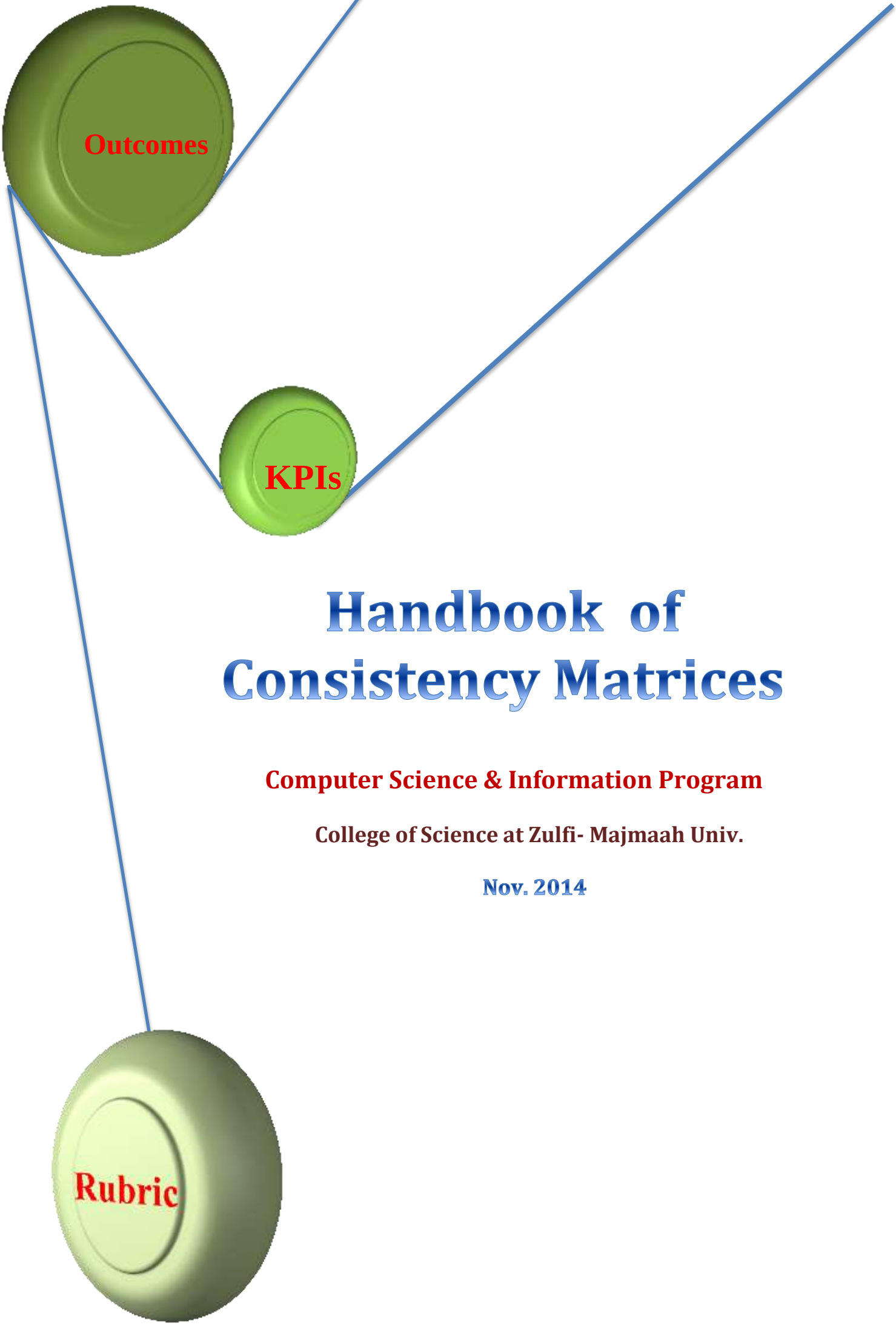

Handbook of Consistency Matrices

Computer Science & Information Program

College of Science at Zulfi- Majmaah Univ.

Nov. 2014

Contents

Matrix 1: Consistency between University & College Missions

Consistency between University & college Missions

Code MUP01

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information**

College mission Keywords / University mission Keywords		University mission: Majmaah University provides educational and research services via an academic system that is capable of competing with an eye on the market demands and the society partnership				
		Developed Educational services	**Developed research services**	**Academic competition**	**Ethical Responsibilities**	**Society partnership**
college mission	Scientific Excellence					
	Affective Plans					
	Developed Programs					
	Sufficient Skills					
	Society Responsibilities					

The current mission of College:

Zulfi College of Science provides scientific excellence through affective plans and developed programs that enable students to acquire the knowledge, skills needed to compete in the labor market and postgraduate.

The Modified mission of College (if needed):

Zulfi College of Science provides graduates who have scientific excellence through affective plans and developed programs with the skills needed to compete in the labor market**.**

Matrix 2: Consistency between College & Program Missions

Consistency between College & Program Missions

Code MUP02

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information**

College mission Keywords / Program mission Keywords		College Mission: Zulfi College of Science provides graduates who have scientific excellence through affective plans and developed programs with the skills needed to compete in the labor market.				
		Scientific Excellence	Affective Plans	Developed Programs	Sufficient Skills	Society Responsibilities
Program mission	Developing education					
	Sufficient skills					
	Team Work					
	Society partnership					

The current mission of program:

Providing outstanding higher education to acquire graduates sufficient skills and knowledge to communicate and work effectively in teamwork through scientific environment to compete in labor market.

The modified mission of program (if needed):

Matrix 3: Consistency between Program Missions and Program Objectives

Consistency between program Missions and program Objectives

Code MUP03

College of Science at Al-Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information**

		Program Mission			
		Developing education	Sufficient skills	Team Work	Society partnership
program Objectives	***Objective (1)***				
	Objective (2)				
	Objective (3)				
	Objective (4)				
	Objective (5)				

Program Objectives: Graduates of Computer Science & Information Program should:

1	Have strong foundation in mathematics and basic concepts of computer science and information.
2	To lay the foundation for further research.
3	Acquire graduates methods and procedures to communicate and work effectively within multi-disciplinary team.
4	Encourage graduates to follow appropriate practices within a professional, legal, and ethical responsibility.
5	Demonstrate efficient IT capabilities, and search for information and engage in life-long self-learning.

Matrix 3a: Mission, Goals and Objectives

Mission, Goals and Objectives

1. Program Mission Statement (insert).

Providing outstanding higher education to acquire graduates sufficient skills and knowledge to communicate and work effectively in teamwork through scientific environment to compete in labor market.

2. List Program Goals (eg. long term, broad based initiatives for the program, if any)

1. **Life Long Learning.**
2. **Professional Responsibility.**
3. **Communication and Organization Skills.**
4. **Awareness of the broad applicability of Computing.**

5. List major objectives of the program within to help achieve the mission. For each measurable objective describe the measurable performance indicators to be followed and list the major strategies taken to achieve the objectives.

Measurable Objectives	Measurable Performance Indicators	Major Strategies
1. Have strong foundation in mathematics and basic concepts of computer science and information.	1.Apply mathematical and scientific principles to formulate models and systems relevant to computer science. (the connection between mathematical models)	**Studying the modern technologies in computer Science & information.**
	2.Solve computer science problems by using the concepts of integral and differential calculus and/or linear algebra. (understanding of applications)	
	3.Appropriate computing interpretation of mathematical and scientific terms. (interpretation of mathematical)	
	4.Translates academic theory into computer science applications. (understanding the application of theory to the problem)	
	5.The uses of appropriate resources needed to solve problems. (resources)	
	6.The integration of new information with previous knowledge. (The integration)	
	7.The understanding of how various pieces of the problem relate to each other and the whole. (various pieces of the problem relate to each other)	
	8.Solutions creativity alternatives.(creates new alternatives)	

2. To lay the foundation for further research.	1.The uses of appropriate resources needed to solve problems. (resources) 2.The integration of new information with previous knowledge. (The integration) 3.The understanding of how various pieces of the problem relate to each other and the whole. (various pieces of the problem relate to each other) 4.Solutions creativity alternatives. (creates new alternatives) 5.Modelling, prototyping, and documentation.(Solution) 6.Selecting appropriate algorithms. (appropriate algorithms) 7.Applying risk analysis. (aware of risk analysis) 8.Developing a design strategy. (design strategy) 9.Use of approaches. (approaches) 10.Developing solutions. (solutions) 11.Using computer science tools. (Uses computer tools) 12.The ratio of graduation projects that keep pace with recent technology. (recent technology) 13.Applying concepts and practices in different situations. (applies the concepts) 14.Awareness of implementation bugs and errors. (bugs and errors) 15.Presentation and workload contribution. (team meetings) 16.Preparation for group meetings. (formulated ideas) 17.Cooperation. (Cooperates with others) 18.Sharing credit of success. (credit for success with others)	Making students to the work of on graduation projects that keep pace with technological development
3. Acquire graduates methods and procedures to communicate and work effectively within multi-disciplinary team.	1.The ratio of graduation projects that keep pace with recent technology. (recent technology) 2.Applying concepts and practices in different situations. (applies the concepts) 3.Awareness of implementation bugs and errors. (bugs and errors) 4.Graduate capabilities to investigate and analyze user needs. (user needs) 5.Graduate capabilities to convey user needs into computer-based system. (convey user needs) 6.Graduate capabilities to validate computer-based system. (validate computer-based system) 7.Professional Appearance. (appearance) 8.Professional Interactions. (relationships) 9.Objectivity. (Analyzes a problem objectively) 10.Presentation and workload contribution. (team meetings) 11.Preparation for group meetings. (formulated ideas) 12.Cooperation. (Cooperates with others) 13. Sharing credit of success. (credit for success with others) 14.Oral presentation delivery. (Talk) 15.Presentation details and appropriateness of the	Cooperative learning

	technical contents as per the time constraint and the audience. (Presentation details)	
	16.Language skills. (English)	
4. Encourage graduates to follow appropriate practices within a professional, legal, and ethical responsibility.	1.Professional Appearance. (appearance)	Effective Communicators and Team Members
	2.Professional Interactions. (relationships)	
	3.Objectivity. (Analyzes a problem objectively)	
	4.The percentage of graduation projects that are related to society. (graduation projects that are related to society)	
	5.Stakeholders feedback about the proficiency of graduates. (The average score of questionnaires)	
	6.Summer training feedback. (The average score of questionnaires)	
	7.Ability of using appropriate techniques and tools to solve computational problems. (use appropriate techniques)	
	8.The ability to interpret results. (interpret results)	
	9.Measurement awareness of errors. (aware of measurement error)	
	10.Knowledge of advanced numerical methods. (numerical methods)	
	11.Applying advanced numerical methods to solve problems. (apply advanced numerical methods)	
	12.Apply numerical methods principles to formulate models and systems relevant to computer science. (the connection between numerical methods and the system)	
5. Demonstrate efficient IT capabilities, and search for information and engage in life-long self-learning.	1.Independent learning. (ability to learn independently)	Continuous adjustment of salaries and improving contract terms, and coordination of scientific-research projects.
	2.Continuous improvement. (Learns from mistakes)	
	3.Capability to think for one's self. (own learning)	
	4.Responsibility for creating one's own learning opportunities. (own learning)	
	5.Integrate IT-based solutions into graduation project environment. (The average score of questionnaires)	
	6.Stakeholders satisfaction. (The average score of questionnaires)	
	7.Supporting design procedure with documentation and references. (documentation and references)	
	8.Ability of using appropriate techniques and tools to solve computational problems. (use appropriate techniques)	
	9.The ability to interpret results. (interpret results)	
	10.Measurement awareness of errors. (aware of measurement error)	

Matrix 4: Consistency between Student Learning Outcomes and Program Objectives

Consistency between Student learning Outcomes and Program Objectives

Code MUP04

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information**

			Program Objectives				
			Objective (1)	***Objective (2)***	***Objective (3)***	***Objective (4)***	***Objective (5)***
Student learning Outcomes	**A**	a1					
		a2					
		a3					
	B	b1					
		b2					
		b3					
		b4					
		b5					
	C	c1					
		c2					
		c3					
	D	d1					
		d2					
		d3					
	E	NA					

(A) knowledge
(B) cognitive skills
(C) interpersonal skills and responsibility
(D) communication, information technology and numerical skills
(E) Psychomotor skills

Domain	Code	*Student learning Outcomes*
A	a1	Acquire knowledge of computing and mathematics appropriate to the discipline including simulation and modeling.
	a2	Recognize the need for and an ability to engage in continuing professional development.
	a3	Understand best practices and standards and their application.
B	b1	Analyze a problem to identify and define the computing requirements appropriate for its solution.
	b2	Design, implement, develop and evaluate complicated computer-based system, process component, or program to meet desired needs.
	b3	Use and apply current technical concepts and practices in the core areas of information technology namely of human computer interaction, information management, programming, networking, web systems and technologies.
	b4	Identify and analyze user needs and take them into account in the selection, creation, evaluation and administration of computer-based systems.
	b5	Integrate IT-based solutions into the user environment effectively.
C	c1	Adhere professional, ethical, legal, security, and social issues and their responsibilities.
	c2	Analyze the local and global impact of computing on individuals, organization, and society.
	c3	Use current techniques, skills, and tools necessary for computing practice.
D	d1	Function effectively on teams to accomplish a common goal.
	d2	Communicate effectively with a range of audiences.
	d3	Apply advanced numerical methods.
E		NA

N	*Program Objectives*
Graduates of Computer Science & Information Program should :	
1	Have strong foundation in mathematics and basic concepts of computer science and information.
2	To lay the foundation for further research.
3	Acquire graduates methods and procedures to communicate and work effectively within multi-disciplinary team.
4	Encourage graduates to follow appropriate practices within a professional, legal, and ethical responsibility.
5	Demonstrate efficient IT capabilities, and search for information and engage in life-long self-learning.

Matrix 5: Consistency between Student Learning Outcomes and NCAAA Outcomes

Consistency between Student Learning Outcomes and NCAAA Outcomes

Code MUP05

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information**

			A NCAAA				B NCAAA						C NCAAA					D NCAAA			E NCAA
			a11	a12	a13	a14	b11	b12	b13	b14	b15	b16	c11	c12	c13	c14	c15	d11	d12	d13	NA
Student Learning Outcomes	A	a1																			
		a2																			
		a3																			
	B	b1																			
		b2																			
		b3																			
		b4																			
		b5																			
	C	c1																			
		c2																			
		c3																			
	D	d1																			
		d2																			
		d3																			
	E	NA																			

(A) knowledge
(B) cognitive skills
(C) interpersonal skills and responsibility
(D) communication, information technology and numerical skills
(E) Psychomotor skills

NCAAA Outcomes

Domain	Code	NCAAA Student Outcomes
A	a1	Possesses a comprehensive, coherent and systematic body of knowledge in a field and the underlying principles and theories associated with it.
	a2	Is aware of related knowledge and theory in other disciplines and, in the case of professional programs, other professional fields.
	a3	Is familiar with the latest developments at the forefront of specializations within the main field of study including critical awareness of current research relating to resolution of issues and extension of knowledge.
	a4	In programs preparing students for professional practice graduates are aware of relevant conventions, regulations, and technical requirements and of how these may be modified over time in response to changing circumstances.
B	b1	Is able to undertake investigations, comprehend and evaluate new information, concepts and evidence from a range of sources.
	b2	Apply conclusions to a wide range of issues and problems with limited guidance.
	b3	Is able to investigate relatively complex problems using a range of information technology and other sources.
	b4	Recommend creative and innovative solutions taking account of relevant theoretical knowledge and practical experience and the consequences of decisions made.
	b5	Can apply these skills and insights in professional and academic contexts relevant to the field of study undertaken.

	b6	In professional programs can use routine procedures appropriately, but identify situations requiring innovative solutions and draw on relevant theoretical and practical insights in response.
C	c1	Contributes to and facilitates constructive resolution of issues in group or team situations, whether in a leadership role or as a member of a group.
	c2	Can exercise group leadership in undefined situations calling for innovative responses.
	c3	Shows initiative in identifying issues requiring attention and in addressing them appropriately on an individual or team basis.
	c4	Takes responsibility for own learning and is able to identify and use means of finding new information or techniques of analysis needed for completion of tasks.
	c5	Deals with ethical and professional issues involving values and moral judgments in ways that are sensitive to others and consistent with underlying basic values and relevant professional codes of practice.
D	d1	When investigating issues and problems can identify relevant statistical or mathematical techniques and apply them creatively in interpreting information and proposing solutions.
	d2	Can communicate effectively both orally and in writing, selecting and using forms of presentation appropriate for differing issues and audiences.
	d3	Routinely uses the most appropriate information and communications technology in gathering, interpreting and communicating information and ideas.
E	e1	NA

Matrix 6: Foundation Skills (University Level)

Foundation Skills (University Level)

Code
MUP06

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information**

Student Learning Outcome: Adhere professional, ethical, legal, security, and social issues and their responsibilities.		
Professional Appearance	kPI(1)	**KPIs**
Professional Interactions	KPI(2)	
Objectivity	KPI(3)	

Foundation Skills (University Level)

