

# Standard Course Outline for ENGR 390: Information and Communication Technology for Sustainability (3 Units)

## *I. General Information*

A. Course Number: ENGR 390

B. Course Title: “Information and Communication Technology for Sustainability”

C. Units: 3

D. Prerequisite: Completion of GE Foundation requirements and upper-division standing. Students must have scored 11 or higher on the GWAR Placement Examination or completed the necessary portfolio course that is a prerequisite for a GWAR Writing Intensive Capstone.

E. Responsible Faculty: Dr. Birgit Penzenstadler, Department of Computer Engineering and Computer Science;

F. Standard course outline prepared by Birgit Penzenstadler, last modified February 10th, 2016

## *II. Catalog Description*

Concepts for understanding and analyzing the sustainability of a given engineering context and how to support it by information and communication technology. Application domains relevant for sustainability engineering like climate change, smart systems, and gamification. Systems thinking for future scenarios.

(Lecture: 2 hours, Activity: 2 hours) Letter grade only (A-F).

## *IV. Curriculum Justification*

This writing-intensive course is the essential stepping-stone for understanding the concept of sustainability and how it relates to the application domains that engineers and related disciplines work in. It equips students with the necessary concepts, methods, and tools to analyze the sustainability of a proposed solution with information and communication technology elements and to assess its long-term effects. As engineers we are responsible for the long-term effects and impacts of the systems we develop; therefore, it is crucial that our students develop an understanding of how these systems impact the environment and our society locally and globally. Furthermore, it enhances their writing and discussion skills.

As a writing-intensive course, students will practice their writing skills in several written assignments of overall more than 5000 words, more than two thirds of the grade are based on written assignments, and students receive feedback on first samples of writing within the first three weeks of the semester (detailed in timeline on page 5 & 6).

## *III. Measurable Student Learning Outcomes, Evaluation Instruments, and Instructional Strategies for Skill Development*

<b><u>SLOs for Sustainability</u></b>	<b>Goal</b>	<b>Instructional Strategy</b>	<b>Assessment / measurement</b>
<b>Understanding of basic sustainability concepts and</b>	Students develop the skill to explain the coarse history of and current application domains for	Brief lectures on concepts and application domains will provide the basis for students’ understanding,	Students will demonstrate their mastery of sustainability concepts in explaining the transfer of these concepts to a

<b>application domains</b>	sustainability concepts and can transfer them to a new context, e.g. in a case study.	which will be deepened in activities to analyze case studies and application domain examples.	new application domain. This will be assessed in team discussions as well as in individual written assignments.
<b>Sustainability dimensions in technology</b>	Students develop the ability to critically reflect upon the different dimensions of sustainability in a given context, specifically in any context that involves software-intensive systems or information and communication technology.	The criteria for the quality of discussion summaries will be discussed in class, and the instructor will give constructive feedback w.r.t. the sustainability dimensions and technology aspects of the discussion. The method for case study analysis will be described and demonstrated.	Students will discuss the lecture content in activities (in small teams) where each time a different student of the team gives a summary of the discussion at the end of the activity. Furthermore, they demonstrate their reflection skills in the written assignments.
<b>Sustainability assessment</b>	Students develop the skills to analyze a given technological solution for its benefits and drawbacks with regard to the sustainability of the surrounding application context and propose improvement measures.	The instructor will go over various examples of problem scenarios and their assessment indicators and then teach strategies that may be applied to iteratively improve the sustainability of the given situation and assessment of that evolution.	Students demonstrate they can assess technological sustainability solutions and design sustainable solutions for their communities that fit the actual underlying needs in scenarios with cultural factors and propose possible sustainability policies.

<b><u>SLOs for Written Communication</u></b>	<b>Writing goal related to course content</b>	<b>Instructional Strategy</b>	<b>Assessment / measurement</b>
<b>Context of and Purpose for Writing</b>	Student will develop abilities to demonstrate a thorough understanding of sustainability concepts in describing the potential of and challenges for sustainability in a particular application domain context, e.g., sustainable food production and sustainable development in engineering.	Brief lectures and classroom discussions will make the students familiar with the context of sustainability application domains and the potential audience for conversations around IT support for these domains. The rubrics for the writing assignments will repeat the most important concepts.	Student will demonstrate awareness of the challenges around sustainability application domains, the potential benefits and drawbacks of IT solutions that support these domains, and will complete the writing tasks with a particular eye towards the interdisciplinary development context.
<b>Content Development</b>	Student will know how to write compelling arguments that demonstrate their understanding of sustainability-supporting information and communication	Standards for good analytical writing will be discussed in class. A writing rubric listing and evaluating the sustainability concepts to be analyzed and described for each writing assignment (e.g., sustainability definition,	Student will demonstrate appropriate and relevant content to develop, explore, and detail benefits and shortcomings of current solutions for sustainability as well as to describe potential future solutions, inspired by

