State University of New York at Fredonia

Department of Computer and Information Sciences

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**SUNY Fredonia**

**Department of Computer and Information Sciences**

**Assessment Plan of the Program Outcomes Aligned to ABET Criteria for Computer Information Systems**

**A. An ability to apply knowledge of computing and mathematics appropriate to the discipline:**

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| **Performance Criteria** | **Curriculum Map (Where Developed)** | **Where Assessed** | **Assessment Method** |
| A1. Demonstrates an understanding of basic data structures and their representation | CSIT 121, 221, 341,  CSIT 205 | CSIT  221, 205 | Selected questions extracted from course examinations and assignments; selected components of course projects |
| A2. Demonstrates an understanding of a high-level programming language and software design | CSIT 121, 105, 221, CSIT 205 | CSIT 205, 221 | Selected questions extracted from course examinations and assignments; selected components of course projects |
| A3. Demonstrates an understanding of number systems and digital logic | CSIT 241, 312 | CSIT 312 | Selected questions extracted from course examinations and assignments |
| A4. Demonstrates an understanding of computer organization and architecture | CSIT 242, 312 | CSIT 312 | Selected questions extracted from course examinations and assignments |
| A5. Demonstrates an understanding of analysis of algorithms | CSIT 205, 221, 341 | CSIT 221, 205 | Selected questions extracted from course examinations and assignments; selected components of course projects |

**RUBRIC SHEET FOR ASSESSMENT OF PROGRAM OUTCOME A.**

***An ability to apply knowledge of computing and mathematics appropriate to the discipline***

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| **Performance Criteria** | **Inadequate** | **Approaches Standard** | **Meets Standard** | **Exceeds Standard** |
| A1. Demonstrates an understanding of basic data structures and their representation. | Does not demonstrate knowledge about ADT such as an array, file, stack, etc.). | Demonstrates knowledge about ADT such as an array, file, stack, etc.). | Select an ADT appropriate for a given task and appropriately use it. | Extend a given ADT with additional features or use it for an application. |
| A2. Demonstrates an understanding of a high-level programming language and software design | Does not demonstrate ability to use objects. | Demonstrates the ability to use simple operations on predefined classes and declare simple classes. | Demonstrates the ability to recognize the need for simple design patterns and declare/extend appropriate data structures to meet the design needs. | Demonstrates the ability to extend a given data structure with additional features or use it in an application in a way that integrates multiple design concepts. |
| A3. Demonstrates an understanding of number systems and digital logic | Does not demonstrate knowledge of number systems and digital logic. | Able to convert numbers from one digital system to another. Basic understanding of digital logic. | Conversion from decimal to binary. Operations on binary and hexadecimal numbers. Able to perform basic Boolean operations. | Conversion from one number system to another. Operations in it. Able to apply in practice Boolean functions and a composition of them. |
| A4. Demonstrates an understanding of computer organization and architecture. | No understanding about the computer organization. | Basic understanding about the computer organization. | Ability to describe the functions of the memory, CPU, and peripherals. | Complete understanding of the computer organization. Ability to use the knowledge in solving practical problems. |
| A5. Demonstrates an understanding of analysis of algorithms | The algorithm does not work correctly. | The algorithm works correctly in some cases. | The algorithm works correctly in the general case and in the special cases. | The algorithm is efficient and works correctly in the general case and in the special cases. |

**B. An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution**

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| **Performance Criteria** | **Curriculum Map (Where Developed)** | **Where Assessed** | **Assessment Method** |
| B1. Demonstrates abilities to develop and design a model for the problem | CSIT 351, 425 | CSIT 351 | Selected components of course projects and assignments |
| B2. Demonstrates competency in analyzing models using appropriate paradigms and following standard practices | CSIT 351, 425, 471, 473 | CSIT 351 | Selected questions extracted from course examinations and assignments |
| B3. Demonstrates competency in determining physical resources and the time required to come to a the solution | CSIT 351, 425  471, 473 | CSIT351 | Selected questions extracted from course examinations and assignments; selected components of course projects |

