

Fiscal Unit/Academic Org	Computer Science & Engr - D1435
Administering College/Academic Group	Arts And Sciences
Co-administering College/Academic Group	Engineering
Semester Conversion Designation	Re-envisioned with significant changes to program goals and/or curricular requirements (e.g., degree/major name changes, changes in program goals, changes in core requirements, structural changes to tracks/options/courses)
Current Program/Plan Name	Computer & Information Science
Proposed Program/Plan Name	Computer & Information Science - CPTRINF-BS
Program/Plan Code Abbreviation	CPTRINF-BS
Current Degree Title	Bachelor of Science

Credit Hour Explanation

Program credit hour requirements		A) Number of credit hours in current program (Quarter credit hours)	B) Calculated result for 2/3rds of current (Semester credit hours)	C) Number of credit hours required for proposed program (Semester credit hours)	D) Change in credit hours
Total minimum credit hours required for completion of program		181	120.7	124	3.3
Required credit hours offered by the unit	Minimum	64	42.7	50	7.3
	Maximum	74	49.3	57	7.7
Required credit hours offered outside of the unit	Minimum	107	71.3	67	4.3
	Maximum	117	78.0	74	4.0
Required prerequisite credit hours not included above	Minimum	4	2.7	2	0.7
	Maximum	4	2.7	3	0.3

Explain any change in credit hours if the difference is more than 4 semester credit hours between the values listed in columns B and C for any row in the above table

The changes within the program are minimal. First, the Gen Ed requirement is reduced from the current GEC in accordance with the ULAC recommendations; it is currently 60 qtr-cr-hrs, equivalent to 40 sem-cr-hrs, and this becomes 36 se-cr-hrs. There are minor cr-hr differences resulting from "breakage" as other courses outside CSE are changed to semesters. For example, currently BS-CIS majors take 21 qtr-cr-hrs of Math courses, equivalent to 14 sem-cr-hrs. The closest reasonable requirement under semesters totals 13 cr-hrs: 10 cr-hrs of calculus and one other 3-cr-hr course, Discrete Math. Similarly, current BS-CIS majors take 6 qtr-cr-hrs of Statistics, equivalent to 4 sem-cr-hrs; the closest reasonable requirement under semesters is a 3-cr-hr course. The net effect of these reductions in out-of-unit cr-hrs and the overall increase of 3.3 cr-hrs in the degree program is an increase of just over 7 cr-hrs offered by the unit.

Program Learning Goals

Note: these are required for all undergraduate degree programs and majors now, and will be required for all graduate and professional degree programs in 2012. Nonetheless, all programs are encouraged to complete these now.

Program Learning Goals	<ul style="list-style-type: none"> • Terminology: Program goals are separated into "objectives" and "outcomes". The former describe what graduates will be doing 3/5 years after graduation; the latter describe knowledge/ skills they will attain by time of graduation. • Graduates of the program will be employed in the computing profession, and will be engaged in learning, understanding, and applying new ideas and technologies as the field evolves. • Graduates with an interest in, and aptitude for, advanced studies in computing will have completed, or be actively pursuing, graduate studies in computing. • Graduates will be informed and involved members of their communities, and responsible computing professionals. • Note: The above are the program "objectives". The "outcomes" are listed in the proposal. Note that the assessment processes are geared toward the outcomes.
-------------------------------	---

Assessment

Assessment plan includes student learning goals, how those goals are evaluated, and how the information collected is used to improve student learning. An assessment plan is required for undergraduate majors and degrees. Graduate and professional degree programs are encouraged to complete this now, but will not be required to do so until 2012.

Is this a degree program (undergraduate, graduate, or professional) or major proposal? Yes

Does the degree program or major have an assessment plan on file with the university Office of Academic Affairs? Yes

Summarize how the program's current quarter-based assessment practices will be modified, if necessary, to fit the semester calendar.

The assessment processes will be based directly on the existing practices for our BS-CSE program. These consist of: (a) an exit-test that allows us to assess the technical outcomes of our programs; (b) a set of rubrics used in certain key courses to help assess the professional and societal outcomes; (c) an exit-survey that gets student opinions on the extent to which the various outcomes are achieved; and (d) an alumni-survey to help assess the extent to which program objectives are achieved.

Program Specializations/Sub-Plans

If you do not specify a program specialization/sub-plan it will be assumed you are submitting this program for all program specializations/sub-plans.

Pre-Major

Does this Program have a Pre-Major? Yes

The associated pre-major is pre-CIS. Admission to the BA CIS major will require the following:

1. Completion of ASC/NMS Survey, Eng. Calculus 1, Physics 1, Gen Ed Writing Level 1, and CSE 2221 (with at least C-).
2. At least 15 sem-cr-hrs (or equivalent) earned at Ohio State
3. A CPHR of at least 2.0 (may be higher when enrollment management is in effect).
4. An MPHR (major point hour ratio) over CSE courses that can be included in the major program, of at least 2.0.
5. Completion of all admission conditions that may have been imposed when the student was admitted to OSU.