Code
MUP06

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information**

Student Learning Outcome: Communicate effectively with a range of audiences.		
Oral presentation delivery	KPI(1)	**KPIs**
Presentation details and appropriateness of the technical contents as per the time constraint and the audience	KPI(2)	
Language skills	KPI(3)	

Matrix 7: Fundamental Skills (Sector Section)

Fundamental Skills (Sector Section)

Code
MUP07

College of Science at Al-Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information**

Student Learning Outcome: Acquire knowledge of computing and mathematics appropriate to the discipline including simulation and modeling.		
Apply mathematical and scientific principles to formulate models and systems relevant to computer science	KPI(1)	KPIs
Solve computer science problems by using the concepts of integral and differential calculus and/or linear algebra	KPI(2)	
appropriate computing interpretation of mathematical and scientific terms	KPI(3)	
Translates academic theory into computer science applications	KPI(4)	

Fundamental Skills (Sector Section)

Code
MUP07

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information**

Student Learning Outcome: Recognize the need for and an ability to engage in continuing professional development.		
Independent learning	KPI(1)	KPIs
Continuous improvement	KPI(2)	
Capability to think for one's self	KPI(3)	
Responsibility for creating one's own learning opportunities	KPI(4)	

Fundamental Skills (Sector Section)

Code
MUP07

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information**

Student Learning Outcome: Understand best practices and standards and their applications.		
The uses of appropriate resources needed to solve problems	KPI(1)	KPIs
The integration of new information with previous knowledge	KPI(2)	
The understanding of how various pieces of the problem relate to each other and the whole	KPI(3)	
Solutions creativity alternatives	KPI(4)	

Fundamental Skills (Sector Section)

Code
MUP07

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information**

Student Learning Outcome: Use current techniques, skills, and tools necessary for computing practice.		
Ability of using appropriate techniques and tools to solve computational problems	KPI(1)	KPIs
The ability to interpret results	KPI(2)	
Measurement awareness of errors	KPI(3)	

Matrix 8: Core Skills (College Section)

Core Skills (College Section)

Code
MUP08

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information**

Student Learning Outcome: Analyze the local and global impact of computing on individuals, organizations, and society.		
The percentage of graduation projects that are related to society.	KPI(1)	KPIs
Stakeholders feedback about the proficiency of graduates.	KPI(2)	
Summer training feedback.	KPI(3)	

Core Skills (College Section)

Code
MUP08

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information**

Student Learning Outcome: Function effectively on teams to accomplish a common goal.		
Presentation and workload contribution	KPI(1)	KPIs
Preparation for group meetings	KPI(2)	
Cooperation	KPI(3)	
Sharing credit of success	KPI(4)	

Fundamental Skills (College Section)

Code
MUP07

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information**

Student Learning Outcome: Apply advanced numerical methods.		
Knowledge of advanced numerical methods	KPI(1)	KPIs
Applying advanced numerical methods to solve problems	KPI(2)	
Apply numerical methods principles to formulate models and systems relevant to computer science	KPI(3)	

Matrix 8a: Program Skills (Program Level)

Program Skills (Program Level)

Code
MUP08a

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information**

Student Learning Outcome: Acquire knowledge of computing and mathematics appropriate to the discipline including simulation and modeling.		
Apply mathematical and scientific principles to formulate models and systems relevant to computer science	KPI(a1-1)	KPIs
Solve computer science problems by using the concepts of integral and differential calculus and/or linear algebra	KPI(a1-2)	
appropriate computing interpretation of mathematical and scientific terms	KPI(a1-3)	
Translates academic theory into computer science applications	KPI(a1-4)	

Program Skills (Program Level)

Code
MUP08a

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information**

Student Learning Outcome: Recognize the need for and an ability to engage in continuing professional development.		
Independent learning	KPI(a2-1)	KPIs
Continuous improvement	KPI(a2-2)	
Capability to think for one's self	KPI(a2-3)	
Responsibility for creating one's own learning opportunities	KPI(a2-4)	

Program Skills (Program Level)

Code
MUP08a

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information**

Student Learning Outcome: Understand best practices and standards and their application.		
The uses of appropriate resources needed to solve problems	KPI(a3-1)	KPIs
The integration of new information with previous knowledge	KPI((a3-2)	
The understanding of how various pieces of the problem relate to each other and the whole	KPI((a3-3)	
Solutions creativity alternatives	KPI((a3-4)	

Program Skills (Program Level)

Code
MUP08a

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information**

Student Learning Outcome: Analyze a problem to identify and define the requirements appropriate for its solution.		
Modelling, prototyping, and documentation.	KPI(b1-1)	KPIs
Selecting appropriate algorithms	KPI(b1-2)	
Applying risk analysis	KPI(b1-3)	

Program Skills (Program Level)

Code
MUP08a

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information**

Student Learning Outcome: Design, implement, develop and evaluate complicated computer-based system, process component, or program to meet desired needs.		
Developing a design strategy	KPI(b2-1)	KPIs
Use of approaches	KPI(b2-2)	
Developing solutions	KPI(b2-3)	
Using computer science tools	KPI(b2-4)	

Program Skills (Program Level)

Code
MUP08a

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information**

Student Learning Outcome: Use and apply current technical concepts and practices in the core areas of information technologies of human computer interaction, information management, programming, networking and web technologies.		
The ratio of graduation projects that keep pace with recent technology.	KPI(b3-1)	KPIs
Applying concepts and practices in different situations	KPI(b3-2)	
Awareness of implementation bugs and errors	KPI(b3-3)	

Program Skills (Program Level)

Code
MUP08a

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information**

Student Learning Outcome: Identify and analyze user needs and take them into account in the selection, creation, evaluation and administration of computer-based systems.		
Graduate capabilities to investigate and analyze user needs.	KPI(b4-1)	KPIs
Graduate capabilities to convey user needs into computer-based system.	KPI(b4-2)	
Graduate capabilities to validate computer-based system.	KPI(b4-3)	

Program Skills (Program Level)

Code
MUP08a

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information**

Student Learning Outcome: Integrate IT-based solutions into the user environment effectively.		
Integrate IT-based solutions into graduation project environment.	KPI(b5-1)	KPIs
Stakeholders satisfaction	KPI(b5-2)	
Supporting design procedure with documentation and references	KPI(b5-3)	

Program Skills (Program Level)

Code
MUP08a

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information**

Student Learning Outcome: Adhere professional, ethical, legal, security, and social issues and their responsibilities.		
Professional Appearance	KPI(c1-1)	KPIs
Professional Interactions	KPI(c1-2)	
Objectivity	KPI(c1-3)	

Program Skills (Program Level)

Code
MUP08a

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information**

Student Learning Outcome: Analyze the local and global impact of computing on individuals, organization, and society.		
The percentage of graduation projects that are related to society.	KPI(c2-1)	KPIs
Stakeholders feedback about the proficiency of graduates.	KPI(c2-2)	
Summer training feedback.	KPI(c2-3)	

Program Skills (Program Level)

Code
MUP08a

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information**

Student Learning Outcome: Use current techniques, skills, and tools necessary for computing practice.		
Ability of using appropriate techniques and tools to solve computational problems	KPI(c3-1)	KPIs
The ability to interpret results	KPI(c3-2)	
Measurement awareness of errors	KPI(c3-3)	

Program Skills (Program Level)

Code
MUP08a

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information**

Student Learning Outcome: Function effectively on teams to accomplish a common goal.		
Presentation and workload contribution	KPI(d1-1)	KPIs
Preparation for group meetings	KPI(d1-2)	
Cooperation	KPI(d1-3)	
Sharing credit of success	KPI(d1-4)	

Program Skills (Program Level)

Code
MUP08a

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information**

Student Learning Outcome: Communicate effectively with a range of audiences.		
Oral presentation delivery	KPI(d2-1)	KPIs
Presentation details and appropriateness of the technical contents as per the time constraint and the audience.	KPI(d2-2)	
Language skills	KPI(d2-3)	

Program Skills (Program Level)

Code
MUP08a

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information**

Student Learning Outcome: Apply advanced numerical methods.		
Knowledge of advanced numerical methods	KPI(d3-1)	KPIs
Applying advanced numerical methods to solve problems	KPI(d3-2)	
Apply numerical methods principles to formulate models and systems relevant to computer science	KPI(d3-3)	

Matrix 9: Student Outcome Rubric

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information** **Code MUP09**

Student Outcome Rubric

Student Learning Outcome: Acquire knowledge of computing and mathematics appropriate to the discipline including simulation and modeling.

		Unsatisfactory	Developing	Satisfactory
KPIs	**Apply mathematical and scientific principles to formulate models and systems relevant to computer science**	Does not understand the connection between mathematical models and the system or process to be analyzed or designed	Chooses a mathematical model or scientific principle that applies to an computer science problem, but has trouble in model development	Able to successfully combines mathematical and/or scientific principles to formulate models and systems relevant to computer science
	Solve computer science problems by using the concepts of integral and differential calculus and/or linear algebra	Does not understand the application of calculus and linear algebra in solving computing problems	Shows nearly complete understanding of applications of calculus and/or linear algebra in problem-solving	Applies concepts of integral and differential calculus and/or linear algebra to solve computing problems
	Appropriate computing interpretation of mathematical and scientific terms	Mathematical terms are interpreted incorrectly or not at all	Most mathematical terms are interpreted correctly	Shows appropriate computing interpretation of mathematical and scientific terms
	Translates academic theory into computer science applications	Does not appear to grasp the connection between theory and the problem	Some gaps in understanding the application of theory to the problem and expects theory to predict reality	Translates academic theory into computer science applications and accepts limitations of mathematical models of physical reality

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information** **Code MUP09**

Student Outcome Rubric

Student Learning Outcome: Recognize the need for and an ability to engage in continuing professional development.

		Unsatisfactory	Developing	Satisfactory
KPIs	**Independent learning**	Requires detailed or step-by-step instructions to complete a task	Requires guidance as to expected outcome of task or project	Demonstrates ability to learn independently
	Continuous improvement	Is unable to recognize own shortcomings or deficiencies	Sometimes is able to avoid repeating the same mistakes	Learns from mistakes and practices continuous improvement
	Capability to think for one's self	Assumes that all learning takes place within the confines of the class	Does not always take responsibility for own learning	Demonstrates capability to think for one's self
	Responsibility for creating one's own learning opportunities	Demonstrates responsibility for creating one's own learning opportunities	Seldom brings information from outside sources to assignments	Demonstrates responsibility for creating one's own learning opportunities

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information** **Code MUP09**

Student Outcome Rubric

Student Learning Outcome: Understand best practices and standards and their application.

		Unsatisfactory	Developing	Satisfactory
KPIs	**The uses of appropriate resources needed to solve problems**	Uses no resources to solve problems	Uses limited resources to solve problems	Uses appropriate resources to locate information needed to solve problems
	The integration of new information with previous knowledge	Has no concept of how previous knowledge and new information relate	Must be assisted in integrating previous knowledge and new information	Takes new information and effectively integrates it with previous knowledge
	The understanding of how various pieces of the problem relate to each other and the whole	Does not realize when major components of the problem are missing	Is missing some of the pieces of the whole problem	Demonstrates understanding of how various pieces of the problem relate to each other and the whole
	Solutions creativity alternatives	Demonstrates solutions implementing simple applications of one formula or equation with close analogies to class/lecture problems	Demonstrates solution with integration of diverse concepts or derivation of useful relationships involving ideas covered in course concepts; however, no alternative solutions are generated	Demonstrates creative synthesis of solution and creates new alternatives by combining knowledge and information

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information** **Code MUP09**

Student Outcome Rubric

Student Learning Outcome: Analyze a problem to identify and define the requirements appropriate for its solution.

		Unsatisfactory	Developing	Satisfactory
KPIs	**Modelling, prototyping, and documentation.**	Solution is poorly modelled, prototyped, and documented	Solution is moderately modelled, prototyped, and documented	Solution is carefully modelled, prototyped, and documented
	Selecting appropriate algorithms	Making no attempt to relate problems to appropriate algorithms.	Selecting inappropriate algorithms to problems.	Selecting appropriate algorithms to problems.
	Applying risk analysis	being unaware of risk analysis.	being aware of risk analysis but doing so at a minimal level	being aware of risk analysis and doing so at a maximal level

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information** **Code MUP09**

Student Outcome Rubric

Student Learning Outcome: Design, implement, develop and evaluate complicated computer-based system, process component, or program to meet desired needs.

		Unsatisfactory	Developing	Satisfactory
KPIs	**Developing a design strategy**	No design strategy; haphazard approach	Uses a design strategy with guidance	Develops a design strategy, decomposition of work into subtasks, development of a timetable
	Use of approaches	Cannot design processes or individual pieces of equipment without significant amounts of help	Can follow a previous example competently	Suggests new approaches and improves on what has been done before
	Developing solutions	Only focuses on one solution to a problem; no optimization attempted	Can develop and compare multiple solutions to a problem, but does not usually arrive at the best result;	Develops several potential solutions and finds optimum

			conducts optimization but neglects one or two key aspects	
	Using computer science tools	No use of computer tools and computer science resources	Minimal or incorrect use of computer tools and resources	Uses computer tools and resources effectively

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information** **Code MUP09**

Student Outcome Rubric

Student Learning Outcome: Use and apply current technical concepts and practices in the core areas of information technology namely of human computer interaction, information management, programming, networking, web systems and technologies.

		Unsatisfactory	Developing	Satisfactory
KPIs	**The ratio of graduation projects that keep pace with recent technology.**	The ratio of graduation projects that keep pace with recent technology is low.	The ratio of graduation projects that keep pace with recent technology is moderate.	The ratio of graduation projects that keep pace with recent technology is high.
	Applying concepts and practices in different situations	Poorly applies the concepts and practices in different situations.	Moderately applies the concepts and practices in different situations.	Efficiently applies the concepts and practices in different situations.
	Awareness of implementation bugs and errors	Is unaware of implementation bugs and errors	Is fairly aware of implementation bugs and errors.	Is aware of implementation bugs and errors.

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information**

Code MUP09

Student Outcome Rubric

Student Learning Outcome: Identify and analyze user needs and take them into account in the selection, creation, evaluation and administration of computer-based systems.

		Unsatisfactory	Developing	Satisfactory
KPIs	**Graduate capabilities to investigate and analyze user needs.**	The ability of graduate to investigate and analyze user needs is poor.	The ability of graduate to investigate user needs is good, but cannot analyze them.	The ability of graduate to investigate and analyze user needs is good.
	Graduate capabilities to convey user needs into computer-based system.	The ability of graduate to convey user needs into computer-based system is poor.	The ability of graduate to convey user needs into computer-based system is moderate.	The ability of graduate to convey user needs into computer-based system is good.
	Graduate capabilities to validate computer-based system.	The ability of graduate to validate computer-based system is poor.	The ability of graduate to validate computer-based system is moderate.	The ability of graduate to validate computer-based system is good.

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information** **Code MUP09**

Student Outcome Rubric

Student Learning Outcome: Integrate IT-based solutions into the user environment effectively.

		Unsatisfactory	Developing	Satisfactory
KPIs	**Integrate IT-based solutions into graduation project environment.**	The average score of questionnaires is less than or equal to 2.5	The average score of questionnaires is in between 2.5 and 3.5	The average score of questionnaires is more than or equal to 3.5
	Stakeholders satisfaction	The average score of questionnaires is less than or equal to 2.5	The average score of questionnaires is in between 2.5 and 3.5	The average score of questionnaires is more than or equal to 3.5
	Supporting design procedure with documentation and references	Design is done incompletely without the proper equations and without references	Design is done, but procedures and equations are not documented or referenced	Supports design procedure with documentation and references

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information** **Code MUP09**

Student Outcome Rubric

Student Learning Outcome: Adhere professional, ethical, legal, security, and social issues and their responsibilities.

		Unsatisfactory	Developing	Satisfactory
KPIs	Professional Appearance	Has unacceptable professional appearance.	Has reasonable professional appearance, but may overestimate his skills and abilities.	Usually demonstrate trustful appearance, self-confidence, convincing personality, and respect for his personal skills without being vain in speech or actions.
	Professional Interactions	Tend to blame others for own issues and problems.	Be punctual, enthusiastic, personal responsibility for his actions, but usually concentrate on establishing good relations with superiors or relations based on personal benefits.	Be punctual, enthusiastic, initiative, show respect for others, take personal responsibility for his actions, and establish successful relationships with superiors and colleagues.

	Objectivity	Has personally biased perspective of problems and issues and fails to assess things objectively.	Evaluates and judges a situation using personal understanding of the situation, possibly applying a personal value system.	Analyzes a problem objectively using facts and professional code of ethics while recognizing individual and cultural biases.

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information** **Code MUP09**

Student Outcome Rubric

Student Learning Outcome: Analyze the local and global impact of computing on individuals, organization, and society.

		Unsatisfactory	Developing	Satisfactory
KPIs	The percentage of graduation projects that are related to society.	The percentage of graduation projects that are related to society is low.	The percentage of graduation projects that are related to society is medium.	The percentage of graduation projects that are related to society is high.
	Stakeholders feedback about the proficiency of graduates.	The average score of questionnaires is less than or equal to 2.5	The average score of questionnaires is in between 2.5 and 3.5	The average score of questionnaires is more than or equal to 3.5
	Summer training feedback.	The average score of questionnaires is less than or equal to 2.5	The average score of questionnaires is in between 2.5 and 3.5	The average score of questionnaires is more than or equal to 3.5

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Student Outcome Rubric

Student Learning Outcome: Use current techniques, skills, and tools necessary for computing practice.

