SUNY Fredonia
College of Arts & Sciences
Department of Computer and Information Sciences
CIS Assessment Report, AY 2018-2019

Department Information	
Department	Computer and Information Sciences
Academic Programs	Computer Science; Computer Information Systems
Degrees	BS
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SUNY Fredonia Mission Statement: Fredonia educates, challenges, and inspires students to become skilled, connected, creative, and responsible global citizens and professionals. The university enriches the world through scholarship, artistic expression, community engagement, and entrepreneurship.

CIS Department Mission Statement: To provide state-of-the-art education to our students to excel in key fields of computer and information sciences and engage them in activities that enhance the welfare of Western New York and our society at large. Through student-centered education in an environment that fosters creative thinking and innovative problem-solving, we prepare our graduates for an assortment of career goals, including graduate studies. We view scholarly investigations and software development as an integral part of instruction, providing opportunities to students for active learning through practicum, research, and internship. Through active involvement in general education and interaction with cross-discipline course work, our programs embody students with life skills that help them become productive citizens and professionals.

The CIS department has adopted eleven program learning outcomes (PLO's) or Goals as per Academic Assessment Program Map of SUNY at Fredonia, which could be categorized into Institutional Learning Goals (IGLs), i.e., Skilled, Connected, Creative and Responsible (Please refer to Table II on page # 3). This selection depends upon which CS/IS track is to be considered at the present time. Please keep in mind that for Information Systems (IS) track, PLO 'K' is invalid. We have mapped these PLO's to the corresponding Campus Baccalaureate Goals. A list of the CIS department PLO's is displayed initially and then our Program Educational Objectives (PEO) are presented. We reiterate that the same list of PLO's from A through I is applicable to both CS and IS tracks. That is why PLO 'J' is occurring two times in the list of PLO's: the upper PLO is for CS track and the lower one is for IS track of the CIS Department.

The following list indicates the Program Learning Outcomes (PLOs) for our CIS Department:

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. [CS]

[J] An understanding of and an ability to support the use, delivery, and management of information systems within an Information Systems environment. [IS]

K. An ability to apply design and development principles in the construction of software systems of varying complexity. [CS]

The PLOs A through J/K are assessed on the basis of courses being taught in CIS Department during each semester and they correlate strongly with our PEO's. Following is a depiction of the relationship between the PEO's and PLO's, and PLO's to the campus baccalaureate goals as prepared by Dr. Zubairi. Table I shows

mapping of PEO's to the corresponding PLO's. Just to point out here that each PLO from A through K is further subdivided into three to five categories or performance criteria (PC) depending on the complexity of algorithm or project work or oral presentation.

In Table I, we present mapping of the CS Department Goals/PLO's that correspond to the SUNY Fredonia campus four baccalaureate goals: (1) Skilled, (2) Connected, (3) Creative and (4) Responsible.

Table I: Mapping of PLOs with corresponding SUNY Fredonia baccalaureate goals

Program learning outcomes/Goals (PLOs/Goals)	Skilled	Connected	Creative	Responsible
A: An ability to apply knowledge of computing and mathematics appropriate to the discipline	Students learn programming through a sequence of progressively difficult courses		Learn to be creative in developing algorithms and in modeling data	
B: An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution	Challenging the students in several courses to solve real-life problems on the computer by developing programs		Learn to be creative in developing algorithms for solving problems and in modeling data	
C: An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs	Learning and using skills to design and implement a computer based solution.			Make sure the program or solution meets the needs
D: An ability to function effectively on teams to accomplish a common goal		Students work in teams to complete a project and share their part of solution with others		Students meet deadlines for various reports
E: An understanding of professional, ethical, legal, security and social issues and responsibilities				Students get the knowledge of ethical and security issues in IT and computer industry.
F: An ability to communicate effectively with a range of audiences		In oral communication courses, students give presentations, handle Q & A and evaluate each other		
G: An ability to analyze the local and global impact of computing on individuals, organizations, and society				Students study examples of the impact of computing on global society.

H: Recognition of the need for and an ability to engage in continuing professional development		Through Internships, the students connect to each other and engage in continuous professional development		Students show a sense of responsibility by taking the professional internships seriously
I: An ability to use current techniques, skills, and tools necessary for computing practice.	In programming and web design courses, students need to use modern tools and be on top of the technology.		Students find creative ways of using current technique and skills.	
J: An understanding of processes that support the delivery and management of information systems within a specific application environment. [IS]	Students acquire appropriate skills on several topics in concerning information systems processes		Students create models that support delivery/management of information systems	
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. [CS]			Students do model and design computing systems in a variety of ways using creative options.	
K: An ability to apply design and development principles in the construction of software systems of varying complexity. [CS}	Students enhance their skills by designing software systems in a variety of languages and platforms.			

Dr. Singh and Dr. Zubairi have created the curriculum map and assessment plan 2014 for Computer Science (CS) and Information Systems (IS) tracks. The curriculum map shows a mapping of the courses to one or more corresponding PLO's. In the assessment plan, a number of performance criteria (PC) has been developed for each PLO/Goal. The specific courses are identified that satisfy these performance criteria, and consequently are picked for assessment in each semester. For each Goal/PLO, a rubric sheet is designed that depicts specific milestones to be achieved by the students to meet or exceed or approach the standard. The rubric sheet also identifies the shortcomings, which are demonstrated by those students who fail to meet the standard.

In the beginning of each semester, the Assessment Coordinator identifies the courses to be picked for assessment work and informs the Instructors teaching those courses for which Goals/PLO's data collection is to be done. Instructors refer to the rubric sheets as a guideline to figure out the specific milestones for students to be achieved. This prior information helps the Instructors to prepare and include specific questions in their course quizzes, assignments, exams and projects. Consequently, instructors design/create exams, assignments and projects that include the relevant kind of work to be performed by the students. As the semester progresses, the Instructors are reminded periodically about the collection of assessment data. Finally, at the end of the semester, the Instructors turn in the collected assessment data to the Assessment Chair. Based on the data collected, the pertinent PLO's are assessed. In spring 2019 semester, a list of courses depicted

in Table II is assessed, which is based on the curriculum map and the response gotten from the Instructors teaching relevant courses. It is worthwhile to mention here that we did not offer CSIT311 course this spring 2019 and therefore, we were unable to perform the assessment analysis for PLOs A4 and I2 in the present assessment report.

