

Assessment Model of the BS-CSE Program in the Computer Science and Engineering Department

Date: Autumn 2006

We use a carefully developed assessment model to assess the degree to which graduates of the BS-CSE program achieve each of the program outcomes and to help in the continuous improvement of the program. The model was developed following extensive discussions among the faculty in the department. We use both *direct* and *indirect* assessments in our approach. The program outcomes which are based on the EC 2000 Criterion 3 outcomes are as follows:

BS-CSE Program Outcomes: Students in the BS-CSE program will attain:

- a. an ability to apply knowledge of mathematics, science, and engineering;
- b. an ability to design and conduct experiments, as well as to analyze and interpret data;
- c. an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, social, political, ethical, health and safety, manufacturability, and sustainability;
- d. an ability to function on multi-disciplinary teams;
- e. an ability to identify, formulate, and solve engineering problems;
- f. an understanding of professional and ethical responsibility;
- g. an ability to communicate effectively;
- h. the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context;
- i. a recognition of the need for, and an ability to engage in life-long learning;
- j. a knowledge of contemporary issues;
- k. an ability to use the techniques, skills, and modern engineering tools necessary for practice as a CSE professional.

The direct assessments we use provide a direct measure, based on actual student performance, of the degree of achievement of the various program outcomes. First, the outcomes were classified into three groups:

1. *Technical skills:* These include outcomes related to the ability to apply knowledge of mathematics, science, and engineering; ability to design a system to meet specifications; etc.
2. *Soft skills:* These include outcomes related to ability to function on multi-disciplinary teams, the ability to communicate effectively, and to engage in lifelong learning;
3. *Societal issues:* These include an understanding of professional and ethical responsibility, understanding of the impact of engineering solutions in an environmental and societal context; etc.

Given the distinct nature of the outcomes in the three groups, we use three distinct approaches, each carefully tailored to evaluating the degree of student achievement of the outcomes in the corresponding group.

1. Direct Assessment of Group 1 Outcomes

Students acquire, throughout the curriculum, the knowledge and skills that help them achieve the outcomes in this group. We created the Program Outcomes Achievement Test (*POCAT*) to help assess the degree to which each of these program outcomes is achieved by BS-CSE students as they near completion of the program. The questions on POCAT are based on topics from nine required high-level courses related to a variety of key topics such as software engineering, formal languages and automata theory, databases, programming languages, computer architecture, etc. All the questions on the test are multiple-choice questions with, typically, two or three questions in each topic area. But they are not the typical questions one might find in, say, the final exams of these courses. Instead, they are more conceptual and are designed to test how well students understand key concepts from across the curriculum. The questions are also chosen in such a way that there is at least one –and often more than one– question directly related to each of the Group 1 outcomes.

All BS-CSE majors are required to take the POCAT one to three quarters before their expected date of graduation. The performance on the test does *not* affect the grades of individual students in any courses, nor are records retained on how individual students performed on the test.

2. Direct Assessment of Group 2 Outcomes

There are three outcomes in the second group, these being, respectively, team-working skills, effective communication, and lifelong learning. We consider each in turn.

For many years now, a number of our courses including, in particular, each of our capstone design courses, have required students to engage in team activities, most commonly in the form of team projects. In order to help assess the extent to which students achieve the outcome related to team-working ability, we have developed a rubric that is used in each capstone course as well as in CSE 560, the junior-level required course on *System Software Design* that includes a large team project, to evaluate the degree to which each student achieves this outcome. The rubric evaluates the student’s team-working skills along three dimensions, these being, “contribution to team project/work”, “taking responsibility”, and “valuing other team members”. For each of these dimensions, four possible levels of achievement are defined in the rubric with the associated scores of 1 through 4 denoting increasing levels of achievement. For example, for the dimension of “taking responsibility”, a score of 1 represents:

Does not perform assigned tasks; often misses meetings and, when present, does not have anything constructive to say; relies on others to do the work;

A score of 4 for the same dimension represents the following level of achievement:

Performs all tasks very effectively; attends all meetings and participates enthusiastically; very reliable.

Along the dimension of “valuing other team members”, a score of 4 represents:

Always listens to others and their ideas; helps them develop their ideas while giving them full credit; always helps the team reach a fair decision.