		Unsatisfactory	Developing	Satisfactory
KPIs	Ability of using appropriate techniques and tools to solve computational problems	Has low ability to use appropriate techniques and tools required to solve problems.	Needs some guidance in using appropriate techniques and tools required to solve problems.	Effectively use the appropriate techniques and tools required to solve problems.
	The ability to interpret results	Has low ability to interpret results.	Has moderate ability to interpret results.	Has high ability to interpret results.
	Measurement awareness of errors	Is aware of measurement error and does account for it statistically	Is aware of measurement error but does not account for it statistically or does so at a minimal level	Is aware of measurement error and does account for it statistically

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information** **Code MUP09**

Student Outcome Rubric

Student Learning Outcome: Function effectively on teams to accomplish a common goal.

		Unsatisfactory	Developing	Satisfactory
KPIs	Presentation and workload contribution	Is absent from team meetings or work sessions >50% of the time	Absent occasionally, but does not inconvenience group Sometimes depends on others to complete the work; contributes less than fair share	Routinely present at team meetings or work sessions. Contributes a fair share to the project workload.
	Preparation for group meetings	Does not contribute to group work at all or submits own work as the group's	Prepares somewhat for group meetings, but ideas are not clearly formulated	Is prepared for the group meeting with clearly formulated ideas
	Cooperation	Routinely fails to prepare for meetings	Occasionally works as a loner or interacts to a minor extent with extra-disciplinary team members	Cooperates with others (outside of the discipline)
	Sharing credit of success	Does work on his/her own; does not	Makes subtle references to other's	Shares credit for success with others

		value team work	poor performance or sometimes does not identify contributions of other team members	and accountability for team results

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information** **Code MUP09**

Student Outcome Rubric

Student Learning Outcome: Communicate effectively with a range of audiences.

		Unsatisfactory	Developing	Satisfactory
KPIs	Oral presentation delivery	Talk is poorly organized, e.g. no clear introduction or summary of talk is presented.	Presents key elements of an oral presentation adequately, but not clearly applied	Plans and delivers an oral presentation effectively; clearly applied, and well organized
	Presentation details and appropriateness of the technical contents as per the time constraint and the audience.	Presentation is inappropriately short or excessively long; omits key results during presentation	Presentation contains excessive or insufficient detail for time allowed or level of audience	Presentation has enough detail appropriate and technical content for the time constraint and the audience
	Language skills	Uses poor English	Occasionally uses an inappropriate style of English.	Uses proper English fluently.

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information** **Code MUP09**

Student Outcome Rubric

Student Learning Outcome: Apply advanced numerical methods.

		Unsatisfactory	Developing	Satisfactory
KPIs	Knowledge of advanced numerical methods	Knowledge of advanced numerical methods is low.	Knowledge of advanced numerical methods is moderate.	Knowledge of advanced numerical methods is high.
	Applying advanced numerical methods to solve problems	Does not apply advanced numerical methods to solve problems	Requires some help to apply advanced numerical methods to solve problems	Applies effectively advanced numerical methods to solve problems
	Apply numerical methods principles to formulate models and systems relevant to computer science	Does not understand the connection between numerical methods and the system or process to be analyzed or designed	Chooses a numerical method that applies to a problem, but has trouble in model development	Able to successfully combines numerical methods and the system or process to be analyzed or designed

Matrix 10: Computer Science & Information Program Tree

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information**

Code
MUP10

Program Tree

University Mission Keyword	College Mission Keywords	Program Mission Keywords	Program Objectives	Student Learning Outcomes (Code)	Courses Numbers
Developed Educational services	Scientific Excellence	Developing education	Objective (1)	a1	PMTH(112,127), MATH(212 , 220, 310) CSI(211,212,222,223,224,311,312,313, 321, 324, 325, 411, 412, 414, 421, 422, 423, 424, 431, 432, 442, 443, 444, 445, 447, 448, 449, 513, 514, 520, 522, 530, 531, 532, 533)` , STAT320
				a3	STAT320 , CSI (211, 212, 221, 223, 311, 312, 313, 314, 322, 324, 325, 411, 412, 414, 421, 423, 424, 425, 431, 441, 442, 443, 445, 446, 447, 448, 449, 511, 514, 520, 522, 525, 530, 531)
			Objective (2)	a3	STAT320 , CSI (211, 212, 221, 223, 311, 312, 313, 314, 322, 324, 325, 411, 412, 414, 421, 423, 424, 425, 431, 441, 442, 443, 445, 446, 447, 448, 449, 511, 514, 520, 522, 525, 530, 531)
				b1	CSI (211, 221, 222, 223, 224, 311, 312, 313, 321, 322, 323, 324, 411, 412, 414, 422, 423, 424, 425, 431, 442, 443, 446, 447, 448, 449, 510, 513, 520, 521, 522, 530, 531, 533)
				b2	CSI (211, 314, 411, 412, 413, 421, 423, 431, 432, 442, 443, 447, 511, 513, 521, 522, 530, 532, 533)
				b3	CSI (211, 224, 314, 322, 323, 413, 414, 425, 441, 443, 445, 447, 449, 510, 511, 514, 520, 521, 530)
				d1	PENG111, ENG210, CSI (211, 212, 221, 223, 224, 312, 314, 321, 322, 324, 325, 411, 413, 414, 421, 422, 424,

					441, 442, 443,444, 446, 447, 448, 510, 511, 513, 514, 521, 522, 525, 530, 531, 532)
			Objective (5)	a2	ENG210, MATH(212, 220 ,310) , STAT320 CSI(221, 311,312,314,323,411,413,422,425,432,441,442,511,512, 513,520,521,525)
				b5	CSI (322, 422, 425, 432, 443, 446, 449, 510, 512, 520, 522,532)
				c3	ENG210 , MATH(212, 220, 310), STAT 320, CSI (211, 221, 222, 223, 311,313, 314, 321, 322, 325, 411, 414, 421, 424, 425, 441, 442, 444, 445, 448, 510, 513, 514, 532)
	Affective Plans	Sufficient skills	Objective (2)	a3	STAT320 , CSI (211, 212, 221, 223, 311, 312, 313, 314, 322, 324, 325, 411, 412, 414, 421, 423, 424, 425, 431, 441, 442, 443, 445, 446, 447, 448, 449, 511, 514, 520, 522, 525, 530, 531)
				b1	CSI (211, 221, 222, 223, 224, 311, 312, 313, 321, 322, 323, 324, 411, 412, 414, 422, 423, 424, 425, 431, 442, 443, 446, 447, 448, 449, 510, 513, 520, 521, 522, 530, 531, 533)
				b2	CSI (211, 221, 223, 312, 313, 314, 321, 324, 325, 411, 412, 413, 421, 423, 431, 432, 442, 443, 447, 511, 513, 521, 522, 530, 532, 533)
				b3	CSI (211, 224, 314, 322, 323, 413, 414, 425, 441, 443, 445, 447, 449, 510, 511, 514, 520, 521, 530)
				d1	PENG111, ENG210, CSI (211, 212, 221, 223, 224, 312, 314, 321, 322, 324, 325, 411, 413, 414, 421, 422, 424, 441, 442, 443,444, 446, 447, 448, 510, 511, 513, 514, 521, 522, 525, 530, 531, 532)
			Objecti ve (3)	b3	CSI (211, 224, 314, 322, 323, 413, 414, 425, 441, 443, 445, 447, 449, 510, 511, 514, 520, 521, 530)
				b4	CSI (325,412,422, 431,432, 441, 442, 443, 449, 512, 520, 522, 525, 533)

				c1	PENG 111, ENG210 , CSI(212, 313, 323, 325, 412, 423, 425, 431, 446, 447, 511, 512, 525, 530, 533)
				d1	PENG111, ENG210, CSI (211, 212, 221, 223, 224, 312, 314, 321, 322, 324, 325, 411, 413, 414, 421, 422, 424, 441, 442, 443,444, 446, 447, 448, 510, 511, 513, 514, 521, 522, 525, 530, 531, 532)
				d2	ENG210, CSI (224, 313, 325, 413, 422, 423, 431, 432, 446, 448, 449, 510, 520, 521, 525, 533)
			Objective (4)	c1	PENG 111, ENG210 , CSI(212, 313, 323, 325, 412, 423, 425, 431, 446, 447, 511, 512, 525, 530, 533)
				c2	CSI(224, 311,321, 431, 432, 446, 522, 530)
				c3	ENG210 , MATH(212, 220, 310), STAT 320, CSI (211, 221, 222, 223, 311,313, 314, 321, 322, 325, 411, 414, 421, 424, 425, 441, 442, 444, 445, 448, 510, 513, 514, 532)
				d3	STAT320 , CSI (222, 323, 411, 421, 422, 432, 444, 445, 510, 512, 514, 520, 531)
			Objective (5)	a2	ENG210, MATH(212, 220 ,310) , STAT320 CSI(221, 311,312,314,323,411,413,422,425,432,441,442,511,512, 513,520,521,525)
				b5	CSI (322, 422, 425, 432, 443, 446, 449, 510, 512, 520, 522,532)
				c3	ENG210 , MATH(212, 220, 310), STAT 320, CSI (211, 221, 222, 223, 311,313, 314, 321, 322, 325, 411, 414, 421, 424, 425, 441, 442, 444, 445, 448, 510, 513, 514, 532)
	Developed Programs	Developing education	Objective (1)	a1	PMTH(112,127), MATH(212 , 220, 310) CSI(211,212,222,223,224,311,312,313, 321, 324, 325, 411, 412, 414, 421, 422, 423, 424, 431, 432, 442, 443, 444, 445, 447, 448, 449, 513, 514, 520, 522, 530, 531, 532, 533)` , STAT320
				a3	STAT320 , CSI (211, 212, 221, 223, 311, 312, 313, 314, 322, 324, 325, 411, 412, 414, 421, 423, 424, 425, 431,

					441, 442, 443, 445, 446, 447, 448, 449, 511, 514, 520, 522, 525, 530, 531)
			Objective (2)	a3	STAT320 , CSI (211, 212, 221, 223, 311, 312, 313, 314, 322, 324, 325, 411, 412, 414, 421, 423, 424, 425, 431, 441, 442, 443, 445, 446, 447, 448, 449, 511, 514, 520, 522, 525, 530, 531)
				b1	CSI (211, 221, 222, 223, 224, 311, 312, 313, 321, 322, 323, 324, 411, 412, 414, 422, 423, 424, 425, 431, 442, 443, 446, 447, 448, 449, 510, 513, 520, 521, 522, 530, 531, 533)
				b2	CSI (211, 221, 223, 312, 313, 314, 321, 324, 325, 411, 412, 413, 421, 423, 431, 432, 442, 443, 447, 511, 513, 521, 522, 530, 532, 533)
				b3	CSI (211, 224, 314, 322, 323, 413, 414, 425, 441, 443, 445, 447, 449, 510, 511, 514, 520, 521, 530)
				d1	PENG111, ENG210, CSI (211, 212, 221, 223, 224, 312, 314, 321, 322, 324, 325, 411, 413, 414, 421, 422, 424, 441, 442, 443,444, 446, 447, 448, 510, 511, 513, 514, 521, 522, 525, 530, 531, 532)
			Objective (5)	a2	ENG210, MATH(212, 220 ,310) , STAT320 CSI(221, 311,312,314,323,411,413,422,425,432,441,442,511,512, 513,520,521,525)
				b5	CSI (322, 422, 425, 432, 443, 446, 449, 510, 512, 520, 522,532)
				c3	ENG210 , MATH(212, 220, 310), STAT 320, CSI (211, 221, 222, 223, 311,313, 314, 321, 322, 325, 411, 414, 421, 424, 425, 441, 442, 444, 445, 448, 510, 513, 514, 532)
		Sufficient Knowledge	Objective (1)	a1	PMTH(112,127), MATH(212 , 220, 310) CSI(211,212,222,223,224,311,312,313, 321, 324, 325, 411, 412, 414, 421, 422, 423, 424, 431, 432, 442, 443, 444, 445, 447, 448, 449, 513, 514, 520, 522, 530, 531, 532, 533)` , STAT320

				a3	STAT320 , CSI (211, 212, 221, 223, 311, 312, 313, 314, 322, 324, 325, 411, 412, 414, 421, 423, 424, 425, 431, 441, 442, 443, 445, 446, 447, 448, 449, 511, 514, 520, 522, 525, 530, 531)
			Objective (2)	a3	STAT320 , CSI (211, 212, 221, 223, 311, 312, 313, 314, 322, 324, 325, 411, 412, 414, 421, 423, 424, 425, 431, 441, 442, 443, 445, 446, 447, 448, 449, 511, 514, 520, 522, 525, 530, 531)
				b1	CSI (211, 221, 222, 223, 224, 311, 312, 313, 321, 322, 323, 324, 411, 412, 414, 422, 423, 424, 425, 431, 442, 443, 446, 447, 448, 449, 510, 513, 520, 521, 522, 530, 531, 533)
				b2	CSI (211, 221, 223, 312, 313, 314, 321, 324, 325, 411, 412, 413, 421, 423, 431, 432, 442, 443, 447, 511, 513, 521, 522, 530, 532, 533)
				b3	CSI (211, 224, 314, 322, 323, 413, 414, 425, 441, 443, 445, 447, 449, 510, 511, 514, 520, 521, 530)
				d1	PENG111, ENG210, CSI (211, 212, 221, 223, 224, 312, 314, 321, 322, 324, 325, 411, 413, 414, 421, 422, 424, 441, 442, 443,444, 446, 447, 448, 510, 511, 513, 514, 521, 522, 525, 530, 531, 532)
Developed research services	Scientific Excellence	Developing education	Objective (1)	a1	PMTH(112,127), MATH(212 , 220, 310) CSI(211,212,222,223,224,311,312,313, 321, 324, 325, 411, 412, 414, 421, 422, 423, 424, 431, 432, 442, 443, 444, 445, 447, 448, 449, 513, 514, 520, 522, 530, 531, 532, 533)` , STAT320
				a3	STAT320 , CSI (211, 212, 221, 223, 311, 312, 313, 314, 322, 324, 325, 411, 412, 414, 421, 423, 424, 425, 431, 441, 442, 443, 445, 446, 447, 448, 449, 511, 514, 520, 522, 525, 530, 531)
			Objective (2)	a3	STAT320 , CSI (211, 212, 221, 223, 311, 312, 313, 314, 322, 324, 325, 411, 412, 414, 421, 423, 424, 425, 431,

					441, 442, 443, 445, 446, 447, 448, 449, 511, 514, 520, 522, 525, 530, 531)
				b1	CSI (211, 221, 222, 223, 224, 311, 312, 313, 321, 322, 323, 324, 411, 412, 414, 422, 423, 424, 425, 431, 442, 443, 446, 447, 448, 449, 510, 513, 520, 521, 522, 530, 531, 533)
				b2	CSI (211, 221, 223, 312, 313, 314, 321, 324, 325, 411, 412, 413, 421, 423, 431, 432, 442, 443, 447, 511, 513, 521, 522, 530, 532, 533)
				b3	CSI (211, 224, 314, 322, 323, 413, 414, 425, 441, 443, 445, 447, 449, 510, 511, 514, 520, 521, 530)
				d1	PENG111, ENG210, CSI (211, 212, 221, 223, 224, 312, 314, 321, 322, 324, 325, 411, 413, 414, 421, 422, 424, 441, 442, 443,444, 446, 447, 448, 510, 511, 513, 514, 521, 522, 525, 530, 531, 532)
			Objective (5)	**a2**	ENG210, MATH(212, 220 ,310) , STAT320 CSI(221, 311,312,314,323,411,413,422,425,432,441,442,511,512, 513,520,521,525)
				b5	CSI (322, 422, 425, 432, 443, 446, 449, 510, 512, 520, 522,532)
				c3	ENG210 , MATH(212, 220, 310), STAT 320, CSI (211, 221, 222, 223, 311,313, 314, 321, 322, 325, 411, 414, 421, 424, 425, 441, 442, 444, 445, 448, 510, 513, 514, 532)
	Affective Plans	**Sufficient skills**	**Objective (2)**	**a3**	STAT320 , CSI (211, 212, 221, 223, 311, 312, 313, 314, 322, 324, 325, 411, 412, 414, 421, 423, 424, 425, 431, 441, 442, 443, 445, 446, 447, 448, 449, 511, 514, 520, 522, 525, 530, 531)
				b1	CSI (211, 221, 222, 223, 224, 311, 312, 313, 321, 322, 323, 324, 411, 412, 414, 422, 423, 424, 425, 431, 442, 443, 446, 447, 448, 449, 510, 513, 520, 521, 522, 530, 531, 533)
				b2	CSI (211, 221, 223, 312, 313, 314, 321, 324, 325, 411,