Table II: Information of each course, its instructor and PLO's to be assessed for spring 2019

S. No.	Course # & Instructor	Program Learning Outcomes (PLOs) To Be Assessed
1.	CSIT201: Mackey	All Es, & G1, G2
2.	CSIT221: Buzi & Haider	I1
3.	CSIT224: Singh	A2, B3
4.	CSIT231: Szocki	I4
5.	CSIT241 & CSIT242: Maloney	A3
6.	CSIT311 (Not offered this Spring 2019 semester)	A4, I2
7.	CSIT321: Hu	I3
8.	CSIT341: Zubairi	A1, A5, B2, & All Js
9.	CSIT425: Haider & Zubairi	B1, B4, and All Cs, Ds, Fs, & Ks
10.	CSIT431: Zubairi	All Fs
11.	CSIT441: Arnavut	All Fs
12.	CSIT455: Hu	All Fs
13.	CSIT300, CSIT400, CSIT497 & CSIT499: Arnavut	Graduating Senior Exit Survey

In the actual assessment analysis of a given course taught during spring 2019, we will present a comprehensive discussion on how each PLO, A through K, is being assessed. In a Table displayed on next page, we present the statement of a given PLO to be assessed in 1st row, followed by its Assessment Method in 2nd row, its Data Source in 3rd row and Assessment Results in the last row. For example, for PLO, 'A', we first list its five Performance Criteria (PC) A1 through A5. For each PC, we represent an abbreviation that relates to its actual description. Then, an inset table is inserted in which for each course, its corresponding PC is presented. This table contains the raw assessment data, which is then combined and aggregated to produce final-result for a PLO that is being assessed. Each entry in this inset table contains a triplet, (x, y, z), that indicates Exceeds Standard, Meets Standard, and Approaches Standard. Arithmetic means are used to combine and aggregate the results. At the end of computation, an actual number of students is used for calculating percentile performances. Arithmetic means are used instead of geometric means because for each PC, the range of values is the same, i.e., the total number of students in a class. Adding the PC values across multiple courses by columns still results in similar patterns, which preserve consistency of the actual results. For presenting the results in three categories, i.e., X (Exceeds), M (Meets) and I (Approaches/Insufficient), the following mathematical formulas are used to aggregate the percentile performances. Here, 'L' is the number of courses in which a given PLO is to be assessed and 'N' is the number of performance criteria for each PLO. Each PC's performance data is listed as a fractional number, p/q, where 'q' is the total number of students in the course and 'p' is the number of students that fulfills X or M or I category of performance. As an obvious example, X/(X+M+I) would be the fraction of the number of students that exceeds a specific performance criterion (PC) in a course being taught. The following three mathematical equations are employed to determine *X, M* and *I* percentile performance, respectively:
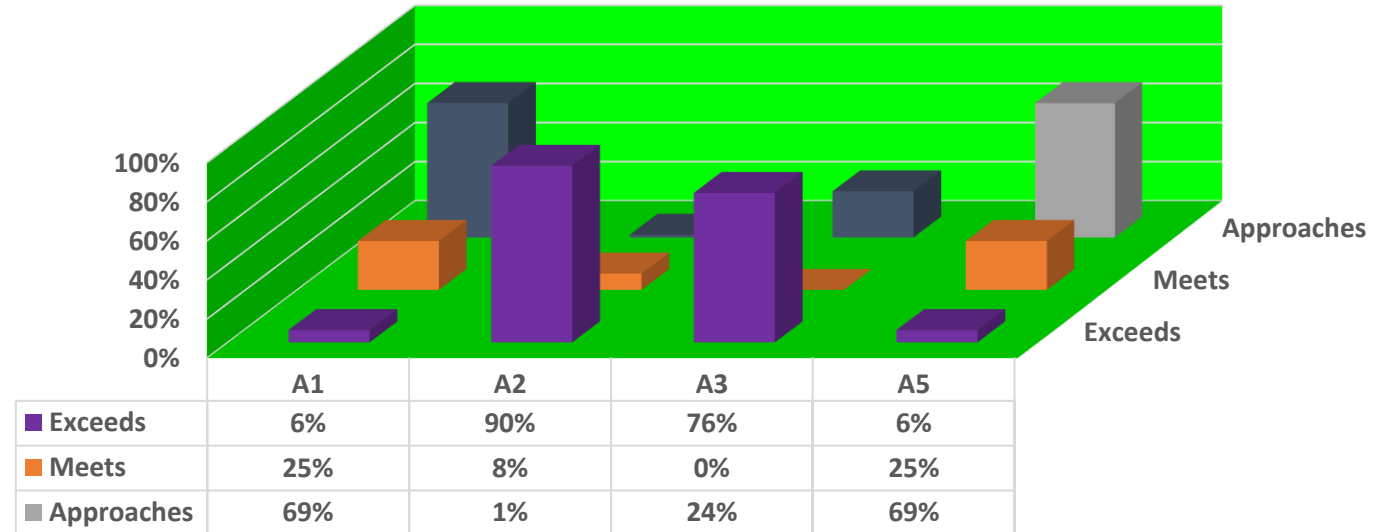
$$X = 100 \times \sum_{j=1}^{L} [(100 \times \sum_{i=1}^{n} \frac{PCX_i}{N}] / L \qquad (1)$$

$$M = 100 \times \sum_{j=1}^{L} [(100 \times \sum_{i=1}^{n} \frac{PCM_i}{N}] / L \qquad (2)$$

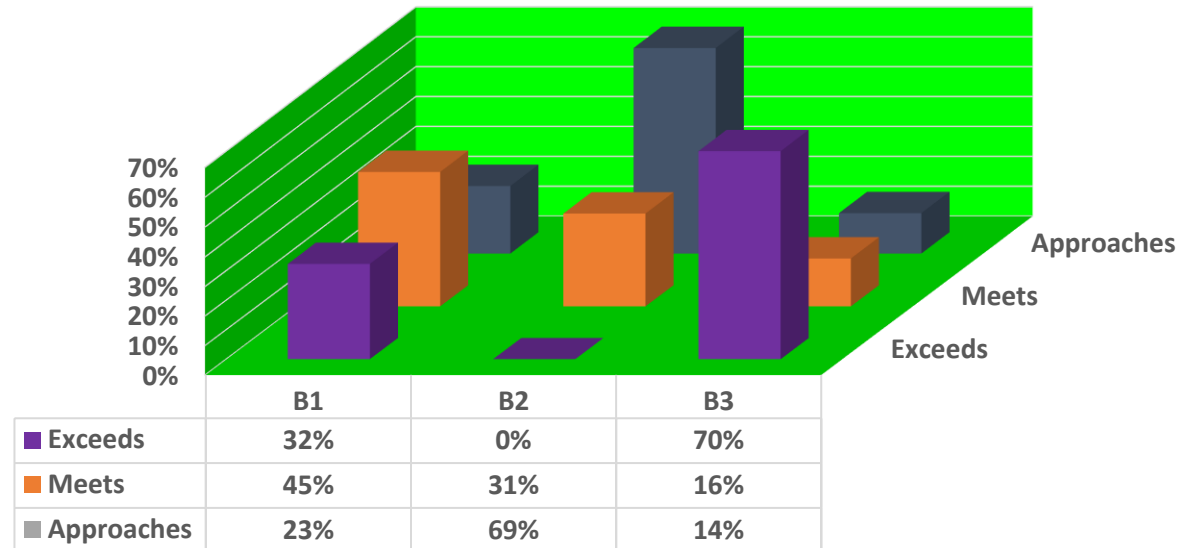$$I = 100 \times \sum_{j=1}^{L} [(100 \times \sum_{i=1}^{n} \frac{PCI_i}{N}] / L \qquad (3)$$

Assessment of Program Learning Outcomes/Goals (PLOs/Goals)