Full details of this and the other rubrics are available at:

<http://www.cse.ohio-state.edu/~neelam/abet/DIRASSMNT/rubrics.html>

To evaluate the outcome related to effective communication, we have developed mechanisms for assessing both oral and written communication skills. First, consider oral communication. In CSE 601, the required

course on *Social and Ethical Issues in Computing*, as well as in each of the capstone design courses, students are required to make oral presentations on a variety of topics. To assess the extent to which students achieve oral communication skills, we have developed a rubric that evaluates a student's oral presentation along four dimensions, these being, "organization", "mechanics", "delivery", and "relating to audience". For each dimension, four possible levels of achievement are defined in the rubric with the associated scores of 1 through 4 denoting increasing levels of achievement. For example, for the dimension of "delivery", a score of 1 represents the following level of achievement:

Mumbles the words, audience members in the back can't hear anything; too many filler words; distracting gestures;

A score of 4 along the same dimension represents:

Natural, confident delivery that does not just convey the message but enhances it; excellent use of volume, pace, etc.

After initial experience with the rubric, it became clear that we need two distinct rubrics, one to evaluate *individual* presentations, the other to evaluate *team* presentations. The rubric we had initially created was well suited for the former purpose but was lacking with respect to the latter. Therefore we created another rubric better suited for evaluating team presentations. This rubric had a specific additional dimension, "contribution as team member", that evaluated the individual student's contribution to the success of the team's overall presentation rather than just his or her portion of it. In addition, the expectations for different levels of achievement along some of the other dimensions were revised somewhat to account for the team-nature of the presentation. For example, along the "organization" dimension, this rubric considers how the student's presentation complements and builds on, or lays the groundwork for, the presentations of his or her team members. Both rubrics are available at the url listed above. These rubrics are now used in the capstone courses and in CSE 601 to evaluate oral presentations. The instructors of these courses present the results of these evaluations in Undergraduate Committee meetings.

3. Direct Assessment of Group 3 Outcomes

A number of courses in the curriculum, including several in the general education portion of the curriculum, contribute to ensuring that students achieve the outcomes related to societal issues. In order to further improve the achievement of these outcomes and in order to assess the degree of this achievement by the time of the students' graduation from the program, CSE 601, the required course on social and ethical issues in computing, requires each student to explore a new or recent product or practice or event etc., consider the impact it may have in a "global, economic, environmental, and societal context" (outcome (h)); and consider as well any relevant contemporary issues (outcome (j)) and how they affect these considerations; and present the findings in a 3–4 page paper. The paper is also required to address ethical and professional issues related to the product, practice, or event (outcome (f)).

The paper is evaluated using a rubric that includes appropriate dimensions corresponding to outcomes (h) and (j), as well as dimensions corresponding to ethical and professional issues, and to effective written communication skills. The dimensions included in the rubric are: "awareness of global effects of the product, practice, or event explored in the paper"; "understanding of economic factors; awareness of implications to society at large"; "awareness of other contemporary issues (political, cultural, etc.)"; "understanding of ethical and professional issues"; "organization of the paper"; and "style of presentation". For each dimension, four possible levels of achievement are defined in the rubric with the associated scores of 1 through 4

denoting increasing levels of achievement. For example, for the dimension related to economic factors, a score of 1 represents the following level of achievement:

Little or no understanding of economic factors involved in the creation and/or use of the product, practice, or event in question;

A score of 4 along the same dimension represents:

Deep understanding of economic factors applied to this and related products and the impact they may have on the economy at large as well as long term trends.

Outcome (i), related to lifelong learning, is similarly developed in a number of courses throughout the curriculum. In order to further improve the achievement of this outcome and in order to help assess the degree of this achievement, each of the capstone design courses requires each student to explore a new tool, technology, or process and write a 3–4 page paper on it. The tool in question may be of direct use in the student’s design project in the course or it may be only tangentially related to it or even not related at all. The key requirements are that the student research the tool on his or her own, evaluate its appropriateness for its intended (and possibly other) purposes, compare it with alternative tools that may be available, and write a clear and succinct paper reporting the findings. Someone reading the paper should be able to get a good idea of the tool’s capabilities, how well it might serve its purposes, what other alternatives might exist, and what their strengths and weaknesses might be. This paper is evaluated using a rubric that includes dimensions related to both lifelong learning skills as well as the quality of writing. The dimensions included in the rubric are: “researching and gathering information”; “analysis and evaluation”; “organization of paper”; and “style of presentation”. Again the rubric defines four distinct levels of achievement along each of these dimensions. These rubrics are available on-line.