					412, 413, 421, 423, 431, 432, 442, 443, 447, 511, 513, 521, 522, 530, 532, 533)
				b3	CSI (211, 224, 314, 322, 323, 413, 414, 425, 441, 443, 445, 447, 449, 510, 511, 514, 520, 521, 530)
				d1	PENG111, ENG210, CSI (211, 212, 221, 223, 224, 312, 314, 321, 322, 324, 325, 411, 413, 414, 421, 422, 424, 441, 442, 443,444, 446, 447, 448, 510, 511, 513, 514, 521, 522, 525, 530, 531, 532)
			Objective (3)	**b3**	CSI (211, 224, 314, 322, 323, 413, 414, 425, 441, 443, 445, 447, 449, 510, 511, 514, 520, 521, 530)
				b4	CSI (325,412,422, 431,432, 441, 442, 443, 449, 512, 520, 522, 525, 533)
				c1	PENG 111, ENG210 , CSI(212, 313, 323, 325, 412, 423, 425, 431, 446, 447, 511, 512, 525, 530, 533)
				d1	PENG111, ENG210, CSI (211, 212, 221, 223, 224, 312, 314, 321, 322, 324, 325, 411, 413, 414, 421, 422, 424, 441, 442, 443,444, 446, 447, 448, 510, 511, 513, 514, 521, 522, 525, 530, 531, 532)
				d2	ENG210, CSI (224, 313, 325, 413, 422, 423, 431, 432, 446, 448, 449, 510, 520, 521, 525, 533)
			Objective (4)	**c1**	PENG 111, ENG210 , CSI(212, 313, 323, 325, 412, 423, 425, 431, 446, 447, 511, 512, 525, 530, 533)
				c2	CSI(224, 311,321, 431, 432, 446, 522, 530)
				c3	ENG210 , MATH(212, 220, 310), STAT 320, CSI (211, 221, 222, 223, 311,313, 314, 321, 322, 325, 411, 414, 421, 424, 425, 441, 442, 444, 445, 448, 510, 513, 514, 532)
				d3	STAT320 , CSI (222, 323, 411, 421, 422, 432, 444, 445, 510, 512, 514, 520, 531)
			Objective (5)	**a2**	ENG210, MATH(212, 220 ,310) , STAT320 CSI(221, 311,312,314,323,411,413,422,425,432,441,442,511,512, 513,520,521,525)
				b5	CSI (322, 422, 425, 432, 443, 446, 449, 510, 512, 520, 522,532)

				c3	ENG210 , MATH(212, 220, 310), STAT 320, CSI (211, 221, 222, 223, 311,313, 314, 321, 322, 325, 411, 414, 421, 424, 425, 441, 442, 444, 445, 448, 510, 513, 514, 532)
	Developed Programs	Developing education	Objective (1)	a1	PMTH(112,127), MATH(212 , 220, 310) CSI(211,212,222,223,224,311,312,313, 321, 324, 325, 411, 412, 414, 421, 422, 423, 424, 431, 432, 442, 443, 444, 445, 447, 448, 449, 513, 514, 520, 522, 530, 531, 532, 533)` , STAT320
				a3	STAT320 , CSI (211, 212, 221, 223, 311, 312, 313, 314, 322, 324, 325, 411, 412, 414, 421, 423, 424, 425, 431, 441, 442, 443, 445, 446, 447, 448, 449, 511, 514, 520, 522, 525, 530, 531)
			Objective (2)	a3	STAT320 , CSI (211, 212, 221, 223, 311, 312, 313, 314, 322, 324, 325, 411, 412, 414, 421, 423, 424, 425, 431, 441, 442, 443, 445, 446, 447, 448, 449, 511, 514, 520, 522, 525, 530, 531)
				b1	CSI (211, 221, 222, 223, 224, 311, 312, 313, 321, 322, 323, 324, 411, 412, 414, 422, 423, 424, 425, 431, 442, 443, 446, 447, 448, 449, 510, 513, 520, 521, 522, 530, 531, 533)
				b2	CSI (211, 221, 223, 312, 313, 314, 321, 324, 325, 411, 412, 413, 421, 423, 431, 432, 442, 443, 447, 511, 513, 521, 522, 530, 532, 533)
				b3	CSI (211, 224, 314, 322, 323, 413, 414, 425, 441, 443, 445, 447, 449, 510, 511, 514, 520, 521, 530)
				d1	PENG111, ENG210, CSI (211, 212, 221, 223, 224, 312, 314, 321, 322, 324, 325, 411, 413, 414, 421, 422, 424, 441, 442, 443,444, 446, 447, 448, 510, 511, 513, 514, 521, 522, 525, 530, 531, 532)
			Objective (5)	a2	ENG210, MATH(212, 220 ,310) , STAT320 CSI(221, 311,312,314,323,411,413,422,425,432,441,442,511,512, 513,520,521,525)
				b5	CSI (322, 422, 425, 432, 443, 446, 449, 510, 512, 520, 522,532)

				c3	ENG210 , MATH(212, 220, 310), STAT 320, CSI (211, 221, 222, 223, 311,313, 314, 321, 322, 325, 411, 414, 421, 424, 425, 441, 442, 444, 445, 448, 510, 513, 514, 532)
		Sufficient Knowledge	Objective (1)	a1	PMTH(112,127), MATH(212 , 220, 310) CSI(211,212,222,223,224,311,312,313, 321, 324, 325, 411, 412, 414, 421, 422, 423, 424, 431, 432, 442, 443, 444, 445, 447, 448, 449, 513, 514, 520, 522, 530, 531, 532, 533)` , STAT320
				a3	STAT320 , CSI (211, 212, 221, 223, 311, 312, 313, 314, 322, 324, 325, 411, 412, 414, 421, 423, 424, 425, 431, 441, 442, 443, 445, 446, 447, 448, 449, 511, 514, 520, 522, 525, 530, 531)
			Objective (2)	a3	STAT320 , CSI (211, 212, 221, 223, 311, 312, 313, 314, 322, 324, 325, 411, 412, 414, 421, 423, 424, 425, 431, 441, 442, 443, 445, 446, 447, 448, 449, 511, 514, 520, 522, 525, 530, 531)
				b1	CSI (211, 221, 222, 223, 224, 311, 312, 313, 321, 322, 323, 324, 411, 412, 414, 422, 423, 424, 425, 431, 442, 443, 446, 447, 448, 449, 510, 513, 520, 521, 522, 530, 531, 533)
				b2	CSI (211, 221, 223, 312, 313, 314, 321, 324, 325, 411, 412, 413, 421, 423, 431, 432, 442, 443, 447, 511, 513, 521, 522, 530, 532, 533)
				b3	CSI (211, 224, 314, 322, 323, 413, 414, 425, 441, 443, 445, 447, 449, 510, 511, 514, 520, 521, 530)
				d1	PENG111, ENG210, CSI (211, 212, 221, 223, 224, 312, 314, 321, 322, 324, 325, 411, 413, 414, 421, 422, 424, 441, 442, 443,444, 446, 447, 448, 510, 511, 513, 514, 521, 522, 525, 530, 531, 532)
	Sufficient Skills	Sufficient skills	Objective (2)	*a3*	STAT320 , CSI (211, 212, 221, 223, 311, 312, 313, 314, 322, 324, 325, 411, 412, 414, 421, 423, 424, 425, 431, 441, 442, 443, 445, 446, 447, 448, 449, 511, 514, 520, 522, 525, 530, 531)
				b1	CSI (211, 221, 222, 223, 224, 311, 312, 313, 321, 322,

					323, 324, 411, 412, 414, 422, 423, 424, 425, 431, 442, 443, 446, 447, 448, 449, 510, 513, 520, 521, 522, 530, 531, 533)
				b2	CSI (211, 221, 223, 312, 313, 314, 321, 324, 325, 411, 412, 413, 421, 423, 431, 432, 442, 443, 447, 511, 513, 521, 522, 530, 532, 533)
				b3	CSI (211, 224, 314, 322, 323, 413, 414, 425, 441, 443, 445, 447, 449, 510, 511, 514, 520, 521, 530)
				d1	PENG111, ENG210, CSI (211, 212, 221, 223, 224, 312, 314, 321, 322, 324, 325, 411, 413, 414, 421, 422, 424, 441, 442, 443,444, 446, 447, 448, 510, 511, 513, 514, 521, 522, 525, 530, 531, 532)
			Objective (3)	***b3***	CSI (211, 224, 314, 322, 323, 413, 414, 425, 441, 443, 445, 447, 449, 510, 511, 514, 520, 521, 530)
				b4	CSI (325,412,422, 431,432, 441, 442, 443, 449, 512, 520, 522, 525, 533)
				c1	PENG 111, ENG210 , CSI(212, 313, 323, 325, 412, 423, 425, 431, 446, 447, 511, 512, 525, 530, 533)
				d1	PENG111, ENG210, CSI (211, 212, 221, 223, 224, 312, 314, 321, 322, 324, 325, 411, 413, 414, 421, 422, 424, 441, 442, 443,444, 446, 447, 448, 510, 511, 513, 514, 521, 522, 525, 530, 531, 532)
				d2	ENG210, CSI (224, 313, 325, 413, 422, 423, 431, 432, 446, 448, 449, 510, 520, 521, 525, 533)
			Objective (4)	***c1***	PENG 111, ENG210 , CSI(212, 313, 323, 325, 412, 423, 425, 431, 446, 447, 511, 512, 525, 530, 533)
				c2	CSI(224, 311,321, 431, 432, 446, 522, 530)
				c3	ENG210 , MATH(212, 220, 310), STAT 320, CSI (211, 221, 222, 223, 311,313, 314, 321, 322, 325, 411, 414, 421, 424, 425, 441, 442, 444, 445, 448, 510, 513, 514, 532)

				d3	STAT320 , CSI (222, 323, 411, 421, 422, 432, 444, 445, 510, 512, 514, 520, 531)
			Objective (5)	**a2**	ENG210, MATH(212, 220 ,310) , STAT320 CSI(221, 311,312,314,323,411,413,422,425,432,441,442,511,512, 513,520,521,525)
				b5	CSI (322, 422, 425, 432, 443, 446, 449, 510, 512, 520, 522,532)
				c3	ENG210 , MATH(212, 220, 310), STAT 320, CSI (211, 221, 222, 223, 311,313, 314, 321, 322, 325, 411, 414, 421, 424, 425, 441, 442, 444, 445, 448, 510, 513, 514, 532)
		Team Work	**Objective (3)**	**b3**	CSI (211, 224, 314, 322, 323, 413, 414, 425, 441, 443, 445, 447, 449, 510, 511, 514, 520, 521, 530)
				b4	CSI (325,412,422, 431,432, 441, 442, 443, 449, 512, 520, 522, 525, 533)
				c1	PENG 111, ENG210 , CSI(212, 313, 323, 325, 412, 423, 425, 431, 446, 447, 511, 512, 525, 530, 533)
				d1	PENG111, ENG210, CSI (211, 212, 221, 223, 224, 312, 314, 321, 322, 324, 325, 411, 413, 414, 421, 422, 424, 441, 442, 443,444, 446, 447, 448, 510, 511, 513, 514, 521, 522, 525, 530, 531, 532)
				d2	ENG210, CSI (224, 313, 325, 413, 422, 423, 431, 432, 446, 448, 449, 510, 520, 521, 525, 533)
		Society partnership	**Objective (3)**	**b3**	CSI (211, 224, 314, 322, 323, 413, 414, 425, 441, 443, 445, 447, 449, 510, 511, 514, 520, 521, 530)
				b4	CSI (325,412,422, 431,432, 441, 442, 443, 449, 512, 520, 522, 525, 533)
				c1	PENG 111, ENG210 , CSI(212, 313, 323, 325, 412, 423, 425, 431, 446, 447, 511, 512, 525, 530, 533)
				d1	PENG111, ENG210, CSI (211, 212, 221, 223, 224, 312, 314, 321, 322, 324, 325, 411, 413, 414, 421, 422, 424, 441, 442, 443,444, 446, 447, 448, 510, 511, 513, 514,

					521, 522, 525, 530, 531, 532)
				d2	ENG210, CSI (224, 313, 325, 413, 422, 423, 431, 432, 446, 448, 449, 510, 520, 521, 525, 533)
			Objective (4)	c1	PENG 111, ENG210 , CSI(212, 313, 323, 325, 412, 423, 425, 431, 446, 447, 511, 512, 525, 530, 533)
				c2	CSI(224, 311,321, 431, 432, 446, 522, 530)
				c3	ENG210 , MATH(212, 220, 310), STAT 320, CSI (211, 221, 222, 223, 311,313, 314, 321, 322, 325, 411, 414, 421, 424, 425, 441, 442, 444, 445, 448, 510, 513, 514, 532)
				d3	STAT320 , CSI (222, 323, 411, 421, 422, 432, 444, 445, 510, 512, 514, 520, 531)
Academic competition	Scientific Excellence	Developing education	Objective (1)	a1	PMTH(112,127), MATH(212 , 220, 310) CSI(211,212,222,223,224,311,312,313, 321, 324, 325, 411, 412, 414, 421, 422, 423, 424, 431, 432, 442, 443, 444, 445, 447, 448, 449, 513, 514, 520, 522, 530, 531, 532, 533)` , STAT320
				a3	STAT320 , CSI (211, 212, 221, 223, 311, 312, 313, 314, 322, 324, 325, 411, 412, 414, 421, 423, 424, 425, 431, 441, 442, 443, 445, 446, 447, 448, 449, 511, 514, 520, 522, 525, 530, 531)
			Objective (2)	a3	STAT320 , CSI (211, 212, 221, 223, 311, 312, 313, 314, 322, 324, 325, 411, 412, 414, 421, 423, 424, 425, 431, 441, 442, 443, 445, 446, 447, 448, 449, 511, 514, 520, 522, 525, 530, 531)
				b1	CSI (211, 221, 222, 223, 224, 311, 312, 313, 321, 322, 323, 324, 411, 412, 414, 422, 423, 424, 425, 431, 442, 443, 446, 447, 448, 449, 510, 513, 520, 521, 522, 530, 531, 533)
				b2	CSI (211, 221, 223, 312, 313, 314, 321, 324, 325, 411, 412, 413, 421, 423, 431, 432, 442, 443, 447, 511, 513, 521, 522, 530, 532, 533)
				b3	CSI (211, 224, 314, 322, 323, 413, 414, 425, 441, 443, 445, 447, 449, 510, 511, 514, 520, 521, 530)

				d1	PENG111, ENG210, CSI (211, 212, 221, 223, 224, 312, 314, 321, 322, 324, 325, 411, 413, 414, 421, 422, 424, 441, 442, 443,444, 446, 447, 448, 510, 511, 513, 514, 521, 522, 525, 530, 531, 532)
			Objective (5)	**a2**	ENG210, MATH(212, 220 ,310) , STAT320 CSI(221, 311,312,314,323,411,413,422,425,432,441,442,511,512, 513,520,521,525)
				b5	CSI (322, 422, 425, 432, 443, 446, 449, 510, 512, 520, 522,532)
				c3	ENG210 , MATH(212, 220, 310), STAT 320, CSI (211, 221, 222, 223, 311,313, 314, 321, 322, 325, 411, 414, 421, 424, 425, 441, 442, 444, 445, 448, 510, 513, 514, 532)
	Affective Plans	**Sufficient skills**	**Objective (2)**	**a3**	STAT320 , CSI (211, 212, 221, 223, 311, 312, 313, 314, 322, 324, 325, 411, 412, 414, 421, 423, 424, 425, 431, 441, 442, 443, 445, 446, 447, 448, 449, 511, 514, 520, 522, 525, 530, 531)
				b1	CSI (211, 221, 222, 223, 224, 311, 312, 313, 321, 322, 323, 324, 411, 412, 414, 422, 423, 424, 425, 431, 442, 443, 446, 447, 448, 449, 510, 513, 520, 521, 522, 530, 531, 533)
				b2	CSI (211, 221, 223, 312, 313, 314, 321, 324, 325, 411, 412, 413, 421, 423, 431, 432, 442, 443, 447, 511, 513, 521, 522, 530, 532, 533)
				b3	CSI (211, 224, 314, 322, 323, 413, 414, 425, 441, 443, 445, 447, 449, 510, 511, 514, 520, 521, 530)
				d1	PENG111, ENG210, CSI (211, 212, 221, 223, 224, 312, 314, 321, 322, 324, 325, 411, 413, 414, 421, 422, 424, 441, 442, 443,444, 446, 447, 448, 510, 511, 513, 514, 521, 522, 525, 530, 531, 532)
			Objective (3)	**b3**	CSI (211, 224, 314, 322, 323, 413, 414, 425, 441, 443, 445, 447, 449, 510, 511, 514, 520, 521, 530)
				b4	CSI (325,412,422, 431,432, 441, 442, 443, 449, 512, 520, 522, 525, 533)
				c1	PENG 111, ENG210 , CSI(212, 313, 323, 325, 412, 423,

