COMPUTER SCIENCE Program

ISLOs, PSLOs, CSLOs, Mapping, and Assessment Plan

		Year 1		Year 2		Year 3		Year 4		Year 5		Year 6	
		F 2013	S 2014	F 2014	S 2015	F 2015	S 2016	F 2016	S 2017	F 2017	S 2018	F 2018	S 2019
INSTITUTIONAL STUDENT LEARNING OUTCOMES - ISLOs													
ISLO 1	**COMMUNICATION**												
1A	Read												
1B	Listen												
1C	Write												
1D	Dialogue												
ISLO 2	**TECHNOLOGY AND INFORMATION COMPETENCY**												
2A	Demonstrate Technical Literacy												
2B	Apply Technology												
2C	Access Information												
2D	Evaluate and Examine Information												
ISLO 3	**CRITICAL AND CREATIVE THINKING**												
3A	Inquire												
3B	Analyze												
3C	Problem Solve												
3D	Express												
ISLO 4	**CITIZENSHIP**												
4A	Ethics												
4B	Diversity												
4C	Sustainability/Global Awareness												
4D	Personal Responsibility												
COMPUTER SCIENCE PROGRAM OUTCOMES - PSLOs	**Related ISLOs**												

PSLO A	Engage in continuous learning as well as research and assess new ideas and information to provide the capabilities for lifelong learning.	1A,1B,1C,1D,2A,2B,2C,2D,3A,3B,3C												
PSLO B	Read and interpret technical information, as well as listen effectively to, communicate orally with, and write clearly for a wide range of audiences.	1A,1B,1C,1D,2A,2B,2C,2D,3A,3B,3C												
PSLO C	Analyze a problem and craft an appropriate algorithmic solution.	1A,2A,2B,2C,2D,3A,3B,3C												
PSLO D	Apply knowledge of computing and mathematics appropriate to the discipline.	1A,2A,2B,2C,2D,3A,3B,3C												
PSLO E	Interpret data, think critically and apply the scientific method.	1A,2A,2B,2C,2D,3A,3B,3C												

COMPUTER SCIENCE CONCENTRATION AA or AS degree - same as the PSLOs.	
MANAGEMENT INFORMATION SYSTEMS CONCENTRATION AA or AS degree - same as the PSLOs.	
EMBEDDED SYSTEMS CONCENTRATION CERTIFICATE OF ACHIEVEMENT - same as the PSLOs.	
WEB PROGRAMMING CONCENTRATION CERTIFICATE OF ACHIEVEMENT - same as the PSLOs.	

	COMPUTER SCIENCE COURSE OUTCOMES - CSLOs	**Related PSLO**												
	CSCI 10 - Introduction to Computing		C - Completed, P- Planned											
CSLO 1	Describe the software development life-cycle.	B												
CSLO 2	Describe the principles of structured programming and be able to describe, design, implement, and test structured programs using currently accepted methodology.	C												
CSLO 3	Explain what an algorithm is and its importance in computer programming.	B,E												
CSLO 4	Explain moral and ethical issues in computer science.	B												
	CSCI 12 - Introduction to Object-Oriented Programming													

CSLO 1	Language fundamentals: students in CSCI-12 will learn and demonstrate basic proficiency in the mechanics of the Java programming language. Areas of proficiency include, but are not limited to, the following: Java overview and history; Java development environment; numbering systems, conversion, and language types; language syntax, structure, keywords, and statements; variables, constants, and datatypes; operators and precedence; forms of flow control (sequential, methods, selection/branching, looping/iteration); basic input/output techniques.	B,D												
CSLO 2	Object-oriented fundamentals: Students in CSCI-12 will apply language fundamentals in support of utilizing and creating Object-Oriented (O-O) software elements. Areas of proficiency include, but are not limited to, the following: definitions and distinctions of classes and objects; using existing Java classes; creating new Java classes; leveraging the Java API library; inheritance; abstract classes and interfaces; polymorphism.	D,E												
CSLO 3	Sound program organization: Students in CSCI-12 will originate new Object-Oriented (O-O) software, using language fundamentals and O-O fundamentals, in accordance with sound software development principles. Areas of proficiency include, but are not limited to, the following: overall program organization; data requirements definition; program structure, layout, readability, and documentation; large task decomposition/allocation into smaller software elements (methods); aggregation of data into appropriate software elements (classes, arrays, static vs noon-static classes); defensive programming (bounds and type checking, exception handling).	C,D												
CSLO 4	Problem-solving application: Students in CSCI-12 will apply language fundamentals, O-O fundamentals, and sound program organization techniques, for the purpose of applying them to various realistic, real-world problem solving scenarios. Representative situations may include, but are not limited to, the following: simple calculations; obtaining program from user input or in bulk; presenting or formatting output data; persisting program output data; developing simple object models from which to begin implementing software solutions; reusing past solutions in new applications; making appropriate problem assumptions and simplifications; class modeling.	C,D,E												
	CSCI 13 - Intermediate Object-Oriented Programming													
CSLO 1	Implement linear lists with arrays and linked objects.	C,D,E												
CSLO 2	Write programs that use the stack and queue data structures, based on provided specifications.	C,D,E												
CSLO 3	Produce intermediate-sized programs using Object-Oriented design principles, with a combination of written and provided code.	B,C,D,E												
CSLO 4	Identify effective techniques to test, debug, and document larger programs.	B,C,E												
CSLO 5	Write a program that uses recursive algorithms operating on a binary tree.	D,E												