Attachments

- bsCisProposalDec2010.pdf

(Program Proposal. Owner: Soundarajan,Neelam)

Comments

- Pass-through approval from COE *(by Tomasko,David Lane on 12/22/2010 02:20 PM)*
- The attachment is the *complete* proposal for the Bs-CIS program *(by Soundarajan,Neelam on 12/22/2010 01:50 PM)*

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Soundarajan,Neelam	12/22/2010 01:50 PM	Submitted for Approval
Pending Approval	Andereck,Claude David	12/22/2010 02:20 PM	Ad-Hoc Approval
Approved	Tomasko,David Lane	12/22/2010 02:20 PM	Unit Approval

To: David Andereck, Associate Dean, College of Arts and Sciences

From: Xiaodong Zhang, CSE Department Chair

Date: 21 December 2010

Re: Semester Proposals for ***BS-CIS, BA-CIS, and CIS Minor Programs***

The faculty of Computer Science and Engineering have worked diligently since early Au09 to prepare the semester proposals for the BS-CIS, BA-CIS, and CIS Minor programs. The CSE Semester Task Force comprising about fifteen CSE faculty members, academic advising staff, and undergraduate and graduate students, began meeting weekly at the start of Au09 to plan the semester conversion. Data collected during these deliberations included historical feedback from BS-CSE graduates (compiled as part of accreditation-based assessment processes of that program over the past 10+ years), input from the CSE Department Industrial Advisory Committee, a survey of all CSE faculty on various issues related to the transition, the Undergraduate Forum (an annual open meeting with undergraduate students), and comparisons with about a dozen computer science and engineering, computer science, and similarly named programs at major peer institutions. I should note that the data based on the BS-CSE program also provides information about the BS-CIS, BA-CIS, and the Minor programs because of the many CSE courses that are common to these programs.

One primary concern in designing the BS-CIS program was to keep it similar, in terms of the computing technical content, to the BS-CSE degree. This gives students a clear choice: BS-CSE if you want the non-computing focus to lie within engineering *vs.* BS-CIS if you want the non-computing focus of the program to lie in the liberal arts. In designing the BA-CIS program, the primary concern was to keep it substantially smaller, in terms of computing technical content, than the BS-CIS degree. This gives students a clear choice between our two degree programs in ASC: BS-CIS if you want a stronger computing technical focus *vs.* BA-CIS if you want a stronger focus on how to apply computing in a sophisticated way to a specific related field. The CIS Minor is intended for a student whose primary interest is not in computing but one who still wants to acquire a reasonable grasp of technical computing fundamentals. These considerations have been important during nearly the entire history of our department and have been suitably addressed in our semester proposals.

The faculty have voted to approve the attached proposals as our semester plans for the ***BS-CIS, BA-CIS, and CIS-Minor programs***, and I also recommend approval. The vote of all CSE faculty members on the proposals was 39 in favor, 0 opposed, 0 abstentions.

Xiaodong Zhang

Robert M. Critchfield Professor, and CSE Department Chair



College of Engineering

122 Hitchcock Hall
2070 Neil Ave
Columbus, OH 43210

Phone (614) 247-6548
E-mail Tomasko.1@osu.edu

Date: 30 November 2010

To: Randy Smith
Vice Provost, Office of Academic Affairs

From: David Tomasko
Associate Dean, Undergraduate Education and Student Services

Subject: Semester Conversion Proposals for the BS-CIS, BA-CIS, and CIS Minor
programs in the College of Arts & Science

The College of Engineering fully supports the continued offering of a Bachelor of Science degree in Computer and Information Science, a Bachelor of Arts degree in Computer and Information Science, and a Minor program in Computer and Information Science, by our Department of Computer Science and Engineering through the College of Arts & Science under semesters.

BS in Computer and Information Science

Primary Contacts: Bruce W. Weide (weide.1, 292-1517) and Neelam Soundarajan (neelam@cse.ohio-state.edu, 2-1444)

1. Fiscal Unit / Academic Organization

Department of Computer Science and Engineering (CSE) (1435)

2. Administering College / Academic Group

College of Natural and Mathematical Sciences (NMS)

3. Co-administering College / Academic Group

College of Engineering (administrative home college for CSE)

4. Semester Conversion Designation

a. Re-envisioned with significant changes to curricular requirements (core requirements, tracks/options/courses), but no changes to program goals

5. Program / Plan Name

Bachelor of Science in Computer and Information Science

6. Type of Program

a. Undergraduate bachelors degree program

7. Program Plan Code Abbreviation

TBD

8. Degree Title

BS in Computer and Information Science

9. Specializations / Sub-plans

Not applicable

10. Program Learning Goals¹

Program goals are separated into “objectives” and “outcomes”. Roughly speaking, the former describe what program graduates will be doing a couple years after graduation, while the latter describe knowledge and skills they will attain by the time of graduation.

The *objectives* of the BS CIS program are:

- I. Graduates of the program will be employed in the computing profession, and will be engaged in learning, understanding, and applying new ideas and technologies as the field evolves.

¹ The goals listed here are draft versions subject to CSE faculty approval.

- II. Graduates with an interest in, and aptitude for, advanced studies in computing will have completed, or be actively pursuing, graduate studies in computing.
- III. Graduates will be informed and involved members of their communities, and responsible computing professionals.

The *outcomes* of the BS CIS program are that students will attain:

- a. an ability to apply knowledge of computing, mathematics including discrete mathematics as well as probability and statistics;
- b. an ability to design and conduct experiments, as well as to analyze and interpret data;
- c. an ability to design, implement, and evaluate a software or a software/hardware system, component, or process to meet desired needs within realistic constraints such as memory, runtime efficiency, as well as appropriate constraints related to economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability considerations;
- d. an ability to function on multi-disciplinary teams;
- e. an ability to identify, formulate, and solve computing problems;
- f. an understanding of professional, ethical, legal, security and social issues and responsibilities;
- g. an ability to communicate effectively with a range of audiences;
- h. an ability to analyze the local and global impact of computing on individuals, organizations, and society;
- i. a recognition of the need for, and an ability to engage in life-long learning and continuing professional development;
- j. a knowledge of contemporary issues;
- k. an ability to use the techniques, skills, and modern engineering tools necessary for practice as a computing professional;
- l. an ability to analyze a problem, and identify and define the computing requirements appropriate to its solution;
- m. an ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices;
- n. an ability to apply design and development principles in the construction of software systems of varying complexity.