	technology systems.	case study analysis, and leverage points analysis)	assigned literature and class discussions.
<b>Sources and Evidence</b>	Student will know how to find and appropriately cite high-quality, credible, relevant sources to develop the arguments and provide the supporting data for the various sustainability analysis assignments.	A guideline for finding high-quality publications and for citing them correctly will be provided as resource to the students	Student will demonstrate consistent use of credible, relevant sources to support the arguments and provide the supporting data for the various sustainability analysis assignments.

<b>SLOs for Inquiry and Analysis</b>	<b>Analysis goal related to course content</b>	<b>Instructional Strategy</b>	<b>Assessment / measurement</b>
<b>Existing Knowledge, Research, and/or Views</b>	Students will be able to define system scopes and understand causes of and dependencies between sustainability problems by seeing the bigger picture, by being able to expand a system's scope to include further impact factors.	The instructor will go over how to judge literature sources and how to synthesize different sources into a "bigger picture", a more abstract description of the content, and how to critically reflect on and challenge own ideas using a checklist of questions before presenting them to an audience.	Students develop a written definition of sustainability and scoping of a system and its problem domain that defines sustainability in a specific context with regard to what to sustain, for whom, for how long, and at what cost.
<b>Analysis</b>	Students will be able to judge the quality of ICT solutions because they understand the wider impact these solutions may have on their operational environment and business as well as societal context. They can analyze the availability or scarcity of resources and judge their consequences for development in business, society, and for the environment.	The sustainability dimensions and leverage points are taught in class in brief lectures, then discussed in teams in the lab, and then the approach for analyzing them for a case study system is detailed with an example before students get to develop a similar analysis themselves.	Students develop and analysis of the five dimensions of sustainability for a case study and analysis of leverage points for an example system where they demonstrate their adequate judgment of the quality of the given ICT solutions, including the availability or scarcity of resources and judge their consequences for ICT development.
<b>Limitations and Implications</b>	Students will be able to use systems thinking concepts to discuss limitations and implications of technology solutions for sustainability application domains.	The instructor will provide the framework of systems thinking, system dynamics, and leverage points and demonstrate how to use these concepts to find the limitations of given solutions.	Students demonstrate their skill to apply the concepts of systems thinking and leverage points to find the limitations in a given analysis scenario and to structure the implications in arguments in their leverage points analysis paper.

## *V. Outline of Subject Matter*

This is a broad outline of topics to be covered. Subject matter and sequence of topics may vary by instructor. Each of the topics may serve as inspiration for case studies and final essays.

1. Introduction to sustainability (definitions, history, aspects)
2. Information and communication technology in relation to sustainability: Reduce-reuse-recycle, eWaste, planned obsolescence
3. The five dimensions of sustainability: environmental, individual, social, economic, and technical
4. The three orders of effect of technical systems and the rebound effects they can create by their operation
5. Peak oil and climate change and how they are facilitated and counteracted by software-intensive systems
6. Sustainable food production and permaculture facilitated by sensors, actuators, and database systems
7. Smart X – green product and service development using embedded systems and the internet of things
8. Behavior change: gamification of sustainability by developing game apps and web games for educating
9. Sustainable development concepts in engineering: sustainability design principles for engineers
10. Sustainable development process: human-centered, eco-aware systems design for long-term resilience
11. Introduction to systems thinking: computational thinking versus systems thinking and when to use which
12. System dynamics: understanding the stocks, flows, buffers, and feedback loops in systems
13. Leverage points: analyzing system dynamics and using leverage points to change systems sustainably
14. Sustainability assessment (metrics and procedures) for information and communication technology systems
15. Possible future scenarios for ICT systems that support different dimensions of sustainability

Below is a **detailed example timeline** that describes for each week of the semester:

- The **topic** of each lecture
- The content and assignment during the **activity**
- The **deliverable** the students hand in by the end of the day (if 1<sup>st</sup> activity) or the end of the week (2<sup>nd</sup> activity)
- The timeline for **feedback and revisions** for the written assignments

**DETAILED EXAMPLE TIMELINE**

Week	Lecture a	Activity a	Deliverable a	Lecture b	Activity b	Deliverable b
1: The concept of sustainability	Introduction: Sustainability as it developed over time in history	Introduction to freewriting, draft of 1 <sup>st</sup> freewriting task (1 page)	Freewrite 1 due, feedback in 48h, revision due by Activity 2a	The most common definitions and how they relate	Freewrite 1 feedback returned; Brainstorm on definitions in teams, submit draft of 200 words	Draft definition due, feedback in 48h, revision due after Activity 2b
2: ICT and sustainability	Sustainability in ICT and ICT for sustainability (environmental informatics, computational sustainability, sustainable HCI, Green IT and Green ICT, and ICT for sustainability)	Definition (1b) feedback returned; Find more examples and classify them, 2 <sup>nd</sup> freewriting task (1 page)	2 <sup>nd</sup> freewrite due (feedback in 48h, revision due by Activity 3a), plus revision of freewrite 1	Renewable energy and smart grids: production and potentials	Freewrite 2 feedback returned; Guideline to finding & citing good information sources; Discussion on renewable energy production in CA	Revision of Sustainability Definition due
3: The five dimensions of sustainability	The five dimensions of sustainability (potentially including goal modeling)	Analyze the five dimensions for a case study, discussion with peers, start writing up the analysis in class, draft as homework by Activity 3b	Revision of freewrite 2	Student mini presentations on case study (preliminary results of dimension analysis)	Rough draft workshop on 5-Dimension Analysis paper, editing to be completed as homework, to be submitted by end of week	5-Dimension Analysis 1000 word draft, feedback by Activity 4b, revision due by Activity 5b
4: The orders of effect and rebound effects	The orders of effect (LES model)	5-Dimension Analysis draft feedback; Analyze the orders of effect for a case study, discuss in team	-	Rebound effects	Analyze potential rebound effects in case study, discuss in team	
5: Peak oil and climate change	Peak Oil presentation	Discussion on peak oil and relations to renewable energy and future alternatives		Climate change, homework to be completed before: watch “An inconvenient truth”	Discuss “An inconvenient truth” and the reactions and follow-up initiatives	Revision of 5-Dimension Analysis due (1500 words)
6: Sustainable food production and permaculture	Sustainable agriculture (available for student presentations)	Team discussion on food habits		Permaculture (available for student presentations)	Team discussion on challenges for permaculture and the relation to our high-tech society	Handout (for those students who did a presentation)
7: Smart X – green product and service development	Overview of smart technology and service development	Individual research on gaps and open challenges in smart technology	Topic idea for final essay, feedback by Activity 7b	Smart systems (available for student presentations)	Reflection on effectiveness of presentation and discussion on final essay ideas	Handout (for those students who did a presentation)

8: Behavior change and gamification of sustainability	Behavior change	3 <sup>rd</sup> freewrite task	Freewrite 3 due, (feedback in 48h, revision due by Activity 9a)	Gamification	Freewrite 3 feedback; Discuss Jane McGonagall TED talk and discuss lecture & talk	-
9: Sustainable development concepts	Concepts - The Karlskrona Manifesto	Comparing different designs / solutions, freewrite task 4	Revision of freewrite 3, draft of freewrite 4 (feedback in 48h, revision due by Activity 10a)	Concepts of decoupling, dematerialization and substitution	Find other solutions and discuss them, short student presentations	-
10: Sustainable development process	Sustainable development with the IMAGINE approach	Case study analysis: Try out with scenario, short student presentations	Revision of freewrite 4	Organizational and cultural factors during development	Group writing: Play through a number of scenarios with cultural factors, establish policies	-
11. Introduction to systems thinking	Introduction to Systems thinking	Exercises from systems thinking playbook	-	Recap of the Sustainable Development Goals	Free writing for topic ideas for the final essay, followed by peer feedback session	-
12. System dynamics and leverage points	Introduction to System dynamics	Case study analysis: System dynamics modeling of example case study, freewrite task 5	Draft of freewrite 5 (feedback in 48h, revision due by Activity 13a)	System dynamics continued	Rough draft workshop for the final essays with feedback by peers	-
13: Leverage points	Leverage points overview	Case study analysis: Analyze leverage points for sample system, start drafting Leverage Points paper		Leverage points interaction and in-depth	Group writing: Rework and refine leverage points for sample system	Complete 1500 word draft of Leverage Points paper by end of week
14: Sustainability Assessment	Measuring & Metrics and ISO standards (ISO 14000 & 26000)	Feedback on Leverage points draft; Define metrics in all dimensions for a case study and discuss in team	-	Introduction of LCA	Try out LCA with a small example, short student presentations	-
15: Future concepts, saving the world, and the like	Utopias	Develop your own scenario, short student presentations	Revision Leverage Points paper due	Latest trends in research and innovations in sustainability	Write your own research questions and discuss research design with peers	Final essay (1800 words) due by end of the week