Programs: Computer Science and Computer Information Systems

PLO/Goal A	An ability to apply knowledge of computing and mathematics appropriate to the discipline.
Assessment Method(s)	Instructors assign program-based questions to be developed by CSIT224, CSIT241, and CSIT341 students. The programs are thoroughly reviewed and graded by the instructors. The instructors provide the Assessment Committee Chair with a graded portfolio of a given number of assignments/exam questions or project work. The Instructors include specific exams questions in CSIT241, and CSIT341 as per the assessment plan.
Data Source	Data source is the programs written by students and graded by instructors in CSIT224, CSIT241, and CSIT341 as well as some specific exam questions from these three courses to be assessed.
Assessment Results	Following are the assessment results as per performance criteria A1, A2, A3 and A5. No data were collected for A4. A1. (DATA) Demonstrates an understanding of basic data structures and their representation A2. (OOPL) Demonstrates an understanding of a high-level object-oriented programming language and software design A3. (DIGITAL) Demonstrates an understanding of number systems and digital logic A5. (ALGM) Demonstrates an understanding of analysis of algorithms Each triplet (x, y, z) indicates (exceeds, meets, insufficient or approaching) <table>

Course	A1 (DATA)	A2 (OBJECT)	A3 (DIGITAL)	A5 (ALGM)
CSIT224		65, 6, 1		
CSIT241			136, 0, 42	
CSIT341	1, 4, 11			1, 4, 1

PLO A: Percentile Performance of A1, A2, A3 and A5

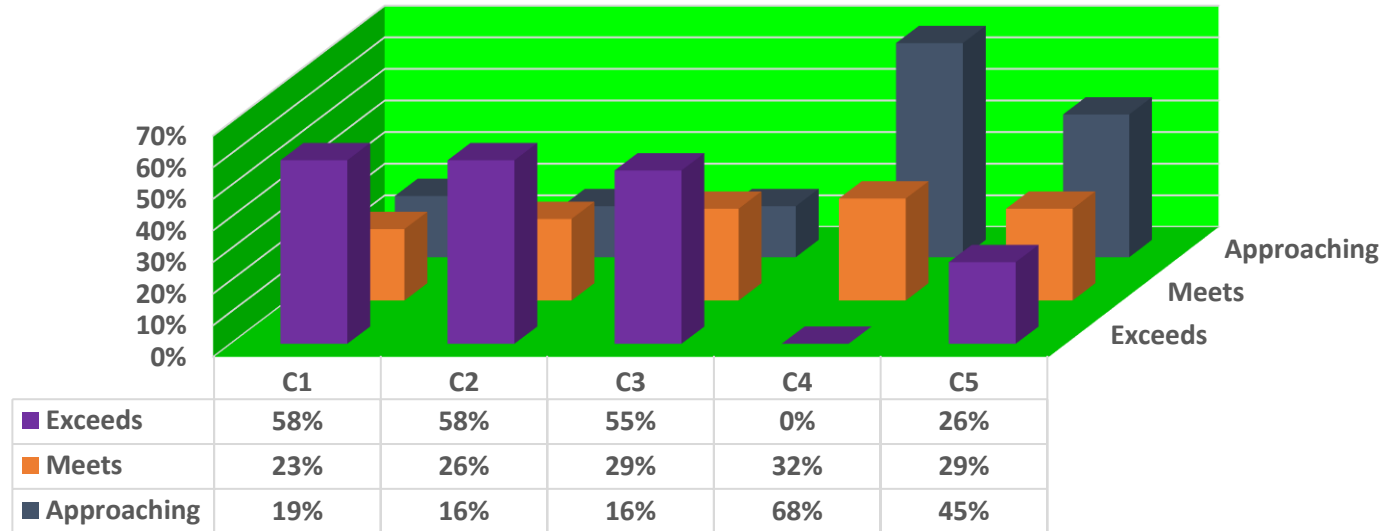|	A1	A2	A3	A5
■ Exceeds	6%	90%	76%	6%
■ Meets	25%	8%	0%	25%
■ Approaches	69%	1%	24%	69%

PLO/Goal B:	An ability to analyze a problem and identify and define the computing requirements appropriate to its solution.
Assessment Method(s)	Students are given programming assignments in which they analyze and solve a problem using appropriate paradigms and resources to arrive at its solution
Data Source	The data was collected by the Instructors of CSIT224, CSIT341 and CSIT425. In CSIT425 course, data were collected by two instructors using Final Project/Final Exam/assignments, whereas in CSIT341 data were collected on competency in analyzing some problems and proposing different models for its solution in spring 2019 semester. In CSIT224, data were collected using two C# projects assigned to students.
Assessment Results	Following are the assessment results as per performance criteria B1, B2, B3 and B4. B1. (SPEC) Demonstrates abilities of writing program specifications and documentation B2. (ANALYZE) Demonstrates competency in analyzing the problem and proposing different models for solution B3. (APPROPR) Demonstrates competency in analyzing models using appropriate paradigms and following standard practices B4. (RESOURCES) Demonstrates competency in determining physical resources and the time required to come to a solution Each triplet x, y, z indicates (exceeds, meets, insufficient or approaching).

Course	B1 (SPEC)	B2 (ANALYZE)	B3 (APPROPR)	B4 (RESOURCES)
CSIT224			52, 12, 10	
CSIT341		0, 5, 11		
CSIT425-01, 02	10, 14, 7			No data collection is done

PLO B: Percentile Performance of B1, B2 and B3

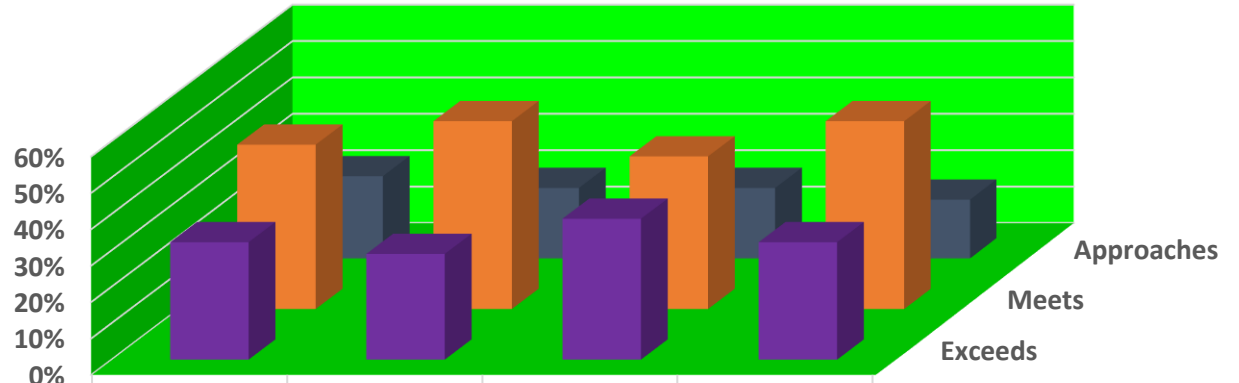|	B1	B2	B3
■ Exceeds	32%	0%	70%
■ Meets	45%	31%	16%
■ Approaches	23%	69%	14%

PLO/Goal C:	An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.
Assessment Method(s)	Students are assigned lab projects to develop a computer-based system to meet the stated objectives.
Data Source	The data was collected by the two Instructors of CSIT425 course during spring 2019. Both instructor's data collection is based on Final Project assigned to a team of students. Both instructors also collected data on creation of documentation relating to the project work, communicating with team members, writing programs to conform to requirements and to meet deadlines in completion of project work.
Assessment Results	Following are the assessment results as per performance criteria C1 through C5. C1. (DESIGN) Demonstrates competency in computer-based system design C2. (REQ) Demonstrates ability in eliciting requirements C3. (METRIC) Demonstrates competency in developing project metrics C4. (TEST) Demonstrates competency in creating and executing test plans C5. (OPTIM) Demonstrates competency in comparing alternative solutions and selecting the optimal one. Each triplet x, y, z indicates (exceeds, meets, insufficient or approaching).