	CSCI 14 - Data Structures												
CSLO 1	Apply algorithm analysis to the operations on data structures and interpret the results.	C, D,E											
CSLO 2	Describe and evaluate the operations and possible implementations of abstract data types for lists and trees.	B,C,D,E											
CSLO 3	Describe the operation and characteristics of sorting algorithms.	B,C,E											
CSLO 4	Describe the operation and application of graph algorithms.	B,C,E											
CSLO 5	Select and justify appropriate data structures and algorithms for complex programming tasks.	C,D,E											
	CSCI 21 - The Game Development Process												
CSLO 1	Identify and distinguish between various electronic game genres and platforms.	B											
CSLO 2	Describe, analyze and criticize a game based on its game play and reward system.	C											
CSLO 3	Write documentation (concept, proposal, manual) for an original game idea.	B											
CSLO 4	Evaluate different issues related to the game industry and culture (gender, violence, etc.).	A,B											
CSLO 5	Identify the different job positions needed in the game industry to design, create, and market an electronic game.	A											
	CSCI 24S - Programming for Mathematics and Science												
CSLO 1	Write computer programs that utilize fundamental programming constructs: variables, arrays, conditionals, loops, and functions.	C,D,E											
CSLO 2	Decompose a programming problem into smaller programs that are easier to reason about and write.	C.D.E											
CSLO 3	Read technical documentation and apply it to a programming problem.	B,C,D,E											
CSLO 4	Analyze the specifications for a simulation or computation and develop a plan for implementing it utilizing decomposition and structured programming techniques.	C,D,E											
	CSCI 26 - Discrete Structures for Computer Science												
CSLO 1	Perform binary and hexadecimal conversions of numbers.	D											
CSLO 2	Solve problems involving sets, relations, functions, and congruences.	C,D											
CSLO 3	Perform computations using recursively defined functions and structures.	C,D											
CSLO 4	Use methods of combinatorics to solve counting problems.	C,D											
CSLO 5	Illustrate the basic terminology and properties of graphs and trees.	C,D											
CSLO 6	Apply the binomial theorem to independent events and Bayes' theorem to dependent events.	C,D,E											

	CSCI 27 - Visual Basic .NET Programming I												
CSLO 1	User Interface Design: Demonstrate techniques for good program design, including making the interface easy for users as well as following guidelines for designing maintainable programs.	C											
CSLO 2	Variables, Constants, and Calculations: Differentiate between various data types, apply proper naming conventions, and declare variables/constants. Perform calculations, convert/format various data types, and use Try/Catch blocks for error handling.	C,D											
CSLO 3	Decisions and Conditions: Use IF statements to control program flow, evaluate conditions using comparison operators, and combine conditions using logical operators. Perform validation on numeric fields, use a CASE structure for multiple decisions, and debug projects using breakpoints.	C,D											
CSLO 4	Menus, Dialog Boxes, and Functions: Create menus for program control, display and use common dialog boxes, and write reusable code in sub procedures and functions.	B,C,D											
CSLO 5	Multiform Projects: Include multiple forms in an application, understand the various form events and how to handle them, and declare variables with the correct scope and access level for multiform projects.	C,D											
CSLO 6	Lists, Loops, and Printing: Differentiate between various types of lists, describe standard list operations, and use loops to process list elements. Send information to the printer using a loop to access each list element.	D,E											
	CSCI 28 - Independent Study												
CSLO 1													
CSLO 2													
CSLO 3													
	CSCI 39 - Introduction to Computer Architecture and Assembly Language												
CSLO 1	Write simple assembly language program segments.	C											
CSLO 2	Demonstrate how fundamental high-level programming constructs are implemented at the machine-language level.	C,E											
CSLO 3	Understand the internal representation of integer, floating point and non-numeric representation of data.	B											
CSLO 4	Explain addressing modes used to access data.	C,D,E		x									
CSLO 5	Use fundamental logic gates to design and implement combinational and sequential digital circuits.	C,D											
	CSCI 46 - System Programming with C												
CSLO 1	Use the standard C libraries for input/output, memory management, and networking.	B,C,D											

