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

ASSESSMENT PLAN

1. **Goals for student learning:**
   In accordance with the department mission to provide outstanding education to its students we expect our graduates to be able to:

   1. Demonstrate core knowledge of computing/information technology and demonstrate robust programming skills.
   2. Be familiar with the computer organization and system software.
   3. Clearly communicate the computer science/computer information systems concepts.
   4. Be able to analyze a real-life problem, identify and define computing requirements for its solution and use appropriate software to solve it.

2. **Methods of assessment:**
   The formal assessment of **Goal 1** is done though the advanced programming courses CSIT 221 Computer Science II and CSIT 205 Visual Basic II. Each of our majors and minors is required to take one of these basic courses. Both courses require extensive programming and problem solving. The programs are thoroughly reviewed and graded by the instructors. The instructors provide the Assessment Committee Chair with a portfolio of a number of assignments. The Assessment Committee applies a rubric sheet and simple statistical methods (mean, median, frequency distribution, and others) to assess Goal 1.

   Goal 2 is assessed through the courses CSIT 311 Assembly Language and Computer Organizations and CSIT 312 Computer Structures. They are mandatory for all our majors and provide knowledge about fundamental computing concepts about the hardware and system software. At the end of the courses, before the exam week, the instructors give a short quiz prepared by the Assessment Committee to all students. The quiz papers are collected by the Assessment Committee chair. Then the Committee Members apply a rubric system developed to specifically assess the achievement of Goal 2 as well as simple statistical methods.

   The department offers a number of speaking intensive courses (CSIT 413, CSIT 425, CSIT 437, CSIT 462, and CSIT 441) requiring at least two oral presentations using a projector and Power Point slides. After the presentation, the students are asked questions by the audience and the instructor. Both peer evaluation and instructor evaluation are applied. The students submit the presentations to the instructor. These speaking intensive courses are used to assess **Goal 3**. The instructors provide the Chair of Assessment Committee with the student portfolio containing the presentations and the evaluation forms. The Assessment Committee reviews the gathered data and draws inferences about Goal 3 using a rubric system.

All our majors and minors are required to take at least one course at 400-level. These courses develop analytical skills for problem solving of real-life problems requiring the identification of problem specification and application of appropriate software to solve it. The problem solution is usually in the form of a substantial computer project. Thus, these courses are most appropriate to assess **Goal 4**. The Assessment Committee identifies three 400-level courses every year when Goal 4 is assessed, collects the projects and the student grades in these courses, reviews them and assesses Goal 4.

In addition to the above assessment, we survey all our graduates using the attached form and use the information to refine the assessment of our programs testing statistical hypotheses and correlations. The results are used to improve learning in our discipline.

3. Time line:

Every year a specific goal is assessed. The final report is submitted at the end of the Spring semester by the Chair of Assessment Committee. The Department then looks for ways to initiate changes to improve the program.

4. Assignment of responsibility:

The instructors offering the courses used to assess a specific goal are informed by the Chair of the Assessment Committee what data they have to collect. They gather the required information and present it to the Department Assessment Committee during the week after the Fall and Spring final exams. The Assessment Committee performs the assessment applying the specified techniques. The committee chair will report the findings to the department chair no later than two weeks after the final exam week.

5. Record keeping:

At the end of each academic year, the department chair submits an annual report to the Dean of Arts & Sciences. This report includes a summary of the department's assessment activities for that year. The data is also kept by the chair of the Assessment Committee and is available to all those with a demonstrable need to know.

6. Processes for using assessment results to improve learning:

The Department Chair will share the findings with the faculty, who look for evidence that the goals are being met, or for indications of problems. If problems have been identified, the Assessment Committee studies them in detail and proposes changes during the following academic year. If necessary, they can make recommendations for the following academic year. The results from assessments performed during the year, will be reviewed at the end of the academic year by those instructors who taught the courses during that year and they may initiate changes to improve the program as well.

References:

1. V. Sazawal et al. Assessment of student learning in computer science education, Journal of Computing Sciences in Colleges, Vol. 19 (2) 2003
2. G. W. Snedecor, W. G. Cochran, Statistical Methods, Iowa State University Press, 978-0813815619

Prepared by Dr. Barneva. Presented to the Department on November 1, 2010. Approved by the Department through paper ballot on November 16, 2010. Sent to Dr. Ingrid Johnston-Robledo on November 19, 2010.