Course	C1 (DESIGN)	C2 (REQ)	C3 (METRIC)	C4 (TEST)	C5 (OPTIM)
CSIT425-01, 02	7, 10, 16	18, 12, 3	8, 10, 15	14, 9, 12	13, 2, 18

PLO C: Percentile Performance of C1, C2, C3 and C4

	C1	C2	C3	C4	C5
■ Exceeds	58%	58%	55%	0%	26%
■ Meets	23%	26%	29%	32%	29%
■ Approaching	19%	16%	16%	68%	45%

PLO/Goal D:	An ability to function effectively on teams to accomplish a common goal.
Assessment Method(s)	Done through project portfolio and peer evaluations.
Data Source	The data was collected by the two Instructors of CSIT425 course during spring 2019. Both instructor's data collection is based on Final Project assigned to a team of students. Both instructors also collected data on creation of documentation relating to the project work, communicating with team members, writing programs to conform to requirements and to meet deadlines in completion of project work.
Assessment Results	Following are the assessment results as per performance criteria D1 through D4. D1. (DOCU) Demonstrates ability to document well the work. D2. (INTER) Demonstrates ability to communicate with team members, listen actively, provide feedback and share information. D3. (VALID) Demonstrates the ability to validate research on an assigned relational database systems topic using empirical evidence to support claims. D4. (DEAD) Demonstrates ability to meet deadlines. Each triplet x, y, z indicates (exceeds, meets, insufficient or approaching). | Course	D1 (DOCU)	D2 (INTER)	D3 (VALID)	D4 (DEAD)
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CSIT425-01,02	3, 23, 7	11, 15, 7	0, 6, 27	13, 5, 15	

PLO D: Percentile Performance of D1, D2, D3 and D4

	D1	D2	D3	D4
■ Exceeds	32%	29%	39%	32%
■ Meets	45%	52%	42%	52%
■ Approaches	23%	19%	19%	16%

PLO/Goal E:	An understanding of professional, ethical, legal, security and social issues and responsibilities.
Assessment Method(s)	Specific questions are included in the assignments and tests for assessing this goal. Instructor teaching this course collects assessment data and forwards it to the assessment Committee Chair.
Data Source	The data collection for E goal is done only for CSIT201 course. In spring 2019, instructor picked relevant questions from two exams. Consequently, he picked five questions for E1, two questions for E2 and four questions for E3. No data collection was done for goal E4 in this assessment work
Assessment Results	Following are the assessment results as per performance criteria E1 through E3. E1. (ETHIC) Understands the ethical issues related to technology. E2. (SECUR) Understands the security issues and problems of identity theft. E3. (MAL) Demonstrates knowledge about the characteristics of different malware types and the difference between them. Each triplet x, y, z indicates (exceeds, meets, insufficient or approaching). {table below}

Course	E1 (ETHIC)	E2 (SECUR)	E3 (MAL)
CSIT201	24, 0, 1	25, 0, 0	23, 0, 2

PLO E : Percentile Performance of E1, E2, E3 and E4

	E1	E2	E3
■ Exceeds	92%	96%	88%
■ Meets	8%	4%	8%
■ Approaching	0%	0%	4%

PLO/Goal F:	An ability to communicate effectively with a range of audiences.
Assessment Method(s)	In oral communication courses, class is divided into several groups of three/four students depending on the complexity of assigned project. Each group presents their project work during class time in last four/five weeks of the course work. Each group presentation is evaluated by their peers as well by the instructor. Instructor collects assessment data and forwards it to the assessment Committee Chair.
Data Source	The data collection was done by five Instructors offering CSIT425-01, CSIT425-02, CSIT431, CSIT441 and CSIT455 courses in spring 2019. Data presented here is collected on Final Project, Categories 2, 4 & 5, Items 1-5 of student presentations, which is a measure of good verbal skills and interaction with other students, good control on ppt. slides, well organization of talk, and covering the topic completely.
Assessment Results	Following are the assessment results as per performance criteria (PC) F1 through F4.

F1. (VERBAL) Demonstrates an ability of good verbal skills
F2. (PRESENT) Demonstrates good knowledge of presentation software
F3. (ORGN) Demonstrates an ability of good organization of the talk
F4. (KNOW) Demonstrates knowledge of the topic

Each triplet (x, y, z) indicates (exceeds, meets, insufficient or approaching).

Course	F1 (VERBAL)	F2 (PRESENT)	F3 (ORGN)	F4 (KNOW)
CSIT425-01 & -02	10, 9, 12	14, 11, 5	8, 11, 12	8, 12, 11
CSIT441	8, 8, 12	4, 12, 0	12, 4, 0	10, 6, 0
CSIT455	3, 10, 3	3, 10, 3	3, 10, 3	3, 10, 3
CSIT431	0, 3, 7	0, 8, 2	0, 8, 2	Not Done

PLO F: F1, F2, F3 and F4 Percentile Performance

	F1	F2	F3	F4
■ Exceeds	33%	33%	36%	33%
■ Meets	36%	44%	31%	33%
■ Approaching	31%	23%	33%	19%

PLO/Goal G:	An ability to analyze the local and global impact of computing on individuals, organizations, and society.
Assessment Method(s)	Selected questions extracted from course examinations and assignments; selected components of course projects.
Data Source	The data was collected for CSIT201 course in spring 2019, so that data analysis on goal G could be performed and reported in current assessment report. The instructor picked three questions from exams for G1 and for G2 one question was specially designed to collect the data on this goal.

Assessment Results	Following are the assessment results as per performance criteria G1 through G2.

Performance Criteria
G1. (IMPACT) Demonstrates an ability to analyze the local and global impact of computing on individuals.
G2. (SOCIETY) Demonstrates an ability to analyze the local and global impact of computing organizations and society.

Each triplet x, y, z indicates (exceeds, meets, insufficient or approaching) percentile performance of each PLO.