11. List of Semester Courses

See Attachment #1: BS CIS Proposed Program Requirements.

General Education requirements follow the ULAC recommendations of 3/19/10 with foreign language proficiency of 12 cr-hrs.

The following notes apply to the pick-lists in the major requirements:

- “Project” course may be any version of CSE 390X, chosen in consultation with an academic advisor, depending on the student’s interests and background.

- “Capstone Design” course may be any version of CSE 591X, chosen in consultation with an academic advisor, depending on the student’s interests and background.

“Technical Elective” courses will be chosen in consultation with an academic advisor, from CSE upper division undergraduate courses (3000 or above), and from a set of non-CSE courses to be designated by the CSE Undergraduate Studies Committee once other departments’ course offerings are known. At least 8 of the 15 required technical elective cr-hrs must be CSE courses. Up to 7 of the 15 required technical elective cr-hrs may be double-counted from one of a set of “related minors” to be designated by the CSE Undergraduate Studies Committee once other departments’ minor offerings are known.

12. Program Rationale

The major decisions from the CSE Semester Task Force investigation were:

- Most CSE semester courses should be 3 sem-cr-hrs, with some 4-sem-cr-hr courses where there are significant out-of-class assignments (primarily programming “lab” assignments). We decided not to take the approach of directly converting existing 3-qtr-cr-hr courses into equivalent 2-sem-cr-hr semester courses. The reason for this decision was that students should not be expected to take 7-8 separate courses in a single term in order to average the 16 cr-hrs per semester required to graduate in four years.
- Much of the breadth of the existing BS CIS major should be retained, with some concession because students are taking only about 2/3 as many different courses as under quarters. The rationale was that CIS is a broad, fast-changing discipline, and premature specialization by undergraduate students could be detrimental to their career development as it could limit their adaptability in the face of future shifts in the field. We felt that achieving a better understanding of fundamental principles that have withstood the test of time, across a rather wide swath through the field, would best serve BS CIS majors.
- Students should have considerable flexibility in making their own trade-offs between depth and additional breadth when choosing technical electives. The reason for this conclusion (in light of the previous comments) was that some students might know that they would like to specialize in an area of the field that is reasonably stable and well-developed, and that it would be folly not to permit this.

The primary substantive changes in the proposed program are as follows:

- The CIS Core in the proposed program mirrors the content areas in the current program, but now involves a choice between two courses in each of four technical areas; currently, some courses in these areas are required while others are optional. Any change to program quality from this part of the proposed new BS CIS program will arise from the additional depth of content in the required core course content areas, which were determined by the CSE faculty to be those most important to *all* BS CIS graduates.
- The Technical Electives portion of the proposed program is slightly smaller than it is under quarters. As now, the CSE faculty will prepare a few suggested sets of technical electives to guide students with particular interests, e.g., artificial intelligence, computer graphics, computer systems, networking, security, software engineering, etc. But overall, the technical elective structure will mirror the current “Individualized Option” in the current BS CIS technical electives. That is, we will continue to encourage students to minor in a related field by allowing them to count as many as 7 cr-hrs of approved non-CSE courses (e.g., some of those in such a minor) among the 15 cr-hrs of technical electives in their major program. Any change to program quality from this part of the

proposed new BS CIS program will arise from the additional depth of content in technical elective course content areas as such courses change from quarters to semesters.

The last significant BS CIS major program revision was in late 2007 as a result of the mandate that ASC degree programs must be 181 cr-hrs (reduced, in this case, from 191 cr-hrs). At the same time, two other changes were made: previously elective courses on professional and ethical issues in computing, and capstone design, were changed to requirements in order to make the program more comparable in technical content to the BS CSE program.

13. Quarters Curriculum Advising Sheet

See Attachment #2: Current Advising Sheet.

14. Semesters Curriculum Advising Sheet

See Attachment #3: Proposed Advising Sheet.

15. Curricular Map

See Attachment #4, where * indicates some contribution, ** indicates moderate contribution, and *** indicates significant contribution to the learning outcome.

16. Associated Pre-Major or Area of Interest

The associated pre-major is *pre-CIS*. Admission to the BS CIS major will require the following:

- Completion of ASC/NMS Survey, Engineering Calculus I, Physics I, Gen Ed Writing Level 1, and CSE 2221 (with at least a C–).
- At least 15 sem-cr-hrs (or equivalent) earned at Ohio State.
- A CPHR of at least 2.0 (may be higher when enrollment management is in effect).
- An MPHR (major point hour ratio), over CSE courses that can be included in the major program, of at least 2.0.
- Completion of all admission conditions that may have been imposed when the student was admitted to OSU.