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RUBRIC SHEET FOR ASSESSMENT OF GOAL 1

"Demonstrate core knowledge of computing/information technology and demonstrate robust programming skills"

Performance Indicator	Inadequate	Approaches Standard	Meets Standard	Exceeds Standard
Demonstrate knowledge of and skill regarding the syntax and semantics of a high level programming language, its control structures, and its basic data representations	The program does not produce correct results.	The program produces correct results but does not display them correctly.	The program works and produces the correct results and displays them correctly. It also meets the specifications.	The program works and meets all of the specifications. It is commented out well.
Demonstrate knowledge of and skill regarding common data abstraction mechanisms (e.g., data types or classes such as arrays, files, stacks, classes, etc.)	Does not demonstrate knowledge about ADT/class such as an array, file, stack, etc.).	Demonstrates knowledge about ADT/class such as an array, file, stack, etc.).	Select an ADT/class appropriate for a given task and appropriately use it.	Extend a given ADT/class with additional features or use it for an application.
Demonstrate knowledge of and skill regarding program correctness issues and practices (e.g., testing program results, test data design, loop invariants)	No output.	Determine whether a program operates correctly on a single example.	Test the program on a supplied data set.	Develop and implement a set of test data for a given problem.

Adapted from Winona State University by Dr. Barneva.

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QUESTION SHEET FOR ASSESSMENT OF GOAL 2

"Be familiar with the computer organization and system software"

The students are asked to answer the following questions:

1. (system software) Distinguish between the terms "translation," "interpretation," and "compilation."

2. (system software) Describe the functions of the operating system.

3. (computer organization) Describe various storage media that could be used as secondary storage devices. Describe major characteristics of disk storage.

4. (computer organization) Describe the functions of CPU.

The Assessment Committee evaluates each question using the scale:

Inadequate
Approaches Standards
Meets Standards
Exceeds Standards

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RUBRIC SHEET FOR ASSESSMENT OF GOAL 3

"Clearly communicate the computer science/computer information systems concepts"

KNOWLEDGE:
Shows an understanding of the material
Able to answer questions

Mostly agree *4 3 2 1 0* *Least agree*

LENGTH:
Long enough to adequately cover assigned material

Mostly agree *4 3 2 1 0* *Least agree*

CONTENT:
Topic covered thoroughly
Enough information given to understand topic
Did not exclude any important information or include any unnecessary information

Mostly agree *4 3 2 1 0* *Least agree*

DESIGN:
Very creative
Easy to see and follow
Did not include any unnecessary graphics

Mostly agree *4 3 2 1 0* *Least agree*

HANDS-ON ACTIVITY:
Included class in the learning process
Did more than lecture to the class

Mostly agree *4 3 2 1 0* *Least agree*

Adapted from Rubrician.com by Dr. Barneva.

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RUBRIC SHEET FOR ASSESSMENT OF GOAL 4

"Be able to analyze a real-life problem, identify and define computing requirements for its solution and use appropriate software to solve it"

Performance Indicator	Inadequate	Approaches Standard	Meets Standard	Exceeds Standard
Specifications	The software is producing incorrect results.	The software produces correct results but does not display them correctly.	The software works and produces the correct results and displays them correctly. It also meets most of the other specifications.	The software works and meets all of the specifications.
Readability	The code is poorly organized and very difficult to read.	The code is readable only by someone who knows what it is supposed to be doing.	The code is fairly easy to read.	The code is exceptionally well organized and very easy to follow.
Reusability	The code is not organized for reusability.	Some parts of the code could be reused in other programs.	Most of the code could be reused in other programs.	The code could be reused as a whole or each routine could be reused.
Documentation	The documentation is simply comments embedded in the code and does not help the reader understand the code.	The documentation is simply comments embedded in the code with some simple header comments separating routines.	The documentation consists of embedded comment and some simple header documentation that is somewhat useful in understanding the code.	The documentation is well written and clearly explains what the code is accomplishing and how.
Efficiency	The code is huge and appears to be patched together.	The code is brute force and unnecessarily long.	The code is fairly efficient without sacrificing readability and understanding.	The code is extremely efficient without sacrificing readability and understanding.

