WICHITA STATE UNIVERSITY

Program Review Self-Study Template

Academic unit: Electrical Engineering and Computer Science

College: Engineering

Date of last review 2015

Date of last accreditation report (if relevant) 2013

List all degrees described in this report (add lines as necessary)

Degree: BS Electrical Engineering CIP* code:14.1099

Degree: BS Computer Engineering CIP code:14.0901

Degree: BS Computer Science CIP code:11.0701

Degree: MS Electrical Engineering CIP code: 14.1099

Degree: MS Computer Networking CIP code: 11.0901

Degree: MS Computer Science CIP code: 11.0701

Degree: PhD Electrical Engineering and Computer Science CIP code: 14.1099

*To look up, go to: Classification of Instructional Programs Website, http://nces.ed.gov/ipeds/cipcode/Default.aspx?y=55

Certificate (s): __ Information Assurance and Cybersecurity

Faculty of the academic unit (add lines as necessary)

Name Signature

Visvakumar Aravinthan, Associate Professor

Abu Asaduzzaman, Associate Professor

Rajiv Bagai, Associate Professor

Animesh Chakravarthy, Associate Professor

Remi Chou, Assistant Professor

Yanwu Ding, Associate Professor

Ali Eslami, Assistant Professor

Hongsheng He, Assistant Professor

Ward Jewell, Professor

Huzefa Kagdi, Associate Professor

Preethika Kumar, Associate Professor _____

Hyuck Kwon, Professor _____

Vinod Namboodiri, Associate Professor _____

Chengzong Pang, Assistant Professor _____

Prakash Ramanan, Professor _____

Sergio Salinas, Assistant Professor _____

Manira Rani, Engineering Educator _____

Zhiyong Shan, Assistant Professor _____

Kaushik Sinha, Assistant Professor _____

Steven Skinner, Professor and Associate Dean _____

Adam Sweeney, Engineering Educator _____

Perlekar Tamtam, Engineering Educator _____

John Watkins, Professor _____

Gergely Zaruba, Professor and Chair _____

Tewodros Zewde, Engineering Educator _____

Submitted by: Gergely Zaruba, Professor and Chair_____ Date: 09/17/2018
(name and title)

In yellow highlighted areas, data will be provided

1. Departmental purpose and relationship to the University mission (refer to instructions in the WSU Program Review document for more information on completing this section).

a. University Mission:

The mission of Wichita State University is to be an essential educational, cultural, and economic driver for Kansas and the greater public good.

b. Program Mission (if more than one program, list each mission):

The mission of the **BS in Electrical Engineering program** is to provide students with a strong foundation in the traditional and contemporary areas of electrical engineering so that they can conceive and solve technological problems in society. Social and humanistic issues are also emphasized in the general education component of the program to provide breadth in education. The program provides graduates with the knowledge, aptitudes, and attitudes which prepare them for corporate and governmental entry level jobs or to pursue further education at the graduate level.

The mission of the **BS in Computer Engineering program** is to provide students with a strong foundation in the traditional and contemporary areas of computer engineering so that they can conceive and solve technological problems in society. Social and humanistic issues are also emphasized in the general education component of the program to provide breadth in education. The program provides graduates with the knowledge, aptitudes, and attitudes which prepare them for corporate and governmental entry level jobs or to pursue further education at the graduate level.

The mission of the **BS in Computer Science program** is to provide students with a strong foundation in the traditional and contemporary areas of computer science so that they can conceive and solve technological problems in society. Social and humanistic issues are also emphasized in the general education component of the program to provide breadth in education. The program provides graduates with the knowledge, aptitudes, and attitudes which prepare them for corporate and governmental entry level jobs or to pursue further education at the graduate level.

The mission of the **MS in Computer Science program** is to provide students with a strong foundation in the traditional and contemporary areas of Computer Science, and to enable students to synthesize, interpret, and apply research and other forms of knowledge for the advancement of the discipline.

The mission of the **MS in Computer Networking program** is to provide students with a strong foundation in the traditional and contemporary areas of Computer Networking, and to enable students to synthesize, interpret, and apply research and other forms of knowledge for the advancement of the discipline.

The mission of the **MS in Electrical Engineering program** is to provide students with a strong foundation in the traditional and contemporary areas of Electrical Engineering, and to enable students to

synthesize, interpret, and apply research and other forms of knowledge for the advancement of the discipline.

The mission of the **PhD in Electrical Engineering and Computer Science program** is to provide students with a strong foundation in the traditional and contemporary areas of Electrical Engineering, Computer Engineering and Computer Science, and to enable students to synthesize, interpret, and apply research and other forms of knowledge for the advancement of the discipline.

c. The role of the program (s) and relationship to the University mission: Explain in 1-2 concise paragraphs.

The roles of the BS in Electrical Engineering program are as follows:
Role 1
The alumni, in the first several years after receiving their baccalaureate degree, will be productive and successful in the professional practice of electrical engineering, as evidenced by:
a. Job satisfaction and contributions towards the success of one's employers
b. Effective participation and leadership on engineering teams
c. Identifying and solving real-world problems
d. Managing increased and varied responsibilities
e. Job-related awards, promotions/raises, and professional accomplishments (e.g., patents, inventions)

Role 2
The alumni, in the first several years after receiving their baccalaureate degree, will be successful in pursuing continuing education, as evidenced by:
a. Effective progression towards an advanced post-undergraduate degree or professional licensure/certification
b. Participation in professional societies, professional conferences, and meetings
c. Participation in lifelong learning by adapting to new technologies, tools and methodologies in electrical engineering, and responding to the challenges of a changing environment
d. Scholarly accomplishments (e.g., publications, presentations)
e. Professional self-study

The roles of the BS in Computer Engineering program are as follows:
Role 1
The alumni, in the first several years after receiving their baccalaureate degree, will be productive and successful in the professional practice of computer engineering, as evidenced by:
a. Job satisfaction and contributions towards the success of one's employers
b. Effective participation and leadership on engineering teams
c. Identifying and solving real-world problems
d. Managing increased and varied responsibilities
e. Job-related awards, promotions/raises, and professional accomplishments (e.g., patents, inventions)

Role 2
The alumni, in the first several years after receiving their baccalaureate degree, will be successful in pursuing continuing education, as evidenced by:

a. Effective progression towards an advanced post-undergraduate degree or professional licensure/certification
b. Participation in professional societies, professional conferences, and meetings
c. Participation in lifelong learning by adapting to new technologies, tools and methodologies in computer engineering, and responding to the challenges of a changing environment
d. Scholarly accomplishments (e.g., publications, presentations)
e. Professional self-study

The roles of the BS in Computer Science program are as follows:
Role 1
The alumni, in the first several years after receiving their baccalaureate degree, will be productive and successful in the professional practice of computing, as evidenced by:
a. Job satisfaction and contributions towards the success of one's employers
b. Effective participation and leadership on computing/engineering teams
c. Identifying and solving real-world problems
d. Managing increased and varied responsibilities
e. Job-related awards, promotions/raises, and professional accomplishments (e.g., patents, inventions)

Role 2
The alumni, in the first several years after receiving their baccalaureate degree, will be successful in pursuing continuing education, as evidenced by:
a. Effective progression towards an advanced post-undergraduate degree or professional certification
b. Participation in professional societies, professional conferences, and meetings
c. Participation in lifelong learning by adapting to new technologies, tools and methodologies in computing, and responding to the challenges of a changing environment
d. Scholarly accomplishments (e.g., publications, presentations)
e. Professional self-study

The role of the MS in Computer Science program is to prepare students for advanced careers in computer science and related fields, as well as further graduate study.

The role of the MS in Computer Networking program is to prepare students for advanced careers in computer networking and related fields, as well as further graduate study.

The role of the MS in Electrical Engineering program is to prepare students for advanced careers in electrical engineering and related fields, as well as further graduate study.

The role of the PhD in Electrical Engineering and Computer Science program is to prepare students for the highest-level careers in electrical engineering, computer engineering or computer science in academia, research and industry.

All the programs directly support Wichita State University's mission to be an essential education and economic driver for Kansas and the greater public good. Our programs do this by requiring students to apply their skill sets in practical or real world contexts.

d. Has the mission of the Program (s) changed since last review? ☐ Yes ☒ No
   i. If yes, describe in 1-2 concise paragraphs. If no, is there a need to change?

   The mission of the programs will likely remain the same. However, there may be a change in the programs themselves, especially the Computer Networking Program, which may not be inline any more with WSU mission due to the needs of industry and needs of students.

e. Provide an overall description of your program (s) including a list of the measurable goals and objectives of the program (s) (programmatic). Have they changed since the last review?
   ☐ Yes ☒ No
   If yes, describe the changes in a concise manner.

The **BS in Electrical Engineering program** offers electives in communications and signal processing, control systems, digital systems, electric power systems, and electronics. Students in their senior year work in teams on a two-semester real world project under the supervision of a faculty member. These projects are conducted in such a manner as to prepare students for a professional career with an emphasis on those skills required of engineering professionals. The demand for classical electrical engineering graduates continues to increase however enrollment seems to show a national declining trend. The electrical engineering graduate is qualified for entry positions in a large number of industries and governmental organizations as a result of the graduate's broad technical background. An electrical engineering degree opens the door to a satisfying and rewarding career. Electrical engineering graduates have the potential to shape the future of society through creative problem solving, design, innovation, and discovery.