17. Credit-Hour Changes

	Number of qtr-cr-hrs in current program	Calculated result for 2/3 of current qtr-cr-hrs	Number of sem-cr-hrs required for proposed program	Change in cr-hrs
Total minimum cr-hrs required for completion of program	181	120.7	124	+3.3
Required cr-hrs offered by the unit	64 to 74	42.7 to 49.3	50 to 57	+7.3 to +7.7
Required cr-hrs offered outside of the unit	107 to 117	71.3 to 78.0	67 to 74	–4.0 to –4.3
Required prerequisite cr-hrs not included above	4	2.7	2 to 3	–0.7 to +0.3

18. *Rationale for Significant Change in Credit Hours*

The primary concern in adjusting requirements for the BS CIS was to keep it similar, in terms of computing technical content, to the BS CSE degree. This gives students a very clear choice: BS CSE if you want the non-computing focus of the program to lie within engineering vs. BS CIS if you want the non-computing focus of the program to lie in the liberal arts. The reason this is important is that we seek to maintain a reasonable balance between students pursuing these two degree paths, as has been the case during nearly the entire history of our department, and not to short-change the computing content of either program in the process. Achieving this goal requires a slight increase in BS CIS total cr-hrs (+3.3 cr-hrs to get to 124 cr-hrs) so it is substantially equivalent to the BS CSE (–1.3 cr-hrs to get to 126 cr-hrs).

The individual changes within the program are minimal. First, the Gen Ed Liberal Arts requirement is slightly reduced in accordance with ULAC recommendations; it is currently 60 qtr-cr-hrs, equivalent to 40 sem-cr-hrs, and this becomes 36 sem-cr-hrs. There are minor cr-hr differences resulting from “breakage” as other courses outside CSE are changed to semesters. For example, current BS CIS majors take 21 qtr-cr-hrs of Mathematics courses, equivalent to 14 sem-cr-hrs. The closest reasonable requirement under semesters totals 13 cr-hrs: 10 cr-hrs of calculus and one other 3-cr-hr course, Discrete Mathematics. Similarly, current BS CIS majors take 6 qtr-cr-hrs of Statistics courses, equivalent to 4 sem-cr-hrs. The closest reasonable requirement under semesters is a 3-cr-hr course. The net effect of the above reductions in out-of-unit cr-hrs and the overall increase of 3.3 cr-hrs in the degree program is an increase of just over 7 in cr-hrs offered by the unit.

19. *Transition Policy*

No BS CIS major who began the degree program under quarters will have progress toward graduation impeded by the transition to semesters. Graduation requirements beginning Su 2012 will be those for BS CIS majors under semesters; but *every* quarter-credit-hour that would have counted toward the BS CIS major under the quarter-based BS CIS program will count (as 2/3 of a semester-credit-hour) toward the requirements for graduation under the semester BS CIS program. Additional advising support will be provided for BS CIS majors to assist in planning course schedules for the last year of quarters (2011-2012) and for at least the first year of semesters. If it is determined that the “normal” conditions covered by the BS CIS major transition worksheet would result in any student facing an unavoidable delay in graduation compared to quarters due to the change to semesters—rather than the student’s failure to meet with an advisor to complete the worksheet or to make satisfactory progress through the mutually agreed program plan—then a revision of specific requirements will be worked out for that student by the advising staff with approval by the CSE Undergraduate Studies Committee.

— Xiaodong Zhang, CSE Department Chair

The transition policy is based on the following principles:

- The switch to semesters will impede no student’s progress toward graduation.
- All students who graduate under semesters, even during the first semester, will do so by meeting the requirements of the semester program.

- Each semester program requirement may be met either by taking an appropriate semester course or sequence, or by substituting a substantially equivalent quarter course or sequence for the corresponding semester course or sequence.
- Excess equivalent credit-hours resulting from such substitutions—either positive or negative—will be credited against technical elective requirements.

Attachment #5: BS CIS Proposed Transition Worksheet is a sample (for a particular student, Alice) of a web-based form that will be used to calculate the effect of observing these principles. The cells with a **dark green background**, along the first column and near the bottom, contain information specific to a student, and are intended to be filled in by the student working with an academic advisor. The remaining cells are fixed, and indicate the substitution mapping between courses that are part of the current BS CIS major program and those of the semester program.

In the sample shown, Alice has completed six GEC courses plus all her foreign language requirement, Math 151 and 152, etc. (the rows containing a “1” in column 1); but not the two remaining GEC courses, Stat 427, etc. (the rows that are empty in column 1). Near the bottom of the worksheet, the row containing “Anything else counted now” shows 17 additional qtr-cr-hrs that would have counted toward Alice’s BS CIS major under quarters. The spreadsheet calculates for Alice the values labeled “Total Completed cr-hrs”, “Total Remaining cr-hrs”, and “Remaining Tech Elective cr-hrs”.

The results: Alice has 131 qtr-cr-hrs toward the BS CIS major. Her substitutions result in a deficit of 9.70 sem-cr-hrs in technical electives, i.e., Alice still has 9.70 cr-hrs of technical electives to take: all net differences in all other categories with satisfied substitutions are combined with remaining technical electives. This number is rounded down to 9 so Alice cannot lose even a fraction of a cr-hr from courses taken under quarters. She must complete all requirements of the semester program not covered by these substitutions.