CSLO 2	Construct multi-file programs using appropriate software engineering tools.	B,C												
CSLO 3	Construct programs utilizing arrays, structures, loops, and/or subroutines.	C,E												
CSLO 4	Debug and add features to existing programs.	B,C												
	CSCI 50 - Introduction to UNIX/LINUX													
CSLO 1	Shell Commands: Understand the basic Linux shell commands : ls, cd, find, grep, ps, bash, tcsh, man, chmod, umask, rm, mkdir, sort, more. Utilize piping and redirection to construct more complex commands.	B												
CSLO 2	Regular expressions: Utilize regular expressions to search for, extract, and transform data from input.	C,D												
CSLO 3	Shell Programming: Construct shell programs utilizing control structures.	C												
CSLO 4	Linux man pages: Understand how to read man pages. Use the man command to find Unix/Linux commands to perform a specific operation.	B												
CSLO 5	Networking: Understand basic networking commands of ssh, sftp and how to use email.	B												
	CSCI 52 - Introduction to SQL		C - Completed, P- Planned											
CSLO 1	Express a database design in an Entity Relationship Diagram using industry-recognized symbologies.	B,C												
CSLO 2	Analyze the schema of an un-normalized database and transform it into equivalent 1st, 2nd, and 3rd Normal Forms.	B,C												
CSLO 3	Construct valid SQL commands to create tables corresponding to a written description or ERD.	B,E												
CSLO 4	Construct valid SQL commands to insert, modify, and delete data into/from the tables.	C,E												
CSLO 5	Based on written descriptions of the data to be selected and the format and ordering of the output, construct valid SQL commands to select data from one or more tables using joins, nested subqueries, functions, and/or operators where necessary.	B,C												
	CSCI 54 - Visual Basic .NET Programming II													
CSLO 1	Create a test plan and program using Visual Basic.NET to provide a solution to a well defined programming program.	B												
CSLO 2	Develop and use classes that have default properties, events, overloaded operators and inherited classes.	C,D,E												
CSLO 3	Compare the different collection classes available in Visual Basic.NET.	C,D,E												
CSLO 4	Use the Dataset Designer to 1) View the schema for the dataset of a data source; 2) Modify a query using Query Builder; 3) Preview the data for a query; 4) Review the SQL statements that are generated for a data source.	B,E												
CSLO 5	Use a multiple-document interface (MDI) for an application that includes menus, toolbars and status bars.	B,C												

	CSCI 55 - ASP.NET Programming (ARCHIVED)	
CSLO 1	Create a test plan and program using Visual Basic.NET to provide a solution to a well-defined programming problem.	B
CSLO 2	Demonstrate techniques used to validate input for a web form using ASP.net validation controls.	C,D
CSLO 3	Use the site navigation features to make it easier for users to navigate through the pages of a web site.	B,C
CSLO 4	Identify different state management techniques available in ASP.net. Use a cookie or query string to pass information from one page to another.	D,E
CSLO 5	Describe the use of these ADO.net components - data adapter, command, connection, data reader, dataset and data table.	D,E
	CSCI 59P - Web Programming with PHP	
CSLO 1	MySQL Basics: Understand the basics of MySQL and its application towards a dynamic web page.	B,D
CSLO 2	PHP Language: Understand the basics of PHP and its application with HTML.	B,D
CSLO 3	Develop Web Site: Demonstrate ability to design and implement a dynamic data-driven web site using PHP, HTML and MySQL.	C,E
	CSCI 59R - Ruby on Rails (ARCHIVED)	
CSLO 1	Ruby Programming Language: Understand the basics of the Ruby programming language.	B,C
CSLO 2	Model View Controller (MVC) Paradigm: Understand the Model/View/Controller (MVC) paradigm and how it is implemented in the Rails programming environment.	B,C
CSLO 3	Rails Website: Demonstrate ability to design and implement a dynamic data-driven web site using Ruby on Rails with a database backend.	D,E
	CSCI 62 - Web Programming I	
CSLO 1	Create navigation lists, create and use various types of links, and understand the difference between absolute and relative paths. Make an image map, understand how to link to various resources on the web, and work with hypertext attributes.	B,D
CSLO 2	Define style rules, demonstrate the use of style precedence and inheritance, and apply color using CSS. Use contextual selectors, work with attribute selectors, and apply text and font styles. Define list styles, use pseudo-classes, and create a rollover effect.	B,D
CSLO 3	Define and set a background image, use browser extension styles, and understand the difference between fixed, fluid, and elastic layouts. Set margins and padding, create rounded corners, use absolute and relative positioning, and work with overflow content, clipped objects, and stacked objects.	B,C