**RUBRIC SHEET FOR ASSESSMENT OF PROGRAM OUTCOME B.**

***An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution***

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| **Performance Criteria** | **Inadequate** | **Approaches Standard** | **Meets Standard** | **Exceeds Standard** |
| B1. Demonstrates abilities to develop and design a model for the problem | Fails to develop and design a model | Is able to develop and design partially a model | Is able to able to develop and design completely a model | Is able to develop and design completely and extend the model to similar problems |
| B2. Demonstrates competency in analyzing models using appropriate paradigms and following standard practices | Does not demonstrate competency in analyzing models and following standard practices | Is able to analyze models using appropriate paradigms but does not follow standard practices | Ability to analyze models using appropriate paradigms and follow standard practices. | Is able to analyze variety of models consistently and following standard practices |
| B3. Demonstrates competency in determining physical resources and the time required to come to a solution | Has no idea of determining resources and time for a solution | Is able to calculate the memory size of the solution but fails to compute time complexity of proposed solution | Ability to calculate memory size and time complexity of the proposed solution. | Ability to calculate the time complexity and memory size of the proposed solution and work backwards to optimize the solution |

**C. An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs**

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| **Performance Criteria** | **Curriculum Map (Where Developed)** | **Where Assessed** | **Assessment Method** |
| C1. Demonstrates competency in system design | CSIT 425, 351 | CSIT 351 | Selected questions extracted from course examinations and assignments; selected components of course projects |
| C2. Demonstrates ability in eliciting requirements | CSIT 425, 351 | CSIT 351 | Selected questions extracted from course examinations and assignments; selected components of course projects |
| C3. Demonstrates competency in developing project metrics | CSIT 425, 351 | CSIT 351 | Selected questions extracted from course examinations and assignments; selected components of course projects |
| C4. Demonstrates competency in testing a completed application for compliance with all required test conditions. | CSIT 425, 351 | CSIT 351 | Selected questions extracted from course examinations and assignments; selected components of course projects |
| C5. Demonstrates competency in comparing alternative solutions and selecting the optimal one | CSIT 425, 351 | CSIT 351 | Selected questions extracted from course examinations and assignments; selected components of course projects |

**RUBRIC SHEET FOR ASSESSMENT OF PROGRAM OUTCOME C**

***An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs***

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| **Performance Criteria** | **Inadequate** | **Approaches Standard** | **Meets Standard** | **Exceeds Standard** |
| C1. Demonstrates competency in system design | Is unable to match the problem to the desired solution parameters | Is able to design a system in its initial form to meet desired needs | Is able to design and implement a system to meet desired needs | Is able to design and implement and evaluate a system to meet desired needs |
| C2. Demonstrates ability in eliciting requirements | Inability to arrive at requirements of the system | Is able to specify some of the requirements of the system | Is able to specify all of the requirements of the system | Is able to specify all the requirements of the system and modify the requirements based on elicitation process |
| C3. Demonstrates competency in developing project metrics | Inability to develop project metrics | Is able to define part of the project metrics | Ability to develop all of the project metrics | Is able to evolve and modify project metrics during the development process |
| C4. Demonstrates competency in testing a completed application for compliance with all required test conditions. | Inability in testing any aspect of an application for compliance with all required test conditions. | Is able to test some aspects of an application for compliance with all required test conditions. | Ability in testing a completed application for compliance with all required test conditions. | Ability in testing and modifying a completed application for compliance with all required test conditions. |
| C5. Demonstrates competency in comparing alternative solutions and selecting the optimal one | Inability to develop a single solution | Is able to analyze at least one solution | Is able to specify alternative solutions and select optimal one | Is able to estimate time and size requirements for all the solutions and justify the optimal solution |

**D. An ability to function effectively on teams to accomplish a common goal**

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| **Performance Criteria** | **Curriculum Map (Where Developed)** | **Where Assessed** | **Assessment Method** |
| D1. Demonstrates ability to document well the work | CSIT 351, 425, 435, 455, 456, 461, 462, 463, 475 | CSIT 351 | Project portfolio |
| D2. Demonstrates ability to communicate with team members, listen actively, provide feedback and share information | CSIT 351, 425, 435, 455, 456, 461, 462, 463, 475 | CSIT 351 | Peer evaluation report |
| D3. Demonstrates the ability to validate research on an assigned relational database systems topic using empirical evidence to support claims. | CSIT 351, 351, 455 | CSIT 351 | Peer evaluation report, project portfolio |
| D4. Demonstrates ability to meet deadlines | CSIT 425, 435, 455, 456, 461, 462, 463, 475, | CSIT 351 | Peer evaluation report, project portfolio |