Alice can see by this method that she has completed all but the requirements shown in **bold** in the sample transition worksheet: “Gen Ed Arts” (3 cr-hrs), “Gen Ed Culture & Ideas or Historical Study” (3 cr-hrs), “Introduction to Probability and Statistics for Engineers” (3 cr-hrs), “Electrical and Computer Engineering I” (4 cr-hrs), “Foundations II” (3 cr-hrs), “Professionalism and Ethics” (1 cr-hr), either “Software Engineering” or “Databases” (3 cr-hrs), either “Theory” or “Programming Languages” (3 cr-hrs), and a “Capstone Design” course (4 cr-hrs), plus 9 cr-hrs of technical electives. In other words, Alice still needs to complete these 36 cr-hrs under semesters in order to complete her BS CIS degree. Once she does this, she will be able to graduate having completed $87.33 + 36 = 123.33$ equivalent sem-cr-hrs rather than the 124 sem-cr-hrs in the new BS CIS major program.

It is possible—though unlikely because the semester BS CIS program is more flexible than the quarter program—that a student might have enough cr-hrs as of the end of Sp12 to graduate within two quarters, but might have failed to cover specific requirements rather than flexible technical electives that would take, say, two semesters to complete. We will rely on systematic advising of students during the year 2011-2012 in order to prevent this from happening.

The main issue facing students in transition is that some substitutions call for completion of a sequence of courses (***bold red italics*** in the transition worksheet) to complete a semester requirement. We will use two approaches to address such problems—the most severe of which arises from CSE 221/222/321, the current introductory course sequence for BS CIS majors.

First, we will offer “bridge courses” in Su12 (CSE 222) and Au12 (CSE 321) in order to accommodate students who wish to start into the introductory sequence in Wi12 or Sp12. The table below shows the schedules such students will be advised to follow, depending on which

quarter they start this sequence. Students who do not plan to take classes during Su12 will be advised to start with Software I in Au12 rather than taking CSE 221 in Sp12. This slight delay should not impact the graduation date for any such student compared to quarters, as there is enough slack in the prerequisite structure of the BS CIS major program to permit a student just starting into the major courses at this point enough time to “catch up”.

Wi12 (qtr)	Sp12 (qtr)	Su12 (sem)	Au12 (sem)
CSE 221	CSE 222		CSE 321 (bridge)
	CSE 221	CSE 222 (bridge)	CSE 321 (bridge)

Second, via systematic advising, we will seek to prevent students from starting into any other sequence in the transition worksheet that they cannot complete under quarters. Students planning to take CSE 360 in Sp12 will be advised to take CSE 459.21 during that quarter as well. Once Mathematics has registered a transition plan to deal with the introductory engineering calculus sequence, we will advise BS CIS students accordingly; similarly for foreign language.

It is, of course, possible that a few students will nonetheless fail to qualify for a substitution after having completed only part of the substituting sequence. For instance, a student might take CSE 360 and CSE 459.21 in Sp12 and fail one of them; or a student might fail CSE 222 in Su12. All such issues will be handled on a case-by-case basis. The student, the CSE Advising Office, and if necessary the CSE Undergraduate Studies Committee will negotiate custom arrangements to fill the gap through a combination of allowing the substitution anyway, offering independent studies to make up deficiencies, and/or very limited requirements waivers. Students who find their progress toward graduation impeded *by failure to meet with an advisor and complete the transition worksheet, by failure to schedule and complete courses as advised, or by a failing grade in any course*, may find themselves with little recourse. The transition worksheet will, therefore, be accompanied by a transition scheduling plan that shows exactly how the student should expect to complete the program without being impeded by the switch to semesters. The student will be asked to sign their own personalized transition worksheet and transition scheduling plan at the advising appointment where such details are worked out with an academic advisor. These meetings will take place starting as soon as this proposal is officially approved.

20. **Assessment Practices**

The BS CIS program has three objectives (“goals” in the terminology used in the “assessment survey” page) and a number of outcomes (“objectives” in the assessment survey page terminology). The outcomes characterize the knowledge and skills that graduates of the program are expected to acquire by the time of their graduation. Hence our assessments are designed to measure the extent to which students acquire these outcomes and we use the results to identify possible improvements.

The outcomes are classified into “technical outcomes” and “soft outcomes” (such as communication skills and team skills). The main assessment tool for the former is a carefully designed multiple-choice test somewhat similar to concept inventories. The main tools for the latter is a set of rubrics that we have designed to evaluate activities in high-level courses intended to develop these skills in our students. Full details are at:

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

Attachment #1:

BS CIS Proposed Program Requirements

General Education: Liberal Arts	Course Number(s)	Cr-hrs	Completed
Writing Level 1		3	
Writing Level 2		3	
Literature		3	
Arts		3	
Historical Study		3	
Social Science 1		3	
Social Science 2		3	
Culture & Ideas or Historical Study		3	
Foreign Language		12	
Total Gen Ed Liberal Arts cr-hrs (= 36)		36	

General Education: Math/Science	Course Number	Cr-hrs	Completed
ASC/NMS Survey	ASC ____	1	
Engineering Calculus I (GE Math)	Math ____	5	
Engineering Calculus II (GE Open Option 1)	Math ____	5	
Physics I (GE Physical Science)	Phys 1131	5	
GE Biological Science	Biol ____	5	
Discrete Mathematics (GE Open Option 2)	Math ____	3	
Intro to Prob and Stat for Engrs (GE Data Analysis)	Stat 3470	3	
Total Gen Ed Math/Science cr-hrs (= 27)		27	

CIS Core	Course Number	Cr-hrs	Completed
Software I	CSE 2221	4	
Foundations I	CSE 2321	3	
Systems I	CSE 2421	4	
Software II	CSE 2231	4	
Foundations II	CSE 2331	3	
Systems II	CSE 2431	3	
Professionalism and Ethics	CSE 3501	1	
Electrical and Computer Engineering I	ECE 2000	4	
Total CIS Core cr-hrs (= 26)		26	