## VI. Modes of Instruction

The class consists of lectures from faculty, student presentations, group work, discussion sessions, exercises that the students perform individually and activities in teams. These form the foundation for the development of content for the writing exercises. In particular, the following

- **Brief lectures:** The faculty will give an introduction to the topics from the list above using slides and discussion notes to encourage immediate reflection and trigger questions. These lectures will be held brief to

allow for more interactive class time instead of one-way communication.

- **Student presentations:** Students will be asked to give short (10 minutes) presentations on specific topics they develop from background literature or from teamwork during activities. This way of peer-learning helps to deepen the understanding of the specific topics for the students working on them and provides all students with a broad overview of the topic area.
- **Guest lectures:** Faculty from other departments and colleges may give a guest lecture on their special topic, a sustainability application domain, for example food, water management, or environmental policy. One or two of those may be used during a semester to offer different views on the content we discuss in class.
- **Discussion sessions:** Students will team up at the beginning of the activity sessions to briefly discuss assigned readings (e.g. a research paper or book chapter) or viewings (e.g. a documentary) before reflection and discussion in the larger group. This activates students more effectively than to prompt the whole course.
- **Free write:** This short activity helps students to explore first ideas and to synthesize thoughts. Prompts may be “Which of the given definitions for sustainability resonates most with you and why?” or “How could one of the design mechanisms presented in class facilitate a solution for promoting renewable energy?”
- **Case Study Analysis:** Small student groups (2-3) read through the description of an analysis case and use a set of criteria and tools discussed in class, for example the five dimensions of sustainability and the three orders of effect, to analyze the context, feasibility, risks, and impact of the described case study project.
- **Group write:** Students team up in groups of 2-3 and synthesize their perspectives on a discussion topic. The challenge is to learn to phrase a concise response that reflects a consolidated view. The same technique can be used to start exploring an idea and writing a first elevator pitch for a research project.
- **Rough draft workshop:** Students give each other peer reviews on a rough draft of 1-2 pages for one of the written assignments. They receive guiding open and closed questions for reviewing, e.g. Was there a clear thread through the argument and to the conclusions? Where could you suggest improvements for the thread? Is the argument convincing? How can the author be more convincing in their presentation of the argument (e.g. choose more adequate wording, reference better sources for confirming statistics)? Subsequently, the students share their feedback with each other. These workshops may take about an hour.

## *VII. Textbook*

Currently, there is no single adequate, encompassing textbook for this course but instead a variety of sources. The following is a short list of textbooks that are most likely to be used for this course. Instructors may assign one or more of these and/or include other relevant texts/readings.

For the writing activities, the following two sources will be used:

- Purdue University Online Writing Lab. 2015. Purdue University. (<https://owl.english.purdue.edu>)
- An Introduction to Writing Across the Curriculum. 2015. University of Colorado. (<http://wac.colostate.edu/intro/>)

The book by Hilty and Aebischer below is a research book with compiled essays and is written accordingly, not as a textbook for courses, but it may well serve to prepare the lectures as it covers most of the topics in the outline of the subject matter.

- Hilty, Lorenz M., and Bernard Aebischer. *ICT Innovations for Sustainability*. Springer International, 2015.

For inspiration for activities, the book by Booth Sweeney gives a lot of options. More detailed resources on individual topics are listed in the bibliography.

