Transcripts of BS-CSE Program Graduates

Transcripts of six Spring '17 graduates of the BS-CSE program, these being the first six whose names start with the letter "G" in an alphabetical listing of Spring '17 graduates of the program, and analysis of the transcripts showing that all six students met all of the EAC curricular requirements as well as all of the program requirements appear in the pages that follow. The students' names and other identifying information has been elided; the last four digits of their student id numbers are used, instead, to identify the students.

The next page contains a summary table that shows, for each of the EAC categories, how many credit hours each student completed. The table also lists the number of credit hours in each category required by the ABET criteria and shows that each student met all the *program criteria requirements* applicable to CSE programs. The table on pages (3) through (6) details the courses the students took in the various categories.

Copies of the students' official transcripts as well as copies of their *degree audit reports* (DARS) are in separate files. The students' names have been erased from the transcripts and from the DARS reports. The student id numbers (all 9 digits) appear on both.

If there any questions about the transcripts or the tables on the next three pages, please e-mail Neelam Soundarajan at:

`soundarajan.1@osu.edu`

Neelam is chair of the CSE Undergraduate Studies Committee and is helping coordinate the site visit. We are looking forward to working with the accreditation team!

(EAC) Transcript Analysis, BS-CSE Program (Summary)

ABET Curricular Category	Number of Credits						
	ABET Criteria Requirement	Credits Actually Earned by Student†					
		0491	4406	2789	5294	8443	7007
College-level Mathematics and Basic Sciences	32	33	37	33	38	34	34
Engineering Topics	48	68	66	69	70	72	72
General Education		24	24	27	27	30	27
Program Criteria Requirements							
Knowledge of math. through differential & integral calculus: Math 1151/1161, 1172/2162		√	√	√	√	√	√
Probability & Statistics: Stat 3470; or Stat 2450, 3450		√	√	√	√	√	√
Discrete Mathematics: CSE 2321; Math 3345		√	√	√	√	√	√
Engineering topics (including computer science) to analyze & design systems with hardware & software components: a wide range of CSE and ECE courses (see following pages).		√	√	√	√	√	√

†As noted earlier, students are identified by the last four digits of their student id number, these being, respectively, 0491, 4406, 2789, 5294, 8443, and 7007, for the six students.

(EAC) Transcript Analysis, BS-CSE Program (Details)

Curricular Category	Credit hours	Courses taken by individual students†1					
		0491	4406	2789	5294	8443	7007
Mathematics and Basic Sciences							
Math 1151: Calculus I; or Math 1161: Accelerated Calculus	5	√	√√	√	√√	√√	√
Math 1172: Eng. Math A; or Math 2162: Acc. Eng. Calculus 2	5	√	√	√	√	√	√
Stat 3470: Intro Prob & Stat for Engrs; or Stat 2450, 3450: Stats for Engrs	3 / 4	√	√	√	√	√	√
CSE 2321: Fnds I: Discrete Structures†2	1	√	√	√	√	√	√
Math 3345: Fnds of Higher Math	3	√	√	√	√	√	√
Math 2568: Linear Algebra	3	√	√	√	√	√	√
Phys 1250: Mechanics, Thermo, Waves; or Phys 1260: Mechanics, Thermo, Waves	5	√	√	√	√	√	√
Mathematics, Science Electives (Minimum:	8 hrs)						
Chem 1210: General Chem I: 5 hrs				√			
Chem 1250: General Chem for Eng: 4 hrs					√		
Earth Sc 1121: Dynamic Earth: 4 hrs		√					
Food Sc 2200: The Science of Food: 3 hrs			√				
Math 2255/2415: Diff Eq: 3 hrs				√	√		
Phys 1251/1261: Elec, Magn, QM: 5 hrs			√		√	√	√
Stat 5301: Inter Data Anl: 4 hrs		√	√			√	√
Total Credit Hrs: Math & Science	33 (min.)	33	37	33	37	34	34

Notes: 1. √ indicates the student completed the particular course at Ohio State; or completed it another school and received transfer credit; √√ means the student received *EM* (exam) credit for the course.

2. CSE 2321, Foundations I: Discrete Structures, is a 3 credit hour course that deals with propositional and first-order logic and basic proof techniques; and then discusses such basic computing topics as graphs, trees, recurrence relations as well as analysis of algorithms. Hence, in the table, 1 credit hour of this course is counted under Mathematics and Basic Sciences, and the other 2 credit hours under Engineering Topics.

(EAC) Transcript Analysis, BS-CSE Program (Details) (contd.)