**RUBRIC SHEET FOR ASSESSMENT OF PROGRAM OUTCOME D**

***An ability to function effectively on teams to accomplish a common goal***

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| **Performance Criteria** | **Inadequate** | **Approaches Standard** | **Meets Standard** | **Exceeds Standard** |
| D1. Demonstrates ability to document well the work | Unable to produce documentation of work done | Ability to produce some documentation covering only some part of the work done | Is able to describe the work done in well formatted report | Ability to prepare consistent, regular and coherent description of work in standard format |
| D2. Demonstrates ability to communicate with team members, listen actively, provide feedback and share information | Does not communicate with team members effectively | Is able to communicate with team members but does not provide information or feedback | Ability to communicate with team members and share information with them | Ability to coordinate well with team members and motivate them to work |
| D3. Demonstrates ability to validate research on an assigned relational database systems topic using empirical evidence to support claims. | Does not demonstrate the ability to validate research on an assigned relational database systems topic using empirical evidence to support claims. | Is able to partially demonstrate the ability to validate research on an assigned relational database systems topic using empirical evidence to support claims. | Is able to demonstrate full ability to validate research on an assigned relational database systems topic using empirical evidence to support claims. | Ability to demonstrate full ability to validate research and extend it on an assigned relational database systems topic using empirical evidence to support claims. |
| D4. Demonstrates ability to meet deadlines | Usually demands an extension in the deadline | Is able to meet some but not all requirements by the deadline | Is generally able to submit the project on time | Is able to finish the project ahead of the time |

**E. An understanding of professional, ethical, legal, security and social issues and responsibilities**

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| **Performance Criteria** | **Curriculum Map (Where Developed)** | **Where Assessed** | **Assessment Method** |
| E1.Understands the ethical issues related to technology | CSIT 201, 251, 435 | CSIT 251 | Selected questions extracted from course examinations and assignments |
| E2. Understands the security issues and problems of identity theft | CSIT 201, 251 | CSIT 251 | Selected questions extracted from course examinations and assignments |
| E3. Demonstrates knowledge about the characteristics of different malware types and the differences between them. | CSIT 201, 251 | CSIT 251 | Selected questions extracted from course examinations and assignments |

**RUBRIC SHEET FOR ASSESSMENT OF PROGRAM OUTCOME E**

**An understanding of professional, ethical, legal, security and social issues and responsibilities**

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| **Performance Criteria** | **Inadequate** | **Approaches Standard** | **Meets Standard** | **Exceeds Standard** |
| E1.Understands the ethical issues related to technology | Unable to relate ethics to use of technology | Able to understand only partially the ethical issues with technology | Ability to understand ethical issues in using technology | Ability to understand ethical issues in technology and determine relevant issues in new situations |
| E2. Understands the security issues and problems of identity theft | Does not realize the importance of security and risks of ID theft | Is able to understand security concerns however not the ID theft risks | Ability to understand the risks and concerns with respect to security issues including ID theft | Ability to suggest correct course of action in a scenario where ID could be compromised |
| E3. Demonstrates knowledge about the various types of malware | Does not possess knowledge of various malware types | Can define viruses but does not know the difference between a virus and a worm | Ability to define all types of malware and differentiate between viruses and worms | In addition to meeting the standard, understands how viruses are structured and how they attack the host system |

**F. An ability to communicate effectively with a range of audiences**

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| **Performance Criteria** | **Curriculum Map (Where Developed)** | **Where Assessed** | **Assessment Method** |
| F1. Demonstrates an ability of good verbal skills | Oral communication courses incl. CSIT425, CSIT455, CSIT462 | Any oral comm. course | Instructor’s report; Peer evaluation report |
| F2. Demonstrates good knowledge of presentation software | Oral communication courses incl. CSIT425, CSIT455, CSIT462 | Any oral comm. course | Instructor’s report; Peer evaluation report |
| F3. Demonstrates an ability of good organization of the talk | Oral communication courses incl. CSIT425, CSIT455, CSIT462 | Any oral comm. course | Instructor’s report; Peer evaluation report |
| F4. Demonstrates knowledge of the topic | Oral communication courses incl. CSIT425, CSIT455, CSIT462 | Any oral comm. course | Instructor’s report; Peer evaluation report |