The Program Educational Objectives (PEO) of the BS in Electrical Engineering program are as follows:
PEO 1
The alumni, in the first several years after receiving their baccalaureate degree, will be productive and successful in the professional practice of electrical engineering, as evidenced by:
a. Job satisfaction and contributions towards the success of one's employers
b. Effective participation and leadership on engineering teams
c. Identifying and solving real-world problems
d. Managing increased and varied responsibilities
e. Job-related awards, promotions/raises, and professional accomplishments (e.g., patents, inventions)

PEO 2
The alumni, in the first several years after receiving their baccalaureate degree, will be successful in pursuing continuing education, as evidenced by:
a. Effective progression towards an advanced post-undergraduate degree or professional licensure/certification
b. Participation in professional societies, professional conferences, and meetings
c. Participation in lifelong learning by adapting to new technologies, tools and methodologies in electrical engineering, and responding to the challenges of a changing environment
d. Scholarly accomplishments (e.g., publications, presentations)
e. Professional self-study

The **BS in Computer Engineering program** allows students to take a broad array of electives or concentrate their electives in hardware related courses, software related courses, computer networking courses or courses from the electrical engineering area. In their senior year, they will work in teams on a two-semester real world project under the supervision of a faculty member. These projects are conducted in such a manner as to prepare students for a professional career with an emphasis on those skills required of engineering professionals. The demand for computer engineering graduates continues to increase. The computer engineering graduate is qualified for entry positions in a large number of industries and governmental organizations as a result of the graduate's broad technical background. A computer engineering degree opens the door to a satisfying and rewarding career. Computer engineering graduates have the potential to shape the future of society through creative problem solving, design, innovation, and discovery.

The Program Educational Objectives of the BS in Computer Engineering program are as follows:
PEO 1
The alumni, in the first several years after receiving their baccalaureate degree, will be productive and successful in the professional practice of computer engineering, as evidenced by:

a. Job satisfaction and contributions towards the success of one's employers
b. Effective participation and leadership on engineering teams
c. Identifying and solving real-world problems
d. Managing increased and varied responsibilities
e. Job-related awards, promotions/raises, and professional accomplishments (e.g., patents, inventions)

PEO 2
The alumni, in the first several years after receiving their baccalaureate degree, will be successful in pursuing continuing education, as evidenced by:

a. Effective progression towards an advanced post-undergraduate degree or professional licensure/certification
b. Participation in professional societies, professional conferences, and meetings
c. Participation in lifelong learning by adapting to new technologies, tools and methodologies in computer engineering, and responding to the challenges of a changing environment
d. Scholarly accomplishments (e.g., publications, presentations)
e. Professional self-study

The professional organization of computer scientists defines computer science as "the systematic study of algorithmic processes that describe and transform information – their theory, analysis, design, efficiency implementation, and application." Underlying all computing is discovering what can be automated and how the automation is best accomplished. The **BS in Computer Science program** allows students to take a broad array of technical electives in computer science, computer engineering, and computer networking. In their senior year, they will work in teams on a two-semester real world project under the supervision of a faculty member. These projects are conducted in such a manner as to prepare the student for a professional career with an emphasis on those skills required of computer science professionals. Opportunities for computer science graduates are abundant in our modern, technologically based society. The computer science graduate is qualified for many entry positions in business, industry, education, and government as a result of the graduate's broad technical background. A computer science degree opens the door to a satisfying and rewarding career. Computer science graduates have the potential to shape the future of society through creative problem solving, design, innovation, and discovery

The Program Educational Objectives of the BS in Computer Science program are as follows:

PEO 1

The alumni, in the first several years after receiving their baccalaureate degree, will be productive and successful in the professional practice of computing, as evidenced by:

a. Job satisfaction and contributions towards the success of one's employers
b. Effective participation and leadership on computing/engineering teams
c. Identifying and solving real-world problems
d. Managing increased and varied responsibilities
e. Job-related awards, promotions/raises, and professional accomplishments (e.g., patents, inventions)

PEO 2

The alumni, in the first several years after receiving their baccalaureate degree, will be successful in pursuing continuing education, as evidenced by:

a. Effective progression towards an advanced post-undergraduate degree or professional certification
b. Participation in professional societies, professional conferences, and meetings
c. Participation in lifelong learning by adapting to new technologies, tools and methodologies in computing, and responding to the challenges of a changing environment
d. Scholarly accomplishments (e.g., publications, presentations)
e. Professional self-study

The **MS in Computer Science** (MSCS) program prepares graduate students for career-oriented jobs or gaining admission into PhD programs around the world. Its curriculum is designed to ensure that students can study traditional areas of computer science as well as modern research trends in courses taught by active researchers having national and international recognition. The department has state-of-the-art laboratories for use by its students, who are also actively sought after by local companies through the university's Cooperative Education opportunity. This provides students with invaluable job experience, financial assistance, and contacts for potential full-time jobs after graduation. The MSCS degree requires the satisfactory completion of a Plan of Study, which must be filed within the first 12 credit hours of graduate course work. The plan of study must be approved by the student's advisor and the MSCS graduate coordinator. Three options are available: (1) the thesis option requires a minimum of 24 hours of course work plus a minimum of 6 hours of thesis, (2) the directed project option requires a minimum of 30 hours of course work plus a minimum of 3 hours of directed project, and (3) the course work option requires a minimum of 36 hours of course work. Each plan of study must contain CS721 Algorithms, at least 12 credit hours of major courses numbered 800 or higher, and at least 3 credit hours of major courses with a research writing and presentation component. Up to 12 credit hours of elective courses, i.e. courses other than the major courses, may be taken by an MSCS student. Of these 12 hours of electives, at most 6 hours may be from outside the EECS department. At least 60% of all credit hours on this plan that are from WSU need to be courses numbered 700 or higher.

The objectives of the MS in Computer Science program are to prepare students for

1. advanced careers in computer science and related fields
2. further graduate study.

The **MS in Computer Networking** (MSCN) program prepares graduate students for career-oriented jobs in the rapidly-growing computer networking industry, or gaining admission into PhD programs around the world. Its curriculum is designed to ensure that students can study theoretical foundations of computer networking as

well as modern research trends in courses taught by active researchers having national and international recognition. The department has state-of-the-art laboratories for use by its students, who are also actively sought after by local companies through the university's Cooperative Education opportunity. This provides students with invaluable job experience, financial assistance, and contacts for potential full-time jobs after graduation. The MSCN degree requires the satisfactory completion of a Plan of Study, which must be filed within the first 12 credit hours of graduate course work. The plan of study must be approved by the student's advisor and the MSCN graduate coordinator. Three options are available: (1) the thesis option requires a minimum of 24 hours of course work plus a minimum of 6 hours of thesis, (2) the directed project option requires a minimum of 30 hours of course work plus a minimum of 3 hours of directed project, and (3) the course work option requires a minimum of 36 hours of course work. Each plan of study must contain CS736, at least one of CS721 Algorithms and CS797G Mathematical Foundations of Computer Networking, at least 12 credit hours of major courses numbered 800 or higher, and at least 3 credit hours of major courses with a research writing and presentation component. Up to 12 credit hours of elective courses, i.e. courses other than the major courses, may be taken by an MSCN student. Of these 12 hours of electives, at most 6 hours may be from outside the EECS department. At least 60% of all credit hours on this plan that are from WSU need to be courses numbered 700 or higher.

The objectives of the MS in Computer Networking program are to prepare students for

1. advanced careers in computer networking and related fields
2. further graduate study.

The **MS in Electrical Engineering** (MSEE) program is a flexible degree program for students who seek an advanced professional career in this field. It also gives critical knowledge to pursue a PhD in Electrical Engineering. Students of the program have the opportunity to build a strong foundation in physical science and mathematics, while exploring key sub-disciplines in Communication & Signal Processing, Computing Systems, Control Systems & Robotics, and Power & Energy Systems, to achieve a thorough command of their chosen sub-disciplines. The program's curriculum and the department's state-of-the-art laboratories prepare students to develop creative solutions to real-world engineering problems in a global economy. Students of this program are actively sought after by local companies through the university's Cooperative Education opportunity. This provides students with invaluable job experience, financial assistance, and contacts for potential full-time jobs after graduation.

The MSEE degree requires the satisfactory completion of a Plan of Study, which must be filed within the first 12 credit hours of graduate course work. The plan of study must be approved by the student's advisor and the MSEE graduate coordinator. Three options are available: (1) the thesis option requires a minimum of 24 hours of course work plus a minimum of 6 hours of thesis, (2) the directed project option requires a minimum of 30 hours of course work plus a minimum of 3 hours of directed project, and (3) the course work option requires a minimum of 36 hours of course work. Each MSEE student chooses a major and a minor specialization area. Current major areas in the department are Communication & Signal Processing, Computing Systems, Control Systems & Robotics, and Power & Energy Systems. Any of these can also be chosen as a minor area. In addition, Networking can be a minor area. Each option requires a certain number of course in the major area and a certain number of course in the minor area. The plan of study must also have 60 percent of the hours at the 700 level or higher. The plan of study must also have nine of the hours at the 800 level or higher.

The objectives of the MS in Electrical Engineering program are to prepare students for

1. advanced careers in electrical engineering and related fields

2. further graduate study.

The **PhD in Electrical Engineering and Computer Science** (PhD EECS) is a degree designed mainly for students interested in pursuing an academic and/or industrial research and development career in a specialization offered by the department. The department offers research opportunities in several areas of specialization, such as Control Systems, Communications & Signal Processing, Energy & Power Systems, Computer Networking, Computer Systems & Architecture, and Algorithms & Software Systems. The program normally contains at least 30 hours of post-master's graduate course work and a formal dissertation reporting on original research. A doctoral student must pass a comprehensive examination, a dissertation approval exam, and a final oral presentation and defense of the dissertation.

The objective of the PhD in Electrical Engineering and Computer Science program is to prepare students for the highest-level careers in electrical engineering, computer engineering and computer science in academia, research and industry.

The Program Educational Objectives for our BS degrees were updated based on input we received from our four key constituencies: students, alumni, faculty and employers. Our MS degree requirements were updated to achieve two goals. First, based on feedback we received from the graduate school, we wanted to make sure that each of our three MS programs were unique. Secondly, there was a desire, particularly for students who were choosing the course only option, to improve the rigor of our MS programs. The PhD program was expanded from Electrical Engineering to Electrical Engineering and Computer Science in order to provide a pathway for all our students to achieve the highest degree in their field.