- Booth Sweeney, L., Meadows, D. *The systems thinking playbook: Exercises to Stretch and Build Learning and Systems Thinking Capabilities*. Chelsea Green Publishing; 2010.

## *VIII. Instructional Policies Requirements*

Instructors may specify their own policies with regard to plagiarism, withdrawal, absences, etc., as long as the policies are consistent with the University policies published in the CSULB Catalog. It is expected that every course will follow University policies on Attendance (PS 01-01), Course Syllabi (PS 04-05), Final Course Grades, Grading

Procedures, and Final Assessments (PS 05-07), and Withdrawals (PS 02-02 rev).

*The following description, or something very similar to it, should also be included in all syllabi: Writing.* Many of the assignments for this class (if not most) will involve some element of writing. Given that we will be looking at how to better communicate the nature and methods of science to students and the public at large, it is only fitting that we pay attention to effective writing. Proper grammar, sentence construction and spelling are expected. Several of the assignments will involve the development of formal drafts, peer review, and revision, while others, such as discussion board assignments, will focus on a quick sharing of ideas. Such requirements or expectations will be provided for each assignment.

## ***IX. Distance Learning/Hybrid Courses***

This course can either be taught in a traditional format where students attend in-class lectures and carry out assignments individually and in teams, or it can be carried out as hybrid course with one face-to-face meeting per week for a lecture and team activities and one remote reading assignment plus an individual research activity/assignment and an online discussion of the results.

## ***X. Bibliography***

This is a highly selective bibliography to provide instructors with a primary set of resource materials. To ensure brevity, important works may be missing from this list. The list is intended to show the range of materials available to our students. Many of the listed articles are research articles and need to be discussed with the students in order to make sure they grasp all concepts described in them.

### **Writing**

- Working it out – Barbara Fine Clouse
- How to Write a Lot – Paul J Sylvia
- Purdue University Online Writing Lab. 2015. Purdue University. (<https://owl.english.purdue.edu>)
- An Introduction to Writing Across the Curriculum. 2015. University of Colorado. (<http://wac.colostate.edu/intro/>)

### **Sustainability**

- Heinberg, Richard, and Daniel Lerch. "What Is Sustainability?." *The Post Carbon Reader* (2010): 11-19.
- Ehrenfeld, John R. "The roots of sustainability." *MIT Sloan Management Review* 46.2 (2005): 23-25.
- Tainter, Joseph A. "Social complexity and sustainability." *ecological complexity* 3.2 (2006): 91-103.

### **ICT and Sustainability**

- Hilty, Lorenz M., and Bernard Aebischer. "ICT for sustainability: An emerging research field." *ICT Innovations for Sustainability*. Springer International Publishing, 2015. 3-36.
- Ferrario, Maria Angela, et al. "Software engineering for 'social good': integrating action research, participatory design, and agile development." *Companion Proceedings of the 36th International Conference on Software Engineering*. ACM, 2014.

### **Application areas**

- Foley, Jonathan A., et al. "Solutions for a cultivated planet." *Nature* 478.7369 (2011): 337-342.
- Deterding, Sebastian, et al. "Gamification. using game-design elements in non-gaming contexts." *CHI'11 Extended Abstracts on Human Factors in Computing Systems*. ACM, 2011.
- Anthony M. Townsend. "Smart cities: Big data, civic hackers, and the quest for a new utopia." W. W. Norton & Company. 2013
- Dohler, M., Vilajosana, I., Vilajosana, X., & LLos, J. "Smart cities: An action plan." In *Barcelona Smart Cities Congress*. (2011, December).

### **Systems thinking**

- Meadows DH. *Thinking in systems: A primer*. Chelsea Green Publishing; 2008.
- Weinberg GM. *An Introduction to General Systems Theory*. Dorset House; 2001.



- Booth Sweeney, L., Meadows, D. The systems thinking playbook: Exercises to Stretch and Build Learning and Systems Thinking Capabilities. Chelsea Green Publishing; 2010.
- Meadows, Donella. Leverage Points: Places to Intervene in a System

#### Assessment

- Tibor, Tom, and Ira Feldman. "ISO 14000: a guide to the new environmental management standards." (1996).
- Pojasek, Robert B. "ISO 26000 guidance on social responsibility. "Environmental Quality Management 20.3 (2011): 85-93.
- Bell, Simon, and Stephen Morse. Sustainability indicators: measuring the immeasurable?. Earthscan, 2008.

