absences will be the dropped quiz scores. Tests missed as a result of unexcused absences will result in a score of zero. Under most circumstances, the final exam grade will be substituted for tests missed due to excused absences. The absence must be excused in advance except in case of extreme emergency. **No makeup exams will be given,** except under unusual circumstances and entirely at the discretion of the instructor.

**Cell Phone Use**
Cell phones should be turned off and put away during class.

**Laptop Use**
Laptops should be turned off during class, unless a student is using the electronic form of the textbook. Laptops may be used during tests if the student has only the electronic form of the book. These students should sit on the front two rows of the classroom during tests and the final exam.

**Missed Exam**
See “Late Work and Make-up Exams,” above.

**Communications**
All outside-of-class communications from the instructor to the students will be conducted through the message and e-mail functions of the Blackboard site for the class. Each student should make sure his or her preferred e-mail address is the one in the Blackboard system, and each student should check e-mail and the Blackboard message site regularly. Students are not required to go through Blackboard to contact the instructor but may do so through direct e-mail to the instructor.

K. **COLLEGE AND UNIVERSITY POLICIES**

- **Academic Integrity (University)**
  It is expected that university students will demonstrate a high level of maturity, self-direction, and ability to manage their own affairs. Students are viewed as individuals who possess the qualities of worth, dignity, and the capacity for self-direction in personal behavior.
  See Full University Policy at [http://catalog.tamucc.edu/content.php?catoid=10&navoid=313#Academic_Integrity](http://catalog.tamucc.edu/content.php?catoid=10&navoid=313#Academic_Integrity)
• **Deadline for Dropping a Course with a Grade of W (University)**
The grade of W will be assigned to any student officially dropping a course by Friday, April 8, 2016. No student is eligible to receive a W without completing the official drop process by this deadline. Visit the Office of the University Registrar for the Course Drop Form that must submitted. After April 8, 2016 a student will not be allowed to drop a course.

• **Grade Appeals (College of Science and Engineering)**
As stated in University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules website at [http://www.tamucc.edu/provost/university_rules/index.html](http://www.tamucc.edu/provost/university_rules/index.html), and the College of Science and Engineering Grade Appeals webpage at [http://sci.tamucc.edu/students/GradeAppeal.html](http://sci.tamucc.edu/students/GradeAppeal.html). For assistance and/or guidance in the grade appeal process, students may contact the chair or director of the appropriate department or school, the Office of the College of Science and Engineering Dean, or the Office of the Provost.

• **Disability Services**
The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please call (361) 825-5816 or visit Disability Services in Corpus Christi Hall 116.

If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

[http://disabilityservices.tamucc.edu/](http://disabilityservices.tamucc.edu/)

**GENERAL DISCLAIMER**
I reserve the right to modify the information, schedule, assignments, deadlines, and course policies in this syllabus if and when necessary. I will announce such changes in a timely manner during regularly scheduled lecture periods and will post any such changes to the class Blackboard site.