Hazardous Waste Operations & Emergency Response  
Department of Physical and Environmental Science  
Fall 2017

A. COURSE INFORMATION

Course number/section:  ESCI 4370.002  
Class meeting time:  Lecture:  R 5:30PM – 7:20PM  
                      Laboratory:  R 7:30PM – 9:20PM  
Class location:  Center for the Sciences (CS) 103  
Course Website:  https://bb9.tamucc.edu/

B. INSTRUCTOR INFORMATION

Instructor:  Nathaniel C. Galvan  
Office location:  NRC 1107  
Office hours:  R 12PM – 1PM  
Telephone:  361-825-5585  
e-mail:  nathaniel.galvan@tamucc.edu  
Appointments:  Additional times are available by appointment

C. COURSE DESCRIPTION

Catalog Course Description

Study of the laws and regulations of hazardous waste management from an historical perspective followed by current techniques for handling, reducing, and disposing of hazardous wastes in an environmentally safe manner. Lab exercises in use of personal protective gear and safe handling of hazardous substances. SMTE 0096 is a co-requisite for this course. Documented completion of this safety training is required early in the semester for continued participation in this course. Safety training given during a laboratory meeting early in the semester is required for continued participation in this course.

Extended Course Description

Hazardous Waste Operations and Emergency Response (HAZWOPER) regulations 29 CFR 1910.120, the U.S. Occupational Safety & Health Administration (OSHA), to support emergency response operations at the local, state, and federal level. Students achieve four separate professional certifications in this course: ICS 100, ICS 700, HAZWOPER, and HAZWOPER Supervisor. This course is recommended for students expecting to enter the environmental workforce or internships within the next year.

This course satisfies the 40-hour off-site employee training requirements of 29 CFR 1910.120 as well as the Resource Conservation and Recovery Act of 1976 (RCRA) and Section 126 of the Superfund Amendments and Reauthorization Act (SARA). These laws apply to workers at hazardous waste sites. The initial training covers safe site investigations, the identification of hazardous materials, typical hazards, proper selection of protective equipment, spill containment and clean-up, container selection, and the transport of spill residues and wastes. The HAZWOPER Supervisor course will prepare the college graduate to supervise others, prepare reports, and assume responsible positions of management at hazardous waste and emergency response sites.
D. PREREQUISITES AND COREQUISITES

Prerequisites
None
Corequisites
SMTE 0096 is required. This must be completed online by the end of the second class day.

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES

Required Textbook(s)

Optional Textbook(s) or Other References
Recommended Free Downloadable Software:
- ALOHA
- CAMEO
- FEMA ICS 100
- FEMA ICS 700
- MARPLOT
- WISER

Supplies
Will be provided.

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 identify:
1. The purposes of OSHA, USEPA, USCG, and NIOSH and their roles in regulating the environmental, health, and occupational safety considerations of the workplace;
2. Hazardous materials, their hazards, their symptoms of exposure, and appropriate engineering controls and personal protective measures;
3. Approved site characterization procedures and methods to: identify problems that may exist in the workplace; assess risks; and how to mitigate those risks;
4. The hazards that may occur when reactive compounds and mixtures are improperly stored or managed;
5. The essential elements of establishing effective site controls including the establishment of safe work zones and decontamination procedures;
6. How to develop and use site health and safety plans (HASP);
7. How to implement response procedures for site or personnel emergencies or hazardous materials exposures.
G. INSTRUCTIONAL METHODS AND ACTIVITIES

Instructional methods include lecture and online training, also lab and field-based exercises.