2. Describe the quality of the program/certificate as assessed by the strengths, productivity, and qualifications of the faculty in terms of SCH, majors, graduates, and scholarly/creative activity (refer to instructions in the WSU Program Review document for more information on completing this section).

Complete the table below and utilize data tables 1-7 provided by the Office of Planning Analysis (covering SCH by FY and fall census day, instructional faculty; instructional FTE employed; program majors; and degree production).

Scholarly Productivity	Number Journal Articles		Number Presentations		Number Conference Proceedings		Performances			Number of Exhibits		Creative Work		No. Books	No. Book Chaps.	No. Grants Awarded or Submitted	$ Grant Value
	Ref	Non-Ref	Ref	Non-Ref	Ref	Non-Ref	*	**	***	Juried	****	Juried	Non-Juried				
Year 1 FY2015	37		38	21	58	1									2	18+70	2,306,448
Year 2 FY2016	22		14	21	50	1										11+52	1,062,195
Year 3 FY2017	18		13	23	50	1										17+45	1,491,545

* Winning by competitive audition. **Professional attainment (e.g., commercial recording). ***Principal role in a performance. ****Commissioned or included in a collection.

- Provide a brief assessment of the quality of the faculty/staff using the data from the table above and tables 1-7 from the Office of Planning Analysis as well as any additional relevant data. Programs should comment on details in regard to productivity of the faculty (i.e., some departments may have a few faculty producing the majority of the scholarship), efforts to recruit/retain faculty, departmental succession plans, course evaluation data, etc.

  Provide assessment here:

  The above table includes the work of 24 faculty members. The table shows acceptable average productivity with commendable performance by about 1/2 of the faculty. The unfortunate fact however is that research dollars are strongly correlated to faculty leaving (it's actually an almost perfect predictor). Thus, faculty who have contributed most to the grant values have left during the past two years.

3. **Academic Program/Certificate: Analyze the quality of the program as assessed by its curriculum and impact on students for each program (if more than one). Attach updated program assessment plan (s) as an appendix (refer to instructions in the WSU Program Review document for more information).**

a. For undergraduate programs, compare ACT scores of the majors with the University as a whole. (Evaluate table 8 [ACT data] from the Office of Planning and Analysis).

Last 3 Years	Total Majors - From fall semester			ACT – Fall Semester (mean for those reporting)			
	CE	CS	EE	CE	CS	EE	All University Students - FT
Year 1→FY2015	83	162	158	24.0	26.0	25.1	23.0
Year 2→FY2016	91	167	153	24.9	25.5	24.7	23.1
Year 3→FY2017	N/A	N/A	N/A	N/A	N/A	N/A	N/A

b. For graduate programs, compare graduate GPAs of the majors with University graduate GPAs. (Evaluate table 9 [GPA data] from the Office of Planning and Analysis)

Last 3 Years	Total Admitted - By FY			Average GPA (Admitted) – Domestic Students Only (60 hr GPA for those with ≥54 hr reported) By FY			
	CN	CS	EE	CN	CS	EE	University
Year 1→FY2015	162	318	349	3.2	3.5	3.5	3.5
Year 2→FY2016	65	199	220	3.4	3.5	3.5	3.5
Year 3→FY2017	83	160	147	3.5	3.5	3.5	3.5

c. Identify the principal learning outcomes (i.e., what skills does your Program expect students to graduate with). Provide aggregate data on how students are meeting those outcomes in the table below. Data should relate to the goals and objectives of the program as listed in 1e. Provide an analysis and evaluation of the data by learner outcome with proposed actions based on the results.

Undergraduate Programs

The EECS department has three bachelor degree programs: BSEE, BSCE and BSCS. The BSEE and BSCE programs are ABET accredited by the Engineering Accreditation Commission (EAC). The BSCS program is ABET accredited by the Computing Accreditation Commission (CAC). Their six year accreditation is up for renewal during the 2020–2021 academic year. Each of these programs has two Program Educational Objectives (PEOs), as listed in section 1 (e), and eleven Student Outcomes. As the next review is still a couple of years away, we are reporting the data from our last ABET self-study (2014).

Review of the BSEE Program

The Student Outcomes are adopted from ABET.

ABET Student Outcomes (EAC)

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

Description:

Outcomes Assessment from Courses: Each required/elective EECS course for the BSEE program contributes to some Student Outcomes; this is indicated in the syllabi for each course. During Spring 2013, the following Outcomes were assessed:

Course (cr hrs)	**a**	**b**	**c**	**d**	**e**	**f**	**g**	**h**	**i**	**j**	**k**
EE 284: Circuits II (3)	x				x						
EE 383: Signals and Systems (3)					x						
EE 492: Electronic Circuits I (3)	x		x								x
EE 493: Electronic Circuits II (4)		x	x			x	x				x
EE 586: Intro to Communication Systems (4)	x	x									
EE 684: Intro Control Systems Concepts (3)			x				x				x

This assessment was based on specific questions in assignments/exams that pertained to each Outcome. The assessment reports consist of the following: individual assessment report from each course and "Big picture" recommendations for the entire program.

Engineering Open House (EOH) Evaluation: Each senior BSEE student is required to complete a two-semester capstone Senior Design Project sequence EE 585/595. The EOH Evaluation is an evaluation of their project presentations during the Engineering Open House in April 2013; this evaluation was performed by two faculty judges who are not associated with EE 585/595. Since each project team consisted of students from multiple programs (BSEE, BSCE and BSCS), this evaluation is common to all the three programs. The scoring rubric and the average scores (average is over the various project presentations, separately for EE 585 and EE 595) follows. For each student outcome, the desired level of performance is 3.5

Criteria/ Outcome	Score				Avg Score	
	1	2	3	4	EE 585	EE 595
Core Knowl. Base (a, j)	No EECS knowl. used	Some EECS knowl. used	Lower class EECS knowl. used	Full EECS undergrad knowl. used	3.3	3.9
Problem Identification (e)	Problem not clearly defined	Problem is somewhat clear, needs more definition	Problem is mostly clear, could be more tightly defined	Problem clearly defined	3.1	3.9
Solution Identification (c, e)	Solution not clearly stated	Solution is somewhat clear, needs more definition	Solution is mostly clear, could be more tightly defined	Solution is clearly stated	2.8	3.6
Application (c, e)	Solution not applied successfully	Project part addresses solution	Project realizes soln., not robust	Project robustly realizes soln.	2.3	3.3
Alternatives (c, e)	No alternative to solution and applicn. explored	One alternative to solution and applicn. explored	Few alternatv to solution and applicn. explored	Multiple alternatives to solution and applicn. explored	2.4	3.2
Teamwork (d)	Roles and functions of individuals not articulated	Some indivs. had some role and function	Each indiv. participated in some way, unclear how	Each indiv. had an articulatd role and function	3.0	3.6
Communicn (g)	Confusing presentation	Somewhat confusing presentation	Presentation mostly made sense	Presentation clear and professional	3.3	3.8

Co-op Survey: This survey is conducted by the WSU Office of Cooperative Education each academic year. It surveys all the BSEE students in the co-op program and their employers, on the students' performance with respect to Outcomes a–k. Students must complete 24 credit hours before enrolling in the co-op program; so, the respondents are mostly sophomores, juniors and seniors. According to the WSU Exit Survey of graduating seniors, about 30% of BSEE students have participated in co-op education. So, this survey covers a good number of BSEE students. In this survey, the student and the employer are asked whether the student had the ability corresponding to each of the 11 Outcomes. The allowed responses, on a scale of 1 to 4, are as follow: 1). Never, 2). Sometimes, 3). Usually, 4). Always.

Coop Assessment Data: BSEE Student has the ability

Year	Studt/Empl	a	b	c	d	e	f	g	h	i	j	k
2009-10	Studt Evaln	3.2	3.2	3.0	3.6	3.3	3.7	3.5	2.7	3.6	3.1	3.4
	Empl Evaln	3.6	3.7	3.6	3.5	3.4	3.6	3.8	3.5	3.4	3.5	3.5
2010-11	Studt Evaln	3.4	3.4	3.2	3.5	3.6	3.8	3.5	3.2	3.6	3.3	3.6
	Empl Evaln	3.7	3.6	3.5	3.6	3.6	3.8	3.7	3.5	3.5	3.5	3.7
2009-11	Studt Evaln	3.3	3.3	3.1	3.6	3.5	3.8	3.5	3.0	3.6	3.2	3.5

Average	Empl Evaln	3.7	3.7	3.6	3.6	3.5	3.7	3.8	3.5	3.5	3.5	3.6

We evaluate this data later, separately, for each Outcome. For comparison purposes, and to put the above data in perspective, we present below the average evaluation (over 2009-11) of all CoE students enrolled in the co-op program.

Coop Assessment Data: CoE Student has the ability

Year	**Studt/Empl**	**a**	**b**	**c**	**d**	**e**	**f**	**g**	**h**	**i**	**j**	**k**
2009-11	Studt Evaln	3.1	2.9	2.5	3.1	3.1	3.5	3.5	2.8	3.5	2.9	3.3
Average	Empl Evaln	3.1	2.7	2.2	2.9	2.9	3.3	3.4	2.8	3.3	2.9	3.2

Desired Performance Level: For each Student Outcome, the desired level of performance for BSCE students' ability is the higher of 3.0 and the CoE average.

Exit Interview: This is an interview of seniors, conducted by the department chair or undergraduate coordinator, during the first semester of their senior year (during the senior check).

WSU Exit Survey: An online university survey of all graduating students. The students are required to take this survey when they submit their (online) Application for Degree during their second last semester.

Capstone Survey: Capstone Survey is an online, anonymous survey of the students enrolled in EE 595 (second semester Senior Design Project); students must complete this survey before passing the senior design project.