It is worth noting that one key advantage of using these rubrics is that, since students in the respective courses are given copies of the appropriate rubrics at the start of the quarter, they know exactly what dimensions are important for each of these activities and what the different levels of achievement in each case mean. This helps the students better achieve the respective outcomes by focusing their attention on the most important aspects of these activities.

4. The Assessment/Continuous Improvement Model

Figure 1 shows the various direct and indirect assessment instruments we use, the groups that are responsible for administering each of the assessments, the particular outcome that each helps assess, and the frequency of usage. Thus, we use three indirect assessment instruments, these being the *exit survey*, the *alumni survey*, and the *annual undergraduate forum*. The results of these going back over a number of years are available at:

<http://www.cse.ohio-state.edu/~neelam/abet/index.html>

The direct assessment instruments depicted are the ones described earlier. *POCAT*, the anonymous, multiple-choice test for graduating seniors, is administered every quarter. Faculty groups are responsible for designing questions appropriate for the various topics, such as software engineering, programming languages etc., that are included in the test; the chair of the Undergraduate Committee chooses the final set of questions for the test.

The rubrics related to oral and written communication are used by the faculty for CSE 601 and each of the capstone design courses each time these courses are offered. More precisely, the oral communication rubric and the social and ethical issues rubric which includes a component evaluating written communication is used in each section of CSE 601. The (team) oral communication rubric and the lifelong learning rubric

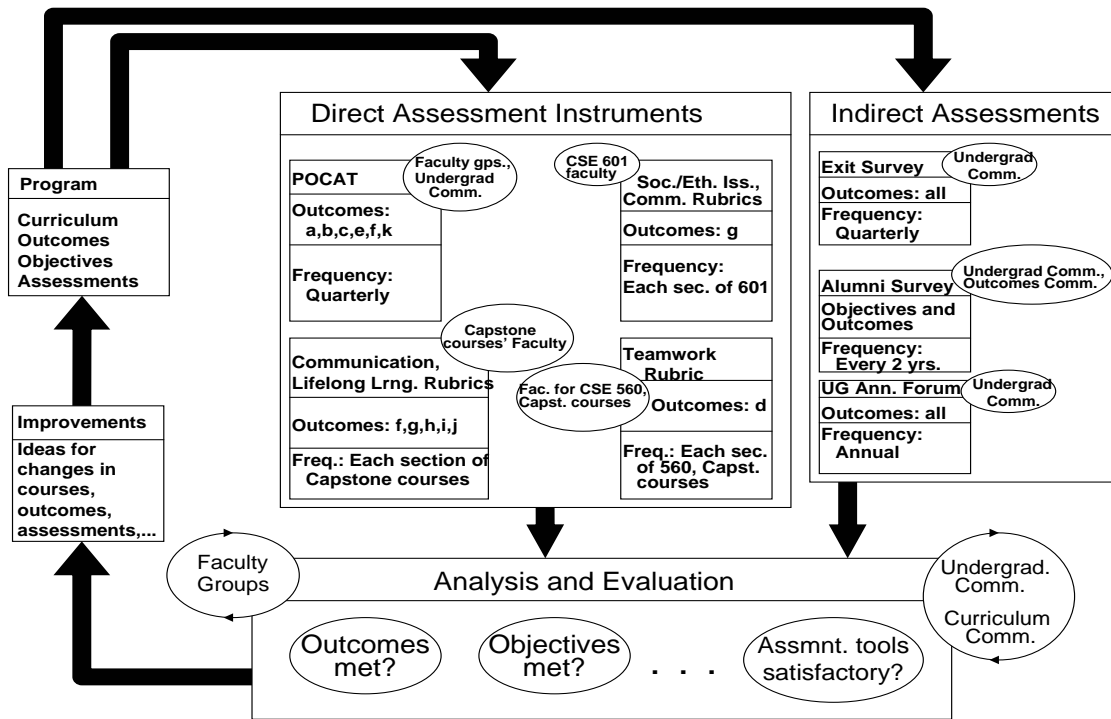


Fig. 1: Assessment and Improvement Processes

which includes a component evaluating written communication is used in each section of each of the capstone courses. The teamwork rubric is used in the capstone courses and in CSE 560, the junior-level course that involves a large team project.