- Students must complete the web-based FEMA NIMS and ICS training programs (ICS 700 and 100) online. The certificates of completion must be shown to the instructor. These may be completed at any time before or as homework during the week of the course.
- All students will be responsible for developing specific documents for the Incident Action Plan during the tabletop exercise.
- Take-home assignments may be given during the course. These assignments will be due during the next class period. Late assignments will receive less than full credit for the assignments. Assignments will not be accepted after one week from the due date and a grade of “0” will be assigned for that assignment.
- Field Exercises are an integral part of this course. These exercises involve working out of small watercraft in the Corpus Christi Marina and other nearby waters. Note: The class may run overtime on field exercise days.
- Student participation in equipment staging, cleanup, and inventory management is required.
- One major examination will be given during the semester.
- The course may include guest speakers representing industrial, regulatory, or spill response organizations or specialized environmental issues. Students will be responsible for material covered by these speakers and it will be included on exams.

This is an OSHA recognized and industrially oriented safety course. Students should be able to assess all hazards and mitigate those hazards. Hazards may exist in the form of mechanical, thermal, electrical, acoustical, chemical, and biological hazards. Spill response equipment and heavy weights may also represent hazards. Students must wear appropriate personal protective equipment. Protective gloves and clothing should be worn whenever working with fuel, oil, and grease. Closed toe shoes must be worn during all class periods that involve working with response equipment. Significant portions of this course will be held outdoors in the sun. Students are responsible for bringing their own hats, sunglasses, protective clothing, and sunscreen lotion.

G. MAJOR COURSE REQUIREMENTS AND GRADING

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>% of FINAL GRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exams</td>
<td>50</td>
</tr>
<tr>
<td>Quizzes</td>
<td>10</td>
</tr>
<tr>
<td>Homework</td>
<td>10</td>
</tr>
<tr>
<td>Presentations</td>
<td>10</td>
</tr>
<tr>
<td>Labs</td>
<td>10</td>
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<tr>
<td>Papers</td>
<td>10</td>
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</tbody>
</table>
H. COURSE CONTENT/SCHEDULE

Overview of Topics Covered
• Regulations Overview
• Site Characterization
• Toxicology
• Hazard Recognition
• Hazard and Safety Analysis
• Hazardous Chemical Awareness
• Radiological Hazards
• Respiratory Protection
• Personal Protective Equipment
• Site Control
• Decontamination
• Medical Surveillance
• Air Monitoring
• Confined Space Entry
• Emergency Procedures
• Material Sampling

This schedule is intended to serve as general guidance. Weather, student abilities, extended discussions on specific and current topics, or other factors may result in significant adjustments to this schedule.