Mapping of Assessment Tools to Student Outcomes:

The following table shows the mapping of assessment tools to the Student Outcomes that they measure. The entries in the table mean the following: D - Direct measure, I - Indirect measure, and B - Includes both direct and indirect measures.

Assessment Tool	a	b	c	d	e	f	g	h	i	j	k
Outcomes Assessment from Courses	D	D	D		D	D	D				D
EOH Evaluation	D		D	D	D		D			D	
Capstone Survey						I	I			I	I
EECS Exit Interview						B	D	D	D	D	
WSU Exit Survey				I	I		I	I			
Co-Op Education Assessment	B	B	B	B	B	B	B	B	B	B	B

Outcome Evaluation:

a). The EOH evaluation shows significant improvement from EE 585 (3.3) to EE 595 (3.9). A high score in EE 595 exceeds the desired performance level (3.5). We will look at the average score of the coop data over the years 2009-11 (last two rows) in column a. Both the Student Evaluation (3.3 out of 4) and the Employer Evaluation (3.7 out of 4) indicate that the BSEE students have this ability; these two numbers also compare very favorably with the CoE data.

b). We will look at the average score of the coop data over the years 2009-11 in column b. Both the Student Evaluation (3.3 out of 4) and the Employer Evaluation (3.7 out of 4) indicate that the BSEE students have this ability; these two numbers also compare very favorably with the CoE data.

c). The EOH evaluation shows two things: Significant improvement from EE 585 to EE 595, in each aspect that contributes to this Outcome and Reasonable scores in EE 595 that are close to the desired performance level (3.5). Our students need improvement in two areas: Robustness (They are able to realize a solution, but their solution needs to be more robust.) and Alternatives (They need to consider multiple alternative solutions.) These areas are being stressed in EE 585/595. We will look at the coop data over the years 2009-11 in column c. Both the Student Evaluation (3.1 out of 4) and the Employer Evaluation (3.6 out of 4) indicate that the BSEE students have this ability; these two numbers also compare very favorably with the CoE data.

d). The EOH evaluation shows two things: Significant improvement from EE 585 (3.0) to EE 595 (3.6) and a good score (3.6) in EE 595 that meets the desired performance level (3.5). So, our students definitely have this ability. We will look at the average score of the Coop data over the years 2009-11 in column d. Both the Student Evaluation (3.6 out of 4) and the Employer Evaluation (3.6 out of 4) indicate that the BSEE students have this ability; these two numbers also compare very favorably with the CoE data. Based on the WSU Exit survey, however, students are not as confident in this skill as we would like.

e). The EOH evaluation shows three things: significant improvement from EE 585 to EE 595, in each aspect that contributes to this Outcome, students have very good ability to identify the problem (3.9), and for identifying a solution, reasonable scores in EE 595 that are close to the desired performance level (3.5). Our students need improvement in two areas: Robustness and Alternatives. These areas are being stressed in EE 585/595. Based on the WSU Exit Survey, students feel confident in this area. We will look at the average score over the years 2009-11 in column e. Both the Student Evaluation (3.5 out of 4) and the Employer Evaluation (3.5 out of 4) indicate that the BSEE students have this ability; these two numbers also compare very favorably with the CoE data.

f). From our capstone survey data, 95% of the students think that their education helped them to understand their ethical responsibility. This is very good. From our EECS Exit Interview Data, we see that the students definitely understand the importance of ethics in the workplace. But their ethical values, as measured by their peers, is not high. This indicates that students are observing unethical behavior in the program, which needs to be addressed. The department plans to finalize and publicize its own policy on academic dishonesty, and this document should be included with the syllabus of each EECS class. We will consider the average coop score over the years 2009-11 in column f. Both the Student Evaluation (3.8 out of 4) and the Employer Evaluation (3.7 out of 4) indicate that the BSEE students have this ability to a great extent; these two numbers also compare very favorably with the CoE data.

g). The EOH Evaluation shows two things: significant improvement from EE 585 (Score 3.3) to EE 595 (Score 3.8) and a high score (3.8) in EE 595 exceeds the desired performance level (3.5). So, our students definitely have this ability. From the capstone survey, we can see that about 90% of the BSEE students feel that their oral and written communication skills are either excellent or adequate. There is room for improvement. From the EECS exit interview data, we also see that the communications skills are acceptable, but there is room for improvement. The WSU Exit Survey shows similar results. Both the Student Evaluation (3.5 out of 4) and the Employer Evaluation (3.8 out of 4) from the coop data indicate that the BSEE students have this ability to a great extent; these two numbers also compare favorably with the CoE data.

h). Based on the EECS exit interview data, the student's understanding of global issues is low. On the WSU Exit Survey, BSEE results match the college, there is need for improvement. Both the Student Evaluation (3.0 out of 4) and the Employer Evaluation (3.5 out of 4) from the Coop data indicate that the BSEE students have this ability; these two numbers also compare very favorably with the CoE data. Overall, though, it is clear that students are not getting enough knowledge of global and societal issues from the General Education courses. Advisers should consider coverage of global and societal issues when helping students select these courses (for registration). Also, these issues should be discussed in EECS courses too.

i). Based on the EECS exit interview data, we see that the students have a reasonably good understanding of the need for life-long learning, but there is room for improvement. Both the Student Evaluation (3.6 out of 4) and the Employer Evaluation (3.5 out of 4) from the Coop data indicate that the BSEE students have this ability to a great extent; these two numbers also compare very favorably with the CoE data.

j) The EOH Evaluation shows two things: significant improvement from EE 585 (Score 3.3) to EE 595 (Score 3.9) and a high score (3.9) in EE 595 exceeds the desired performance level (3.5). Based on the EECS exit interview data, the student's understanding of contemporary issues is very low. They are not getting enough of this from Gen Ed courses. These issues should be discussed in EECS courses too. Both the Student Evaluation (3.2 out of 4) and the Employer Evaluation (3.5 out of 4) from the Coop data indicate that the BSEE students have this ability; these two numbers also compare very favorably with the CoE data.

k) From the capstone survey, we see that students are not confident of their ability to use MATLAB. We are considering requiring a 1 hour course that uses MATLAB to solve electrical and computer engineering problems. The students are more confident in their ability to use C/C++, but more work is required. Both the Student Evaluation (3.5 out of 4) and the Employer Evaluation (3.6 out of 4) from the Coop data indicate that the BSEE students have this ability; these two numbers also compare very favorably with the CoE data.

Review of the BSCE Program

The Student Outcomes are adopted from ABET.

ABET Student Outcomes (EAC)

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

Description:

Outcomes Assessment from Courses: Each required/elective EECS course for the BSCE program contributes to some Student Outcomes; this is indicated in the syllabi for each course. During spring 2013, the following Outcomes were assessed:

Course (cr hrs)	**a**	**b**	**c**	**d**	**e**	**f**	**g**	**h**	**i**	**j**	**k**
CS 394: Intro to Computer Arch (3)	x								x		
CS 411: Object-Oriented Programming (3)					x						
CS 540: Operating Systems (3)	x										
EE 284: Circuits II (3)	x				x						
EE 492: Electronic Circuits I (3)	x		x								x

This assessment was based on specific questions in assignments/exams that pertained to each Outcome. The assessment reports consist of the following: individual assessment report from each course and "Big picture" recommendations for the entire program.

Engineering Open House (EOH) Evaluation: Each senior BSCE student is required to complete a two-semester capstone Senior Design Project sequence EE 585/595. The EOH Evaluation is an evaluation of their project presentations during the Engineering Open House in April 2013; this evaluation was performed by two faculty judges who are not associated with EE 585/595. Since each project team consisted of students from multiple programs (BSEE, BSCE and BSCS), this evaluation is common to all the three programs. The scoring rubric and the average scores (average is over the various project presentations, separately for EE 585 and EE 595) is given in the BSEE section. For each student outcome, the desired level of performance is 3.5

Co-op Survey: This survey is conducted by the WSU Office of Cooperative Education each academic year. It surveys all the BSCE students in the co-op program and their employers, on the students' performance with respect to Outcomes a–k. Students must complete 24 credit hours before enrolling in the co-op program; so, the respondents are mostly sophomores, juniors and seniors. According to the WSU Exit Survey of graduating seniors, about 38% of BSCE students have participated in co-op education. So, this survey covers a good number of BSCE students. In this survey, the student and the employer are asked whether the student had the ability corresponding to each of the 11 Outcomes. The allowed responses, on a scale of 1 to 4, are as follow: 1). Never, 2). Sometimes, 3). Usually, 4). Always.

Coop Assessment Data: BSCE Student has the ability

Year	**Studt/Empl**	**a**	**b**	**c**	**d**	**e**	**f**	**g**	**h**	**i**	**j**	**k**
2009-10	Studt Evaln	3.0	3.2	3.0	3.0	3.3	3.5	3.5	3.3	3.2	3.2	3.3
	Empl Evaln	3.3	4.0	3.2	2.8	3.0	3.8	3.5	3.2	3.3	3.0	3.2
2010-11	Studt Evaln	3.8	3.2	2.8	3.8	3.6	3.8	3.8	3.2	3.8	3.4	3.8
	Empl Evaln	3.6	4.0	4.0	3.8	3.4	3.8	4.0	3.4	3.8	3.6	3.5
2009-11	Studt Evaln	3.4	3.2	2.9	3.4	3.5	3.7	3.7	3.3	3.5	3.3	3.6
Average	Empl Evaln	3.5	4.0	3.6	3.3	3.2	3.8	3.8	3.3	3.6	3.3	3.4

We evaluate this data later, separately, for each Outcome. For comparison purposes, and to put the above data in perspective, we present below the average evaluation (over 2009-11) of all CoE students enrolled in the co-op program.