Course	G1 (IMPACT)	G2 (SOCIETY)
CSIT201	20, 0, 5	18, 0, 7

PLO G: Percentile Performance of G1 and G2

	G1	G2
■ Exceeds	80%	72%
■ Meets	20%	28%
■ Approaching	0%	0%

PLO/Goal I:	An ability to use current techniques, skills, and tools necessary for computing practice.
Assessment Method(s)	Selected questions extracted from course examinations and assignments; selected components of course projects.
Data Source	The data was collected by the three Instructors offering CSIT221-01 & CSIT221-02, CSIT231 and CSIT321 courses on I1, I3 and I4, respectively, during spring 2019. The data collection is done C++ using MS VB.NET, Bash/C on Linux server and one other computing language for the three

	respective courses. Since CSIT311 course was not offered during spring 2019, and therefore, no data was collected on Assembly Language for Goal/PLO, I2.
Assessment Results	Following are the assessment results as per performance criteria I1 through I4.

Performance Criteria
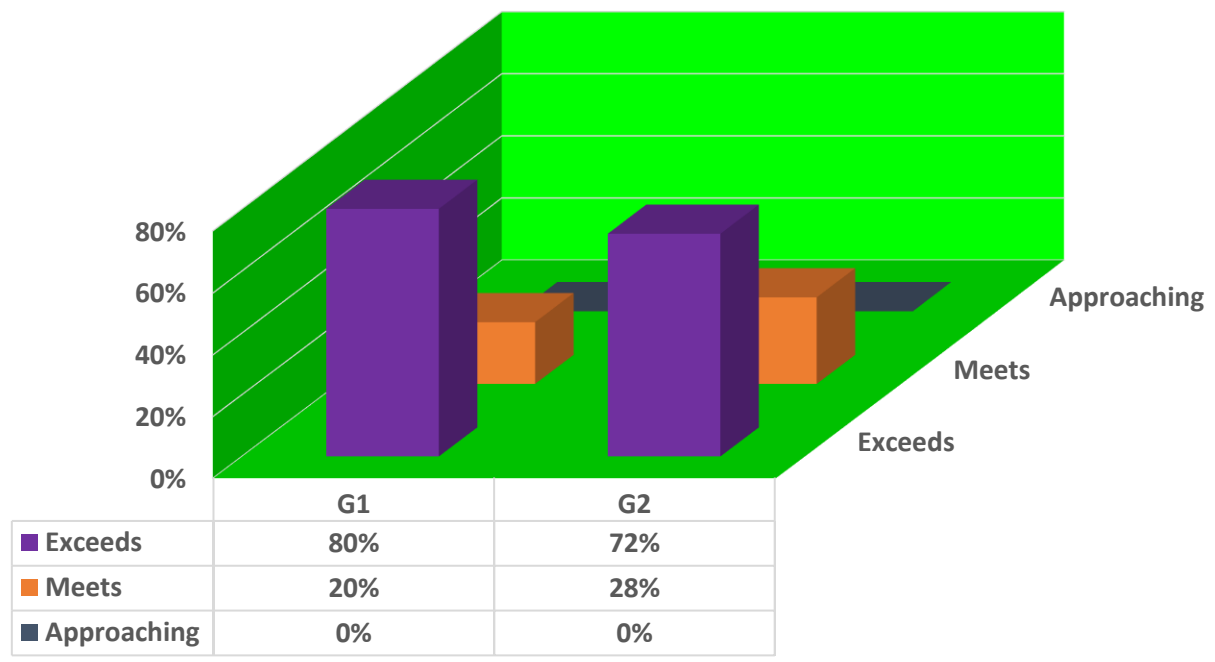I1. (C++) Demonstrates competency in C++ programming.
I2. (ASSEMB) Demonstrates competency in assembly language programming
I3. (OTHER) Demonstrates competency in programming in other languages
I4. (UNIX) Demonstrates competency in the use of the UNIX operating system

Each triplet (x, y, z) indicates (exceeds, meets, insufficient or approaching). |

Course	I1 (C++)	I2 (ASSEMB)	I3 (OTH)	I4 (LINUX)
CSIT221-01, CSIT221-02	8, 20, 19			
CSIT231				12, 103,41
CSIT321			7, 16, 8	12, 103, 41