Adapted from California State University, Long Beach by Dr. Barneva

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SURVEY OF COMPUTER SCIENCE/COMPUTER INFORMATION SYSTEMS GRADUATES

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

1. You earned your B.S. degree in
    a. Computer Science
    b. Computer Information Systems
2. Year started at SUNY Fredonia_____ Year graduated_____
   Overall years spent at college (for transferred students)_____
3. How satisfied are you with your education at the Department of Computer Science in SUNY Fredonia?
    a. Excellent
    b. Good
    c. Average
    d. Poor
    e. Very Poor
4. Do you already have a job?
    a. Yes b. No
5. Are you admitted to graduate school?
    a. Yes b. No
6. Is your employment or graduate school related to your major?
    a. Yes
    b. No
7. How well your education at Fredonia prepared you for employment or graduate school?
    a. Excellent
    b. Good
    c. Average
    d. Poor
    e. Very Poor

6. Please recall your first computer science related job after you completed the B.S. degree at SUNY Fredonia. In your opinion, what were the five most important computer information sciences courses taken at Fredonia which helped you obtain your first job or prepared you for graduate examinations (GRE).:

a. _____
b. _____
c. _____
d. _____
e. _____

7. If you are working or going to graduate school in the computer science field, please list the five most important computing-related topic areas that have had significant impact on your profession or your graduate studies.

a. _____
b. _____
c. _____
d. _____
e. _____

8. 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?

a. _____
b. _____
c. _____
d. _____
e. _____

Optional Information

Name_____ Employer _____

Email address _____ Position _____

Prepared by Dr. Khalid Siddiqui

CURRICULUM MAPS

A mapping of Computer Information Systems courses to goals:

CSIT 151	Introduction to Information Systems	Goal 1
CSIT 105	Visual BASIC I	Goal 1
CSIT 121	Computer Science I	Goal 1
CSIT 205	Visual BASIC II	Goal 1
CSIT 221	Computer Science II	Goal 1
CSIT 107	Web Programming I	Goal 1
CSIT 207	Web Programming II	Goal 1
CSIT 251	Information Systems Structures	Goals 2, 4
CSIT 312	Computer Structures	Goal 2
CSIT 351	Business Systems Development	Goal 4

Departmental Electives

CSIT 203	Multimedia Systems	Goal 1
CSIT 241	Discrete Math for Computer Science I	Goal 2
CSIT 335	Data Communications/Networks I	Goal 2
CSIT 341	Data Structures	Goal 1
CSIT 425	Software Engineering	Goals 3, 4
CSIT 435	Data Communications/Networks II	Goals 2, 4
CSIT 455	Relational/Object Databases	Goals 3, 4
CSIT 456	Information and Decision Support Systems	Goals 3, 4
CSIT 461	Intro to AI and Knowledge Engineering	Goals 3, 4
CSIT 462	Computer Graphics	Goals 3, 4
CSIT 463	Intro DIP/Computer Vision	Goal 4
CSIT 471	Information Systems Management	Goal 4
CSIT 473	Data Warehouse and Mining	Goal 4
CSIT 475	Electronic Commerce	Goal 4

A mapping of Computer Science courses to goals:

CSIT 121	Computer Science I	Goal 1
CSIT 221	Computer Science II	Goal 1
CSIT 224	Problem Solving using Objects	Goal 1
CSIT 231	System Programming	Goal 1
CSIT 241	Discrete Math for Computer Science I	Goal 1
CSIT 311	Assembly Language/Computer Organization	Goal 2
CSIT 321	Paradigms of Programming Language	Goals 1, 2
CSIT 341	Date Structures	Goals 1, 2
CSIT 242	Discrete Math for Computer Science II	Goal 2
CSIT 413	Computer Architecture	Goals 2, 3, 4
CSIT 425	Software Engineering	Goals 3, 4
CSIT 431	Intro to Operating Systems	Goal 2, 3
CSIT 433	Compiler Construction	Goal 2, 3
CSIT 437	Advanced Operating Systems	Goal 2, 3

Departmental Electives

CSIT411	Programming for Embedded Microcontrollers	Goals 2
CSIT435	Data Communications/Networks II	Goals 2, 3, 4
CSIT441	Analysis/Design of Algorithms	Goals 3, 4
CSIT443	Theory of Computation	Goals 1, 2
CSIT455	Relational/Object Databases	Goal 4
CSIT461	Intro to AI and Knowledge Engineering	Goal 4
CSIT462	Computer Graphics	Goals 3, 4
CSIT463	Intro DIP/Computer Vision	Goal 4

Prepared by Dr. Barneva.