Curricular Category	Credit hours	Courses taken by individual students					
		0491	4406	2789	5294	8443	7007
Engineering Topics							
Engr 1181, 1182: Fnds of Engr; or[†3] Engr 1281, 1282: Fnds of Engr (H)[†3]	4/ 8	√	√	√	 √	 √	 √
ECE 2000: Elec & Comp Eng I; or[†4] ECE 2060: Intro to Dig. Logic	4/ 3	√	√	√	√	√	√
ECE 2100: Elec & Comp Eng II; or[†4] ECE 2020: Intro to Analog Sys. & Cir.	4/ 3	√	√	√	√	√	 √
CSE 2221: Software Components	4	√	√	√	√	√	√
CSE 2231: Software Dev & Des	4	√	√	√	√	√	√
CSE 2321: Fnds I: Discr Str.	2	√	√	√	√	√	√
CSE 2331: Fnds II: Data Str & Alg	3	√	√	√	√	√	√
CSE 2421: Intro Comp. Org.	4	√	√	√	√	√	√
CSE 2431: Intro Operating Sys	3	√	√	√	√	√	√
CSE 2501: Soc, Ethical, & Prof. Issues in Computing	1	√	√	√	√	√	√
CSE 3231: Software Eng Tech; or CSE 3241: Intro to Database Sys	3	 √	 √	 √	 √	 √	 √
CSE 3321: Automata, Formal Langs or CSE 3341: Prin of Prog Langs	3	√	 √	√	√	 √	 √
CSE 3421: Intro Comp. Arch. or CSE 3461: Comp Netw & Internet Tech	3	 √	 √	√	 √	√	√
CSE 3521: AI I: Basic Tech.; or CSE 3541: Game & Anim. Tech.	3	√	 √	 √	√	√	√
Subtotal Cr. Hrs: Engineering Topics (Eng. Topics continued on next page)	43 (min.)	45	45	45	49	49	48

Notes: 3. Engr 1181, 1182 (2 credit hours each) is a 2-semester freshman sequence that introduces students to some fundamental ideas common to various engineering disciplines. It also has students work in teams (typically 4 students each) on a number of simple projects. Engr 1281, 1282 (5 credit hours and 3 credit hours respectively) is an alternative sequence intended mainly for *honors* students and has students work on more challenging projects in a number of domains.

4. ECE 2000, 2100 (4 credit hours each) was a sequence that covered material related to digital and analog circuits and also included material on signal processing, tying together the various topics in a novel manner. All CSE majors (as well as ECE majors) were required to take this sequence. Unfortunately, our students (as well as ECE majors) did not have the background necessary to fully understand the presented material and, as detailed in the self-study, we received considerable negative feedback from the students. Hence, the ECE faculty, in consultation with our faculty, came up with a completely revised set of courses covering these materials in a more conventional manner. With this revision, CSE students are required to take two 3-credit hour courses, ECE 2020 (analog circuits) and ECE 2060 (digital logic); the resulting 2-credit reduction being made up for by increasing the number of technical elective hours from 15 to 17; or 16 if a student has completed ECE 2000 and then takes 2020 (as in the case of 7007 in the table).

(EAC) Transcript Analysis, BS-CSE Program (Details) (contd.)

Curricular Category	Credit hours	Courses taken by individual students					
		0491	4406	2789	5294	8443	7007
Engineering Topics (contd.)							
Subtotal Cr. Hrs: Engineering Topics (from last page)	43 (min.)	45	45	45	49	49	48
Junior Project: CSE 3901: Web Apps; or CSE 3902: Interactive Systems;	4	 ✓	 ✓	 ✓	 ✓	 ✓	 ✓
Capstone Project: CSE 5911: Software Applications; or CSE 5912: Game Des. & Dev.; or CSE 5914: Knowledge-Based Sys; or CSE 5915: Information Systems	4	 ✓	 ✓	 ✓	 ✓	 ✓	 ✓
Technical Electives: Total (minimum[5]) CSE courses (minimum[5]) See individual transcripts for courses	 (15/16) (8/9)	 15 15	 17[6] 13	 25[6] 25	 34[6] 13	 16[6] 15	 17[6] 16
Total Credit Hrs: Engineering Topics	60 (min.)	68	66	78	70	72	72

Notes: 5. As detailed in the self-study and mentioned in Note (4) on the previous page, students are required to complete 15 credit-hours of *technical elective* courses if they have completed ECE 2000, 2100; 17 hours if they instead complete ECE 2060, 2020; and 16 hours if they complete ECE 2000, followed by ECE 2020. Of these, at least 8 (or 9 in case the student has to complete 16/17 hours of technical electives) must be CSE courses at the 3000-level or above; the rest may be a suitable combination of CSE and non-CSE courses to enable students, who are also interested in some other discipline (such as data analytics or biomedical engineering) with an eye toward possibly apply computing ideas to that discipline, to obtain some relevant knowledge. (We should note that one of the courses that the student with the id "5294" took was Linguistics 3801 (3 cr-hrs) whose topic is *code breaking*, including discussion of the related old and new techniques. We have counted the hours for this course as part of the 13 hours of the CSE Technical Electives for this student since essentially the same course could be taught as a CSE course. If this course were not so included, the figure in this row for this student would be 10 hours. All the other courses included among the CSE Technical Electives for all students were CSE courses.)