PLO I: I3 Percentile Performance

	I1	I3	I4
Exceeds	18%	40%	8%
Meets	44%	48%	65%
Approaching	38%	12%	26%

PLO/Goal 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.
Assessment Method(s)	Selected questions extracted from course examinations and assignments; selected components of course projects.
Data Source	The data was collected by just one Instructor offering CSIT341 as CSIIT311 was not offered during spring 2019. The instructor picked Q. 1 from HW # 4, Q. 2 from HW # 1 and Q. 2 from Worksheet # 4 to collect the data in spring 2019.
Assessment Results	Following are the assessment results as per performance criteria J1 through J4. Performance Criteria J1. (MODEL) Demonstrates an ability to apply mathematical modeling to computing problems J2. (ALGM) Demonstrates an ability to develop different algorithms for a computing problem J3. (EFFIC) Demonstrates an ability to evaluate algorithm efficiency J4. (MEMORY) Understands the tradeoff between memory and running time Each triplet (x, y, z) indicates (exceeds, meets, insufficient or approaching). <table><tr><td>Course</td><td>J1 (MODEL)</td><td>J2 (ALGM)</td><td>J3 (EFFIC)</td><td>J4 (MEMORY)</td></tr><tr><td>CSIT341</td><td>0, 16, 8</td><td>0, 12, 12</td><td>0, 14, 10</td><td>0, 14, 10</td></tr><tr><td></td><td></td><td></td><td></td><td></td></tr></table>
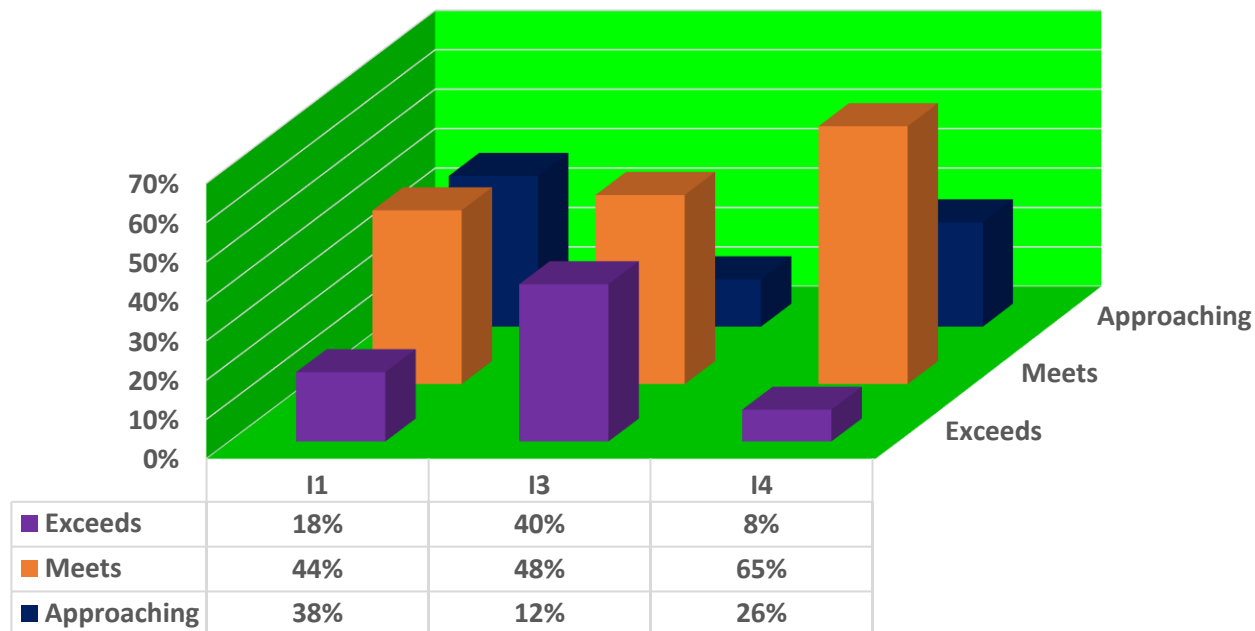
PLO J: Percentile Performance of J1, J2, J3 and J4
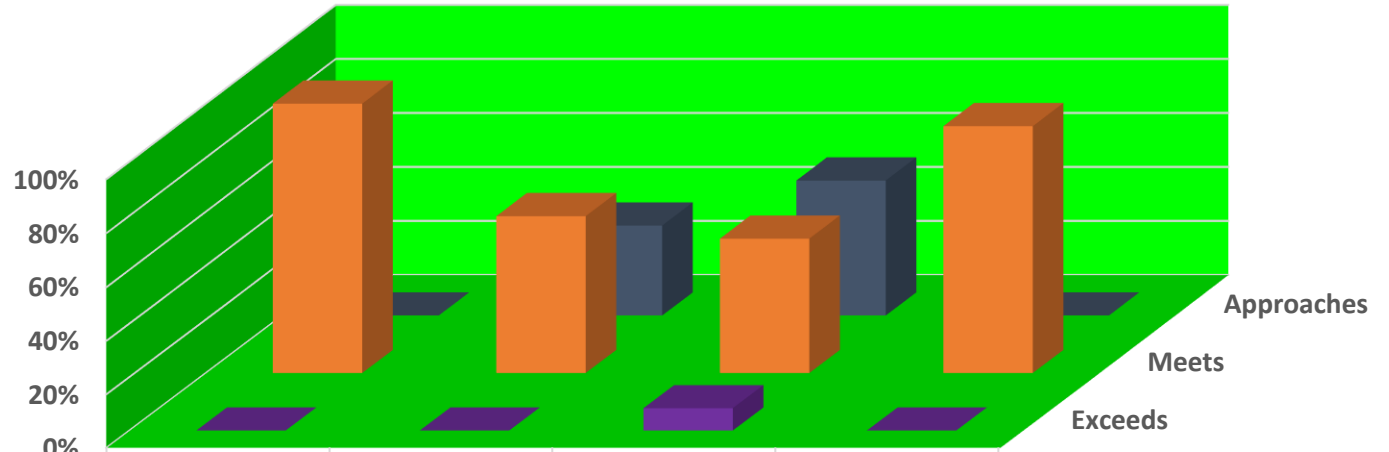
	J1	J2	J3	J4
■ Exceeds	0%	0%	8%	0%
■ Meets	100%	58%	50%	92%
■ Approaches	0%	33%	50%	0%

PLO/Goal K:	An ability to apply design and development principles in the construction of software systems of varying complexity.
Assessment Method(s)	Based on project portfolio.
Data Source	The data was collected by the two Instructors offering CSIT425 in spring 2019. One instructor picked the measures to achieve this goal K from Group Project's functional and non-functional requirements, deliverables and milestones, project plan, and group project total points awarded. Oher instructor used the following parameters in his data collection: formal project description such as requirements, design specifications and UML, time estimation to complete project, project planning, project documentation and user's guide.

Assessment Results	Following are the assessment results as per performance criteria K1 through K4. Performance Criteria K1. (FORMAL) Demonstrates an ability of formally describing a software system K2. (ESTIM) Ability to establish estimates K3. (PLAN) Able to develop a project plan K4. (DOCU) Able to provide adequate internal and external documentation Each triplet (x, y, z) indicates (exceeds, meets, insufficient or approaching).

Course	K1 (FORMAL)	K2 (ESTIM)	(K3 PLAN)	K4 (DOCU)
CSIT425-01 & -02	19, 14, 0	21, 5, 7	7, 22, 4	13, 6, 5

PLO K: Percentile Performance of K1, K2, K3 and K4

	K1	K2	K3	K4
Exceeds	65%	29%	29%	39%
Meets	32%	19%	19%	52%
Approaches	3%	52%	52%	10%
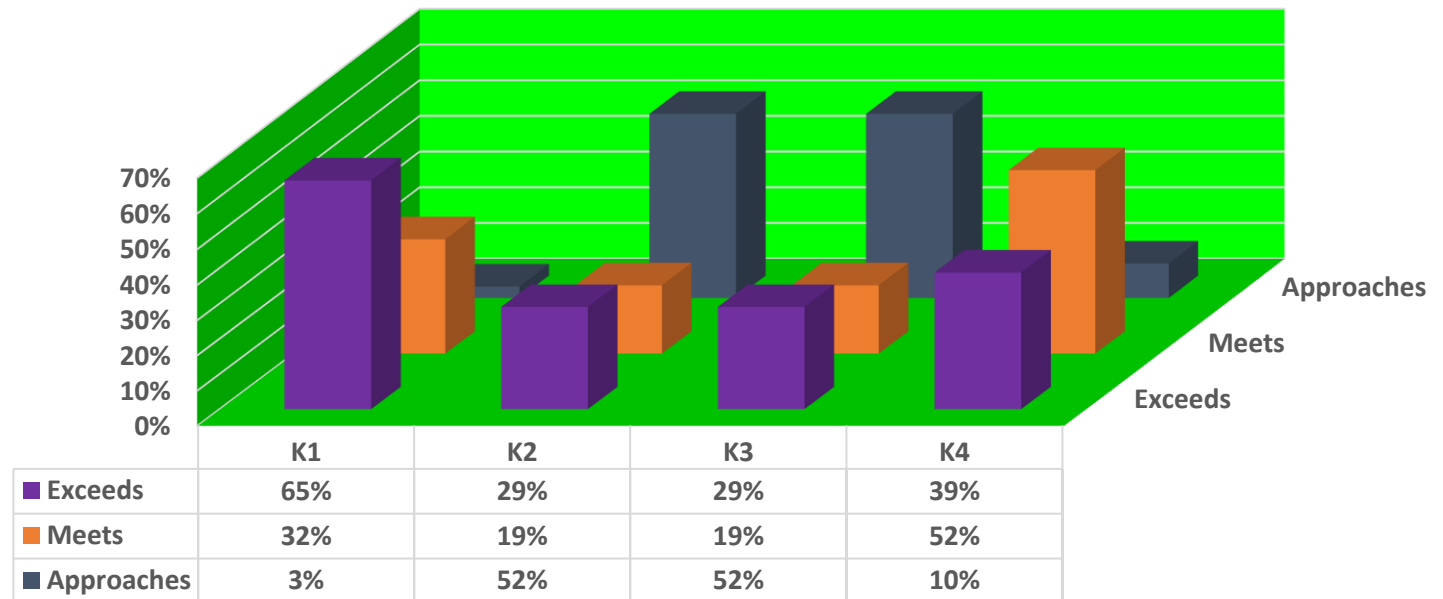
PLO/Goal H:	Recognition of the need for and an ability to engage in continuing professional development.
Assessment Method(s)	In past, the Department Secretary and Dr. Singh invited and encouraged the graduating students to fill out a hard copy of the attached survey (Appendix I). The chair also reminded the faculty to identify the graduating students and ask them to fill out anonymously the exit survey. Chair also reminded the faculty members to send the collected data to Dr. Singh before a deadline date set by him.