The results of both the direct and indirect assessments are analyzed and discussed in meetings of the Undergraduate Committee. In the case of the direct assessments, the discussions are led by the faculty groups most directly involved with the assessment in question. These discussions lead to ideas for improvement of various kinds in individual courses and, in some cases, in the assessment instruments themselves. Further, these discussions often lead to issues related to different parts of the curriculum and these questions are referred to the Curriculum Committee. Typically these questions are then addressed in the appropriate *Course Group Reports* (CGRs); the complete details of the CGR mechanism are described elsewhere.

The questions that are addressed in the discussions in the Undergraduate Committee, the Curriculum Committee, and among the involved faculty vary depending on the particular assessment result being discussed and, occasionally, on specific problems that might be indicated by a specific assessment. For example, in the discussion at an Undergraduate Committee meeting, of the results obtained using the *social and ethical issues rubric* in the Winter '06 quarter's offering of CSE 601, the focus was on students' understanding of economic factors since student performance along all the other dimensions on the rubric was relatively good. Similarly, the discussion in the Undergraduate Committee on the results of Winter '06 quarter's POCAT focused on what changes could be made, possibly in CSE 321, to address the apparent confusion among students about a specific topic in data structures (the topic in question was *binary search trees*). By contrast, the discussion of the results of the evaluation of oral communication skills in the Autumn '05 offering of CSE 758, one of our capstone design courses, focused on the *rubric* since the faculty member who taught

the course had discovered that important dimensions related to the *team* nature of the presentations in the capstone courses needed to be considered but were not included in our rubric. Ideas for improvements in specific courses, in the overall curriculum, in the particular outcomes, and in the assessment instruments, are arrived at based on these discussions. Appropriate individual faculty members and faculty groups implement the improvements, thus completing the assessment-evaluation-improvement loop.

Rubric for Assessment of Team Working Skills

Background: The major part of each BS-CSE capstone course is an extensive team project involving the design and/or implementation of a system to meet a given set of specifications. The team sizes vary from one course to the next but in all cases, the team project is the major focus of the course and of the students' activities in the course. This project plays an important role in further developing the team working skills of the students. The rubric below is used to evaluate each student with respect to the program outcome (d), an ability to function on multi-disciplinary teams.

Rubric: Each student is evaluated along three dimensions, these having to do respectively with the student's contribution to the project/work, how effectively the student discharged his or her responsibilities as a member of the team, and the quality of his or her interactions with the other team members. Each of these dimensions is assigned a score of 1 through 4, these values representing increasing degrees of achievement in the particular dimension, as described in the table below in the rows corresponding to the various dimensions. The last column are the actual scores assigned to this particular student, based on his or her actual performance, along the four dimensions. The overall total score is assigned by simply adding together the scores corresponding to the four dimensions.

Some of the ideas for this rubric came from information at:
<http://www.uwstout.edu/soe/profdev/rubrics.shtml>.

Name of person being evaluated: _____
 Course and quarter of evaluation: _____

	1	2	3	4	Points assigned
Contribution to the team project/work	Does not collect any relevant information; no useful suggestions to address team's needs;	Collects information when prodded; tries to offer some ideas, but not well developed, and not clearly expressed, to meet team's needs;	Collects basic, useful information related to the project; occasionally offers useful ideas to meet the team's needs;	Collects and presents to the team a great deal of relevant information; offers well-developed and clearly expressed ideas directly related to the group's purpose.	
Taking responsibility	Does not perform assigned tasks; often misses meetings and, when present, does not have anything constructive to say; relies on others to do the work;	Performs assigned tasks but needs many reminders; attends meetings regularly but generally does not say anything constructive; sometimes expects others to do his/her work;	Performs all assigned tasks; attends meetings regularly and usually participates effectively; generally reliable;	Performs all tasks very effectively; attends all meetings and participates enthusiastically; very reliable.	
		Usually does much			

Valuing other team members	Often argues with team mates; doesn't let anyone else talk; occasional personal attacks and "put-downs"; wants to have things done his way and does not listen to alternate approaches;	of the talking; does not pay much attention when others talk, and often assumes their ideas will not work; no personal attacks and put-downs but sometimes patronizing; when others get through to him, works reasonably well with them;	Generally listens to others' points of view; always uses appropriate and respectful language; tries to make a definite effort to understand others' ideas;	Always listens to others and their ideas; helps them develop their ideas while giving them full credit; always helps the team reach a fair decision.
	Total:			

