

**Certificate in Greenhouse Gas Management**  
The George Washington University  
School of Engineering and Applied Science  
Department of Engineering Management and Systems Engineering

*This syllabus is a demonstration syllabus only. The final syllabus will be distributed on the first day of class.*

**COURSE TITLE & NUMBER:** **Greenhouse Gas Measurement and Reporting**  
EMSE 6291

**COURSE DESCRIPTION:** The existing methodologies and standards for measuring and reporting greenhouse gas (GHG) emissions with particular emphasis on accepted environmental accounting frameworks for the business sector and regulatory schemes.

**COURSE GOAL:** Students will develop (1) technical skills required to estimate, analyze, and manage greenhouse gas emission inventories at various scales, (2) ability to report results that satisfy current and emerging local, national, and international requirements, and (3) knowledge to advise business leaders on the implications of these inventories.

**COURSE INSTRUCTOR:** Dr. Tod Delaney

**COURSE LEARNING OBJECTIVES:**

1. Assess objectives of the GHG inventory to design the GHG inventory.
2. Identify, evaluate and assemble resources about greenhouse gas emissions.
3. Prepare, analyze, and interpret GHG data in response to applicable regulations and standards.
4. Develop, estimate, and critique the major elements of a GHG report and supporting documentation.

**COURSE PROCESSES:** Lectures, active discussions (in-class and on-line), problem sets, case studies, small group projects, and multi-media are employed to provide students with the opportunity to learn through different approaches and mechanisms. Grading methods will conform to typical university grading policy.

**COURSE PREREQUISITES:** Masters level status or consent of instructor.  
EMSE 6290 or concurrent registration in EMSE 6290

**ASSUMED PRIOR KNOWLEDGE, SKILLS, AND ABILITIES:** Knowledge of physics, chemistry, earth science, mathematics, and at least one social science, at college level. Ability to use word processing, spreadsheets, web and library search tools, and presentation tools. Skill at writing and expression in English at college level. Familiarity with, and consistent adherence to, the GWU Code of Student Conduct (<http://studentconduct.gwu.edu/code-student-conduct>).

**COURSE** The Greenhouse Gas Protocol, **A Corporate Accounting and Reporting**

RESOURCE: **Standard, Revised Edition**, World Resources Institute and World Business Council for Sustainable Development, 112p. Available free online.  
<http://www.ghgprotocol.org/standards/corporate-standard>

ASSESSMENT OF COURSE OUTCOMES: You will have at least one, and usually several, opportunities to develop and demonstrate expertise in each of the learning outcomes listed above. This information will be posted on the course BlackBoard web site. Assignments may relate to more than one learning outcome.

GRADING EVALUATION METHODS: Grades will be recorded in BlackBoard and available to you real-time. Final course grades will be based on the following items and letter grades will be assigned as follows: A ( $\geq 90\%$ ), B (80-89%), C (70-79%), D (60-69%), F ( $< 60\%$ ).

COURSE ASSIGNMENTS: Individual Project (20%)  
Team Project (20%)  
Problem Sets (20%)  
Comprehensive Exam (20%)  
On-Line Discussion (20%)

## Greenhouse Gas Measurement and Reporting Course Schedule

Session	Topics and Assignments
1	Introduction to GHG inventories. How does a GHG inventory inform GHG management? Who requires inventories? Who uses the information?
2	How do businesses and governments apply GHG inventories? What risks does a GHG inventory identify? How does an inventory help the bottom line?
3	Why are there different protocols and standards? What gets included and what is excluded? How does IPCC define key categories and how is this information applied?
4	What are the types of boundaries and why do they matter? How are boundaries important to inventories? What if my boundaries change, or are different than yours?
5	Who is responsible for emissions and why does it matter? What are the types of control? What are some of the problems in determining control? <b>Assignment of term paper.</b>
6	What are the ways we can measure emissions? How do we go from the things we can measure to the things that matter? How do you turn this into actionable information?
7	What are the major sources of emissions in different industries? What are the emissions not included in the Kyoto Protocol and why are they important? How are new sources created?
8	What is the data collection problem? What is the data management problem? What are some solutions to these problems? <b>Individual projects due at beginning of class.</b>
9	<b>Presentation of individual projects. Assignment of term project.</b> What are the technical issues that challenge GHG accounting?
10	What are the climate forcers? How do we determine the importance of climate forcers? How do we relate the things we measure to the effect of those things on climate?
11	How do we assess the quality and uncertainty of the GHG data and report? Who is responsible for quality control? What if something goes wrong?
12	Who determines what and when I report? What are some common information management approaches? What determines if the same information is useful for more than one report?
13	What are the latest developments on GHG reporting? How can I keep current in the profession? What are the things that are on the horizon (like carbon markets) that will affect GHG reporting?
14	<b>Project team presentations</b> <b>Course Collaborative Review and Evaluations</b>
15	<b>Comprehensive Exam</b>