	In spring 2019, this exit survey has been redesigned using Google Form on University Google Drive storage space so that students could fill it out online anonymously. Senior students graduating in spring 2019 were requested to fill out senior exit survey before/on a deadline date set by Dr. Singh. This anonymous and indirect technique would help us to refine the CIS curriculum, and consequently, the assessment report during future data collection and analysis work.
Assessment Results	The data is collected by the department secretary is forwarded to the Department Chair and Assessment Coordinator. I am pleased to state that thirteen senior students participated in senior exit survey during spring of 2019. Eleven students were Computer Science (CS) majors and remaining two senior students were Information Systems (IS) majors. Six students could major in seven or eight semesters. Three students majored in less than five semesters at Fredonia University. One student majored in twelve semesters and another student did it in ten semesters. Among thirteen senior students, eight students were transfer. The students transferring to Fredonia from another school or transferring from another major have already earned 30-80 credits. Consequently, this category of students spent on the average one/three years for graduating at Fredonia University. One senior student changed his major from Computer Science to Information Systems, whereas another student changed his major from Music to Computer Science. Positive and negative feedback from senior students will be discussed below in conclusions section of this assessment report.
Conclusions	
Have you had an opportunity to discuss these results within your department? If so, what form did this take? What conclusions were drawn about student learning as a result of their assessment efforts?	The above reported results have been compiled after spending a lot of time and effort on the part of Dr. Singh in reminding the CIS faculty periodically throughout the spring 2019 semester and providing them with a tailor-made rubric for recording the assessment data correctly. I would request Department Chair to include an agenda item in first faculty meeting to be held during beginning of Fall 2019 semester so-as-to take proper steps to enhance the quality of collected data especially for the four courses CSIT221 (I1), CSIT341 (A1, A5, B2, J2, J3), CSIT425 (C4, C5, K2, K3) and CSIT431 (F1 & F4) by the respective instructors teaching these courses in fall 2019. Special emphasis is to be given to PLOs as listed in parentheses of these four courses. This assessment report represents a systematic study of compiled results of assessment data collected for eleven /Goals or PLOs: A, B, C, D, E, F, G, H, I, J and K during spring 2019 semester. As told by Dr. Zubairi that he was instrumental in developing the relevant equations to aggregate the assessment data in past. These equations have been rewritten elegantly in mathematical form by Dr. Singh. Dr. Singh collected the assessment data from several Instructors and processed the raw data using MS Excel software version 2016 to arrive at the final conclusions. All Instructors have cooperated and provided assessment data in a timely manner except one instructor. We believe that the assessment of eleven Goals or PLOs just in one semester is itself is a great achievement. Additionally, Dr. Singh being full-time continent faculty in the CIS department has exceptionally tremendous teaching and service load. The results of assessment data analysis are presented in tabular as well as in graphical form in this report at appropriate places. If we combine the percentile performance of two categories: Meets and Exceeds Standard, then the results are satisfactory for almost all the eleven Goals/PLO's investigated in the current study except for the four courses CSIT221 (I1), CSIT341 (A1, A5, B2, J2, J3), CSIT425 (C4, C5, K2, K3) and CSIT431 (F1 & F4), where all PLOs are below 70%, but particularly for Goal C4 of CSIT425, percentile performance is below 50%. For most of PLOs, we obtain percentile performance in the range of 70-100%. However, C$ for CSIT425 is to be improved in future data collection and course offerings in fall 2019. We conclude that more data collection is definitely required to improve upon the percentile performance of

several PLOs as listed above to close the loop. This important issue could be included and discussed in the first faculty meeting to be held in August/September 2019.

At the end of this report, the results of senior exit survey are presented. When asked to rate their level of satisfaction with the CIS Department on a scale of 0 to 5, two senior students who responded to Senior Exit Survey gave perfect score of 5/5. Five students rated 4/5 points and remaining six students rated the department in a scale of 2 - 3. The overall average of the department rating is 3.0/5.0, which is not so bad considering the current situation that majority CIS faculty is contingent. Therefore, to enhance department rating, university must allocate more resources. On top of it, three full-time faculty members are leaving the department in the coming fall 2019. Eight students took internships and independent study courses. Around 40 % of the seniors who participated in this survey took independent study/senior project courses. Senior students listed around 30 very useful courses being currently offered in the CIS department. Among these courses, the following courses were listed to be very useful: CSIT107, CSIT121, CSIT151, CSIT201, CSIT207, CSIT221, CSIT224, CSIT231, CSIT291, CSIT307, CSIT321, CSIT333, CSIT335, CSIT341, CSIT435, CSIT441, CSIT425, CSIT455, CSIT456 and CSIT463.

One Senior student commented, "We need more availability of computers/labs for CSIT courses. There were too many times to count that my classes should've been taken in a lab where it was taught in a classroom. You can't learn practical Computer Science in a classroom." Another Student made these comments, "The wide variety of term projects and seminars were helpful."

Here are some plus points cited by senior students in exit survey about the department and its faculty:

1. Instructor 1 is a great professor, and instructor 2 is also a phenomenal professor that is under appreciated in this department from my viewpoint. Thankfully the school has been working to increase its STEM programs by trying to get the computer science program to be more marketable especially with the construction of Houghton (if it is being built for the reasons I think it is being built).
2. Some teachers are nice and good.
3. There are very little good things I can say about this department. The good, I encountered was by taking classes with instructor 1 and Instructor 2. With Instructor 1, although the courses may have been some of the hardest I've come across, I came out of them more knowledge and more prepared than I was before. However, the most good came from Instructor 2. He is by far one of the most underrated professors in the department, and that saddens me. You can tell that, that man enjoys teaching and helping other students. I cannot tell you the amount of times I've gone into to his office to ask questions on homework, or to get clarification on a final project. He also helps so much out of the classroom. I have gone to him to help me practice for multiple Interviews. He would spend his free time, to look over my resume, helping me perfect it. Most Importantly He was someone I could go talk to about my frustrations within the department or just in life in general. One other good part was Professor Cole. that man is one of the happiest and nicest people I've encountered at my time here.
4. Instructor 2 and the Instructor 3 were enormously helpful in every way and were the two reasons why I did not transfer or switch majors.
5. There were a few professors that were genuinely good at teaching difficult concepts. Tutoring and Labs were very accessible. Access to online materials such as Linkedin, Lynda, etc. were helpful and it certainly helps having free access to them. Many opportunities outside of classes to be involved with programming related subjects (seminars, programming competitions, etc.)
6. The lab (Fenton 115) was a great resource for CS students