CIS Core Choices	Course Number	Cr-hrs	Completed
Project (one of ...)	CSE 3901, 3902, ...	4	
Software: Software Engineering or Databases	CSE 3231 or 3241	3	
Foundations: Theory or Programming Languages	CSE 3321 or 3341	3	
Systems: Architecture or Networking	CSE 3421 or 3461	3	
Applications: Artificial Intelligence or Graphics	CSE 3521 or 3541	3	
Capstone Design (one of ...)	CSE 5911, 5912, ...	4	
Total CIS Core Choices cr-hrs (= 20)		20	

Technical Electives	Course Number	Cr-hrs	Completed
Technical Elective			
Technical Elective			
Technical Elective			
Technical Elective			
Technical Elective			
Total Technical Electives cr-hrs (≥ 15 ; ≥ 8 CSE)			

Grand Total (≥ 124)

Attachment #2: Current Advising Sheet
B.S. in Computer and Information Science)
(Students entering Summer 2007 or later)*

Computer Science Core

CSE 221	4	_____
222	4	_____
321	4	_____
360	4	_____
459.XX	1	_____
541	3	_____
560	5	_____
601	1	_____
625	3	_____
655	4	_____
660	3	_____
670	3	_____
675.02	4	_____
680	3	_____

Total CS Core: 46 _____

Mathematics and Statistics

Math	Math 151	5	_____
	Math 152	5	_____
	Math 153	5	_____
	Math 366	3	_____
	Math 566	3	_____
Statistics	Stat 427	3	_____
	Stat 428	3	_____

Total Math and Statistics: 27 _____

*Students who entered OSU prior to Au '04 may substitute Math 254 for Math 566 and 2 hours of technical electives.

Natural Science

Physics	111 or 131	5	_____
	112 or 132	5	_____
Bio Science	_____	5	_____
Science Elective	_____	5	_____

At least 5 hrs of Biological Science is required.

Total Natural Sciences: 20 _____

CIS Technical Electives

See reverse side for technical options

Total CIS Tech Elects: min 28 _____

*Students should check with their Academic Advisor to determine which curriculum is the appropriate one for their enrollment at OSU.

General Education Curriculum (GEC)

Details at: <http://artsandsciences.osu.edu/students/gec.cfm>
GEC Questions should be directed to your Arts & Science Counselor in Denney Hall

Foreign Language

_____101 _____102 _____
 _____103 _____104 _____
Total Foreign Language: 20 _____

English and Communication Skills

English 110 5 _____
 Writing 2: _____ 5 _____
Total English 10 _____

Social Sciences

Select two courses, with at least one course each from two of the three sections, as specified in the document at the url listed above.

Total Social Sciences: 10 _____

Arts and Humanities

Literature: _____ _____
 Vis/Perf Art: _____ _____

Total Arts and Humanities: 10 _____

Historical Survey

History _____ 5 _____
 History _____ 5 _____
Total Historical Survey: 10 _____

Diversity Experiences

May be fulfilled by an approved 5 cr-hr course in another GEC category, or by a separate course in each of these areas.

_____ ☐ 5 _____
 _____ ★ 5 _____
 _____ ☐ or ★ 5 _____
Total Social Diversity: 0 - 15 _____

The course categories "□, □★" are explained in the document at the url listed above.

Total CIS Major: minimum 181 _____

B.S. in Computer and Information Science)

(Students entering Summer 2007 or later)*

Technical Options — 28 cr-hrs

You must choose one of the four technical options below. Each of the options includes a set of **Required Courses** and a number of credit-hours of **Elective Courses**. The CSE courses that may be included in the latter are:

- Letter-graded courses at the 500-level and above, unless otherwise noted in the *OSU Course Bulletin*;
- Up to 1 hour of 459 (in addition to that required as part of the core);
- Up to 2 hours of 693 (individual studies);
- Up to 3 hours of 699 or H783 (for honors students pursuing undergraduate research).

The remainder may be CSE courses as specified above, or ISE 573, Math 568/571, 572, 575, 647, and 648; AMIS 310; BusFin 420; BusMHR 400; Bus Mgt 430/630; BusMkt 450. Note that only one of Math 568 or Math 571 may be counted. In the third option (ICA), at least 3 hours of the Elective Courses must be CSE courses. The remainder may be CSE courses or other appropriate courses; AMIS 531, 627, 653, 658, 659, and GEOG 607 may be of special interest to students in this option.

If you wish to count as an elective course one that does not meet the requirements of your chosen option, you must get prior approval from your faculty advisor.

Software Systems Option — 28 cr-hrs

Required Courses

551	3	_____
677	3	_____
757	3	_____
Capstone*	4	_____

*Suggested capstone 758

Total Required Courses: 13 _____

Elective Courses

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Total Elective Courses: 15

At least 10 hours in the electives must be CSE course work.

Information Systems Option — 28 cr-hrs

Required Courses

616	4	_____
671	3	_____
AMIS 211 or AMIS 310	5	_____
Capstone*	4	_____

*Suggested capstone 772

Total Required Courses: 16 _____

Elective Courses

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Total Elective Courses: min 12 _____

At least 8 hours in the electives must be CSE course work

Econ 200 must be taken as a Social Science GEC since it is a prerequisite for the AMIS course.