					425, 431, 446, 447, 511, 512, 525, 530, 533)
				d1	PENG111, ENG210, CSI (211, 212, 221, 223, 224, 312, 314, 321, 322, 324, 325, 411, 413, 414, 421, 422, 424, 441, 442, 443,444, 446, 447, 448, 510, 511, 513, 514, 521, 522, 525, 530, 531, 532)
				d2	ENG210, CSI (224, 313, 325, 413, 422, 423, 431, 432, 446, 448, 449, 510, 520, 521, 525, 533)
			Objective (4)	c1	PENG 111, ENG210 , CSI(212, 313, 323, 325, 412, 423, 425, 431, 446, 447, 511, 512, 525, 530, 533)
				c2	CSI(224, 311,321, 431, 432, 446, 522, 530)
				c3	ENG210 , MATH(212, 220, 310), STAT 320, CSI (211, 221, 222, 223, 311,313, 314, 321, 322, 325, 411, 414, 421, 424, 425, 441, 442, 444, 445, 448, 510, 513, 514, 532)
				d3	STAT320 , CSI (222, 323, 411, 421, 422, 432, 444, 445, 510, 512, 514, 520, 531)
			Objective (5)	a2	ENG210, MATH(212, 220 ,310) , STAT320 CSI(221, 311,312,314,323,411,413,422,425,432,441,442,511,512, 513,520,521,525)
				b5	CSI (322, 422, 425, 432, 443, 446, 449, 510, 512, 520, 522,532)
				c3	ENG210 , MATH(212, 220, 310), STAT 320, CSI (211, 221, 222, 223, 311,313, 314, 321, 322, 325, 411, 414, 421, 424, 425, 441, 442, 444, 445, 448, 510, 513, 514, 532)
	Developed Programs	Developing education	Objective (1)	a1	PMTH(112,127), MATH(212 , 220, 310) CSI(211,212,222,223,224,311,312,313, 321, 324, 325, 411, 412, 414, 421, 422, 423, 424, 431, 432, 442, 443, 444, 445, 447, 448, 449, 513, 514, 520, 522, 530, 531, 532, 533)` , STAT320
				a3	STAT320 , CSI (211, 212, 221, 223, 311, 312, 313, 314, 322, 324, 325, 411, 412, 414, 421, 423, 424, 425, 431, 441, 442, 443, 445, 446, 447, 448, 449, 511, 514, 520, 522, 525, 530, 531)

			Objective (2)	a3	STAT320 , CSI (211, 212, 221, 223, 311, 312, 313, 314, 322, 324, 325, 411, 412, 414, 421, 423, 424, 425, 431, 441, 442, 443, 445, 446, 447, 448, 449, 511, 514, 520, 522, 525, 530, 531)
				b1	CSI (211, 221, 222, 223, 224, 311, 312, 313, 321, 322, 323, 324, 411, 412, 414, 422, 423, 424, 425, 431, 442, 443, 446, 447, 448, 449, 510, 513, 520, 521, 522, 530, 531, 533)
				b2	CSI (211, 221, 223, 312, 313, 314, 321, 324, 325, 411, 412, 413, 421, 423, 431, 432, 442, 443, 447, 511, 513, 521, 522, 530, 532, 533)
				b3	CSI (211, 224, 314, 322, 323, 413, 414, 425, 441, 443, 445, 447, 449, 510, 511, 514, 520, 521, 530)
				d1	PENG111, ENG210, CSI (211, 212, 221, 223, 224, 312, 314, 321, 322, 324, 325, 411, 413, 414, 421, 422, 424, 441, 442, 443,444, 446, 447, 448, 510, 511, 513, 514, 521, 522, 525, 530, 531, 532)
			Objective (5)	a2	ENG210, MATH(212, 220 ,310) , STAT320 CSI(221, 311,312,314,323,411,413,422,425,432,441,442,511,512, 513,520,521,525)
				b5	CSI (322, 422, 425, 432, 443, 446, 449, 510, 512, 520, 522,532)
				c3	ENG210 , MATH(212, 220, 310), STAT 320, CSI (211, 221, 222, 223, 311,313, 314, 321, 322, 325, 411, 414, 421, 424, 425, 441, 442, 444, 445, 448, 510, 513, 514, 532)
		Sufficient Knowledge	Objective (1)	a1	PMTH(112,127), MATH(212 , 220, 310) CSI(211,212,222,223,224,311,312,313, 321, 324, 325, 411, 412, 414, 421, 422, 423, 424, 431, 432, 442, 443, 444, 445, 447, 448, 449, 513, 514, 520, 522, 530, 531, 532, 533)` , STAT320
				a3	STAT320 , CSI (211, 212, 221, 223, 311, 312, 313, 314, 322, 324, 325, 411, 412, 414, 421, 423, 424, 425, 431, 441, 442, 443, 445, 446, 447, 448, 449, 511, 514, 520, 522, 525, 530, 531)

			Objective (2)	a3	STAT320 , CSI (211, 212, 221, 223, 311, 312, 313, 314, 322, 324, 325, 411, 412, 414, 421, 423, 424, 425, 431, 441, 442, 443, 445, 446, 447, 448, 449, 511, 514, 520, 522, 525, 530, 531)
				b1	CSI (211, 221, 222, 223, 224, 311, 312, 313, 321, 322, 323, 324, 411, 412, 414, 422, 423, 424, 425, 431, 442, 443, 446, 447, 448, 449, 510, 513, 520, 521, 522, 530, 531, 533)
				b2	CSI (211, 221, 223, 312, 313, 314, 321, 324, 325, 411, 412, 413, 421, 423, 431, 432, 442, 443, 447, 511, 513, 521, 522, 530, 532, 533)
				b3	CSI (211, 224, 314, 322, 323, 413, 414, 425, 441, 443, 445, 447, 449, 510, 511, 514, 520, 521, 530)
				d1	PENG111, ENG210, CSI (211, 212, 221, 223, 224, 312, 314, 321, 322, 324, 325, 411, 413, 414, 421, 422, 424, 441, 442, 443,444, 446, 447, 448, 510, 511, 513, 514, 521, 522, 525, 530, 531, 532)
	Sufficient Skills	Sufficient skills	Objective (2)	a3	STAT320 , CSI (211, 212, 221, 223, 311, 312, 313, 314, 322, 324, 325, 411, 412, 414, 421, 423, 424, 425, 431, 441, 442, 443, 445, 446, 447, 448, 449, 511, 514, 520, 522, 525, 530, 531)
				b1	CSI (211, 221, 222, 223, 224, 311, 312, 313, 321, 322, 323, 324, 411, 412, 414, 422, 423, 424, 425, 431, 442, 443, 446, 447, 448, 449, 510, 513, 520, 521, 522, 530, 531, 533)
				b2	CSI (211, 221, 223, 312, 313, 314, 321, 324, 325, 411, 412, 413, 421, 423, 431, 432, 442, 443, 447, 511, 513, 521, 522, 530, 532, 533)
				b3	CSI (211, 224, 314, 322, 323, 413, 414, 425, 441, 443, 445, 447, 449, 510, 511, 514, 520, 521, 530)
				d1	PENG111, ENG210, CSI (211, 212, 221, 223, 224, 312, 314, 321, 322, 324, 325, 411, 413, 414, 421, 422, 424, 441, 442, 443,444, 446, 447, 448, 510, 511, 513, 514, 521, 522, 525, 530, 531, 532)

			Objective (3)	b3	CSI (211, 224, 314, 322, 323, 413, 414, 425, 441, 443, 445, 447, 449, 510, 511, 514, 520, 521, 530)
				b4	CSI (325,412,422, 431,432, 441, 442, 443, 449, 512, 520, 522, 525, 533)
				c1	PENG 111, ENG210 , CSI(212, 313, 323, 325, 412, 423, 425, 431, 446, 447, 511, 512, 525, 530, 533)
				d1	PENG111, ENG210, CSI (211, 212, 221, 223, 224, 312, 314, 321, 322, 324, 325, 411, 413, 414, 421, 422, 424, 441, 442, 443,444, 446, 447, 448, 510, 511, 513, 514, 521, 522, 525, 530, 531, 532)
				d2	ENG210, CSI (224, 313, 325, 413, 422, 423, 431, 432, 446, 448, 449, 510, 520, 521, 525, 533)
			Objective (4)	c1	PENG 111, ENG210 , CSI(212, 313, 323, 325, 412, 423, 425, 431, 446, 447, 511, 512, 525, 530, 533)
				c2	CSI(224, 311,321, 431, 432, 446, 522, 530)
				c3	ENG210 , MATH(212, 220, 310), STAT 320, CSI (211, 221, 222, 223, 311,313, 314, 321, 322, 325, 411, 414, 421, 424, 425, 441, 442, 444, 445, 448, 510, 513, 514, 532)
				d3	STAT320 , CSI (222, 323, 411, 421, 422, 432, 444, 445, 510, 512, 514, 520, 531)
			Objective (5)	a2	ENG210, MATH(212, 220 ,310) , STAT320 CSI(221, 311,312,314,323,411,413,422,425,432,441,442,511,512, 513,520,521,525)
				b5	CSI (322, 422, 425, 432, 443, 446, 449, 510, 512, 520, 522,532)
				c3	ENG210 , MATH(212, 220, 310), STAT 320, CSI (211, 221, 222, 223, 311,313, 314, 321, 322, 325, 411, 414, 421, 424, 425, 441, 442, 444, 445, 448, 510, 513, 514, 532)

		Team Work	Objective (3)	b3	CSI (211, 224, 314, 322, 323, 413, 414, 425, 441, 443, 445, 447, 449, 510, 511, 514, 520, 521, 530)
				b4	CSI (325,412,422, 431,432, 441, 442, 443, 449, 512, 520, 522, 525, 533)
				c1	PENG 111, ENG210 , CSI(212, 313, 323, 325, 412, 423, 425, 431, 446, 447, 511, 512, 525, 530, 533)
				d1	PENG111, ENG210, CSI (211, 212, 221, 223, 224, 312, 314, 321, 322, 324, 325, 411, 413, 414, 421, 422, 424, 441, 442, 443,444, 446, 447, 448, 510, 511, 513, 514, 521, 522, 525, 530, 531, 532)
				d2	ENG210, CSI (224, 313, 325, 413, 422, 423, 431, 432, 446, 448, 449, 510, 520, 521, 525, 533)
		Society partnership	Objective (3)	b3	CSI (211, 224, 314, 322, 323, 413, 414, 425, 441, 443, 445, 447, 449, 510, 511, 514, 520, 521, 530)
				b4	CSI (325,412,422, 431,432, 441, 442, 443, 449, 512, 520, 522, 525, 533)
				c1	PENG 111, ENG210 , CSI(212, 313, 323, 325, 412, 423, 425, 431, 446, 447, 511, 512, 525, 530, 533)
				d1	PENG111, ENG210, CSI (211, 212, 221, 223, 224, 312, 314, 321, 322, 324, 325, 411, 413, 414, 421, 422, 424, 441, 442, 443,444, 446, 447, 448, 510, 511, 513, 514, 521, 522, 525, 530, 531, 532)
				d2	ENG210, CSI (224, 313, 325, 413, 422, 423, 431, 432, 446, 448, 449, 510, 520, 521, 525, 533)
			Objective (4)	c1	PENG 111, ENG210 , CSI(212, 313, 323, 325, 412, 423, 425, 431, 446, 447, 511, 512, 525, 530, 533)
				c2	CSI(224, 311,321, 431, 432, 446, 522, 530)
				c3	ENG210 , MATH(212, 220, 310), STAT 320, CSI (211, 221, 222, 223, 311,313, 314, 321, 322, 325, 411, 414, 421, 424, 425, 441, 442, 444, 445, 448, 510, 513, 514, 532)
				d3	STAT320 , CSI (222, 323, 411, 421, 422, 432, 444, 445, 510, 512, 514, 520, 531)

	Sufficient Skills	Sufficient skills	Objective (2)	a3	STAT320 , CSI (211, 212, 221, 223, 311, 312, 313, 314, 322, 324, 325, 411, 412, 414, 421, 423, 424, 425, 431, 441, 442, 443, 445, 446, 447, 448, 449, 511, 514, 520, 522, 525, 530, 531)
				b1	CSI (211, 221, 222, 223, 224, 311, 312, 313, 321, 322, 323, 324, 411, 412, 414, 422, 423, 424, 425, 431, 442, 443, 446, 447, 448, 449, 510, 513, 520, 521, 522, 530, 531, 533)
				b2	CSI (211, 221, 223, 312, 313, 314, 321, 324, 325, 411, 412, 413, 421, 423, 431, 432, 442, 443, 447, 511, 513, 521, 522, 530, 532, 533)
				b3	CSI (211, 224, 314, 322, 323, 413, 414, 425, 441, 443, 445, 447, 449, 510, 511, 514, 520, 521, 530)
				d1	PENG111, ENG210, CSI (211, 212, 221, 223, 224, 312, 314, 321, 322, 324, 325, 411, 413, 414, 421, 422, 424, 441, 442, 443,444, 446, 447, 448, 510, 511, 513, 514, 521, 522, 525, 530, 531, 532)
			Objective (3)	b3	CSI (211, 224, 314, 322, 323, 413, 414, 425, 441, 443, 445, 447, 449, 510, 511, 514, 520, 521, 530)
				b4	CSI (325,412,422, 431,432, 441, 442, 443, 449, 512, 520, 522, 525, 533)
				c1	PENG 111, ENG210 , CSI(212, 313, 323, 325, 412, 423, 425, 431, 446, 447, 511, 512, 525, 530, 533)
				d1	PENG111, ENG210, CSI (211, 212, 221, 223, 224, 312, 314, 321, 322, 324, 325, 411, 413, 414, 421, 422, 424, 441, 442, 443,444, 446, 447, 448, 510, 511, 513, 514, 521, 522, 525, 530, 531, 532)
				d2	ENG210, CSI (224, 313, 325, 413, 422, 423, 431, 432, 446, 448, 449, 510, 520, 521, 525, 533)
			Objective (4)	c1	PENG 111, ENG210 , CSI(212, 313, 323, 325, 412, 423, 425, 431, 446, 447, 511, 512, 525, 530, 533)
				c2	CSI(224, 311,321, 431, 432, 446, 522, 530)

				c3	ENG210 , MATH(212, 220, 310), STAT 320, CSI (211, 221, 222, 223, 311,313, 314, 321, 322, 325, 411, 414, 421, 424, 425, 441, 442, 444, 445, 448, 510, 513, 514, 532)
				d3	STAT320 , CSI (222, 323, 411, 421, 422, 432, 444, 445, 510, 512, 514, 520, 531)
			Objective (5)	a2	ENG210, MATH(212, 220 ,310) , STAT320 CSI(221, 311,312,314,323,411,413,422,425,432,441,442,511,512, 513,520,521,525)
				b5	CSI (322, 422, 425, 432, 443, 446, 449, 510, 512, 520, 522,532)
				c3	ENG210 , MATH(212, 220, 310), STAT 320, CSI (211, 221, 222, 223, 311,313, 314, 321, 322, 325, 411, 414, 421, 424, 425, 441, 442, 444, 445, 448, 510, 513, 514, 532)
		Team Work	Objective (3)	b3	CSI (211, 224, 314, 322, 323, 413, 414, 425, 441, 443, 445, 447, 449, 510, 511, 514, 520, 521, 530)
				b4	CSI (325,412,422, 431,432, 441, 442, 443, 449, 512, 520, 522, 525, 533)
				c1	PENG 111, ENG210 , CSI(212, 313, 323, 325, 412, 423, 425, 431, 446, 447, 511, 512, 525, 530, 533)
				d1	PENG111, ENG210, CSI (211, 212, 221, 223, 224, 312, 314, 321, 322, 324, 325, 411, 413, 414, 421, 422, 424, 441, 442, 443,444, 446, 447, 448, 510, 511, 513, 514, 521, 522, 525, 530, 531, 532)
				d2	ENG210, CSI (224, 313, 325, 413, 422, 423, 431, 432, 446, 448, 449, 510, 520, 521, 525, 533)
		Society partnership	Objective (3)	b3	CSI (211, 224, 314, 322, 323, 413, 414, 425, 441, 443, 445, 447, 449, 510, 511, 514, 520, 521, 530)
				b4	CSI (325,412,422, 431,432, 441, 442, 443, 449, 512, 520, 522, 525, 533)
				c1	PENG 111, ENG210 , CSI(212, 313, 323, 325, 412, 423, 425, 431, 446, 447, 511, 512, 525, 530, 533)