### *XI. Student-Level Assessment*

The exact set of course assignments will vary depending on the instructor. University policy requires that no single evaluation of student achievement may count for more than one-third of final grade. Appropriate assessment tools include quizzes, exams, written homework, assignments and oral presentations. As a writing-intensive capstone at least two-thirds of the final grade must be based on writing and all assignments, assessment, and revisions must be integrated throughout the course. Furthermore, the course will meet all requirements for the writing intensive capstone, including a minimum of 5,000 words of writing and early feedback on writing (by week 3). The instructor will also provide feedback to student writing, and allow revision on a regular basis (noted in syllabus).

Sample assignments and essays:

#### WRITTEN TASKS

- **Freewriting:** You will complete 5 freewriting tasks (approximately 1 page each), to begin exploring some key concepts and projects for this class. This gives you a lightweight introduction into writing and into putting your own reflective thoughts into words.  
→ All of these will receive feedback by the following class meeting.
- **Sustainability Definition:** Write your own definition of sustainability (**200 words**). This will help you reflect on the different definitions that you have heard and to compare and decide in which direction your personal understanding of the term develops.  
→ Draft will receive feedback by the following class meeting. Revision due 3 days after feedback.
- **Individual papers:** You will write 3 individual papers over the course of the semester, two with 1500 words and one with 1800 words. They let you explore concepts in more depth and work on your academic writing style.
  1. **5-Dimension Analysis:** Analyze the five dimensions of sustainability for a case study (**1500 words**)
  2. **Leverage points analysis:** Analyze leverage points for an example system (**1500 words**)
  3. **Final essay** on chosen special topic with instructor consent (**1800 words**)
 → Draft will receive feedback within 1 week. Revision due 1 week after feedback.

The sustainability definition and the individual papers sum up to at least **5000 words** in total.

#### PRESENTATION / DISCUSSION TASKS

- **Scenario exploration:** Discussion of scenarios with cultural factors, establish sustainability policies amongst a team and sum them up according to a template for the other teams at the end of the activity.
- **Presentation:** Oral presentation of 10 minutes duration on a selected topic (instructor will provide list to choose from) in class with a 1-page handout summarizing the key points.
- **Active participation:** You are expected to actively participate in class and in team discussions – it makes you learn better, reflect more, and trains your communication skills.

## *XII. Course-Level Assessment*

The exact set of course assignments will vary depending on the instructor. University policy requires that no single evaluation of student achievement may count for more than one-third of final grade. Appropriate assessment tools may include quizzes, exams, written homework, assignments and oral presentations. The suggestion is:

1. Several individual written homeworks: Definition of sustainability, case study analysis paper, leverage points analysis paper, and final essay.
2. Team assignments (to practice and demonstrate the skills from the course objectives above): discussion of scenarios with cultural factors, developing sustainability policies, oral presentations on sustainability application domains and relating them back to the foundational applied sustainability concepts discussed in class.
3. Level of activity in class: Students will be required to participate actively in class by posing questions and answering review questions and discussion questions. This is required for both the lectures as well as the team works.

<i>Assignment</i>	<i>Writing-intensive</i>	<i>Output</i>	<i>1<sup>st</sup> submission</i>	<i>Final version</i>
5 freewriting tasks on key concepts	Yes	1 page each	n.a.	10% in sum
Definition of sustainability	Yes	200 words	n.a.	10%
5-Dimension analysis	Yes	1500 words	5%	5%
Scenario exploration	No	Oral summary	n.a.	10%
Oral presentation	No	Slides & Handout	n.a.	10%
Leverage points analysis	Yes	1500 words	10%	10%
Final essay	Yes	1800 words	n.a.	20%
Active participation in class and in team discussions	No			10%

The writing-intensive part of the grade is composed by freewriting (10%), the definition (10%), the 5-Dimension Analysis (5% draft + 5% final version), the Leverage Points analysis (10% draft + 10% final version), and the final essay (20%). This sums up to **70% of the grade being based on individual writing assignments**.

## *XIII. Consistency of this Standard Course Outline across Sections*

The course coordinator will review this SCO and offer advice and/or materials to each faculty member new to teaching the course. All future syllabi will conform to the SCO. The course coordinator may offer or require regular review of instructors' course materials as well as anonymous samples of student work.