<table>
<thead>
<tr>
<th>DATE (BY DAY OR WEEK)</th>
<th>TOPIC</th>
<th>CHAPTER(S)</th>
<th>ASSIGNMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>8/31</td>
<td>Introduction, Syllabus, Topic Schedule &amp; Internet Resources Sheet Overview of Environmental Laws and Regulations</td>
<td>Chapter 1: The Hazardous Materials Management System</td>
<td>Complete &amp; Print IS 100.b &amp; 700.a Certifications (On your own) <a href="http://training.fema.gov/IS/crslist.aspx">http://training.fema.gov/IS/crslist.aspx</a> ***Copies of ICS 100 and ICS 700 Certifications are due no later than September 15. ***</td>
</tr>
<tr>
<td>9/7</td>
<td>Hazardous Waste Management and Hazardous Waste Concepts</td>
<td>Chapter 2: Health and Safety</td>
<td></td>
</tr>
<tr>
<td>9/14</td>
<td>Incident Management System</td>
<td>Chapter 3: The Incident Management System</td>
<td></td>
</tr>
<tr>
<td>9/21</td>
<td>Developing ICS Forms and Incident Action Plans</td>
<td>Chapter 3: The Incident Management System</td>
<td>Managing the Incident Video The Emergency Operations Center Video Assign ICS Roles and Responsibilities. NIMS ICS 100 and 700 training certificates due today.</td>
</tr>
<tr>
<td>Date</td>
<td>Event</td>
<td>Chapter</td>
<td>Material / Video</td>
</tr>
<tr>
<td>-------</td>
<td>--------------------------------------------</td>
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<td>----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>10/5</td>
<td>Exam I</td>
<td>6</td>
<td>GHS/HAZCOM Safety Data Sheets</td>
</tr>
<tr>
<td>10/12</td>
<td>Site Safety Plans / Sampling and Chain of Custody</td>
<td>6</td>
<td>Air Monitoring Instruments Video Personal Protective Equipment (PPE)</td>
</tr>
<tr>
<td>10/19</td>
<td>Monitoring Equipment / Computer Aided Resources for Hazardous Materials Incidents</td>
<td>7</td>
<td>Air Monitoring Instruments Video Personal Protective Equipment (PPE)</td>
</tr>
<tr>
<td>10/26</td>
<td>Personal Protective Clothing and Chemical Protective Clothing</td>
<td>8</td>
<td>Selection and Use of PPE and CPC Don, Fit and Doffing of SCBA’s Static Electricity Video &amp; Confined Space Entry Video</td>
</tr>
<tr>
<td>11/2</td>
<td>Implementing Response Objectives</td>
<td>10</td>
<td>Operation of Cascade Air Supply System and Other Air Recharge Systems; Level A Dress Out and Operations; Review for Exam II and Lab Quiz II.</td>
</tr>
<tr>
<td>11/9</td>
<td>Exam II</td>
<td>11</td>
<td>Over-packing a Container; Decontamination Corridor Set-up; Tabletop Exercise</td>
</tr>
<tr>
<td>11/16</td>
<td>Spill Response Techniques and Materials</td>
<td>11</td>
<td>Over-packing a Container; Decontamination Corridor Set-up; Tabletop Exercise</td>
</tr>
<tr>
<td>11/23</td>
<td>Thanksgiving Holiday!</td>
<td></td>
<td>Final Exercise – Full Level A Spill Response Drill.</td>
</tr>
<tr>
<td>11/30</td>
<td>Incident Command</td>
<td></td>
<td>Final Exercise – Full Level A Spill Response Drill.</td>
</tr>
<tr>
<td>12/7</td>
<td>Study for Final Exam</td>
<td></td>
<td>Final Exercise – Full Level A Spill Response Drill.</td>
</tr>
<tr>
<td>12/14</td>
<td>Final Exam No Lab Quiz</td>
<td></td>
<td>Final Exercise – Full Level A Spill Response Drill.</td>
</tr>
</tbody>
</table>

Note: Changes in this course schedule may be necessary and will be announced to the class by the Instructor. The assignments and exams shown are directly related to the Student Learning Outcomes described in Section F.
I. COURSE POLICIES

Attendance/Tardiness
OSHA mandates the number of hours that must be completed in these certification courses. Any missed time must be made up through special arrangements with the instructor. Students seeking HAZWOPER certification for this OSHA mandated training MUST attend all 48 hours of class sessions including participation in the lab demonstrations, experiments, and field exercises. Forty-hours of combined classroom and lab attendance are required in order to be issued a certificate of completion meeting the requirements of 29CFR 1910.120 for Hazardous Waste Operators and Emergency Responders (HAZWOPER). An additional 8 hours are required for HAZWOPER Supervisors. Any students who miss any course hours must attend make-up sessions prior to being awarded a grade or a certificate of completion. The laboratory portion of this course will include a tabletop emergency response management exercise and a simulated spill response in full personal protective equipment. The student should make every effort to complete this short-course with the class. The student must schedule any required make-up course sessions or exams with the instructor within two months of the scheduled completion of the course.

Late Work and Make-up Exams
All exams, assignments, and make-up work must be completed by the last scheduled class day of the semester. A grade of incomplete will be assigned if course work is not completed and it will have to be completed during the next regular semester.

Extra Credit
No extra credit is permitted in this course.

Cell Phone Use
Texting and voice calls should not be conducted during the instructional periods but are allowed during breaks.

Laptop Use
If a student does bring electronic devices the equipment should be protected by a waterproof bag or case. The instructors do not have any responsibility for such equipment.