As detailed in the self-study, students' choice of technical elective courses, core-choice courses (3231/3241; 3321/3341; 3421/3461; 3521/3541; see previous page), junior project course, and capstone project course must satisfy the requirements of their specialization option. The student with id "2789" chose the *Computer Graphics and Game Design* option which requires the student to complete CSE 3541, 3902 and one of 5542, 5543, 5544, 5545, and 5912. The student completed 3541, 3902, 5542, and 5912. The student with id "8443" chose the *Artificial Intelligence* option which requires the student to complete CSE 3521, 5522, and one of 5523, 5524, 5525, and 5526; and CSE 5914 is recommended as the capstone course. The student completed 3521, 5522, 5523, 5526, and 5914. The remaining four students chose the *Individualized* option which does not require any specific set of courses, instead, allowing the students, in consultation with the advisor, to tailor a suitable choice of courses appropriate for their career goals and/or technical interests.

6. The student with id "4406" took 13 credit hours of CSE as technical elective courses and [contd.]

(EAC) Transcript Analysis, BS-CSE Program (Details) (contd.)

Curricular Category	Credit hours	Courses taken by individual students					
		0491	4406	2789	5294	8443	7007
General Education							
English 1110, Writing II[†7]	6	√	√	√	√	√	√
Social Sciences[†8]	6	√	√	√	√	√	√
Historical Study	3	√	√	√	√	√	√
Literature	3	√	√	√	√	√	√
Visual/Perf. arts	3	√	√	√	√	√	√
Culture and ideas and prof. ethics	3	√	√	√	√	√	√
Total Credit Hrs: General Education	24	24	24	27	27	30	27

Notes: 6. [contd.] took Stat 5301 (4 cr. hrs) also as a tech elective; this course is included in the entry for the student under "Mathematics, Science Electives" on page 3. "2789" took 25 hours of CSE courses as tech electives. But, for some reason (having to do with how it is programmed) the DARS system reports only 15 cr. hrs., listing the other 10 hours near the end of the student's report (under "course work counted for graduation but not used for a specific GEC or major requirement").
"5294" completed 34 cr. hrs. of tech electives, 10 of which were CSE courses; the other 24 hours consisted of Math 2415 (diff. equations) and Linguistics 3801 (code making & breaking), courses in mechanical and industrial engineering, environmental and natural resources, etc. The DARS report lists 15 hours under tech electives and the other 19 near the end of the report.
"8443" completed Physics 1251 (5 cr. hrs.) and Stat 5301 (4 hrs.) to meet the Math/Science electives requirement; since that requirement was for 8 hrs., the additional hour was counted as part of tech electives. The student also completed 15 hours of CSE courses as part of tech electives for a total of 16 hrs. The DARS listed 15 hours under tech electives and 1 hour at the end of the report.
"7007" was similar. The student completed Physics 1261 (5 hrs.) and Stat 5301 (4 hrs.) to meet the Math/Science electives requirement. 8 of those hours were counted toward that requirement, the additional hour as part of tech electives. The student completed 16 hours of CSE courses as part of technical electives for a total of 17 hours. The DARS report listed 16 hours under technical electives and 1 hour near the end of the report; note that since this student took ECE 2000, 2020 (7 hrs.) rather than ECE 2000, 2100 (8 hrs.), the student was required to complete 16 hrs. of technical electives rather than 15.

7. Several courses in various topics, each with a focus on developing writing skills, each numbered 2367, have been designated "second writing courses". Students are required to take at least one of these courses.

8. Students are also required to take a course that addresses social diversity issues. Typically, however, this is not an additional course since many of the courses in the social science category or one of the other categories listed deal with diversity issues; such a course then *double counts* toward both categories. Similarly, *professional ethics* may be addressed by a course that falls under the *social sciences* category rather than in the *cultures and ideas* category; if the student were to take such a course, he/she is also required to take a course that falls under the *cultures and ideas* category.
A relatively new course that falls in the *cultures and ideas* category and addresses *professional ethics* is Philosophy 1338. This *four* credit hour course was developed specifically for CSE majors and deals with ethical theory from a philosophical point of view but with a focus on ethical dilemmas raising by computing technology. For details concerning this course, please refer to the self-study. None of the six students considered here took this course (since it was only recently introduced).

(EAC) Transcript Analysis, BS-CSE Program (Details) (contd.)

Program Criteria (for CSE Programs): All six students completed the following courses, thus meeting the program criteria requirements for CSE programs.	
Knowledge of probability and statistics	Stat 3470; or Stat 2450 and 3450
Knowledge of math. through differential & integral calculus	Math 1151/1161; 1172/2162
Discrete mathematics	CSE 2321; Math 3345
Sciences (biological, chemical, physical)	Physics 1250/1260 (5 credit hours) Students are also required to take 8 additional credit hours of math/science courses from a specified list; for most students, including all six here, this will include at least 3 more credit hours of science courses.
Engineering topics (including computing science) to analyze & design systems with hardware & software components.	ECE 2000/2060, 2100/2020; and a large number of CSE courses listed above and on previous pages