Student Learning Outcomes Ananlysis

Subject
Computer Science
Grade

SLOs for Assessment Key:
1. Ambiguous - (Grey) 2.
Not assessable in Summitive - (Grey)
3. Repetitive (with in same grade) - (Grey)
4. Repetitive (with in same learning level) - (Grey)

S #	Domains	Standards	Benchmarks	Topic/ Title	NCP-SLO No.	NCP (2022)-SLOs description	Status of SLOs	SLOs for Assessment	Cognitive Domain
1	Domain A: Computer Systems	Students will learn about components and interactions between computer systems, stages of software development, data representation and transmission across networks of computing systems, and the implications on usability, reliability, security, etc	Benchmark I: Students will identify and analyze logic gates in digital systems Benchmark II: Students will identify stages of system software development Benchmark III: Students will learn about scalability, reliability, and security of computer networks		SLO CS-11-A-01	Students will be able to understand and apply logic gates in digital systems, define and create truth tables using Boolean operators like AND, OR, NOT, NAND, XOR) and logic diagrams	Matched SLO		Apply
2	Domain A: Computer Systems	Students will learn about components and interactions between computer systems, stages of software development, data representation and transmission across networks of computing systems, and the implications on usability, reliability, security, etc	Benchmark I: Students will identify and analyze logic gates in digital systems Benchmark II: Students will identify stages of system software development Benchmark III: Students will learn about scalability, reliability, and security of computer networks		SLO CS-11-A-02	Students will be able to understand and evaluate stages of the systems design, e.g. software development life cycle (analysis, design, coding, and testing etc.), and software development methodologies	Matched SLO		Apply
3	Domain A: Computer Systems	Students will learn about components and interactions between computer systems, stages of software development, data representation and transmission across networks of computing systems, and the implications on usability, reliability, security, etc	Benchmark I: Students will identify and analyze logic gates in digital systems Benchmark II: Students will identify stages of system software development Benchmark III: Students will learn about scalability, reliability, and security of computer networks		SLO CS-11-A-02	Students will be able to understand and explain the scalability and reliability of networking systems via network topology	Matched SLO		Understand
4	Domain A: Computer Systems	Students will learn about components and interactions between computer systems, stages of software development, data representation and transmission across networks of computing systems, and the implications on usability, reliability, security, etc	Benchmark I: Students will identify and analyze logic gates in digital systems Benchmark II: Students will identify stages of system software development Benchmark III: Students will learn about scalability, reliability, and security of computer networks		SLO CS-11-A-04	Understand and explain the need for cybersecurity and contrast different methods of encryption to transmit data	Matched SLO		Understand
5	Domain B: Computational Thinking & Algorithms	Students will identify and decompose simple and complex problems, create & evaluate appropriate solutions using computational approaches, and understand and apply common algorithms used in solving computational problems	Benchmark II: Students have core concepts of basic data structures and algorithms used extensively in computer science and knowledge of how to apply these techniques toward solving more complex and real-life problems.		SLO CS-11-B-01	Plan, develop, systematically test, and refine computational artifacts for problem-solving such as pseudocode, etc.	Matched SLO		Analyse
6	Domain B: Computational Thinking & Algorithms	Students will identify and decompose simple and complex problems, create & evaluate appropriate solutions using computational approaches, and understand and apply common algorithms used in solving computational problems	Benchmark II: Students have core concepts of basic data structures and algorithms used extensively in computer science and knowledge of how to apply these techniques toward solving more complex and real-life problems.		SLO CS-11-B-02	Apply common search, and sort algorithms	Matched SLO		Apply
7	Domain C: Programming Fundamentals	Students will create and debug projects in programming languages Python, HTML, and JavaScript, learning how to translate algorithms into code and define & apply fundamental programming constructs such as sequence, selection, and iteration	Benchmark I: Students will develop, test, and debug static website (using HTML and CSS) and a dynamic website (using JavaScript)		SLO CS-11-C-01	Students should understand the importance of computer programming and applications	Matched SLO		Understand
8	Domain C: Programming Fundamentals	Students will create and debug projects in programming languages Python, HTML, and JavaScript, learning how to translate algorithms into code and define & apply fundamental programming constructs such as sequence, selection, and iteration	Benchmark II: Students will develop, test, debug command-line interface (CLI) applications in Python		SLO CS-11-C-02	Students should be able to write and execute simple programs in Python.	Matched SLO		Apply
9	Domain C: Programming Fundamentals	Students will create and debug projects in programming languages Python, HTML, and JavaScript, learning how to translate algorithms into code and define & apply fundamental programming constructs such as sequence, selection, and iteration	Benchmark II: Students will develop, test, debug command-line interface (CLI) applications in Python		SLO CS-11-C-03	Students should be able to draw shapes using Turtle Graphics functions in Python	Matched SLO		Apply