**RUBRIC SHEET FOR ASSESSMENT OF PROGRAM OUTCOME F**

***An ability to communicate effectively with a range of audiences***

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| **Performance Criteria** | **Inadequate** | **Approaches Standard** | **Meets Standard** | **Exceeds Standard** |
| F1. Demonstrates an ability of good verbal skills | Reads from script; does not face audience; gaps in material, breaks down during presentation | Ability to complete the presentation although without showing confidence | Confidently presents the topic and faces the audience | Excellent presentation and interaction with the audience throughout the talk |
| F2. Demonstrates good knowledge of presentation software | Does not know how to start or resume presentation; spends long time adjusting the presentation software | Able to use standard features of presentation software with some help from audience | Uses standard features of presentation software with confidence and without help from audience | Able to control the presentation fully and the presentation uses advanced features of the host software |
| F3. Demonstrates an ability of good organization of the talk | The talk is haphazard with no real organization | Able to define an outline in the beginning but does not follow it in the presentation | Follows outline and presents a coherent talk with distinct sections | Presents an unusually brilliant talk with clear objectives and coherent structure |
| F4. Demonstrates knowledge of the topic | It is obvious that the speaker is unfamiliar with the topic | Shows some knowledge of the topic but does not answer related questions | Demonstrates full knowledge of the topic and handles questions well | Ability to command the topic and respond with various options to show thorough knowledge of the topic |

**G. An ability to analyze the local and global impact of computing on individuals, organizations, and society.**

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| **Performance Criteria** | **Curriculum Map (Where Developed)** | **Where Assessed** | **Assessment Method** |
| G1. Demonstrates an ability to analyze the local and global impact of computing on individuals | CSIT 201, 251, 456 | CSIT 251 | Selected questions extracted from course examinations and assignments; selected components of course projects |
| G2. Demonstrates an ability to analyze the local and global impact of computing organizations and society | CSIT 201, 251, 456 | CSIT 251 | Selected questions extracted from course examinations and assignments; selected components of course projects |

**RUBRIC SHEET FOR ASSESSMENT OF PROGRAM OUTCOME G**

**An ability to analyze the local and global impact of computing on individuals, organizations, and society**

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| --- | --- | --- | --- | --- |
| **Performance Criteria** | **Inadequate** | **Approaches Standard** | **Meets Standard** | **Exceeds Standard** |
| G1. Demonstrates an ability to analyze the local and global impact of computing on individuals | Does not realize the scope and impact of computing on individuals | Ability to relate to at least one aspect of impact of computing on individuals | Ability to understand the scope and impact of computing on individuals and relate to it | Ability to determine best computing practices to enhance the positive impact on individuals |
| G2. Demonstrates an ability to analyze the local and global impact of computing organizations and society | Does not realize the scope and impact of computing on organizations and society | Ability to relate to at least one aspect of impact of computing on organizations and society | Ability to understand the scope and impact of computing on organizations and society and relate to it | Ability to determine best computing practices to enhance the positive impact on organizations and society |

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

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| **Performance Criteria** | **Curriculum Map (Where Developed)** | **Where Assessed** | **Assessment Method** |
| H1. Participates in independent studies, theses, projects, internships | CSIT 300, CSIT 400, CSIT 499, CSIT 497 | CSIT 300, 490, 499, 497 | Graduating Senior Exit Survey |
| H2. Demonstrates ability to learn skills related to new technology and research. | Advisement | Outside class | Graduating Senior Exit Survey |
| H3. Understands the need to maintain currency in the discipline | Advisement | Outside class | Graduating Senior Exit Survey |

**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

* 1. Computer Science \_\_\_\_\_\_Advanced Computing Track /\_\_\_\_\_\_\_Software Development Track/ \_\_\_\_\_General Track
  2. Computer Information Systems \_\_\_\_\_\_\_ Systems Development/ \_\_\_\_\_\_\_ Systems Management
  3. 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?

1. Yes b. No

5. Did take any of the courses (circle what is appropriate):

1. CSIT 499 Project,
2. CSIT 497 Thesis,
3. HONR 400 Thesis,
4. CSIT 400 Independent Study,
5. CSIT 300 Internship.

6. Did you attend any conferences, workshops, seminars to broaden knowledge and skills?

1. Yes b. No

7. Do you already have a job offer?

1. Yes b. No

If yes, is it related to your major?

* 1. Yes b. No

8. Do you plan to attend graduate school?

1. Yes, already accepted into graduate school; Field: \_\_\_\_\_\_\_\_\_\_\_
2. Yes, applying now; Field: \_\_\_\_\_\_\_\_\_\_\_\_\_
3. Yes, in the future
4. 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?