Evaluator's name: _____
 Date of evaluation: _____

Rubric for Assessment of Oral Communication Skills (for Team Presentations)

Background: Each BS-CSE capstone course requires each student to make one or more oral presentations. The presentations may be either individual presentations or team-based; in the latter case, each student is required to participate in a significant manner in the presentation(s). The presentation may be either directly related to the student's design project in the course or may be on a different topic such as a new tool, technology, or process that may or may not be related to the project. The capstone courses include this activity in order to further develop the oral communication skills of the student. This rubric below is used to evaluate team presentations; a different rubric is used to evaluate individual presentations. This rubric is used to evaluate the communication skills of each student in the team. This evaluation helps us evaluate the extent to which the program achieves the outcome related to oral communication (outcome (d)). It also helps evaluate the extent of achievement of the outcome related to team working, outcome (d); see also the other rubric related to general team working skills.

Rubric: The student's presentation is evaluated along five dimensions. The first four are mainly concerned with the individual student's oral skills and have to do respectively with the organization of his/her portion of the presentation, the mechanics (mainly quality of slides), effectiveness of delivery, and how well the speaker relates to the audience. The fifth dimension is concerned with the student's team working skills as exhibited during the team presentation as a whole. Each of these dimensions is assigned a score of 1 through 4, these values representing increasing degrees of achievement in the particular dimension, as described in the table below in the rows corresponding to the various dimensions. The last column are the actual scores assigned to this particular student's presentation along the five dimensions. The overall total score is assigned by simply adding together the scores corresponding to the five dimensions.

Some of the ideas for this rubric came from the one at: <http://www.ncsu.edu/midlink/rub.pres.html>.

Name of person being evaluated: _____
Course and quarter of evaluation: _____

	1	2	3	4	Points assigned
Organization	Audience cannot understand presentation because of poor organization; introduction is undeveloped or irrelevant; relation to the rest of the team's presentation is unclear.	Audience has difficulty following presentation because of some abrupt jumps; some of the main points are unclear or not sufficient stressed;	Satisfactory organization; clear introduction; main points are well stated, even if some transitions are somewhat sudden; relation to the rest of the team's presentation clear.	Superb organization; builds on and provides support for the rest of the team's presentation; main points well stated and argued, with each leading to the next point of the talk.	
	Slides seem to have been cut-and pasted			Very creative slides; carefully thought out to bring out both the	

Mechanics	together haphazardly at the last minute; numerous mistakes; speaker not always sure what is coming next;	Boring slides; no glaring mistakes but no real effort made into creating truly effective slides;	Generally good set of slides; conveys the main points well;	main points of this part of the presentation as well as the relation to the rest of the team presentation; maintains audience interest throughout.
Delivery	Mumbles the words, audience members in the back can't hear anything; too many filler words; distracting gestures;	Low voice, occasionally inaudible; some distracting filler words and gestures; articulation mostly, but not always, clear;	Clear voice, generally effective delivery; minimal distracting gestures, etc., but somewhat monotone;	Natural, confident delivery that does not just convey the message but enhances it; excellent use of volume, pace etc.
Relating to audience	Reads most of the presentation from the slides or notes with no eye contact with audience members; seems unaware of audience reactions;	Occasional eye contact with audience but mostly reads the presentation; some awareness of at least a portion of the audience; only brief responses to audience questions;	Generally aware of the audience reactions; maintains good eye contact when speaking and when answering questions;	Keeps the audience engaged throughout the presentation; modifies material on-the-fly based on audience questions and comments; keenly aware of audience reactions.
Contribution as a team member	Seems to have no interest in the presentations by the other members of the team; occasionally gets into arguments with the other members.	Mainly focused on his/her portion of the presentation; responds when another team member asks him/her a direct question but otherwise does not attempt to help other team members address audience questions.	Good team player. Is interested in the presentations by the other team members; makes a definite effort to ensure the success of the overall team presentation by occasionally helping the rest of the team respond to audience questions.	Superb team player. Goes out of his way to help the rest of the team in any way he can to address audience questions, get over glitches during their presentations, etc., but doing all this as unobtrusively as possible.
Total:				

Evaluator's name: _____ Date: _____

Rubric for Assessment of Oral Communication Skills (for Individual Presentations)

Background: CSE 601, the one credit course on social and ethical issues in computing (required for all BS-CSE majors, tech elective for BS-CIS majors), requires all students to make an oral presentation from a specified list of topics related to the course. Each BS-CSE capstone course also requires each student to make one or more oral presentations. The presentations may be either individual presentations or team-based; in the latter case, each student is required to participate in a significant manner in the presentation(s). The presentation may be either directly related to the student's design project in the course or may be on a different topic such as a new tool, technology, or process that may or may not be related to the project. The capstone courses (each of which has 601 as a prerequisite) include this activity in order to further develop the oral communication skills of the student.