10	Domain C: Programming Fundamentals	Students will create and debug projects in programming languages Python, HTML, and JavaScript, learning how to translate algorithms into code and define & apply fundamental programming constructs such as sequence, selection, and iteration	Benchmark II: Students will develop, test, debug command-line interface (CLI) applications in Python		SLO CS-11-C-04	Students should be able to understand the need for libraries and learn the use of some simple libraries in Python.	Matched SLO		Understand
11	Domain C: Programming Fundamentals	Students will create and debug projects in programming languages Python, HTML, and JavaScript, learning how to translate algorithms into code and define & apply fundamental programming constructs such as sequence, selection, and iteration			SLO CS-11-C-05	Students should be able to translate simple algorithms that use sequence and repetition in Python.	Matched SLO		Apply
12	Domain C: Programming Fundamentals	Students will create and debug projects in programming languages Python, HTML, and JavaScript, learning how to translate algorithms into code and define & apply fundamental programming constructs such as sequence, selection, and iteration			SLO CS-11-C-06	Students should be able to decompose a problem into sub-problems and implement those sub-problems using functions in Python.	Matched SLO		Apply
13	Domain C: Programming Fundamentals	Students will create and debug projects in programming languages Python, HTML, and JavaScript, learning how to translate algorithms into code and define & apply fundamental programming constructs such as sequence, selection, and iteration			SLO CS-11-C-07	Students will determine ways of debugging their code in Python	Matched SLO		Understand
14	Domain D: Data and Analysis	Standard 1: Students will be able to understand the scope of data science, how computer systems collect, store, process, visualize, and interpret data	Benchmark II: Students will be able to represent databases using UML diagrams and extract data using queries, and create data visualizations using software tools		SLO CS-11-D-01	Students will be able to relate the role and importance of model building with their real-world applications	Matched SLO		Apply
15	Domain D: Data and Analysis	Standard 2: Students will get an introduction to the relational data model, relational database engines, and SQL and how to design good schemas.	Benchmark II: Students will be able to represent databases using UML diagrams and extract data using queries, and create data visualizations using software tools		SLO CS-11-D-02	Students will understand and explain experimental design in data science	Matched SLO		Understand
16	Domain D: Data and Analysis	Standard 3: What is AI and machine learning, and how does it relate to data and data science	Benchmark II: Students will be able to represent databases using UML diagrams and extract data using queries, and create data visualizations using software tools		SLO CS-11-D-03	Students will analyze pre-existing datasets to create summary statistics and data visuals (such as bar charts, pie charts, line graphs, etc.)	Matched SLO		Apply
17	Domain E: Applications of Computer Science	Standard 1: Students will understand computer technologies such as Blockchain / AI / IoT / Cloud Computing / Game design and development	Benchmark I: Students learn about different technologies that support the latest applications of CS and their relevance to Pakistan. Benchmark II: Students learn about data techniques in AI applications and the social implications of technology.		SLO CS-11-E-01	Students should be able to describe technologies that are the foundations of IoT systems, Cloud Computing, and Blockchain	Matched SLO		Remember
18	Domain E: Applications of Computer Science	Standard 2: Students should be able to understand how computers learn, make decisions, and the applications, challenges, and social implications of AI	Benchmark I: Students learn about different technologies that support the latest applications of CS and their relevance to Pakistan. Benchmark II: Students learn about data techniques in AI applications and the social implications of technology.		SLO CS-11-E-02	Students should be able to evaluate how different stakeholder's culture, values, and (sometimes conflicting) interests affect AI System designs.	Matched SLO		Analyse
19	Domain F: Impacts of Computing	Standard 1: Students will be able to understand ethics and laws related to computing and the use of computing devices, media, data, the internet, and the application of personal privacy and network security.	Benchmark I: Students will interpret documents related to computing systems and evaluate their legal and ethical implications. Benchmark II: Students will be able to illustrate how they can maintain privacy online and address security concerns they may encounter with the use of computing devices and applications Benchmark III: Students will demonstrate their ability to collaborate and communicate on the design of computing applications		SLO CS-11-F-01	Understand and apply safe & responsible use of information sources, identifying sources of reliable information compared to unreliable information and its sources	Matched SLO		Analyse
20	Domain F: Impacts of Computing	Standard 2: The environmental, cultural, and human impact of computing and assistive technologies for the modern world.	Benchmark I: Students will interpret documents related to computing systems and evaluate their legal and ethical implications. Benchmark II: Students will be able to illustrate how they can maintain privacy online and address security concerns they may encounter with the use of computing devices and applications Benchmark III: Students will demonstrate their ability to collaborate and communicate on the design of computing applications		SLO CS-11-F-02	Define and discuss how computing has increased connectivity by enabling communication between people and the environmental, cultural, and human impact of increased connectivity	Matched SLO		Understand

21	Domain G: Digital Literacy	Standard: Collect & analyze information and publish to various audiences using digital tools and media-rich resources, and use digital tools to design and develop a significant digital artefact through research design, data collection, and communication.	Benchmark II: Use digital tools to design and develop a significant digital artefact through research design, data collection, and communication.		SLO CS-11-G-01	Perform advanced searches to locate information and/or design a data-collection approach to gather original data (e.g., qualitative interviews, surveys, prototypes, simulations)	Matched SLO		Apply