# Administrative Information and Academic Integrity

## UNIVERSITY RESOURCES AND POLICIES

### Class Policies:

- Attendance is expected at every class session. Students should notify the instructor in advance if attendance is not possible on a particular date.
- Blackboard will be used to post all class materials, resources, homework, required and optional readings, detailed guidelines for the paper and the team presentations, the comprehensive final briefing, and grades. BlackBoard is mandatory for group assignments.
- Discuss arrangements for late submission of materials with the instructor in advance. Late work is subject to daily grade reductions except in special circumstances of demonstrated emergencies.

**Academic Integrity:** Each student is required to observe the University's code for academic integrity as presented at <http://www.gwu.edu/~ntegrity/code.html>.

**University Support Services:** Information regarding disability support services and counseling services can be found at <http://gwired.gwu.edu/dss/> and <http://gwired.gwu.edu/counsel/CounselingServices/AcademicSupportServices> respectively.

## EMERGENCY INFORMATION:

### What to do if the instructor does not arrive:

If the Instructor does not arrive for the class at the designated starting time and has not notified the class of a late starting time or the cancellation of the class, the students should wait in the classroom for at least 30 minutes before departing. One member of the class should be selected to notify the EMSE Department of the Instructor's absence by calling the EMSE Department at 202-994-7541 on the next business day.

### What to do in the case of an emergency:

- All students should familiarize themselves with the emergency evacuation routes from the course classroom. Pay particular attention to understanding how to leave if all power is out and there is no light.
- In the event of an emergency evacuation of the class building, the students are to assemble at:
  - Primary Location: front steps of GSA building E St entrance (next to Elliott School on White House side, middle of block),
  - Secondary Location: playground in Rawlins Park in front of Elliott School across E St.

and not depart until the Instructor has accounted for all of the students.

### General emergency preparedness information:

- GW Campus Advisories. Students should check the GW Campus Advisories Web Site at: <http://www.campusadvisories.gwu.edu/index.cfm> for current information related to campus conditions, closures, safety information and any other information concerning events that may disrupt normal operations.
- GW Alert. All students, faculty and staff registered in the GW banner system GW will receive emergency alerts, notifications and updates sent directly to their GW email address. If individuals elect to receive these alerts on a mobile device they may log on to GWeb Information Web Site at <https://banweb.gwu.edu> and update their contact information to include mobile devices.

### ***Academic integrity:***

Academic integrity is central to the learning and teaching process. Students are expected to conduct themselves in a manner that will contribute to the maintenance of academic integrity by making all reasonable efforts to prevent the occurrence of academic dishonesty. Academic dishonesty includes, but is not limited to, obtaining or giving aid on an examination, having unauthorized prior knowledge of an examination, doing work for another student, and plagiarism of all types.

The number one problem that students run into with regards to academic integrity is plagiarism. It is not okay to copy, use, or otherwise exploit other people's ideas, words, or creations without giving them credit in the proper form. Sometimes this means you must use quotation marks, while other times a simple source citation will do the trick. Changing a few words in a paraphrase is not enough to turn source material into "your own words" – in fact, that's a really bad idea to even try. Changing the phrasing order of sentences is not okay and using the thesaurus to find ways to change "happy" to "glad" is also a very bad idea.

It is expected that students know how to correctly quote and cite material, and also how to write well. This is a doctoral level course and students will be held to the high standards associated with this level of education. For those students who need assistance, the GWU Writing Center is available. See <http://www.gwu.edu/~gwriter/>.

**There is no such thing as "boilerplate" or "standard language" in academia.** Students are expected to write their reports themselves, using their own language and their own formulation. If it is necessary to use material from other sources, it is expected (and mandatory) that the standards of academic style and integrity will be followed. This includes glossaries and appendices. For additional information see The George Washington University Code of Academic Integrity <http://www.gwu.edu/~ntegrity/>