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

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

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

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

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**I. An ability to use current techniques, skills, and tools necessary for computing practice.**

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| **Performance Criteria** | **Curriculum Map (Where Developed)** | **Where Assessed** | **Assessment Method** |
| I1. Demonstrates competency in programming or work with systems | CSIT 121, 221, 203, 208, 306 | CSIT 221, 205 | Selected questions extracted from course examinations and assignments; selected components of course projects |
| I2. Demonstrates competency in web programming (HTML, HTML5, CSS, PHP, SQL, Ruby on Rails, Android) | CSIT 107, 207, 307,  333 | CSIT 107 | Selected questions extracted from course examinations and assignments; selected components of course projects |

**RUBRIC SHEET FOR ASSESSMENT OF PROGRAM OUTCOME I**

***An ability to use current techniques, skills, and tools necessary for computing practice***

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| --- | --- | --- | --- | --- |
| **Performance Criteria** | **Inadequate** | **Approaches Standard** | **Meets Standard** | **Exceeds Standard** |
| I1. Demonstrates competency in programming or work with systems | Cannot write a single program without syntax and semantic mistakes | Is able to write a program with correct syntax but it does not achieve the target | Ability to write program that achieves the target and it is free from syntax errors | Ability to write program that achieves target and extends functionality further |
| I2. Demonstrates competency in HTML & CSS programming | Cannot write a single HTML & CSS program without syntax and semantic mistakes | Is able to write a HTML & CSS program with correct syntax but it does not achieve the target | Ability to write HTML & CSS program that achieves the target and it is free from syntax errors | Ability to write HTML & CSS program that achieves target and extends functionality further |

**J. An understanding of processes that support the delivery and management of information systems within a specific application environment.**

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| **Performance Criteria** | **Curriculum Map (Where Developed)** | **Where Assessed** | **Assessment Method** |
| J1. Demonstrates an understanding of processes that support the delivery of business information systems | CSIT 151, 251, 351 | CSIT 351 | Selected questions extracted from course examinations and assignments; selected components of course projects |
| J2. Demonstrates an understanding of processes that support the management of business information systems | CSIT 251, 351, 471 | CSIT 351 | Selected questions extracted from course examinations and assignments; selected components of course projects |
| J3. Demonstrates an understanding of fundamentals of a modern programming language and data management for business information systems | CSIT 251, 351, 471 | CSIT 351 | Selected questions extracted from course examinations and assignments; selected components of course projects |
| J4. Demonstrates an understanding of systems analysis, design and role of business information systems | CSIT 251, 351, 471 | CSIT 351 | Selected questions extracted from course examinations and assignments; selected components of course projects |

**RUBRIC SHEET FOR ASSESSMENT OF PROGRAM OUTCOME J**

**J. An understanding of processes that support the delivery and management of information systems within a specific application environment.**

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| --- | --- | --- | --- | --- |
| **Performance Criteria** | **Inadequate** | **Approaches Standard** | **Meets Standard** | **Exceeds Standard** |
| J1. Demonstrates an understanding of processes that support the delivery of business information systems | Cannot demonstrate an understanding of processes that support the delivery of business information systems | Can demonstrate an understanding of processes that support the delivery of business information systems | Can demonstrate and apply an understanding of processes that support the delivery of business information systems | Ability to use an understanding of processes that support the delivery of business information systems |
| J2. . Demonstrates an understanding of processes that support the management of business information systems | Cannot demonstrate an understanding of processes that support the management of business information systems | Can demonstrate an understanding of processes that support the management of business information systems | Can demonstrate and apply an understanding of processes that support the management of business information systems | Ability to use an understanding of processes that support the management of business information systems |
| J3. Demonstrates an understanding of fundamentals of a modern programming language and data management used for information systems | Cannot demonstrates an understanding of fundamentals of a modern programming language and data management used for information systems | Is able to demonstrates an understanding of fundamentals of a modern programming language and data management used for information systems | Can apply an understanding of fundamentals of a modern programming language and data management used for information systems | Ability to use nicely an understanding of fundamentals of a modern programming language and data management used for information systems |
| J4. Demonstrates an understanding of systems analysis, design and role of business information systems | Cannot demonstrates an understanding of systems analysis, design and role of business information systems | Can demonstrates an understanding of systems analysis, design and role of business information systems | Can independently apply an understanding of systems analysis, design and its role to business information systems | Has ability to apply an understanding of systems analysis, design and extend its role to business information systems |