The rubric below is used to evaluate students' presentations with respect to the program outcome (g), an ability to communicate effectively, in both CSE 601 and in the capstone courses. Team presentations in the capstone courses are evaluated using a slightly different rubric. The results of the evaluations are discussed regularly (typically once a year) by the Undergraduate Studies Committee; possible changes in the program to address any widespread problems are considered based on this evaluation and the discussion in UGSC. Note that the recent addition of Communication 321, the five credit course on public speaking, as a required course in the general education portion of the BS-CSE program has gone into effect only recently. It is expected that this will be reflected in more polished oral presentations in both 601 and the capstone courses in the course of the next two years or so.

Rubric: The student's presentation is evaluated along four dimensions, these having to do respectively with the organization of the presentation, the mechanics (mainly quality of slides), effectiveness of delivery, and how well the speaker relates to the audience. Each of these dimensions is assigned a score of 1 through 4, these values representing increasing degrees of achievement in the particular dimension, as described in the table below in the rows corresponding to the various dimensions. The last column are the actual scores assigned to this particular student's presentation along the four dimensions. The overall total score is assigned by simply adding together the scores corresponding to the four dimensions.

Some of the ideas for this rubric came from the one at: http://www.ncsu.edu/midlink/rub_pres.html.

Name of person being evaluated: _____
 Course and quarter of evaluation: _____

	1	2	3	4	Points assigned
Organization	Audience cannot understand presentation because of poor organization; introduction is undeveloped or irrelevant; main points and conclusion are unclear;	Audience has difficulty following presentation because of some abrupt jumps; some of the main points are unclear or not sufficient stressed;	Satisfactory organization; clear introduction; main points are well stated, even if some transitions are somewhat sudden; clear conclusion;	Superb organization; clear introduction; main points well stated and argued, with each leading to the next point of the talk; clear summary and conclusion.	

Mechanics	Slides seem to have been cut-and-pasted together haphazardly at the last minute; numerous mistakes; speaker not always sure what is coming next;	Boring slides; no glaring mistakes but no real effort made into creating truly effective slides;	Generally good set of slides; conveys the main points well;	Very creative slides; carefully thought out to bring out both the main points as well as the subtle issues while keeping the audience interested.	
Delivery	Mumbles the words, audience members in the back can't hear anything; too many filler words; distracting gestures;	Low voice, occasionally inaudible; some distracting filler words and gestures; articulation mostly, but not always, clear;	Clear voice, generally effective delivery; minimal distracting gestures, etc., but somewhat monotone;	Natural, confident delivery that does not just convey the message but enhances it; excellent use of volume, pace etc.	
Relating to audience	Reads most of the presentation from the slides or notes with no eye contact with audience members; seems unaware of audience reactions;	Occasional eye contact with audience but mostly reads the presentation; some awareness of at least a portion of the audience; only brief responses to audience questions;	Generally aware of the audience reactions; maintains good eye contact when speaking and when answering questions;	Keeps the audience engaged throughout the presentation; modifies material on-the-fly based on audience questions and comments; keenly aware of audience reactions.	
Total:					

Evaluator's name: _____
 Date of evaluation: _____

Rubric for Assessment of Lifelong Learning Skills and Written Communication Skills

Background: Each BS-CSE capstone course requires each student to explore a new tool, technology, or process and write a three or four page paper on it. The tool etc. in question may be of direct use in the student's design project in the course or it may be only tangentially related to it or even not related at all. The key requirements are that the student research the tool on his or her own, evaluate its appropriateness for its intended (and possibly other) purposes, compare it with alternative tools that may be available, and write a clear and succinct paper reporting the findings. Someone reading the paper should be able to get a good idea of the tool's capabilities, how well it might serve its purposes, what other alternatives might exist and what their strengths and weaknesses might be. The capstone courses include this activity in order to further develop the lifelong learning abilities of the student as well as his or her written communication skills. The rubric below is used to evaluate the student's paper with respect to both of these outcomes.