Coop Assessment Data: CoE Student has the ability

Year	Studt/Empl	a	b	c	d	e	f	g	h	i	j	k
2009-11	Studt Evaln	3.1	2.9	2.5	3.1	3.1	3.5	3.5	2.8	3.5	2.9	3.3
Average	Empl Evaln	3.1	2.7	2.2	2.9	2.9	3.3	3.4	2.8	3.3	2.9	3.2

Desired Performance Level: For each Student Outcome, the desired level of performance for BSEE students' ability is the higher of 3.0 and the CoE average.

Exit Interview: This is an interview of seniors, conducted by the department chair or undergraduate coordinator, during the first semester of their senior year (during the senior check).

WSU Exit Survey: An online university survey of all graduating students. The students are required to take this survey when they submit their (online) Application for Degree during their second last semester.

Capstone Survey: Capstone Survey is an online, anonymous survey of the students enrolled in EE 595 (second semester Senior Design Project); students must complete this survey before passing the senior design project.

Mapping of Assessment Tools to Student Outcomes:

The following table shows the mapping of assessment tools to the Student Outcomes that they measure. The entries in the table mean the following: D - Direct measure, I - Indirect measure, and B - Includes both direct and indirect measures.

Assessment Tool	a	b	c	d	e	f	g	h	i	j	k
Outcomes Assessment from Courses	D	D	D		D	D	D				D
EOH Evaluation	D		D	D	D		D			D	
Capstone Survey						I	I			I	I
EECS Exit Interview						B	D	D	D	D	
WSU Exit Survey				I	I		I	I			
Co-Op Education Assessment	B	B	B	B	B	B	B	B	B	B	B

Outcome Evaluation:

a). The EOH evaluation shows significant improvement from EE 585 (3.3) to EE 595 (3.9). A high score in EE 595 exceeds the desired performance level (3.5). We will look at the average score of the coop data over the years 2009-11 (last two rows) in column a. Both the Student Evaluation (3.4 out of 4) and the Employer Evaluation (3.5 out of 4) indicate that the BSCE students have this ability; these two numbers also compare very favorably with the CoE data.

b). We will look at the average score of the coop data over the years 2009-11 in column b. Both the Student Evaluation (3.2 out of 4) and the Employer Evaluation (4.0 out of 4) indicate that the BSCE students have this ability; these two numbers also compare very favorably with the CoE data.

c). The EOH evaluation shows two things: Significant improvement from EE 585 to EE 595, in each aspect that contributes to this Outcome and Reasonable scores in EE 595 that are close to the desired performance level (3.5). Our students need improvement in two areas: Robustness (They are able to realize a solution, but their solution needs to be more robust.) and Alternatives (They need to consider multiple alternative solutions.) These areas are being stressed in EE 585/595. We will look at the coop data over the years 2009-11 in column c. Both the Student Evaluation (2.9 out of 4) and the Employer Evaluation (3.6 out of 4) indicate that the BSCE students have this ability; these two numbers also compare very favorably with the CoE data.

d). The EOH evaluation shows two things: Significant improvement from EE 585 (3.0) to EE 595 (3.6) and a good score (3.6) in EE 595 that meets the desired performance level (3.5). So, our students definitely have this ability. We will look at the average score of the Coop data over the years 2009-11 in column d. Both the Student Evaluation (3.4 out of 4) and the Employer Evaluation (3.3 out of 4) indicate that the BSCE students have this ability; these two numbers also compare very favorably with the CoE data. Based on the WSU Exit survey, however, students are not as confident in this skill as we would like.

e). The EOH evaluation shows three things: significant improvement from EE 585 to EE 595, in each aspect that contributes to this Outcome, students have very good ability to identify the problem (3.9), and for identifying a solution, reasonable scores in EE 595 that are close to the desired performance level (3.5). Our students need improvement in two areas: Robustness and Alternatives. These areas are being stressed in EE 585/595. Based on the WSU Exit survey, however, students are not as confident in this skill as we would like. We will look at the average score over the years 2009-11 in column e. Both the Student Evaluation (3.5 out of 4) and the Employer Evaluation (3.2 out of 4) indicate that the BSCE students have this ability; these two numbers also compare very favorably with the CoE data.

f). From our capstone survey data, 95% of the students think that their education helped them to understand their ethical responsibility. This is very good. From our EECS Exit Interview Data, we see that the students definitely understand the importance of ethics in the workplace. But their ethical values, as measured by their peers, is not high. This indicates that students are observing unethical behavior in the program, which needs to be addressed. The department plans to finalize and publicize its own policy on academic dishonesty, and this document should be included with the syllabus of each EECS class. We will consider the average coop score over the years 2009-11 in column f. Both the Student Evaluation (3.7 out of 4) and the Employer Evaluation (3.8 out of 4) indicate that the BSCE students have this ability to a great extent; these two numbers also compare very favorably with the CoE data.

g). The EOH Evaluation shows two things: significant improvement from EE 585 (3.3) to EE 595 (3.8) and a high score (3.8) in EE 595 exceeds the desired performance level (3.5). So, our students definitely have this ability. From the capstone survey, we can see that about 95% of the BSCE students feel that their oral and written communication skills are either excellent or adequate. This very good. From the EECS exit interview data, we also see that the communications skills are acceptable, but there is room for improvement. The WSU Exit Survey shows similar results. Both the Student Evaluation (3.7 out of 4) and the Employer Evaluation (3.8 out of 4) from the coop data indicate that the BSCE students have this ability to a great extent; these two numbers also compare favorably with the CoE data.

h). Based on the EECS exit interview data, the student's understanding of global issues is low. On the WSU Exit Survey, BSCE results match the college, there is need for improvement. Both the Student Evaluation (3.3 out of 4) and the Employer Evaluation (3.3 out of 4) from the Coop indicate that the BSCE students have this ability; these two numbers also compare very favorably with the CoE data. Overall, though, it is clear that students are not getting enough knowledge of global and societal issues from the General Education courses. Advisers should consider coverage of global and societal issues when helping students select these courses (for registration). Also, these issues should be discussed in EECS courses too.

i). Based on the EECS exit interview data, we see that the students have a reasonably good understanding of the need for life-long learning, but there is room for improvement. Both the Student Evaluation (3.5 out of 4) and the Employer Evaluation (3.6 out of 4) from the Coop data indicate that the BSCE students have this ability to a great extent; these two numbers also compare very favorably with the CoE data.

j) The EOH Evaluation shows two things: significant improvement from EE 585 (3.3) to EE 595 (3.9) and a high score (3.9) in EE 595 exceeds the desired performance level (3.5). Based on the EECS exit interview data, the student's understanding of contemporary issues is very low. They are not getting enough of this from Gen Ed courses. These issues should be discussed in EECS courses too. Both the Student Evaluation (3.3 out of 4) and the Employer Evaluation (3.3 out of 4) from the Coop data indicate that the BSCE students have this ability; these two numbers also compare very favorably with the CoE data.

k) From the capstone survey, we see that students are not confident of their ability to use MATLAB. We are considering requiring a 1 hour course that uses MATLAB to solve electrical and computer engineering problems. The students are more confident in their ability to use C/C++. Both the Student Evaluation (3.6 out of 4) and the Employer Evaluation (3.4 out of 4) from the Coop data indicate that the BSCE students have this ability; these two numbers also compare very favorably with the CoE data.

Review of the BSCS Program

The Student Outcomes are adopted from ABET. While these are similar to those used for BSEE and BSCE, they are different as BSCS is accredited under another commission.

ABET Student Outcomes (CAC)

a). An ability to apply knowledge of computing and mathematics appropriate to the discipline.
b). An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.
c). An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.
d). An ability to function effectively on teams to accomplish a common goal.
e). An understanding of professional, ethical, legal, security and social issues and responsibilities.
f). An ability to communicate effectively with a range of audiences.
g). An ability to analyze the local and global impact of computing on individuals, organizations, and society.
h). Recognition of the need for and an ability to engage in continuing professional development.
i). An ability to use current techniques, skills, and tools necessary for computing practice.

j). 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.
k). An ability to apply design and development principles in the construction of software systems of varying complexity.

Description:

Outcomes Assessment from Courses: Each required/elective EECS course for the BSCS program contributes to some Student Outcomes; this is indicated in the syllabi for each course. During spring 2013, the following Outcomes were assessed:

Course (cr hrs)	**a**	**b**	**c**	**d**	**e**	**f**	**g**	**h**	**i**	**j**	**k**
CS 394: Intro to Computer Arch (3)	x							x			
CS 411: Object-Oriented Programming (3)			x								x
CS 540: Operating Systems (3)	x										
CS 560: Data Structs & Algs II (3)		x	x								
CS 665: Intro to Database Systems (3)				x		x			x		
CS 680: Intro to Software Engg (3)				x						x	x

This assessment was based on specific questions in assignments/exams that pertained to each Outcome. The assessment reports consist of the following: individual assessment report from each course and "Big picture" recommendations for the entire program.

Engineering Open House (EOH) Evaluation: Each senior BSCS student is required to complete a two-semester capstone Senior Design Project sequence EE 585/595. The EOH Evaluation is an evaluation of their project presentations during the Engineering Open House in April 2013; this evaluation was performed by two faculty judges who are not associated with EE 585/595. Since each project team consisted of students from multiple programs (BSEE, BSCE and BSCS), this evaluation is common to all the three programs. The scoring rubric and the average scores (average is over the various project presentations, separately for EE 585 and EE 595) follows. For each student outcome, the desired level of performance is 3.5.