				d1	PENG111, ENG210, CSI (211, 212, 221, 223, 224, 312, 314, 321, 322, 324, 325, 411, 413, 414, 421, 422, 424, 441, 442, 443,444, 446, 447, 448, 510, 511, 513, 514, 521, 522, 525, 530, 531, 532)
				d2	ENG210, CSI (224, 313, 325, 413, 422, 423, 431, 432, 446, 448, 449, 510, 520, 521, 525, 533)
			Objective (4)	c1	PENG 111, ENG210 , CSI(212, 313, 323, 325, 412, 423, 425, 431, 446, 447, 511, 512, 525, 530, 533)
				c2	CSI(224, 311,321, 431, 432, 446, 522, 530)
				c3	ENG210 , MATH(212, 220, 310), STAT 320, CSI (211, 221, 222, 223, 311,313, 314, 321, 322, 325, 411, 414, 421, 424, 425, 441, 442, 444, 445, 448, 510, 513, 514, 532)
				d3	STAT320 , CSI (222, 323, 411, 421, 422, 432, 444, 445, 510, 512, 514, 520, 531)
	Society Responsibilities	Sufficient skills	Objective (2)	a3	STAT320 , CSI (211, 212, 221, 223, 311, 312, 313, 314, 322, 324, 325, 411, 412, 414, 421, 423, 424, 425, 431, 441, 442, 443, 445, 446, 447, 448, 449, 511, 514, 520, 522, 525, 530, 531)
				b1	CSI (211, 221, 222, 223, 224, 311, 312, 313, 321, 322, 323, 324, 411, 412, 414, 422, 423, 424, 425, 431, 442, 443, 446, 447, 448, 449, 510, 513, 520, 521, 522, 530, 531, 533)
				b2	CSI (211, 221, 223, 312, 313, 314, 321, 324, 325, 411, 412, 413, 421, 423, 431, 432, 442, 443, 447, 511, 513, 521, 522, 530, 532, 533)
				b3	CSI (211, 224, 314, 322, 323, 413, 414, 425, 441, 443, 445, 447, 449, 510, 511, 514, 520, 521, 530)
				d1	PENG111, ENG210, CSI (211, 212, 221, 223, 224, 312, 314, 321, 322, 324, 325, 411, 413, 414, 421, 422, 424, 441, 442, 443,444, 446, 447, 448, 510, 511, 513, 514, 521, 522, 525, 530, 531, 532)
			Objective (3)	b3	CSI (211, 224, 314, 322, 323, 413, 414, 425, 441, 443, 445, 447, 449, 510, 511, 514, 520, 521, 530)

				b4	CSI (325,412,422, 431,432, 441, 442, 443, 449, 512, 520, 522, 525, 533)
				c1	PENG 111, ENG210 , CSI(212, 313, 323, 325, 412, 423, 425, 431, 446, 447, 511, 512, 525, 530, 533)
				d1	PENG111, ENG210, CSI (211, 212, 221, 223, 224, 312, 314, 321, 322, 324, 325, 411, 413, 414, 421, 422, 424, 441, 442, 443,444, 446, 447, 448, 510, 511, 513, 514, 521, 522, 525, 530, 531, 532)
				d2	ENG210, CSI (224, 313, 325, 413, 422, 423, 431, 432, 446, 448, 449, 510, 520, 521, 525, 533)
			Objective (4)	c1	PENG 111, ENG210 , CSI(212, 313, 323, 325, 412, 423, 425, 431, 446, 447, 511, 512, 525, 530, 533)
				c2	CSI(224, 311,321, 431, 432, 446, 522, 530)
				c3	ENG210 , MATH(212, 220, 310), STAT 320, CSI (211, 221, 222, 223, 311,313, 314, 321, 322, 325, 411, 414, 421, 424, 425, 441, 442, 444, 445, 448, 510, 513, 514, 532)
				d3	STAT320 , CSI (222, 323, 411, 421, 422, 432, 444, 445, 510, 512, 514, 520, 531)
			Objective (5)	a2	ENG210, MATH(212, 220 ,310) , STAT320 CSI(221, 311,312,314,323,411,413,422,425,432,441,442,511,512, 513,520,521,525)
				b5	CSI (322, 422, 425, 432, 443, 446, 449, 510, 512, 520, 522,532)
				c3	ENG210 , MATH(212, 220, 310), STAT 320, CSI (211, 221, 222, 223, 311,313, 314, 321, 322, 325, 411, 414, 421, 424, 425, 441, 442, 444, 445, 448, 510, 513, 514, 532)
		Team Work	Objective (3)	b3	CSI (211, 224, 314, 322, 323, 413, 414, 425, 441, 443, 445, 447, 449, 510, 511, 514, 520, 521, 530)
				b4	CSI (325,412,422, 431,432, 441, 442, 443, 449, 512, 520, 522, 525, 533)
				c1	PENG 111, ENG210 , CSI(212, 313, 323, 325, 412, 423, 425, 431, 446, 447, 511, 512, 525, 530, 533)

				d1	PENG111, ENG210, CSI (211, 212, 221, 223, 224, 312, 314, 321, 322, 324, 325, 411, 413, 414, 421, 422, 424, 441, 442, 443,444, 446, 447, 448, 510, 511, 513, 514, 521, 522, 525, 530, 531, 532)
				d2	ENG210, CSI (224, 313, 325, 413, 422, 423, 431, 432, 446, 448, 449, 510, 520, 521, 525, 533)
		Society partnership	**Objective (3)**	**b3**	CSI (211, 224, 314, 322, 323, 413, 414, 425, 441, 443, 445, 447, 449, 510, 511, 514, 520, 521, 530)
				b4	CSI (325,412,422, 431,432, 441, 442, 443, 449, 512, 520, 522, 525, 533)
				c1	PENG 111, ENG210 , CSI(212, 313, 323, 325, 412, 423, 425, 431, 446, 447, 511, 512, 525, 530, 533)
				d1	PENG111, ENG210, CSI (211, 212, 221, 223, 224, 312, 314, 321, 322, 324, 325, 411, 413, 414, 421, 422, 424, 441, 442, 443,444, 446, 447, 448, 510, 511, 513, 514, 521, 522, 525, 530, 531, 532)
				d2	ENG210, CSI (224, 313, 325, 413, 422, 423, 431, 432, 446, 448, 449, 510, 520, 521, 525, 533)
			Objective (4)	**c1**	PENG 111, ENG210 , CSI(212, 313, 323, 325, 412, 423, 425, 431, 446, 447, 511, 512, 525, 530, 533)
				c2	CSI(224, 311,321, 431, 432, 446, 522, 530)
				c3	ENG210 , MATH(212, 220, 310), STAT 320, CSI (211, 221, 222, 223, 311,313, 314, 321, 322, 325, 411, 414, 421, 424, 425, 441, 442, 444, 445, 448, 510, 513, 514, 532)
				d3	STAT320 , CSI (222, 323, 411, 421, 422, 432, 444, 445, 510, 512, 514, 520, 531)
Society partnership	**Sufficient Skills**	Sufficient skills	**Objective (2)**	**a3**	STAT320 , CSI (211, 212, 221, 223, 311, 312, 313, 314, 322, 324, 325, 411, 412, 414, 421, 423, 424, 425, 431, 441, 442, 443, 445, 446, 447, 448, 449, 511, 514, 520, 522, 525, 530, 531)
				b1	CSI (211, 221, 222, 223, 224, 311, 312, 313, 321, 322, 323, 324, 411, 412, 414, 422, 423, 424, 425, 431, 442, 443, 446, 447, 448, 449, 510, 513, 520, 521, 522, 530, 531, 533)

				b2	CSI (211, 221, 223, 312, 313, 314, 321, 324, 325, 411, 412, 413, 421, 423, 431, 432, 442, 443, 447, 511, 513, 521, 522, 530, 532, 533)
				b3	CSI (211, 224, 314, 322, 323, 413, 414, 425, 441, 443, 445, 447, 449, 510, 511, 514, 520, 521, 530)
				d1	PENG111, ENG210, CSI (211, 212, 221, 223, 224, 312, 314, 321, 322, 324, 325, 411, 413, 414, 421, 422, 424, 441, 442, 443,444, 446, 447, 448, 510, 511, 513, 514, 521, 522, 525, 530, 531, 532)
			Objective (3)	**b3**	CSI (211, 224, 314, 322, 323, 413, 414, 425, 441, 443, 445, 447, 449, 510, 511, 514, 520, 521, 530)
				b4	CSI (325,412,422, 431,432, 441, 442, 443, 449, 512, 520, 522, 525, 533)
				c1	PENG 111, ENG210 , CSI(212, 313, 323, 325, 412, 423, 425, 431, 446, 447, 511, 512, 525, 530, 533)
				d1	PENG111, ENG210, CSI (211, 212, 221, 223, 224, 312, 314, 321, 322, 324, 325, 411, 413, 414, 421, 422, 424, 441, 442, 443,444, 446, 447, 448, 510, 511, 513, 514, 521, 522, 525, 530, 531, 532)
				d2	ENG210, CSI (224, 313, 325, 413, 422, 423, 431, 432, 446, 448, 449, 510, 520, 521, 525, 533)
			Objective (4)	**c1**	PENG 111, ENG210 , CSI(212, 313, 323, 325, 412, 423, 425, 431, 446, 447, 511, 512, 525, 530, 533)
				c2	CSI(224, 311,321, 431, 432, 446, 522, 530)
				c3	ENG210 , MATH(212, 220, 310), STAT 320, CSI (211, 221, 222, 223, 311,313, 314, 321, 322, 325, 411, 414, 421, 424, 425, 441, 442, 444, 445, 448, 510, 513, 514, 532)
				d3	STAT320 , CSI (222, 323, 411, 421, 422, 432, 444, 445, 510, 512, 514, 520, 531)
			Objective (5)	**a2**	ENG210, MATH(212, 220 ,310) , STAT320 CSI(221, 311,312,314,323,411,413,422,425,432,441,442,511,512, 513,520,521,525)
				b5	CSI (322, 422, 425, 432, 443, 446, 449, 510, 512, 520, 522,532)

				c3	ENG210 , MATH(212, 220, 310), STAT 320, CSI (211, 221, 222, 223, 311,313, 314, 321, 322, 325, 411, 414, 421, 424, 425, 441, 442, 444, 445, 448, 510, 513, 514, 532)
		Team Work	Objective (3)	b3	CSI (211, 224, 314, 322, 323, 413, 414, 425, 441, 443, 445, 447, 449, 510, 511, 514, 520, 521, 530)
				b4	CSI (325,412,422, 431,432, 441, 442, 443, 449, 512, 520, 522, 525, 533)
				c1	PENG 111, ENG210 , CSI(212, 313, 323, 325, 412, 423, 425, 431, 446, 447, 511, 512, 525, 530, 533)
				d1	PENG111, ENG210, CSI (211, 212, 221, 223, 224, 312, 314, 321, 322, 324, 325, 411, 413, 414, 421, 422, 424, 441, 442, 443,444, 446, 447, 448, 510, 511, 513, 514, 521, 522, 525, 530, 531, 532)
				d2	ENG210, CSI (224, 313, 325, 413, 422, 423, 431, 432, 446, 448, 449, 510, 520, 521, 525, 533)
		Society partnership	Objective (3)	b3	CSI (211, 224, 314, 322, 323, 413, 414, 425, 441, 443, 445, 447, 449, 510, 511, 514, 520, 521, 530)
				b4	CSI (325,412,422, 431,432, 441, 442, 443, 449, 512, 520, 522, 525, 533)
				c1	PENG 111, ENG210 , CSI(212, 313, 323, 325, 412, 423, 425, 431, 446, 447, 511, 512, 525, 530, 533)
				d1	PENG111, ENG210, CSI (211, 212, 221, 223, 224, 312, 314, 321, 322, 324, 325, 411, 413, 414, 421, 422, 424, 441, 442, 443,444, 446, 447, 448, 510, 511, 513, 514, 521, 522, 525, 530, 531, 532)
				d2	ENG210, CSI (224, 313, 325, 413, 422, 423, 431, 432, 446, 448, 449, 510, 520, 521, 525, 533)
			Objective (4)	c1	PENG 111, ENG210 , CSI(212, 313, 323, 325, 412, 423, 425, 431, 446, 447, 511, 512, 525, 530, 533)
				c2	CSI(224, 311,321, 431, 432, 446, 522, 530)
				c3	ENG210 , MATH(212, 220, 310), STAT 320, CSI (211, 221, 222, 223, 311,313, 314, 321, 322, 325, 411, 414, 421, 424, 425, 441, 442, 444, 445, 448, 510, 513, 514,

					532)
				d3	STAT320 , CSI (222, 323, 411, 421, 422, 432, 444, 445, 510, 512, 514, 520, 531)
	Society Responsibilities	Sufficient skills	Objective (2)	a3	STAT320 , CSI (211, 212, 221, 223, 311, 312, 313, 314, 322, 324, 325, 411, 412, 414, 421, 423, 424, 425, 431, 441, 442, 443, 445, 446, 447, 448, 449, 511, 514, 520, 522, 525, 530, 531)
				b1	CSI (211, 221, 222, 223, 224, 311, 312, 313, 321, 322, 323, 324, 411, 412, 414, 422, 423, 424, 425, 431, 442, 443, 446, 447, 448, 449, 510, 513, 520, 521, 522, 530, 531, 533)
				b2	CSI (211, 221, 223, 312, 313, 314, 321, 324, 325, 411, 412, 413, 421, 423, 431, 432, 442, 443, 447, 511, 513, 521, 522, 530, 532, 533)
				b3	CSI (211, 224, 314, 322, 323, 413, 414, 425, 441, 443, 445, 447, 449, 510, 511, 514, 520, 521, 530)
				d1	PENG111, ENG210, CSI (211, 212, 221, 223, 224, 312, 314, 321, 322, 324, 325, 411, 413, 414, 421, 422, 424, 441, 442, 443,444, 446, 447, 448, 510, 511, 513, 514, 521, 522, 525, 530, 531, 532)
			Objective (3)	b3	CSI (211, 224, 314, 322, 323, 413, 414, 425, 441, 443, 445, 447, 449, 510, 511, 514, 520, 521, 530)
				b4	CSI (325,412,422, 431,432, 441, 442, 443, 449, 512, 520, 522, 525, 533)
				c1	PENG 111, ENG210 , CSI(212, 313, 323, 325, 412, 423, 425, 431, 446, 447, 511, 512, 525, 530, 533)
				d1	PENG111, ENG210, CSI (211, 212, 221, 223, 224, 312, 314, 321, 322, 324, 325, 411, 413, 414, 421, 422, 424, 441, 442, 443,444, 446, 447, 448, 510, 511, 513, 514, 521, 522, 525, 530, 531, 532)
				d2	ENG210, CSI (224, 313, 325, 413, 422, 423, 431, 432, 446, 448, 449, 510, 520, 521, 525, 533)
			Objective (4)	c1	PENG 111, ENG210 , CSI(212, 313, 323, 325, 412, 423, 425, 431, 446, 447, 511, 512, 525, 530, 533)

				c2	CSI(224, 311,321, 431, 432, 446, 522, 530)
				c3	ENG210 , MATH(212, 220, 310), STAT 320, CSI (211, 221, 222, 223, 311,313, 314, 321, 322, 325, 411, 414, 421, 424, 425, 441, 442, 444, 445, 448, 510, 513, 514, 532)
				d3	STAT320 , CSI (222, 323, 411, 421, 422, 432, 444, 445, 510, 512, 514, 520, 531)
			Objective (5)	a2	ENG210, MATH(212, 220 ,310) , STAT320 CSI(221, 311,312,314,323,411,413,422,425,432,441,442,511,512, 513,520,521,525)
				b5	CSI (322, 422, 425, 432, 443, 446, 449, 510, 512, 520, 522,532)
				c3	ENG210 , MATH(212, 220, 310), STAT 320, CSI (211, 221, 222, 223, 311,313, 314, 321, 322, 325, 411, 414, 421, 424, 425, 441, 442, 444, 445, 448, 510, 513, 514, 532)
		Team Work	Objective (3)	b3	CSI (211, 224, 314, 322, 323, 413, 414, 425, 441, 443, 445, 447, 449, 510, 511, 514, 520, 521, 530)
				b4	CSI (325,412,422, 431,432, 441, 442, 443, 449, 512, 520, 522, 525, 533)
				c1	PENG 111, ENG210 , CSI(212, 313, 323, 325, 412, 423, 425, 431, 446, 447, 511, 512, 525, 530, 533)
				d1	PENG111, ENG210, CSI (211, 212, 221, 223, 224, 312, 314, 321, 322, 324, 325, 411, 413, 414, 421, 422, 424, 441, 442, 443,444, 446, 447, 448, 510, 511, 513, 514, 521, 522, 525, 530, 531, 532)
				d2	ENG210, CSI (224, 313, 325, 413, 422, 423, 431, 432, 446, 448, 449, 510, 520, 521, 525, 533)
		Society partnership	Objective (3)	b3	CSI (211, 224, 314, 322, 323, 413, 414, 425, 441, 443, 445, 447, 449, 510, 511, 514, 520, 521, 530)
				b4	CSI (325,412,422, 431,432, 441, 442, 443, 449, 512, 520, 522, 525, 533)
				c1	PENG 111, ENG210 , CSI(212, 313, 323, 325, 412, 423, 425, 431, 446, 447, 511, 512, 525, 530, 533)

				d1	PENG111, ENG210, CSI (211, 212, 221, 223, 224, 312, 314, 321, 322, 324, 325, 411, 413, 414, 421, 422, 424, 441, 442, 443,444, 446, 447, 448, 510, 511, 513, 514, 521, 522, 525, 530, 531, 532)
				d2	ENG210, CSI (224, 313, 325, 413, 422, 423, 431, 432, 446, 448, 449, 510, 520, 521, 525, 533)
			Objective (4)	**c1**	PENG 111, ENG210 , CSI(212, 313, 323, 325, 412, 423, 425, 431, 446, 447, 511, 512, 525, 530, 533)
				c2	CSI(224, 311,321, 431, 432, 446, 522, 530)
				c3	ENG210 , MATH(212, 220, 310), STAT 320, CSI (211, 221, 222, 223, 311,313, 314, 321, 322, 325, 411, 414, 421, 424, 425, 441, 442, 444, 445, 448, 510, 513, 514, 532)
				d3	STAT320 , CSI (222, 323, 411, 421, 422, 432, 444, 445, 510, 512, 514, 520, 531)