Rubric: The student's paper is evaluated along four dimensions, these having to do respectively with the quality of research the student has performed concerning the topic, the quality of analysis/evaluation, the effectiveness of the presentation and organization of the paper, and the overall style of writing. Note that the first two dimensions are concerned with the lifelong learning outcome (program outcome (i)), the last two are concerned with effective written communication (outcome (g)). Each of these dimensions is assigned a score of 1 through 4, these values representing increasing degrees of achievement in the particular dimension, as described in the table below in the rows corresponding to the various dimensions. The last column are the actual scores assigned to this particular student, based on his or her actual performance, along the four dimensions. The overall total score is assigned by simply adding together the scores corresponding to the four dimensions.

Some of the ideas for this rubric came from information at:
<http://www.uwstout.edu/soe/profdev/rubrics.shtml>.

Name of person being evaluated: _____
 Course and quarter of evaluation: _____

	1	2	3	4	Points assigned
Research/gathering information	Collects minimal information about just the particular tool/technology;	Collects adequate information about the tool but not much about related ones;	Collects adequate information about the tool as well as the related ones;	Digs up all kinds of information, follows leads all the way, comes up with exhaustive information including all the background.	
Analysis/evaluation	Analysis simply involves restating gathered information; claims not supported by evidence;	Some analysis done but somewhat shallow; some supporting evidence;	Careful analysis; good supporting evidence for conclusions;	Detailed analysis accounting for all the information; conclusions extremely well	

				supported.	
Presentation of ideas/organization of paper	Bland presentation; sequencing and pace of topics seems random; doesn't lead up to any clear conclusions;	Some of the ideas are presented well; others are lacking; offers plausible conclusion(s);	Ideas are well organized and help the reader move along; the key points are presented but does not demonstrate in-depth understanding; leads up to convincing conclusion(s);	The paper is clear and focused; relevant, quality details give the reader important information; helps the reader develop *insight* into the topic.	
Style	Occasional problems with word choices and sentence structure, leaving the reader unsure of the meaning; often resorts to jargon/ cliches;	Words and sentences are adequate in general but lack energy; reader has to struggle to keep reading to the end;	Good writing style; sentences flow smoothly and evenly;	Compelling writing style; connects strongly with the reader and keeps him or her engaged right to the end.	
Total:					

Evaluator's name: _____
 Date of evaluation: _____

Rubric for Assessment of Outcomes Related to Societal Issues

Background: For convenience, we have classified our program outcomes (which closely parallel the EAC Criterion 3 outcomes) into three groups. The first group consists of outcomes dealing with technical skills; the second group consists of outcomes dealing with "soft skills"; the third group consists of the two outcomes dealing with societal issues. This page concerns our approach to evaluating the outcomes in the third group.

Outcomes in the group: The outcomes in the third group are:

- h. the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context;
- j. a knowledge of contemporary issues;

In addition, outcome (f), an understanding of professional and ethical responsibility, also falls partly under this group.

Evaluation of outcomes: A number of courses in the curriculum, including especially several in the *general education* portion of the curriculum, contribute to ensuring that students achieve these outcomes. In order to further improve the achievement of these outcomes and in order to assess the degree of this achievement by the time of the students' graduation from the program, CSE 601, the required course on social and ethical issues in computing, requires each student to explore a new or recent *product or practice or event* etc., consider the impact it may have in a "global, economic, environmental, and societal context" (outcome (h)); consider as well any relevant contemporary issues (outcome (j)) as well as ethical and professional issues (outcome (f)) related to the product, practice, or event; and present the findings in a 3-4 page paper. CSE 601 includes this activity in order to further develop the degree of student achievement of these outcomes. The rubric below is used to evaluate the student's paper with respect to these outcomes. The rubric also evaluates the student's paper with respect to the effectiveness of written communication skills of the student (program outcome (g)).