Criteria/ Outcome	Score				Avg Score	
	1	2	3	4	EE 585	EE 595
Core Knowl. Base (a, j)	No EECS knowl. used	Some EECS knowl. used	Lower class EECS knowl. used	Full EECS undergrad knowl. used	3.3	3.9
Problem Identification (b)	Problem not clearly defined	Problem is somewhat clear, needs more definition	Problem is mostly clear, could be more tightly defined	Problem clearly defined	3.1	3.9
Solution Identification (b, c)	Solution not clearly stated	Solution is somewhat clear, needs more definition	Solution is mostly clear, could be more tightly defined	Solution is clearly stated	2.8	3.6
Application (b, c)	Solution not applied successfully	Project part addresses solution	Project realizes soln., not robust	Project robustly realizes soln.	2.3	3.3
Alternatives (b, c)	No alternative to solution and applicn. explored	One alternative to solution and applicn. explored	Few alternatv to solution and applicn. explored	Multiple alternatives to solution and applicn. explored	2.4	3.2
Teamwork (d)	Roles and functions of individuals not articulated	Some indivs. had some role and function	Each indiv. participated in some way, unclear how	Each indiv. had an articulatd role and function	3.0	3.6
Communicn (f)	Confusing presentation	Somewhat confusing presentation	Presentation mostly made sense	Presentation clear and professional	3.3	3.8

Co-op Survey: This survey is conducted by the WSU Office of Cooperative Education each academic year. It surveys all the BSCS students in the co-op program and their employers, on the students' performance with respect to Outcomes a–k. Students must complete 24 credit hours before enrolling in the co-op program; so, the respondents are mostly sophomores, juniors and seniors. According to the WSU Exit Survey of graduating seniors, about 36% of BSCS students have participated in co-op education. So, this survey covers a good number of BSCS students. In this survey, the student and the employer are asked whether the student had the ability corresponding to each of the 11 Outcomes. The allowed responses, on a scale of 1 to 4, are as follow: 1). Never, 2). Sometimes, 3). Usually, 4). Always. Since the survey was based on EAC Outcomes, we use the following mapping to convert them to CAC Outcomes.

Mapping of EAC Outcomes to CAC Outcomes

EAC Outcome	CAC Outcome
a	a
c	c
d	d
e	b
f	e
g	f
h	g
i	h
k	i

The following table gives the average response of all the students and the employers.

Co-op Assessment Data: BSCS Student had the Ability

Year	Studt/Empl	a	b	c	d	e	f	g	h	i
2009-10	Studt Evaln	3.4	3.6	3.3	3.5	3.9	3.6	2.7	3.6	3.4
	Empl Evaln	3.5	3.3	3.5	3.4	3.5	3.7	2.9	3.1	3.3
2010-11	Studt Evaln	3.5	3.8	3.0	3.8	3.5	3.3	2.8	3.5	3.8
	Empl Evaln	3.8	3.0	3.7	3.0	4.0	3.8	3.3	3.3	3.3
2009-11	Studt Evaln	3.5	3.7	3.2	3.7	3.7	3.5	2.8	3.6	3.6
Average	Empl Evaln	3.7	3.2	3.6	3.2	3.8	3.8	3.1	3.2	3.3

We evaluate this data later, separately, for each Outcome. For comparison purposes, and to put the above data in perspective, we present below the average evaluation (over 2009-11) of all CoE students enrolled in the co-op program.

Coop Assessment Data: CoE Student has the ability

Year	Studt/Empl	a	b	c	d	e	f	g	h	i
2009-11	Studt Evaln	3.1	3.1	2.5	3.1	3.5	3.5	2.8	3.5	3.3
Average	Empl Evaln	3.1	2.9	2.2	2.9	3.3	3.4	2.8	3.3	3.2

Desired Performance Level: For each Student Outcome, the desired level of performance for BSCS students' ability is the higher of 3.0 and the CoE average.

Exit Interview: This is an interview of seniors, conducted by the department chair or undergraduate coordinator, during the first semester of their senior year (during the senior check).

WSU Exit Survey: An online university survey of all graduating students. The students are required to take this survey when they submit their (online) Application for Degree during their second last semester.

Capstone Survey: Capstone Survey is an online, anonymous survey of the students enrolled in EE 595 (second semester Senior Design Project); students must complete this survey before passing the senior design project.

Mapping of Assessment Tools to Student Outcomes:

The following table shows the mapping of assessment tools to the Student Outcomes that they measure. The entries in the table mean the following: D - Direct measure, I - Indirect measure, and B - Includes both direct and indirect measures.

Assessment Tool	a	b	c	d	e	f	g	h	i	j	k
Outcomes Assessment from Courses	D	D	D	D		D		D	D	D	D
EOH Evaluation	D	D	D	D		D				D	
Capstone Survey					I	I			I		
EECS Exit Interview					I	D	D	D			
WSU Exit Survey		I		I		I	I				
Co-Op Education Assessment	B	B	B	B	B	B	B	B	B		

Outcome Evaluation:

a). The EOH evaluation shows significant improvement from EE 585 (3.3) to EE 595 (3.9). A high score in EE 595 exceeds the desired performance level (3.5). We will look at the average score of the coop data over the years 2009-11 (last two rows) in column a. Both the Student Evaluation (3.5 out of 4) and the Employer Evaluation (3.7 out of 4) indicate that the BSCS students have this ability; these two numbers also compare very favorably with the CoE data.

b). The EOH evaluation shows three things: significant improvement from EE 585 to EE 595, in each aspect that contributes to this Outcome, students have very good ability to identify the problem (3.9), and for identifying a solution, reasonable scores in EE 595 that are close to the desired performance level (3.5). Our students need improvement in two areas: Robustness and Alternatives. These areas are being stressed in EE 585/595. Based on the WSU Exit survey, students also feel confident as well. We will look at the average score over the years 2009-11 in column e. Both the Student Evaluation (3.7 out of 4) and the Employer Evaluation (3.2 out of 4) indicate that the BSCS students have this ability; these two numbers also compare very favorably with the CoE data.

c). The EOH evaluation shows two things: Significant improvement from EE 585 to EE 595, in each aspect that contributes to this Outcome and Reasonable scores in EE 595 that are close to the desired performance level (3.5). Our students need improvement in two areas: Robustness (They are able to realize a solution, but their solution needs to be more robust.) and Alternatives (They need to consider multiple alternative solutions.) These areas are being stressed in EE 585/595. We will look at the coop data over the years 2009-11 in column c. Both the Student Evaluation (3.2 out of 4) and the Employer Evaluation (3.6 out of 4) indicate that the BSCS students have this ability; these two numbers also compare very favorably with the CoE data.

d). The EOH evaluation shows two things: Significant improvement from EE 585 (3.0) to EE 595 (3.6) and a good score (3.6) in EE 595 that meets the desired performance level (3.5). So, our students definitely have this ability. We will look at the average score of the Coop data over the years 2009-11 in column d. Both the Student Evaluation (3.7 out of 4) and the Employer Evaluation (3.2 out of 4) indicate that the BSCS students have this ability; these two numbers also compare very favorably with the CoE data. Based on the WSU Exit survey, however, students are not as confident in this skill as we would like.

e). From our capstone survey data, 84% of the students think that their education helped them to understand their ethical responsibility. This is good, but needs to be improved. From our EECS Exit Interview Data, we see that the students definitely understand the importance of ethics in the workplace. But their ethical values, as measured by their peers, is not high. This indicates that students are observing unethical behavior in the program, which needs to be addressed. The department plans to finalize and publicize its own policy on academic dishonesty, and this document should be included with the syllabus of each EECS class. We will consider the average coop score over the years 2009-11 in column f. Both the Student Evaluation (3.7 out of 4) and the Employer Evaluation (3.8 out of 4) indicate that the BSCS students have this ability to a great extent; these two numbers also compare very favorably with the CoE data.

f). The EOH Evaluation shows two things: significant improvement from EE 585 (3.3) to EE 595 (3.8) and a high score (3.8) in EE 595 exceeds the desired performance level (3.5). So, our students definitely have this ability. From the capstone survey, we can see that about 95% of the BSCS students feel that their oral and written communication skills are either excellent or adequate. This very good. From the EECS exit interview data, we also see that the communications skills very good. The WSU Exit Survey shows similar results. Both the Student Evaluation (3.5 out of 4) and the Employer Evaluation (3.8 out of 4) from the coop data indicate that the BSCS students have this ability to a great extent; these two numbers also compare favorably with the CoE data.

g). Based on the EECS exit interview data, the student's understanding of global issues is low. On the WSU Exit Survey, BSCS scores are lower than the college; there is need for improvement. Both the Student Evaluation (2.8 out of 4) and the Employer Evaluation (3.1 out of 4) from the Coop indicate that the BSCS students' ability is borderline. Overall, though, it is clear that students are not getting enough knowledge of global and societal issues from the General Education courses. Advisers should consider coverage of global and societal issues when helping students select these courses (for registration). Also, these issues should be discussed in EECS courses too.

h). Based on the EECS exit interview data, we see that the students have a reasonably good understanding of the need for life-long learning, but there is room for improvement. Both the Student Evaluation (3.6 out of 4) and the Employer Evaluation (3.2 out of 4) from the Coop indicate that the BSCS students have this ability.

i). From the capstone survey, about 90% of the students are confident of their programming skills in Java, C and C++. This is very good. Both the Student Evaluation (3.6 out of 4) and the Employer Evaluation (3.3 out of 4) indicate that the BSCS students have this ability; these two numbers also compare favorably with CoE data.

Graduate Programs

MS in Computer Science

The admission and degree requirements of the MS in Computer Science program have undergone major restructuring, for students starting the program in fall 2014 or later. Its new degree requirements have been designed to ensure that its students demonstrate the following:

1. **An ability to self-educate**

   Students complete the program with either a thesis, project, or just coursework. Thesis and project students will be evaluated by their advisor on the ability demonstrated to self-educate. Coursework students must take at least one course that contains a research project involving self-education. Evaluation of such students will be performed by the course instructor.

2. **Communicate effectively**

   Thesis and project students will be evaluated by their advisor on their written and oral communication, and coursework students by the instructor of the course taken by them containing the research project, which will also involve submission of a written report.

3. **Competency in core areas**

   The only core course of this program is CS 721 – Advanced Algorithms and Analysis. The competency of the students in this area will be measured and reported by the course instructor.