Food in Class
Acceptable in Classroom. Not allowed in Laboratory.

Missed Exam
All exams, assignments, and make-up work must be completed by the last scheduled class day of the semester. A grade of incomplete will be assigned if course work is not completed and it will have to be completed during the next regular semester.

Participation
Students are expected to behave as if they were an integral part of a spill response team.

Safety
All students registered for this course must complete a TAMU-CC ESCI lab safety course SMTE 0096 online by the end of the second class day. This is an OSHA recognized and industrially oriented safety course. Students should assess all hazards and mitigate those hazards. Protective gloves and clothing should be
worn whenever working with equipment. Closed toe shoes must be worn during all class periods that involve working with response equipment. Significant portions of this course will be held outdoors in the sun. Students are responsible for bringing their own hats, sunglasses, protective clothing, and sunscreen lotion. Any student with a serious (peeling or blistering) sunburn as a result of this class may have their course grade reduced by one letter.

J. COLLEGE AND UNIVERSITY POLICIES

• **Academic Integrity (University)**
  University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. (Plagiarism is the presentation of the work of another as one’s own work.) In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in a failing grade.

• **Classroom/Professional Behavior**
  Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor’s ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.

• **Statement of Civility**
  Texas A&M University-Corpus Christi has a diverse student population that represents the population of the state. Our goal is to provide you with a high quality educational experience that is free from repression. You are responsible for following the rules of the University, city, state and federal government. We expect that you will behave in a manner that is dignified, respectful and courteous to all people, regardless of sex, ethnic/racial origin, religious background, sexual orientation or disability. Behaviors that infringe on the rights of another individual will not be tolerated.

• **Deadline for Dropping a Course with a Grade of W (University)**
  I hope that you never find it necessary to drop this or any other class. However, events can sometimes occur that make dropping a course necessary or wise. Please consult with your academic advisor, the Financial Aid Office, and me, before you decide to drop this course. Should dropping the course be the best course of action, you must initiate the process to drop the course by going to the Student Services Center and filling out a course drop form. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. Please consult the Academic Calendar ([http://www.tamucc.edu/academics/calendar/](http://www.tamucc.edu/academics/calendar/)) for the last day 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/)

• **Statement of Academic Continuity**
  In the event of an unforeseen adverse event, such as a major hurricane and classes could not be held on the campus of Texas A&M University–Corpus Christi; this course would continue through the use of Blackboard and/or email. In addition, the syllabus and class activities may be modified to allow continuation of the course. Ideally, University facilities (i.e., emails, web sites, and Blackboard) will be operational within two days of the closing of the physical campus. However, students need to make certain that the course instructor has a primary and a secondary means of contacting each student.

• **Other Important Policies**
  Material covered in this course includes training required by the Occupational Safety and Health Administration (OSHA) for personnel working in oil spill response activities as described in 29 CFR 1910.120 and OSHA Publication 3172. OSHA regulates the safety and health of employees involved in response operations in any
emergency response activities involving oil and other hazardous substances. While students are not employees, they are learning how to supervise safe work practices after graduation. Field exercises in this course are outdoors. Preparing for and executing these, exercises may include the use of booms, skimmers, and pumps, and potentially some heavy lifting. The safety of every student is of paramount importance. Personal protective equipment (PPE) must be worn whenever appropriate. Students should not engage in any activity that is beyond their safe capacity to complete the activity safely. Whether a disability or simply a physical limitation, you must act safely and communicate your personal situation to the instructor.

K. OTHER INFORMATION

- **Academic Advising**

  The College of Science & Engineering requires that students meet with an Academic Advisor as soon as they are ready to declare a major. The Academic Advisor will set up a degree plan, which must be signed by the student, a faculty mentor, and the department chair. Meetings are by appointment only; advisors do not take walk-ins. Please call or stop by the Advising Center to check availability and schedule an appointment. The College’s Academic Advising Center is located in Center for Instruction 350 or can be reached at (361) 825-3928.

**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.