Rubric: The student's paper is evaluated along six dimensions, these having to do respectively with the student's awareness of global effects that the product/ practice/ event etc. (p/p/e) in question may have; the student's understanding of the involved economic factors; the student's awareness of the implications to society at large; awareness of other relevant contemporary issues; consideration of relevant ethical and professional issues; the quality of the presentation of the ideas in the student's paper; and the style of writing. Note that the first three dimensions are concerned with the "broad education" outcome (outcome (h)); the third and fourth are concerned with the "contemporary issues" outcome (outcome (j)); the fifth is concerned with the "ethical/professional issues" outcome (outcome (f)); and the last two are concerned with effective communication skills (outcome (g)). Each of these dimensions is assigned a score of 1 through 4, these values representing increasing degrees of achievement in the particular dimension, as described in the table below in the rows corresponding to the various dimensions. The numbers in the last column are the actual scores assigned to any particular student, based on his or her paper, along the six dimensions. The overall total score is assigned by simply adding together the scores corresponding to the six dimensions. Note, however, that some dimensions may not be appropriate for certain papers, depending on the topic of the paper; in such cases, no score is recorded in the corresponding row under the "points assigned" column. Results of this evaluation for the Winter '06 quarter are [available](#).

Some of the ideas for this rubric came from information at:
<http://www.uwstout.edu/soe/profdev/rubrics.shtml>.

Name of person being evaluated: _____
 Course and quarter of evaluation: _____

	1	2	3	4	Points assigned
Awareness of global effects of the product/practice/event etc. (Note: "p/p/e" is used to denote "product/ practice/ event etc.")	Seems to have considered only effects on immediate users;	Some awareness of the more extended effects of the p/p/e;	Good understanding of the widespread effects of the p/p/e but with somewhat limited perspective about long-term factors;	Deep understanding of the immediate and long-term issues involving the p/p/e on users and non-users locally and globally.	
Understanding of economic factors	Little or no understanding of economic factors involved in the creation and/or use of the p/p/e;	Some understanding of these economic factors as applied to this p/p/e;	Good understanding of economic factors as applied to this p/p/e and how it affects other related p/p/e's etc.	Deep understanding of economic factors applied to this and related products and the impact they may have on the economy at large as well as long term trends.	
Awareness of implications to society at large	Little or no understanding of (or interest in?) implications to society involved in the creation and/or use of the p/p/e;	Moderate understanding of the implications to society in the creation and/or use of the p/p/e;	Good understanding of the implications to society in the creation and/or use of the p/p/e, as well as its relation to general societal issues;	Deep understanding of the immediate and longterm implications to society in the creation and/or use of the p/p/e, and the overall potential benefits and risks to society.	
				Deep understanding	

<p>Awareness of (other) contemporary issues (political, cultural, ...)</p>	<p>Little or no understanding of (or interest in?) contemporary issues directly related to the creation and/or use of the p/p/e;</p>	<p>Moderate understanding of the main relevant contemporary issues directly related to the creation and/or use of the p/p/e;</p>	<p>Good understanding of all the relevant contemporary issues directly related to the creation and/or use of the p/p/e;</p>	<p>of all the relevant contemporary issues related to the creation and/or use of the p/p/e, as well as of issues that may be only tangentially related; good analysis of all these issues and how they might impact the general acceptance of the p/p/e and how this might affect the future development of similar p/p/e's.</p>	
<p>Understanding of ethical and professional issues</p>	<p>Little or no understanding of professional/ethical issues even where there are serious questions involved;</p>	<p>Some consideration of professional, ethical issues raised directly by the p/p/e;</p>	<p>Good understanding of all the essential issues related to the p/p/e; reasonable analysis of the relevant issues;</p>	<p>Deep understanding of the professional issues involved and the ethical implications of the p/p/e; careful, convincing analysis of all relevant factors.</p>	
<p>Presentation of ideas and organization of the paper</p>	<p>Bland presentation; sequencing and pace of topics seems random; doesn't lead up to any clear conclusions;</p>	<p>Some of the ideas are presented well; others are lacking; offers plausible conclusion(s);</p>	<p>Ideas are well organized and help the reader move along; the key points are presented but does not demonstrate in-depth understanding; leads up to</p>	<p>The paper is clear and focused; relevant, quality details give the reader important information; helps the reader develop</p>	

			convincing conclusion(s);	<i>insight</i> into the topic.	
Style	Occasional problems with word choices and sentence structure, leaving the reader unsure of the meaning; often resorts to jargon/ cliches;	Words and sentences are adequate in general but lack energy; reader has to struggle to keep reading to the end;	Good writing style; sentences flow smoothly and evenly;	Compelling writing style; connects strongly with the reader and keeps him or her engaged right to the end.	
Total:					

Evaluator's name: _____
Date of evaluation: _____