4. **A knowledge of professional and ethical responsibility**

   All students of the program need to pass 4 CITI modules, namely Research Misconduct, Authorship, Conflicts of Interest, and Data Management. The passing grade in each module is 80%. Students graduate only after passing each module, thus all our graduating students demonstrate this knowledge.

Due to the recent nature of changes to this program, and a recent change in administration, currently assessment scores on the first three items above are not available. Those scores will be reported in future assessment cycles of the program.

MS in Computer Networking

The admission and degree requirements of the MS in Computer Networking program have undergone major restructuring, for students starting the program in fall 2014 or later. Its new degree requirements have been designed to ensure that its students demonstrate the following:

1. **An ability to self-educate**

   Students complete the program with either a thesis, project, or just coursework. Thesis and project students will be evaluated by their advisor on the ability demonstrated to self-educate. Coursework students must take at least one course that contains a research project involving self-education. Evaluation of such students will be performed by the course instructor.

2. **Communicate effectively**

   Thesis and project students will be evaluated by their advisor on their written and oral communication, and coursework students by the instructor of the course taken by them containing the research project, which will also involve submission of a written report.

3. **Competency in core areas**

   The core courses of this program are CS 736 – Data Communications and either CS 721 – Advanced Algorithms and Analysis or CS 797G – Mathematical Foundations of Computer Networking. The competency of the students in this area will be measured and reported by the instructors of these courses.

4. **A knowledge of professional and ethical responsibility**

All students of the program need to pass 4 CITI modules, namely Research Misconduct, Authorship, Conflicts of Interest, and Data Management. The passing grade in each module is 80%. Students graduate only after passing each module, thus all our graduating students demonstrate this knowledge.

Due to the recent nature of changes to this program, and a recent change in administration, currently assessment scores on the first three items above are not available. Those scores will be reported in future assessment cycles of the program.

MS in Electrical Engineering

The admission and degree requirements of the MS in Electrical Engineering program have recently undergone major restructuring, for students starting the program in fall 2014 or later. Its new degree requirements have been designed to ensure that its students demonstrate the following:

1. **An ability to self-educate**

   Students complete the program with either a thesis, project, or just coursework. Thesis and project students will be evaluated by their advisor on the ability demonstrated to self-educate. Coursework students must take at least one course that contains a research project involving self-education. Evaluation of such students will be performed by the course instructor.

2. **Communicate effectively**

   Thesis and project students will be evaluated by their advisor on their written and oral communication, and coursework students by the instructor of the course taken by them containing the research project, which will also involve submission of a written report.

3. **Competency in core areas**

   Students of this program graduate with one of four major areas: Communication & Signal Processing, Computing Systems, Control Systems & Robotics, or Power & Energy Systems. The competency of the students in the chosen major area will be measured and reported by the instructors of selected courses in these areas.

4. **A knowledge of professional and ethical responsibility**

   All students of the program need to pass 4 CITI modules, namely Research Misconduct, Authorship, Conflicts of Interest, and Data Management. The passing grade in each module is 80%. Students graduate only after passing each module, thus all our graduating students demonstrate this knowledge.

Due to the recent nature of changes to this program, and a recent change in administration, currently assessment scores on the first three items above are not available. Those scores will be reported in future assessment cycles of the program.

PhD in Electrical Engineering and Computer Science

The degree structure of the PhD in Electrical Engineering & Computer Science program, which was earlier PhD in Electrical Engineering, was revised in 2013, to enable students to get a PhD in CS-related areas. There are current changes implemented due to the reduced credit hour requirements and the streamlining of our degree plans. Its degree requirements ensure that its students demonstrate the following:

1. **An ability to self-educate and do independent research**

Students complete the program with a dissertation and will be evaluated by their dissertation committee on the ability demonstrated to self-educate and do independent research.

2. **Communicate effectively in writing and presentation**

   Students will be evaluated by their dissertation committee on their written and oral communication.

3. **Competency in major and minor areas**

   Students of this program graduate with one of six major areas: Control Systems, Communications & Signal Processing, Energy & Power Systems, Computer Networking, Computer Systems & Architecture, or Algorithms & Software Systems. They also choose a minor area. The competency of the graduating students in the chosen major and minor areas is ensured by requiring them to pass major and minor comprehensive exams, thus all our graduating students demonstrate this knowledge.

4. **A knowledge of professional and ethical responsibility**

   All students of the program need to pass 4 CITI modules, namely Research Misconduct, Authorship, Conflicts of Interest, and Data Management. The passing grade in each module is 80%. Students graduate only after passing each module, thus all our graduating students demonstrate this knowledge.

Due to the recent nature of changes to this program, and a recent change in administration, currently assessment scores on the first three items above are not available. Those scores will be reported in future assessment cycles of the program.

d. Provide aggregate data on student majors satisfaction (e.g., exit surveys), capstone results, licensing or certification examination results (if applicable), employer surveys or other such data that indicate student satisfaction with the program and whether students are learning the curriculum (for learner outcomes, data should relate to the outcomes of the program as listed in 3c).

Evaluate table 10 from the Office of Planning and Analysis regarding student satisfaction data.

Undergraduate - CE

Student Satisfaction (e.g., exit survey data on overall program satisfaction).* If available, report by year, for the last 3 years			Learner Outcomes (e.g., capstone, licensing/certification exam pass-rates) by year, for the last three years				
Year	N	Result (e.g., 4.5 on scale of 1-5, where 5 highest)	Year	N	Name of Exam	Program Result	National Comparison±
2015	14	3.9	1				
2016	15	3.5	2				
2017	24	3.9	3				

Undergraduate - CS

Student Satisfaction (e.g., exit survey data on overall program satisfaction).* If available, report by year, for the last 3 years			Learner Outcomes (e.g., capstone, licensing/certification exam pass-rates) by year, for the last three years				
Year	N	Result (e.g., 4.5 on scale of 1-5, where 5 highest)	Year	N	Name of Exam	Program Result	National Comparison±
2015	31	3.8	1				
2016	22	3.5	2				
2017	28	3.8	3				

Undergraduate - EE

Student Satisfaction (e.g., exit survey data on overall program satisfaction).* If available, report by year, for the last 3 years			Learner Outcomes (e.g., capstone, licensing/certification exam pass-rates) by year, for the last three years				
Year	N	Result (e.g., 4.5 on scale of 1-5, where 5 highest)	Year	N	Name of Exam	Program Result	National Comparison±
2015	42	3.6	1				
2016	49	3.9	2				
2017	50	3.8	3				

The student satisfaction surveys show an acceptable level for our undergraduate programs. We would like to the student satisfaction for the undergraduate programs in the department to be higher, we need to determine what the major contributors are for not more students responding favorably. We believe that the stagnation can be partially attributed to the high churn rate of faculty in the department. We have lines to hire to replace faculty lost but the stability of instructors remains an issue. Our department will also look at how we can streamline our curricula and how we can ensure better attainments of student outcomes.

Graduate - CN

Student Satisfaction (e.g., exit survey data on overall program satisfaction).* If available, report by year, for the last 3 years			Learner Outcomes (e.g., capstone, licensing/certification exam pass-rates) by year, for the last three years				
Year	N	Result (e.g., 4.5 on scale of 1-5, where 5 highest)	Year	N	Name of Exam	Program Result	National Comparison±
2015	132	4.3	1				
2016	60	4.4	2				
2017	27	3.8	3				

Graduate - CS

Student Satisfaction (e.g., exit survey data on overall program satisfaction).* If available, report by year, for the last 3 years			Learner Outcomes (e.g., capstone, licensing/certification exam pass-rates) by year, for the last three years				
Year	N	Result (e.g., 4.5 on scale of 1-5, where 5 highest)	Year	N	Name of Exam	Program Result	National Comparison±
2015	25	4.4	1				
2016	37	4.3	2				
2017	24	4.2	3				

Graduate - EE

Student Satisfaction (e.g., exit survey data on overall program satisfaction).* If available, report by year, for the last 3 years			Learner Outcomes (e.g., capstone, licensing/certification exam pass-rates) by year, for the last three years				
Year	N	Result (e.g., 4.5 on scale of 1-5, where 5 highest)	Year	N	Name of Exam	Program Result	National Comparison±
2015	72	4.3	1				
2016	78	4.4	2				
2017	46	4.4	3				

Graduate students generally seem very pleased with our graduate programs. There was a small dip in 2017 in our MSCN student satisfaction. However, this may be due to the small sample size.

e. Provide aggregate data on how the goals of the *WSU General Education Program* and *KBOR 2020 Foundation Skills* are assessed in undergraduate programs (optional for graduate programs).

Outcomes:	Results	
	Majors	Non-Majors
○ Have acquired knowledge in the arts, humanities, and natural and social sciences ○ Think critically and independently ○ Write and speak effectively ○ Employ analytical reasoning and problem solving techniques		

Note: Not all programs evaluate every goal/skill. Programs may choose to use assessment rubrics for this purpose. Sample forms available at: http://www.aacu.org/value/rubrics/

Many of these goals match with our ABET outcomes in Section 3 b. The table below shows the correlation. We are currently not assessing library research skills directly. See Section 3b for an assessment of EECS undergraduate majors. We did not assess non-majors.