Information and Computation Assurance Option — 28 cr-hrs

Required Courses

551	3	_____
651	3	_____
677	3	_____
678	3	_____
Capstone*	4	_____

*Suggested capstone 762

Total Required Courses: 16 _____

Elective Courses

_____	_____	_____
_____	_____	_____
_____	_____	_____

Total Elective Courses: min 12 _____

At least 3 of the electives hours must be CSE course work

B.S. in Computer and Information Science)

(Students entering Summer 2007 or later)*

Individualized Option — 28 cr-hrs OR (18 CSE cr-hrs + approved minor)

Students pursuing this option are required to complete 18 hours of CSE courses and **one** of the following:

- 10 hours of CSE and non-CSE courses approved by the advisor; OR
- a minor program approved by the advisor

The CSE courses included in the program must be from among those listed at the start of the list of Technical Options.

Students interested in this option are urged to consult with their advisor early in their program, so that they can get approval of the courses they propose to take including the non-CSE courses or the minor, whichever applies.

The following tracks have been pre-approved for students in the following options. Note that the Business Information Systems track requires only 11 hours of the CSE courses but requires students to also complete the 20 credit hour Business Minor (for a total of 31 credit hours).

Use the following lists:

Graphics/Animation

CSE 581.....4

Capstone.....4 (CSE 682 or 786 suggested)

Technical electives (CSE courses).....10

Technical electives OR suitable minor...10

The following courses are strongly recommended for those technical electives required above: CSE 681,694A,781,782,784,786/682

Recommended for students pursuing a minor in Studio Art; Industrial, Interior & Visual Communications Design

Artificial Intelligence

CSE 6303

Capstone.....4 (CSE 786 or 731 suggested)

Technical Electives (CSE courses)....11

Technical Electives OR suitable minor...10

The following course are strongly recommended for these technical electives required above: CSE 612, 634, 730, 732, 733,735, 779, 786/731.

Recommended for students pursuing a minor in Linguistics; Psychology

Advanced Studies

One of CSE 725/755/780.....3

One of CSE 760/775.....3

One of Math 568/571/647/648....3

Capstone.....4

Technical Electives (CSE courses)....5

Technical Electives OR suitable minor 10

Choose suitable CSE courses at 500 level or above as specified at the start of the list of Technical Options.

Recommended for students pursuing a minor in Mathematics

Business Information Systems (31 cr hrs)

CSE 616.....4

CSE 671.....3

Capstone.....4 (CSE 772 suggested)

Business Minor (required)....20

Attachment #3:

BS CIS Proposed Advising Sheet

Total Cr-Hrs for BS CIS Degree: 124

Autumn (1st Semester)			Spring (2nd Semester)		
ASC	ASC/NMS Survey	1	CSE 2221	Software I	4
Math	Engineering Calculus I	5	Math	Engineering Calculus II	5
Phys 1131	Physics I	5	Biol	Biology	5
Gen Ed	Writing Level 1	3	Gen Ed	Foreign Language 2	3
Gen Ed	Foreign Language 1	3			
		Total 17			Total 17
Autumn (3rd Semester)			Spring (4th Semester)		
CSE 2231	Software II	4	CSE 2331	Foundations II	3
CSE 2321	Foundations I	3	CSE 2421	Systems I	4
Stat 3470	Intro to Prob and Stat for Engineers	3	ECE 2000	Electrical and Computer Engineering I	4
Math	Discrete Mathematics	3	Gen Ed	Writing Level 2	3
Gen Ed	Foreign Language 3	3	Gen Ed	Foreign Language 4	3
		Total 16			Total 17
Autumn (5th Semester)			Spring (6th Semester)		
CSE 2431	Systems II	3	CSE	Software: Software Eng or Databases	3
CSE 2501	Professionalism and Ethics	1	CSE	Systems: Architecture or Networks	3
CSE 390x	Project	4	CSE	Applications: AI or Graphics	3
Gen Ed	Historical Study	3	Gen Ed	Arts	3
Gen Ed	Social Science 1	3	Gen Ed	Culture & Ideas or Historical Study	3
		Total 14			Total 15
Autumn (7th Semester)			Spring (8th Semester)		
CSE	Foundations: Theory or Prog Lang	3	CSE 591x	Capstone Design	4
	Technical Elective	3		Technical Elective	3
	Technical Elective	3		Technical Elective	3
	Technical Elective	3	Gen Ed	Social Science 2	3
Gen Ed	Literature	3			
		Total 15			Total 13

Admission to the BS CIS major requires:

- Completion of courses shown above in *italics* (or honors versions thereof).
- At least 15 cr-hrs earned at Ohio State.
- A CPHR of at least 2.0 (may be higher when enrollment management is in effect).
- An MPHR (major point hour ratio), over CSE courses that can be included in the major program, of at least 2.0.
- Completion of all admission conditions that may have been imposed when the student was admitted to OSU.

Technical Electives include:

- At least 8 cr-hrs of CSE courses at the 3000-level or above
- At most 1 cr-hr of CSE 425X
- At most 2 cr-hrs total of CSE 4193, 4193H, 4998, 4998H, 4999, 4999H
- At most 7 cr-hrs of letter-graded non-CSE courses approved by the academic advisor
- CSE Advising Office can suggest tracks based on interest, and minor programs with 7 cr-hrs counted as Technical Electives

Attachment #4:

**BS in Computer and Information Science Curriculum Map:
Courses to Program Outcomes (a–n; see page 2)**

Note: In the table below, * indicates some contribution, ** indicates moderate contribution, *** indicates significant contribution to the learning outcome.