CSLO 4	Create headings and cells in a table, use cells that span multiple rows/columns, define row/column groups, and add a table summary. Understand the difference between formatting a table using attributes vs. using CSS styles, collapse table borders, and create a multi-column layout.	B,C												
CSLO 5	Create form elements including field sets, legends, in put boxes, labels, selection lists, radio buttons, text area boxes, check boxes, spinners, sliders, and form buttons. Apply styles to web forms, validate form data, and understand how web forms interact with web servers.	B,E												
CSLO 6	Explore audio/video file formats and embed an audio/video clip using a variety of techniques. Understand how to incorporate Flash video (as well as YouTube video) and embed a Java applet using a variety of techniques.	B,E												
	CSCI 63 - Web Programming II (ARCHIVED)		C - Completed, P- Planned											
CSLO 1	Create text and box shadows, work with filters, rotate an object using CSS3, and use linear gradients. Apply a border image, set the opacity, and apply print styles. Define the visual viewport, create a media query, and apply styles for mobile devices.	B,D												
CSLO 2	Understand the rules for creating valid XHTML documents and explore the relationship between HTML5 and XHTML. Apply a DTD to an XHTML document and test/validate that document under the strict DTD.	B,E												
CSLO 3	Create a script element, write text to a web page using JavaScript, understand and use basic JavaScript syntax, and work with various data types and variables. Create and call a JavaScript function, access an external JavaScript file, and use basic debugging techniques and tools.	B,C												
CSLO 4	Create and use event handlers, extract information from Date objects, and work with arithmetic operators. Control how JavaScript works with numeric values, explore conditional, comparison, and logical operators, and run time-delayed commands.	B,C												
CSLO 5	Create an array, populate and reference array elements, and work with array methods. Use various types of loops to repeat blocks of code, loop through the contents of an array, and work with ECMAScript5 array methods. Create conditional statements, use conditional statements with arrays and loops to create a table, and understand how to interrupt loops.	D,E												
CSLO 6	Understand the document object model (DOM), reference document objects using a variety of techniques, and use an event handler as an object property. Change the inline style of a document object, use a CSS selector in an object reference, and loop through an object collection.	B,E												
	CSCI 66 - Object-Oriented Programming Using C++													

CSLO 1	Demonstrate knowledge of C++ concepts including structures, classes, methods, objects, and primitive types. Included is an understanding of the basic C++ libraries.	B												
CSLO 2	Use the object-oriented language concepts available in C++ to demonstrate encapsulation, abstraction, instantiation, overloading, inheritance, composition, and polymorphism.	B,C,D												
CSLO 3	Apply the object-oriented language concepts available in C++ to design and implement a program that applies to a real-world application.	C,E												
	CSCI 76A - Game Programming													
CSLO 1	Demonstrate knowledge of basic 2D game concepts including the game engine, playing fields, sprites and events.	B,D												
CSLO 2	Demonstrate knowledge of the game engine's update/render/draw loop and how this loop is utilized to implement a game.	B,C,D												
CSLO 3	Apply the basic 2D game concepts to design and implement a 2D game. The design includes a game design document and the implementation includes the operation game software.	C,E												
	CSCI 79 - Mobile Device Programming													
CSLO 1	Graphics: Write code to draw a custom view for a mobile device application using lines, rectangles, ellipses, and/or bitmap image files.	B,C												
CSLO 2	Views: Implement a mobile device application that contains multiple views controlled by user-interface elements.	B,C,E												
CSLO 3	Tools: Identify the tools, steps, and components used to create a mobile device application containing common features such as standard user-interface controls, tables, and custom graphical views.	A,B,C												
	CSCI 95 - Internship in Computer Science													
CSLO 1	Perform internship duties that relate to educational or occupational goal.													
CSLO 2	Complete proposed internship and expand knowledge and skills in chosen field.													
CSLO 3	Evaluate internship success with site supervisor and instructor.													
	CSCI 300 - Selected Topics in Computer Science													
CSLO 1														
CSLO 2														
CSLO 3														
CSLO 4														
	CSCI 400 - Selected Topics in Computer Science													
CSLO 1														
CSLO 2														
CSLO 3														

CSLO 4															

CSLO#	COURSE NUMBER: COURSE NAME	Related PSLO													