WSU General Education Program and KBOR 2020 Foundation Skills	Similar ABET Student Outcome

Write and speak effectively	(g) An ability to communicate effectively
Think critically and independently	(b) Ability to design/conduct experiments, and analyze/interpret data
Employ analytical reasoning and problem solving techniques	(e) An ability to identify, formulate, and solve engineering problems
Have acquired knowledge in the arts, humanities, and natural and social sciences	(h) The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context

f. For programs/departments with concurrent enrollment courses (per KBOR policy), provide the assessment of such courses over the last three years (disaggregated by each year) that assures grading standards (e.g., papers, portfolios, quizzes, labs, etc.) course management, instructional delivery, and content meet or exceed those in regular on-campus sections.
Provide information here:

We do not offer concurrent enrollment courses.

g. Indicate whether the program is accredited by a specialty accrediting body including the next review date and concerns from the last review.
Provide information here:

Our undergraduate programs are accredited by ABET. Our next visit will be in 2020. Our last visit was in 2013. There were no shortcomings nor were there any concerns for any of the three programs after the last review.

h. Provide the process the department uses to assure assignment of credit hours (per WSU policy 2.18) to all courses has been reviewed over the last three years.
Provide information here:

That catalog has been reviewed to ensure that all courses meet the definitions of 2.18. All new courses go through the CCF process that ensures that they meet the definitions of 2.18. The chair is responsible for the course schedule each semester and ensures that all courses are scheduled for the proper amount of time that matches the catalog and the definitions of 2.18. Faculty are also required to include the credit hour definitions in their syllabus. This ensures that students are also aware of the out of class requirements.

i. Provide a brief assessment of the overall quality of the academic program using the data from 3a – 3e and other information you may collect, including outstanding student work (e.g., outstanding

scholarship, inductions into honor organizations, publications, special awards, academic scholarships, student recruitment and retention).
Provide assessment here:

The overall quality of the academic programs is high. We have an excellent faculty. Our enrollment numbers indicate that our undergraduate and graduate programs are some of the most sought after programs in the university. While not indicated directly here, the department and college have made significant investments over the last 6 years in laboratory equipment for educational laboratories.

4. Analyze the student need and employer demand for the program/certificate. Complete for each program if appropriate (refer to instructions in the WSU Program Review document for more information on completing this section).

a. Evaluate tables 11-15 from the Office of Planning Analysis for number of applicants, admits, and enrollments and percent URM students by student level and degrees conferred.

Undergraduate - CE

	Race/Ethnicity by Major Enrollment***									Race/Ethnicity by Graduate***								
	NRA	H	AI/AN	A	B	NH/PI	C	MR	UNK	NRA	H	AI/AN	A	B	NH/PI	C	MR	UNK
2015	390	54	7	95	21	0	392	20	18	212	4	0	15	6	0	45	1	3
2016	312	66	9	118	30	0	315	23	21	189	2	2	11	6	0	48	3	4

NRA=Non-resident alien; H=Hispanic; AI/AN=American Indian/ Alaskan Native; A=Asian; B=Black; NH/PI=Native Hawaiian/Pacific Islander; C=Caucasian; MR=Multi-race; UNK=Unknown

b. Utilize the table below to provide data that demonstrates student need and demand for the program.

Employment of Majors*							
	Average Salary	Employ-ment % In state	Employment % in the field	Employment : % related to the field	Employment: % outside the field	No. pursuing graduate or profes-sional educa-tion	Projected growth from BLS** Current year only. ↓
Year 1 - 2015							
Year 2 - 2016							
Year 3 - 2017							

* May not be collected every year

** Go to the U.S. Bureau of Labor Statistics Website: http://www.bls.gov/oco/ and view job outlook data and salary information (if the Program has information available from professional associations or alumni surveys, enter that data)

- Provide a brief assessment of student need and demand using the data from tables 11-15 from the Office of Planning and Analysis and from the table above. Include the most common types of positions, in terms of employment graduates can expect to find.

Provide assessment here:

Our computer science, computer networking, and computer engineering graduates could take jobs in many dozens of differently categorized occupations. In general the *Computer and Information Technology Occupations* according to the Bureau of Labor Statistics have an annual median wage of $84,580 in May 2017, which is about 124% more than the median annual wage. Focusing on just the *Software Developer* category, the job outlook growth is 24% which is much faster than average. Graduates with *computer* or *computing* in their bachelor/master/PhD of science degrees are in extremely high demand.

Electrical and Electronics engineers have a job outlook increase of 7% (as fast as average). Their median annual wage is about $95K.

5. **Analyze the service the Program/certificate provides to the discipline, other programs at the University, and beyond. Complete for each program if appropriate (refer to instructions in the WSU Program Review document for more information on completing this section).**

Evaluate table 16 from the Office of Planning Analysis for SCH by student department affiliation on fall census day.

Percentage of SCH Taken (last 3 years reported)			
At Fall Census Day	Year 1 (2014)	Year 2 (2015)	Year 3 (2016)
UG Majors	38.6%	50.7%	60.2
Gr Majors	48.8%	36.3%	26.4
Non-Majors	12.6%	13%	13.5

a. Provide a brief assessment of the service the Program provides. Comment on percentage of SCH taken by majors and non-majors, nature of Program in terms of the service it provides to other University programs, faculty service to the institution, and beyond.

Provide assessment here:

The table above can be misleading as the department has seven programs with four different sheets from OPA being combined (to obtain the above table). The department itself (due to its nature of being an engineering department with specific foci) may not provide a significant portion of instruction to students from other departments' programs but the seven programs in the department do provide each other with significant shared instructional resources. This is however not captured by the data shown in Tables 16 due to that data being focused on the department faculty not on the program faculty. From the viewpoint of having seven programs in the department and adding and an additional eighth unit for the non-departmental students, a uniform distribution of students would result in 12.5% (1/8) of students being served from outside the department. The data shows that that the actual percentage is actually higher than that so an argument can be made that the department provides more than its fair share of service to other departments' programs.

The EECS department's faculty participates in all major committees in the university, the college, and the department. Our faculty are involved in shared governance, and committees that serve the greater good. As the department is highly research-active, it provides significant visibility to the University by having faculty on research review panels, journal and conference technical committees, organizing committees for conferences, local chapters of societies (e.g., IEEE). Again, due to research-activity our faculty represents their work and their university during conference and professional meetings by presenting their state-of-the-art engineering/science work.

6. Report on the Program's/certificate's goal (s) from the last review. List the goal (s), data that may have been collected to support the goal, and the outcome. Complete for each program if appropriate (refer to instructions in the WSU Program Review document for more information on completing this section).

The goals were department wide and not program specific.

(For Last 3 FYs)	Goal (s)	Assessment Data Analyzed	Outcome
	Increase the number of tenure track faculty (improving student to faculty ratio)	Table 4 and current data	We had 18 T/TT faculty previously, we have 20 now, however this includes a faculty member who is on leave. We have three T/TT lines to hire but we cannot seem to be able to keep our young, productive faculty. This goal has not been satisfactorily accomplished.
	Strengthen research programs in the department	Research grants awarded and Table 2.	The total amount for grants awarded during 2012-2014 was about $4M. The total award during 2015-2017 was $3.4M. Unfortunately, about 2.3M of that was contributed by faculty who have left the department. (The amount of research funding unfortunately is a strong predictor(!) for faculty churn.) As we failed to keep successful young faculty, this goal remains unaccomplished.
	Growing BS and PhD programs and reducing MS program	Tables 6 of the OPA documents.	Our doctoral program went from 32 (in 2014) to 42 (in 2016) back to about 35 currently. The trend shows stagnation. The M.S. population went from 451 (2014) to 197 (in 2016). The BS population went from 674 (in 2014) to 723 (in 2016). Growing the PhD program was not accomplished. This is strongly related to the previous two goals not being accomplished. The BS program has grown and it still shows a trend for growth; no specific goal was set but the growth is significant. The department succeeded in reducing the M.S. population

			very significantly (although goals were not specific). Unfortunately this goal and its accomplishment is controversial.

7. Summary and Recommendations

a. Set forth a summary of the report including an overview evaluating the strengths and concerns. List recommendations for improvement of each Program (for departments with multiple programs) that have resulted from this report (relate recommendations back to information provided in any of the categories and to the goals and objectives of the program as listed in 1e). Identify three year goal (s) for the Program to be accomplished in time for the next review.

Provide assessment here:

If you will allow, I (Gergely Zaruba) will provide this section in a first-person narrative. I became the chair of the EECS department late August of 2018, long after the original deadline for this form to be submitted has passed. It was during my second or third week as a chair when I found out that this self-study has not been completed. I was not familiar with all the processes for assessment and evaluation at WSU (I have been the director of an ABET accredited program for about six years and I am an ABET program evaluator for computer engineering programs having been on four visits, so I understand the need for a proper assessment and evaluation process). Working on this document definitely helps me in understanding my department and understanding where the data (or the lack of it) shows reasons for concern. We are also ramping up for our ABET accreditation, and as such we will need to revamp to use the new ABET criteria. (Unfortunately, the person in charge of our ABET processes is on faculty leave this academic year, which adds to the burden.) The next section is not based on faculty consensus in my department but based on knowledge that I have gathered in the past four weeks and based on the data (or lack thereof) in this self-study.

The strengths of our department and our programs are:

- Strong enrollments due to high job demands in EECS related fields
- Faculty who are willing to participate in finding and implementing creative solutions

The challenges of our department and our programs are:

- Funding success is an almost perfect predictor for faculty churn
- The national trend in declining electrical engineering enrollment
- The national trend in declining international applications to graduate programs (graduate student populations in EECS are predominantly international students)
- Large student to faculty ratio
- Large churn in faculty (especially young faculty) which results in less breadth of subjects taught

- Misalignment of some of our programs with national trends (i.e., computer networking is not as attractive as it was ten years ago)

The perceived plans and goals of our department and our programs are:

- To revise our strategic plans to be more commensurate with the zeitgeist (local and global)
- To revise our curricula for all programs and to revise our programs to fit the strategic plan
- To rework, reassert or redefine, and streamline our assessment and evaluation processes to receive appropriate feedback about our programs (and to be able to have plans on how to act based on the data)
- To improve student to faculty ratio
- To improve student retention and satisfaction with the programs
- To gracefully and strategically increase enrollment for programs where we have capacity or additional resources
- To investigate how to increase participation in our programs by students from underrepresented groups
- To improve faculty retention
- To strengthen research programs in the department that will have a positive effect on our graduate programs

As we move forward, we will need to set specific measurable goals based on our strategic plans.