Course Number	a	b	c	d	e	f	g	h	i	j	k	l	m	n
CSE 2221	***	*	***		**		*		*		***	**	*	***
CSE 2231	***	*	***	**	**		*		*		***	**	*	***
CSE 2321	***		**		*				*		**	**	**	
CSE 2331	***	*	**		**				**		**	**	**	*
CSE 2421	**	**	***		**						***	***	***	**
CSE 2431	**	**	**		***				*		***	**	***	**
CSE 2501					*	***	**	***	*	**				
CSE 3231	*		**	*	**	*	*	*	*	*	**	**	**	**
CSE 3241	***	*	**	***	**		*		*		***	*	*	*
CSE 3321	***		*		***				**		**	**	*	
CSE 3341	***	**	***	*	***	*	*	*	**	*	***	***	***	***
CSE 3421	***	*	**		**				*	**	*	*	**	*
CSE 3461	**	**	*	**	*			*	*	**	**	*	*	*
CSE 3521	***	*	**		**	*		*	*	*	**	**	*	**
CSE 3541	***	**	***		*	*	*	*	*	*	**	***	***	**
CSE 390X	**		***	***	**	*	**				***	*	*	**
CSE 591X	***	*	***	***	***	**	***	*	***	***	***	***	***	***
ECE 2000	***	***	***	*	**		*		*		**	*	*	
Calc 1,2	**	*	*		*							*		
Phys 1		**			*									
BioSc		**		*										
Stats 1	**	***	*		*									
DiscrMath	**	*	**		**				*		*			
Wrtng 1,2				*		*	***	*		**				
Literature							***	*		**				
Arts				*			**	*		*				
History						*	**	**		**				
SocStd 1,2				*		***	**	**		***				
FornLang				*		**	**	*		*				

Attachment #5:

BS CIS Proposed Transition Worksheet

Bold red italics: combination required

Done?	Quarter Course Completed	q-cr-hrs	Equiv s-cr-hrs	Substitutes For	s-cr-hrs	Excess s-cr-hrs
1	Engl 110	5	3.33	Writing Level 1	3	0.33
1	GEC Second Writing	5	3.33	Writing Level 2	3	0.33
1	GEC Literature	5	3.33	Literature	3	0.33
1	GEC Visual/Performing Arts	5	3.33	Arts	3	0.33
1	GEC Historical Study 1	5	3.33	Historical Study	3	0.33
1	GEC Social Science 1	5	3.33	Social Science 1	3	0.33
1	GEC Social Science 2	5	3.33	Social Science 2	3	0.33
1	GEC Historical Study 2	5	3.33	Culture & Ideas or Historical Study	3	0.33
1	Foreign Language	20	13.33	Foreign Language	12	1.33
1	ASC 100	1	0.67	ASC/NMS Survey	1	-0.33
1	Math 151 and Math 152	10	6.67	Engineering Calculus I (GE Math)	5	1.67
1	Math 153	5	3.33	Engineering Calculus II (GE Open Option 1)	5	-1.67
1	Phys 131	5	3.33	Physics I (GE Physical Science)	5	-1.67
1	Biol 113	5	3.33	GE Biological Science	5	-1.67
1	Math 566	3	2.00	Discrete Mathematics (GE Open Option 2)	3	-1.00
1	Stat 427	3	2.00	Intro to Prob and Stat for Engrs (GE Data Analysis)	3	-1.00
1	*		0.00	Electrical and Computer Engineering I	4	-4.00
1	CSE 221 and CSE 222 and CSE 321	12	8.00	Software I and II	8	0.00
1	Math 366	3	2.00	Foundations I	3	-1.00
1	CSE 680	3	2.00	Foundations II	3	-1.00
1	CSE 360 and (CSE 459.21 or CSE 459.22)	5	3.33	Systems I	4	-0.67
1	CSE 660	3	2.00	Systems II	3	-1.00
1	CSE 601	1	0.67	Professionalism and Ethics	1	-0.33
1	CSE 560	5	3.33	Project	4	-0.67
1	CSE 757 or CSE 670	3	2.00	Software Engineering/Databases	3	-1.00
1	CSE 625 or CSE 655 (+1 *)	3	2.00	Theory/Programming Languages	3	-1.00
1	CSE 675.01 (-1 *) or CSE 677 (-1 *)	4	2.67	Architecture/Networking	3	-0.33
1	CSE 581 (+1 *) or CSE 681 (+1 *) or CSE 630	3	2.00	Graphics/Artificial Intelligence	3	-1.00
1	CSE Capstone Design	4	2.67	Capstone Design	4	-1.33
1	Anything else counted now: [list here]	17	11.33	Technical Electives	15	-3.67

* ECE I may be taken under semesters, or 4 s-cr-hrs may be added in tech electives; any equiv s-cr-hr difference counts in tech electives.

131	87.33	Total Completed cr-hrs
	36.67	Total Remaining cr-hrs
	9.70	Remaining Tech Elective cr-hrs

After meeting with my academic advisor, I understand the conversion of my coursework from quarters to semesters. I also understand that:

1) I will not be impeded toward graduation if I follow the plan put forward in this transition worksheet and the attached timetable for completion, and

2) if I fail to make satisfactory progress on my part, fail to schedule promptly and appropriately and complete courses as advised, and/or otherwise fail to follow this plan, graduation in a timely fashion may not be possible.

Student printed name / signature / date: _____ / _____ / _____

Advisor printed name / signature / date: _____ / _____ / _____