7. The campus is easy to get to

Here are some adverse remarks made by senior students:

1. More upper level courses should be in computer labs. we need to be working with the code that with an instructor present and not just being send out on our own.
2. Some teachers are mean and bad
3. During my 4 years here at Fredonia, I encountered much bad than good within this department. Starting with Computer Science 2. Given that I had a different teacher for CS1, we did not start CS2 where my course left off. I think we started a good 2 chapters ahead. Instructor 5 decided for our first homework assignment that we should slightly modify the final exam from CS1 and update it with the new skills we've learned. I did not have him CS1 so therefore I did not have the project, and he gave us little time to make improvements. Another Issue I had with him, is I got very lost one week in class with the material he was teaching. I went to go see him for help, and he straight up told me that I just needed to work harder. He told me that I should be spending so much of my time studying for his course per week, instead of taking the time to sit down with me and help explain these new topics. He like other professors in the department did not grade our assignments or at least did not tell us our grades. I had no idea what any of my grades were before the final. Come time for final grades I got a B-. Based on the grades I did see, there was no way I should have gotten a B-. I emailed him and asked him for a breakdown of my grades. He apologized and said that I got an A-, not a B-. That is quite the difference in grades. Some of my other issues within this department is with the head of the department itself. Having a dual degree, I needed to make sure I got in the courses for both degrees in 4 years. I switched advisors, so that I could have Instructor 4. He was okay at it however, he constantly was trying to ignore my 2nd degree. Many of times he tried pushing courses that I was not ready for, saying oh you're smart, you can handle it, along the lines of advising he decided that he no longer wanted to advise me and gave me another advisor. This new advisor was new to the school and had no idea about anything between my 2 degrees and decided to question every override or equivalencies that I had. It is understandable but annoying. Another issue I have with Instructor 4, is that he put me on the flyer for the department without my permission. I have no desire to be on it. He asked me after he already printed all of these flyers up. My last main issue with this department is the fact that they tried to deny my graduation request. I got an email the Friday before spring break saying that I couldn't graduate. They claimed that I had not taken any of my 400 level electives. I in fact did and got A's in both. When I tried telling them that, with my transcript and hand, their claim was I didn't take the course I was advised to take which was ECommerce. The department had, without telling any of us dropped the course, which I tried explaining as well. Eventually we got it all worked out, but that is not a stress I needed to worry about this past semester.
4. I never felt welcome in the department. From day 1 I was told that the program is designed for those who have no prior experience, but it became clear that was not true. Though I tried my absolute best, I found a lack of support everywhere and was often talked down to by most faculty within the department. Even the former chair, refused to sign off on the paper that let me add the web minor, instead trying to talk me out of it. Later, when I needed an override, he threw a fit like a child because I needed him to sign the sheet. He sighed and slammed down a clipboard he had and did not speak a word to me. In addition, few things felt practical. Theory is great, but as far as employment goes, and college is supposed to prepare us for employment, we were only ever told that coding questions are asked at interviews but never given examples or made to work on examples. Material was rushed through so very quickly, leaving me behind and afraid to speak up. I do not think the money I paid for my degree from this department has been

	worth it. Many times, I was made to feel low about myself and dealt with thoughts of self-harm and even suicide. With many faculty members leaving, please think about what is best for students in the future. 5. The department doesn't focus enough on practical applications and hardware. 6. Overall the curriculum had way too many courses outside of major requirements. Difficult learning curve for transfer students due to differences in the programming languages used (from JCC to Fredonia). Not enough variety in CS electives, and not enough time to take electives with all the general credits needed. Some professors weren't helpful, and basically only read the lecture slides. Too much emphasis on the theory of programming rather than the practical application, while theory is important, syntax and problem solving should be focused on more. 7. You really need to teach Github and stay up to date with most relevant technology 8. We need more class offerings in upper level credits in CSIT

Appendix-I

State University of New York at Fredonia
Department of Computer and Information Sciences
2154 Fenton Hall (716) 673-4820

RUBRIC SHEET FOR ASSESSMENT OF PROGRAM OUTCOME H

Recognition of the need for and an ability to engage in continuing professional development

GRADUATING SENIORS EXIT SURVEY

Please check the appropriate entry, or choose the most suitable option, or fill the blanks for each of the question given below where possible.

Date: _____

1. You earned your B.S. degree in
   - Computer Science _____Advanced Computing Track /_____Software Development Track/ _____General Track
   - Computer Information Systems _____ Systems Development/ _____ System Management
   - Another major, but I got a minor in _____ Computer Science/ _____ Computer Information Systems

2. a. Year started at SUNY Fredonia_____ Year graduated_____
   b. Did you change your major? Yes _____ No_____
      If Yes:
         c. What was your previous major?_____
   d. Did you transfer from another college to SUNY Fredonia? Yes _____ No_____
      If Yes:
         e. How many credit hours did you transfer?
         Less than 30____ Between 30 and 60_____ Between 60 and 75____ Over 75____
         f. How many semesters overall you spent at college (at SUNY Fredonia and the college your transferred from)? _____
3. On a scale of 6 to 1 (with 6 being Excellent and 1 being very poor): How satisfied are you with your education at the Department of Computer and Information Sciences in SUNY Fredonia?

4. Did you participate in any independent study or group project?
- Yes
  b. No

5. Did take any of the courses (circle what is appropriate):
-
  - CSIT 499 Project,
  - CSIT 497 Thesis,
  - HONR 400 Thesis,
  - CSIT 400 Independent Study,
  - CSIT 300 Internship.

6. Did you attend any conferences, workshops, seminars to broaden knowledge and skills?
- Yes
  b. No

7. Do you already have a job offer?
- Yes
  b. No

If yes, is it related to your major?
- Yes
  b. No

8. Do you plan to attend graduate school?
- Yes, already accepted into graduate school; Field: _____
- Yes, applying now; Field: _____
- Yes, in the future
- No

9. List five courses you liked the most at Fredonia
a. _____
b. _____
c. _____
d. _____
e. _____

10. If you have a job offer, list four courses that were most beneficial to you in securing the job.
a. _____
b. _____
c. _____
d. _____

11. If you had the option to take more elective choices in the discipline, what topic areas would you have liked to have taken at SUNY Fredonia?

- _____
- _____
- _____
- _____

12. How accessible do you feel faculty offices and classrooms were?
(inaccessible)   1   2   3   4   5   (very accessible)

13. Do you think the access you had to workspace and equipment were sufficient for your coursework
(disagree)   1   2   3   4   5   (agree)

14. What activities or courses helped you most to understand the need to maintain currency in the discipline
_____
_____
_____

15. List what technology-related skills, if any, you have learned outside classes at SUNY Fredonia
_____
_____
_____

16. Do you have a positive remark/comment(s) to share?
_____
_____
_____

17. Do you have a negative remark/comment(s) to share?
_____
_____
_____