Matrix 11: Assessment Methods used to Measure Student Learning Outcomes

Assessment methods used to measure Student Learning Outcomes

Assessment Method	Student Learning Outcome (Code)
▪ *Conducting scientific research and follow-up of advances in the field.* ▪ *Quarterly tests.* ▪ *Duties and discussions within the lecture.*	a1, a2, a3
▪ *Practical test* ▪ *Written test* ▪ *Individual and group activities* ▪ *Short cognitive tests*	b1, b2, b3, b4, b5
▪ *evaluation of field activities*	c1, c2, c3

▪ *verbal tests* ▪ *assessment assignments* ▪ *style note*	
▪ *Written tests* ▪ *Laboratory tests* ▪ *Evaluate the information gathered by the students that are using information networks.*	d1, d2, d3

Matrix 12: Program learning outcomes & courses (X Matrix)

Program learning outcomes & courses Matrix
(X Matrix)

Code MUP12

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information**

		Student learning outcomes																
		A			**B**					**C**			D			E		
		a1	**a2**	**a3**	**b1**	**b2**	**b3**	**b4**	**b5**	**c1**	**c2**	**c3**	**d1**	**d2**	**d3**	**e1**	**e2**	**e..**
	PENG 111											■		■				
	PMTH 112	■		■						■			■					
	PCOM 113	■	■	■								■						
	PSSC 114												■					
	PENG 121										■	■		■				
	PENG 123		■							■		■		■				
	PMTH 127	■		■						■			■					
	PPHS 128	■								■				■				
	SALM 101												■	■				
	SALM 102									■			■					
	SALM 103									■			■					
	SALM 104											■	■	■				
	ARAB 101												■	■				
	CSI 211	■		■	■							■	■					
	CSI 212	■		■	■						■	■	■	■				
	MATH 212	■			■	■	■			■			■					
	PHYS 217	■		■	■		■											

	Student learning outcomes																	
	A			B					C			D			E			
	a1	a2	a3	b1	b2	b3	b4	b5	c1	c2	c3	d1	d2	d3	e1	e2	e..	
ENG 210									■		■	■						
ZPSY 211											■	■	■					
CSI 221	■	■	■	■	■						■	■						
CSI 222	■			■							■			■				
MATH 220	■			■	■	■			■			■						
CSI 223	■		■	■	■						■	■						
CSI 224	■		■			■			■			■	■					
CHEM 225	■		■	■							■							
CSI 311	■	■	■	■	■	■			■			■						
CSI 312	■		■	■		■		■		■	■		■					
CSI 313	■				■				■			■	■					
CSI 314	■	■		■	■						■	■						
MATH 310	■	■	■	■					■		■	■	■					
CSI 321	■			■	■					■	■	■						
CSI 322			■	■				■			■	■						
CSI 323	■	■		■					■					■				
CSI 324	■	■	■	■	■							■						
CSI 325	■		■		■		■		■		■	■	■					
STAT 320	■	■	■															
CSI 411	■	■	■	■	■						■	■	■					
CIS 412	■		■	■	■							■						
CSI 413	■		■	■	■						■	■						
CSI 414	■		■	■		■					■		■	■				

	Student learning outcomes																	
	A			B					C			D			E			
	a1	a2	a3	b1	b2	b3	b4	b5	c1	c2	c3	d1	d2	d3	e1	e2	e..	
CSI 421	■		■		■	■			■			■						
CSI 422	■		■			■	■				■	■	■					
CSI 423	■		■	■	■				■				■					
CSI 424	■	■	■	■	■						■	■		■				
CSI 425	■				■	■			■			■						
CSI 431	■		■	■	■				■		■	■	■					
CSI 432	■	■			■		■	■	■			■	■					
CSI 441		■	■			■	■				■	■						
CSI 442	■	■	■	■	■		■				■	■						
CSI 443	■		■	■	■	■	■	■				■						
CSI 444	■		■	■		■				■	■	■		■				
CSI 445	■	■	■			■	■				■	■		■				
CSI 446			■					■	■	■		■	■					
CSI 447	■	■		■	■	■				■		■						
CSI 448	■				■	■	■		■			■						
CSI 449	■	■	■	■	■	■			■			■						
CSI 510			■	■				■			■	■						
CSI 511			■	■				■	■		■	■						
CSI 512		■	■			■	■			■	■	■		■				
CSI 513	■	■		■	■						■	■						
CSI 514	■		■			■					■	■		■				
CSI 520			■		■	■		■			■	■	■					
CSI 521	■		■	■	■						■	■						
CSI 522	■		■	■	■		■	■		■		■						

		Student learning outcomes																
		A			**B**					**C**			D			E		
		a1	**a2**	**a3**	**b1**	**b2**	**b3**	**b4**	**b5**	**c1**	**c2**	**c3**	**d1**	**d2**	**d3**	**e1**	**e2**	**e..**
	CSI 525																	
	CSI 530																	
	CSI 531																	
	CSI 532																	
	CSI 533																	

Computer Science & Information Programme learning outcomes：

Domain	Code	*learning outcomes*
A	a1	Acquire knowledge of computing and mathematics appropriate to the discipline including simulation and modeling.
	a2	Recognize the need for and an ability to engage in continuing professional development.
	a3	Understand of best practices and standards and their application.
B	b1	Analyze a problem to identify and define the computing requirements appropriate to its solution.
	b2	Design, implement, develop and evaluate complicated computer-based system, process component, or program to meet desired needs.
	b3	Use and apply current technical concepts and practices in the core information technologies of human computer interaction, information management, programming, networking, web systems and technologies.
	b4	Identify and analyze user needs and take them into account in the selection, creation, evaluation and administration of computer-based systems.
	b5	Integrate IT-based solutions into the user environment effectively.
C	c1	Adhere professional, ethical, legal, security, and social issues and their responsibilities.
	c2	Analyze the local and global impact of computing on individuals, organization, and society.
	c3	Use current techniques, skills, and tools necessaryfor computing practice.
D	d1	Function effectively on teams to accomplish a common goal.
	d2	Communicate effectively with a range of audiences.
	d3	Apply advanced numerical methods.

Matrix 13: Student Learning Outcomes to Courses Matrix (I,R,E Matrix)

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information**

Code
MUP13

Student Learning Outcomes to Courses Matrix (I,R,E Matrix)

		Student learning outcomes																
		A			**B**					**C**			D			E		
		a1	**a2**	**a3**	**b1**	**b2**	**b3**	**b4**	**b5**	**c1**	**c2**	**c3**	**d1**	**d2**	**d3**	**e1**	**e2**	**e..**
	PENG 111											**I**		**I**				
	PMTH 112	**I**		**I**						**I**			**I**					
	PCOM 113	**I**	**I**	**I**								**I**						
	PSSC 114												**I**					
	PENG 121										**I**	**I**		**I**				
	PENG 123		**I**							**I**		**I**		**I**				
	PMTH 127	**I**		**I**						**I**			**I**					
	PPHS 128	**I**								**I**				**I**				
	SALM 101												**I**	**I**				
	SALM 102									**I**			**I**					
	SALM 103									**I**			**I**					
	SALM 104											**I**	**I**	**I**				
	ARAB 101												**I**	**I**				
	CSI 211	**I**		**I**	**I**							**I**	**I**					
	CSI 212	**I**		**I**	**I**						**I**	**I**	**I**	**I**				
	MATH 212	**I**			**I**	**I**	**I**			**I**			**I**					
	PHYS 217	**I**		**I**	**I**		**I**											
	ENG 210									**I**		**I**	**I**					

	Student learning outcomes																	
	A			B					C			D			E			
	a1	a2	a3	b1	b2	b3	b4	b5	c1	c2	c3	d1	d2	d3	e1	e2	e..	
ZPSY 211											I	I	I					
CSI 221	I	I	I	I	I						I	I						
CSI 222	I			I							I			I				
MATH 220	I			I	I	I			I			I						
CSI 223	I		I	I	I						I	I						
CSI 224	I		I			I			I			I	I					
CHEM 225	I		I	I							I							
CSI 311	R	R	R	R	R	R			R			R						
CSI 312	R		R	R				R		R	R		R					
CSI 313	R				R				R			R	R					
CSI 314	R	R		R	R						R	R						
MATH 310	R	R	R	R					R		R	R	R					
CSI 321	R			R	R					R	R	R						
CSI 322			R	R				R			R	R						
CSI 323	R	R		R					R			R		R				
CSI 324	R	R	R	R	R							R						
CSI 325	R		R		R		R		R		R	R	R					
STAT 320	I	I	I															
CSI 411	R	R	R	R	R						R	R	R					
CIS 412	R		R	R	R							R						
CSI 413	R		R	R	R						R	R						
CSI 414	R		R	R		R					R		R	R				
CSI 421	E		E		E	E			E			E						

	Student learning outcomes																	
	A			B					C			D			E			
	a1	a2	a3	b1	b2	b3	b4	b5	c1	c2	c3	d1	d2	d3	e1	e2	e..	
CSI 422	E		E			E	E				E	E	E					
CSI 423	E		E	E	E				E				E					
CSI 424	E	E	E	E	E						E	E		E				
CSI 425	E				E	E			E			E						
CSI 431	E		E	E	E				E		E	E	E					
CSI 432	E	E			E		E	E	E			E	E					
CSI 441		E	E			E	E				E	E						
CSI 442	E	E	E	E	E		E				E	E						
CSI 443	E		E	E	E	E	E	E				E						
CSI 444	E		E	E		E				E	E	E		E				
CSI 445	E	E	E			E	E				E	E		E				
CSI 446			E					E	E	E		E	E					
CSI 447	E	E		E	E	E				E		E						
CSI 448	E				E	E	E		E			E						
CSI 449	E	E	E	E	E	E			E			E						
CSI 510			E	E				E			E	E						
CSI 511			E	E				E	E		E	E						
CSI 512		E	E			E	E			E	E	E		E				
CSI 513	E	E		E	E						E	E						
CSI 514	E		E			E					E	E		E				
CSI 520			E		E	E		E			E	E	E					
CSI 521	E		E	E	E						E	E						
CSI 522	E		E	E	E		E	E		E		E						
CSI 525	E		E	E			E			E	E	E	E					

		Student learning outcomes																
		A			B					C			D			E		
		a1	a2	a3	b1	b2	b3	b4	b5	c1	c2	c3	d1	d2	d3	e1	e2	e..
	CSI 530	E		E	E	E	E			E		E	E					
	CSI 531	E		E	E								E		E			
	CSI 532	E				E			E			E	E					
	CSI 533	E		E	E		E	E		E			E					

(I) Introduce
(R)Reinforce
(E) Emphasize

Student Learning Outcomes:

Domain	CODE	*Student learning Outcomes*
A	a1	Acquire knowledge of computing and mathematics appropriate to the discipline including simulation and modeling.
	a2	Recognize the need for and an ability to engage in continuing professional development.
	a3	Understand best practices and standards and their application.
B	b1	Analyze a problem to identify and define the computing requirements appropriate for its solution.
	b2	Design, implement, develop and evaluate complicated computer-based system, process component, or program to meet desired needs.
	b3	Use and apply current technical concepts and practices in the core areas of information technology namely of human computer interaction, information management, programming, networking, web systems and technologies.
	b4	Identify and analyze user needs and take them into account in the selection, creation, evaluation and administration of computer-based systems.
	b5	Integrate IT-based solutions into the user environment effectively.
C	c1	Adhere professional, ethical, legal, security, and social issues and their responsibilities.
	c2	Analyze the local and global impact of computing on individuals, organization, and society.
	c3	Use current techniques, skills, and tools necessary for computing practice.
D	d1	Function effectively on teams to accomplish a common goal.
	d2	Communicate effectively with a range of audiences.
	d3	Apply advanced numerical methods.
E		NA

Matrix 14: Selected Courses for Measuring Student Learning Outcomes

College of Science at Az-Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information**

Code
MUP14

Selected Courses for Measuring Student Learning Outcomes

	Student learning outcomes																	
	A			**B**					**C**			D			E			
	a1	**a2**	**a3**	**b1**	**b2**	**b3**	**b4**	**b5**	**c1**	**c2**	**c3**	**d1**	**d2**	**d3**	**e1**	**e2**	**e..**
CSI 311																		
CSI 312																		
CSI 313																		
CSI 314																		
CSI 321																		
CSI 322																		
CSI 323																		
CSI 324																		
CSI 325																		
CSI 411																		
CIS 412																		
CSI 413																		
CSI 421																		
CSI 423																		
CSI 425																		
CSI 445																		
CSI 510																		
CSI 511																		

		Student learning outcomes																
		A			**B**					**C**			D			E		
		a1	**a2**	**a3**	**b1**	**b2**	**b3**	**b4**	**b5**	**c1**	**c2**	**c3**	**d1**	**d2**	**d3**	**e1**	**e2**	**e..**
	CSI 512																	
	CSI 513																	
	CSI 520																	

Program student learning outcomes:

Domain	CODE	*Student learning Outcomes*
A	a1	Acquire knowledge of computing and mathematics appropriate to the discipline including simulation and modeling.
	a2	Recognize the need for and an ability to engage in continuing professional development.
	a3	Understand best practices and standards and their application.
B	b1	Analyze a problem to identify and define the computing requirements appropriate for its solution.
	b2	Design, implement, develop and evaluate complicated computer-based system, process component, or program to meet desired needs.
	b3	Use and apply current technical concepts and practices in the core areas of information technology namely of human computer interaction, information management, programming, networking, web systems and technologies.
	b4	Identify and analyze user needs and take them into account in the selection, creation, evaluation and administration of computer-based systems.
	b5	Integrate IT-based solutions into the user environment effectively.
C	c1	Adhere professional, ethical, legal, security, and social issues and their responsibilities.
	c2	Analyze the local and global impact of computing on individuals, organization, and society.
	c3	Use current techniques, skills, and tools necessary for computing practice.
D	d1	Function effectively on teams to accomplish a common goal.
	d2	Communicate effectively with a range of audiences.
	d3	Apply advanced numerical methods.
E		NA

Matrix 15: Student Learning Outcomes Measuring Schedule

College of Science at Zulfi **Department: Computer Science & Information** **Program: Computer Science & Information**

Student Learning Outcomes Measuring Schedule

Code
MUP15

		1st year			2nd year			3rd year			4th year			5th year		
		S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3	S1	S2	S3
courses	CSI 311							a1, b1	a2, b2							
	CSI 312							a3, c2	a1, b1							
	CSI 313							b2, d1	a1, d1							
	CSI 314							a2, d1	b1, c3							
	CSI 321							b2, c2	c3, d1							
	CSI 322							b5, c3	a3, b1							
	CSI 323							a2, c1	a2, d3							
	CSI 324							a1, d1	a2, b2							
	CSI 325							b4, d2	c3, d2							
	CSI 411										a1, a2	a3, d2				
	CIS 412										a3, d1	a1, b2				
	CSI 413										b1, c3	b2, d1				
	CSI 421										b2, b3	a1, c1				
	CSI 423										c1, d2	c1, d2				
	CSI 425										b3, c1	a1, b2				
	CSI 445										b4, d1	b3, d3				
	CSI 510													b5, c3	a3, b1	
	CSI 511													a3, b5	b1, c1	
	CSI 512													b4, c2	c2, d3	
	CSI 513													a1, b1	a2, b2	
	CSI 520													b2, b3	b5, d2	

(**S1**) First Semester (**S2**) Second Semester (**S3**) Third Semester

Matrix 16: Course Student Learning Outcomes to Program Learning Outcomes Map (Level 1 & 2)

Course Number	Course Title	Credit Hours	Weekly Hours			Prerequisite
			Lecture	Lab	EX	
PENG 111	Preparatory English (1)	8	20	0	0	-
PMTH 112	Introduction to Mathematics (1)	2	2	0	1	-
PCOM 113	Computer Skills	2	1	2	0	-
PSSC 114	Learning and Communication Skills	2	1	2	0	-
PENG 121	Preparatory English (2)	6	14	0	0	PENG 111
PENG 123	English for Science and Engineering	2	2	0	0	PENG 111
PMTH 127	Introduction to Mathematics (2)	4	4	0	1	PMTH 112
PPHS 128	General Physics	3	2	2	0	-
	Total	**29**	**48**	**2**	**0**	

College of Science at Zulfi Department: Computer Science & Information
Program: Computer Science & Information

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **PENG 111 - Preparatory English (1)**[1]

Course Learning Outcomes:

1	Producing new ideas
2	Describing others, places and things
3	Grammar
4	Vocabulary learning

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)		
Course LOs #	**Use LOs Codes**	
	C3	**D2**
1		
2		
3		
4		

[1] **PENG 111 - Preparatory English (1)**

College of Science at Zulfi **Department: Computer Science & Information**
Program: Computer Science & Information

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **PMTH 112 - Introduction to Mathematics (1)**[2]

Course Learning Outcomes:

1	Introducing some basic math concepts
2	Study some different ways to solve the linear and nonlinear equations
3	Study Some Concepts in the analytic geometry
4	Discussing the functions Characteristics and some kinds of special functions (exponential and logarithmic functions)
5	Identification of mathematical concepts
6	Comparison among logarithmic and Exponential functions
7	Team work inside the holes
8	Preparing a good Presentation (collecting required information)

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	Program Learning Outcomes Use LOs Codes			
	A1	A3	C1	D1
1				
2				
3				
4				
5				
6				
7				
8				

[2] **PMTH 112 - Introduction to Mathematics (1)**

College of Science at Zulfi **Department: Computer Science & Information**
Program: Computer Science & Information

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **PCOM 113 - Computer Skills**[3]

Course Learning Outcomes: Upon successful completion of this course, student will be able to:

1	Recognize when to use each of the Microsoft Office programs to create professional business documents.
2	Use Microsoft Office programs to create personal and/or business documents following current professional and/or industry standards.
3	Pursue future courses specializing in one or more of the programs.
4	Apply skills and concepts for basic use of computer hardware, software, networks, and the Internet in the workplace and in future coursework as identified by the internationally accepted Internet and Computing Core (IC3) standards.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	Program Learning Outcomes Use LOs Codes			
	a1	a2	a3	c3
1				
2				
3				
4				

[3] **PCOM 113 - Computer Skills**

College of Science at Zulfi **Department: Computer Science & Information**
Program: Computer Science & Information

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **PSSC 114 – Communication and Education skills**[4]

Course Learning Outcomes:

1	Dealing with the public in the celebrations and others.
2	Positive Cooperation and sharing with others.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)	
Course LOs #	**Program Learning Outcomes Use LOs Codes**
	d1
1	
2	

[4] **PSSC 114 – Communication and Education skills**

College of Science at Zulfi Department: Computer Science & Information
Program: Computer Science & Information

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map
Course Number: **PENG 121- Preparatory English (2)**[5]
Course Learning Outcomes:

1	Develop good ESL reading, writing, speaking and listening skills
2	Improve and expand on their vocabulary, comprehension, conversation and pronunciation skills.
3	Use previously learned strategies of previewing and prediction on reading materials on familiar topics.
4	Write related sentences to form paragraphs reflecting different patterns of organization: time, order of importance, and space, by using distinct groups of transition words and prepositions.
5	Expand and combine simple sentences by adding modifying words, clauses, and phrases
6	Edit and proofread one's own reading to apply appropriate rules of grammar and mechanics of writing and make appropriate word choice.
7	Demonstrate the skills needed to participate in a conversation that builds knowledge collaboratively.
8	Listen carefully and respectfully to others' viewpoints; articulate their own ideas and questions clearly; and situate their own ideas in relation to other voices and ideas.
9	Be able to prepare, organize, and deliver an engaging oral presentation.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)			
Course LOs #	**Use LOs Codes**		
	C2	**C3**	**D2**
1			
2			
3			
4			
5			
6			
7			
8			
9			

[5] **PENG 121- Preparatory English (2)**

College of Science at Zulfi **Department: Computer Science & Information**
Program: Computer Science & Information

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **PENG 123 - English for Science and Engineering**[6]

Course Learning Outcomes:

1	Familiarity with technical and semi-technical engineering related vocabulary.
2	Prepare learners for their everyday working lives.
3	Communicate professionally in the technical field.
4	Use of basic mathematical and statistical information in English and the use of ICT in searching for information and presenting reports.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)				
Course LOs #	**Program Learning Outcomes Use LOs Codes**			
	A2	**C1**	**C3**	**D2**
1				
2				
3				
4				

[6] **PENG 123 - English for Science and Engineering**

College of Science at Zulfi **Department: Computer Science & Information**
Program: Computer Science & Information

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map
Course Number: **PMTH 127 - Introduction to Mathematics (2)**[7]
Course Learning Outcomes:

1	Study trigonometric functions and trigonometric identities with applications
2	Using Elimination and Substitution Methods to solve linear and nonlinear systems
3	Discussing an introduction to Analytical Geometry and Studying the three Conic sections (Parabola, ellipse and Hyperbola)
4	Studying some rules in differentiation with application
5	Identification of mathematical concepts in Trigonometric functions
6	Studying an analytic geometry
7	Identify the concept of the limit and derivative with solving.
8	Team work inside the holes
9	Discussing Groups during the lectures
10	Preparing a good Presentation (collecting required information)

Mapping:

Map course LOs with the program LOs.
(Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	Program Learning Outcomes Use LOs Codes			
	A1	A3	C1	D1
1	■			
2		■		
3	■			
4		■		
5	■			
6	■			
7	■			
8				■
9				■
10			■	

[7] **PMTH 127 - Introduction to Mathematics (2)**

College of Science at Zulfi Department: Computer Science & Information
Program: Computer Science & Information

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **PPHS 128 – General Physics** [8]

Course Learning Outcomes:

1	Recognize the fundamental physical quantities and their units
2	Define vectors in Cartesian and polar Coordinates and their addition in terms of their Cartesian components
3	Acting responsibly and ethically in carrying out individual as well as group projects.
4	Improving student communication skills such as : writing, reading, presenting, negotiating and debating

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)			
Course LOs #	**Program Learning Outcomes Use LOs Codes**		
	a1	**c1**	**d2**
1			
2			
3			
4			

[8] **PPHS 128 – General Physics**

Matrix 16: Course Student Learning Outcomes to Program Learning Outcomes Map (Univ. Req.)

University Requirements: (Mandatory 12 credit hours)

Course Number	Course Title	Credit Hours	Weekly Hours		Elections	Total Credits
			Lecture	Lab		
ZPSY 211	Educational & Thinking Skills	2	2	**0**	**Mandatory**	2
SALM 101	Introduction to Islamic Culture	2	2	0	**Students choose 3 courses**	6
SALM 102	Islam and Society Building	2	2	0		
SALM 103	Economic System in Islam	2	2	0		
SALM 104	Fundamentals of Political System in Islam	2	2	0		
ARAB 101	Arabic Language Skills	2	2	0	**Students choose 1 course**	2
ARAB 103	Arabic Writing	2	2	0		
ELEC 101	Principles of Health and Fitness	2	2	0	**Students choose 1 course**	2
ELEC102	Business Entrepreneurship	2	2	0		
SOCI 101	Societal Issues	2	2	0		
LHR 101	Human Rights Systems	2	2	0		
FCH 101	Family and Childhood	2	2	0		
VOW 101	Volunteering Systems	2	2	0		
		Total				**12**

College of Science at Zulfi Department: Computer Science & Information
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Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **SALM 101 – Introduction to Islamic Culture**[9]

Course Learning Outcomes:

1	Students work in a team through collaborative work
2	Initiative in the presentation of the problems and work to resolve them, either within the group or the individual level

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)		
Course LOs #	**Program Learning Outcomes Use LOs Codes**	
	d1	**d2**
1		
2		

[9] **SALM 101 – Introduction to Islamic Culture**

College of Science at Zulfi Department: Computer Science & Information
Program: Computer Science & Information

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **SALM 102 – Islam and Society Building**[10]

Course Learning Outcomes:

1	ability to form groups and the distribution of tasks
2	ability to express an opinion and accept others' opinions

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)		
Course LOs #	**Program Learning Outcomes Use LOs Codes**	
	c1	**d1**
1		
2		

[10] **SALM 102 – Islam and Society Building**

College of Science at Zulfi Department: Computer Science & Information
Program: Computer Science & Information

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **SALM 103 – Economic System in Islam**[11]

Course Learning Outcomes:

1	ability to form groups and the distribution of tasks
2	ability to express an opinion and accept others' opinions

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)		
Course LOs #	**Program Learning Outcomes Use LOs Codes**	
	c1	**d1**
1		
2		

[11] **SALM 103 – Economic System in Islam**

College of Science at Zulfi Department: Computer Science & Information
Program: Computer Science & Information

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **SALM 104 – Fundamentals of Political System in Islam**[12]

Course Learning Outcomes:

1	ability to work in teams through collaborative work
2	Initiative in the presentation of the problems and work to resolve them, either within the group or the individual level
3	The use of modern technology through the collection of information, and the work of explanatory slides of material through PowerPoint presentations

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)			
Course LOs #	**Program Learning Outcomes Use LOs Codes**		
	c3	**d1**	**d2**
1			
2			
3			

[12] **SALM 104 – Fundamentals of Political System in Islam**

College of Science at Zulfi Department: Computer Science & Information
Program: Computer Science & Information

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **ARAB 101 – Arabic Language Skills** [13]

Course Learning Outcomes:

1	Students work in a team through collaborative work
2	Initiative in the presentation of the problems and work to resolve them, either within the group or the individual level

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)		
Course LOs #	**Program Learning Outcomes Use LOs Codes**	
	d1	**d2**
1		
2		

[13] **ARAB 101 – Arabic Language Skills**

Matrix 16: Course Student Learning Outcomes to Program Learning Outcomes Map (Level 3)

Course Code	Course Name	Lec	Lab	Ex	Cr	Prerequisite
CSI 211	Programming 1	2	2	0	3	PCOM 113
CSI 212	Disc. Math for CS 1	2	0	2	3	PMTH 127
Math 212	Calculus 1	3	0	1	3	PMTH 127
PHYS 217	Physics 2	2	2	0	3	PPHS 128
ENG 210	Tech. English	2	0	0	2	PENG 121
ZPSY 211	Educational & Thinking Skills	2	0	0	2	--
Total		**16**				

College of Science at Zulfi Department: Computer Science & Information
Program: Computer Science & Information

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map
Course Number: **CSI 211 - Programming (1)** [14]
Course Learning Outcomes:

1	Construct error free C++ programs.
2	Divide a problem into its logical components.
3	Design and code small to medium sized problems from the start using C/C++ constructs, such as input/output statements, if-then-else statements, while and for loops, functions, …
4	Apply knowledge of computing and mathematics appropriate to the discipline.
5	Design, implement and evaluate a computer-based system, process, component, or program to meet desired needs.
6	Analyze a problem, and identify and define the computing requirements appropriate to its solution.
7	Understand professional, ethical, legal, security, and social issues and responsibilities.
8	Work cooperatively in a small group environment.
9	Save time and space in each task.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	Program Learning Outcomes Use LOs Codes				
	A1	**A3**	**B1**	**C3**	**D1**
1					
2					
3					
4					
5					
6					
7					
8					
9					

[14] **CSI 211 - Programming (1)**

College: College of Science at Az Zulfi Department: Computer Science and Information Program: Computer Science and Information

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **CSI 212 – Discrete Math for CS1**[15]

Course Learning Outcomes:

1	Recognize different methods to attack a problem.
2	Record and reproduce the main version of structures.
3	Define and outline the relationships between objects.
4	Analyze and reconstruct a problem
5	Reorganize the relationships between a problem and other objects
6	Differentiate and compare between the alternative solutions of a problem to justify the optimal one.
7	Develop Creativity and imagination skills, Self-assessment ability and Critical thinking and analytic ability.
8	Master different techniques of proof (direct proof, proof by counterexample, proof by contradiction, mathematical induction) to identify and apply the most appropriate in a particular situation
9	Team working skills: cooperative working in groups inside the class, or/and efficient participation in take-home-assignments.
10	Oral Skills: free discussions save the students' time and allow them to feel "involved" in the discussion, rather than simply being outside spectators.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course ILOs #	Program Learning Outcomes Use LOs Codes						
	a1	a3	b1	c2	c3	d1	d2
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							

[15] **CSI 212 – Discrete Math for CS1**

College: College of Science at Az Zulfi Department: Computer Science and Information Program: Computer Science and Information

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **MATH 212 – Calculus (1)**[16]

Course Learning Outcomes:

1	Recognize, indicate and discuss the rate of growth/decay of any relation.
2	Classify, and convert relations from one domain to another to reproduce new adequate form that clearly match a solution.
3	Analyse the problem, plan for the solution, develop the solution(s), and justify these solution(s).
4	Manage and compile the effects of quantities that can never be directly evaluated.
5	Practice how to apply and manipulate carefully the physical or/and geometric conditions on a set of variables to sketch the locus of these variables.
6	Prepare and sketch clear illustrative graphs that demonstrate and measure the behaviour of complicated relations with time or/and location(s).
7	Sketch Flowcharts or/and apply Pseudo code to modify computer program(s) that execute the solution(s) of the manipulated problem(s).
8	Acquire teamwork communications skills, e.g. Lead and motivate individuals.
9	Able to work in stressful environment and within constraints.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course ILOs #	Program Learning Outcomes Use LOs Codes					
	a1	b1	b2	b3	c1	d1
1	■					
2		■				
3		■				
4	■					
5				■		
6			■			
7			■			
8						■
9					■	

[16] **MATH 212 – Calculus (1)**

College: College of Science at Az Zulfi Department: Computer Science and Information Program: Computer Science and Information

Code
MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **PHYS 217- Physics (2)**[17]

Course Learning Outcomes:

1	Will be able to understand and deal with general physics principles
2	Will be able to understand and analyse Kirchhoff's laws and Gauss law
3	Will be able to understand and analyse the electric circuits.
4	Will be able to use Kirchhoff's laws to obtain the electric elements such as resistors, capacitors and inductors in the electric circuits.
5	Will be able to understand and analyse the magnetic sources and magnetic fields and their applications

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course ILOs #	Program Learning Outcomes Use LOs Codes			
	a1	a3	b1	b3
1				
2				
3				
4				
5				

[17] **PHYS 217- Physics (2)**

College: College of Science at Az Zulfi Department: Computer Science and Information Program: Computer Science and Information

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **ENG 210 – Technical English** [18]

Course Learning Outcomes:

1	Recognize the definition of technical abbreviations.
2	Know the meaning of technical terms.
3	Describe the meaning of technical expressions.
4	Familiarity with new Software products terminology.
5	Precise use of new educational computer systems.
6	Team working skills: cooperative working in groups inside the class, or/and efficient participation in take-home-assignments.
7	Oral Skills: free discussions save the students' time and allow them to feel "involved" in the discussion, rather than simply being outside spectators.
8	Communication skills: a video conference helps the student to skip the fear-threshold of scientific interaction.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	Program Learning Outcomes Use LOs Codes		
	c1	c3	d1
1			
2			
3			
4			
5			
6			
7			
8			

[18] **ENG 210 – Technical English**

College: College of Science at Az Zulfi Department: Computer Science and Information Program: Computer Science and Information

Code
MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **ZPSY 211 - Educational & Thinking Skills** [19]

Course Learning Outcomes:

1	Integration into the working group and take responsibility, and self-confidence.
2	The development of the skills of dialogue and accept the opinions of others.
3	Initiative in the presentation of the problems and work to resolve them, either within the group or the individual level
4	The use of modern technology through the collection of information, and the work of explanatory slides of material through PowerPoint presentations

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	Program Learning Outcomes Use LOs Codes		
	C3	D1	D2
1			
2			
3			
4			

[19] **ZPSY 211 - Educational & Thinking Skills**

Matrix 16: Course Student Learning Outcomes to Program Learning Outcomes Map (Level 4)

Course Code	Course Name	Lec	Lab	Ex	Cr	Prerequisite
CSI 221	Programming 2	2	2	0	3	CSI 211
CSI 222	Disc. Math For CS 2	2	0	0	2	CSI 212
MATH 220	Calculus 2	3	0	1	3	MATH 212
CSI 223	Dig. Logic Design	2	2	0	3	PHYS 217
CSI 224	Fund. of Inf. Systems	3	0	0	3	---
CHEM 225	General Chemistry	2	0	0	2	---
Total		**16**				

College: College of Science at Al-Zulfi

Department: Computer Science and Information

Program: Computer Science and Information

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map
Course Number: CSI 221 - Programming (2) [20]

Course Learning Outcomes:

1	Students will have skills for upgrade their simple programs in C++.
2	Students will have an understanding of programming based on object, and complex programming.
3	Apply C++ program structure and the VC++ object.
4	Students will be able to analyze programming problems.
5	Work in a group and learn time management
6	Present a short report in a written form and orally using appropriate scientific language.
7	Use Information technology and computer skills to gather information about a selected topic.
8	Operate questions during the lecture, work in groups, and communicate with each other and with me electronically, and periodically visit the sites I recommended.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	Program Learning Outcomes Use LOs Codes						
	a1	a2	a3	b1	b2	c3	d1
1							
2							
3							
4							
5							
6							
7							
8							

[20] CSI 221 - Programming (2)

College: College of Science at AZ-Zulfi Department: Computer Science & Information
Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **CSI 222 - Discrete Mathematics for Computer Science (2)**[21]

Course Learning Outcomes:

1	Understand advanced concepts in discrete mathematics
2	Understand the basic concepts of Number Theory and Modular Arithmetic
3	Understand the abstract algebra concepts like groups, rings, and fields.
4	Understand the fundamental concepts of Automata theory
5	Learn to apply topics of number theory in computer science.
6	Be able to relate mathematical concepts with theory of Computer Science.
7	Be able to design FAs, NFAs, Grammars, languages modelling, and basics of small compilers

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)				
Course LOs #	**Program Learning Outcomes Use LOs Codes**			
	a1	**b1**	**c3**	**d3**
1				
2				
3				
4				
5				
6				
7				

[21] **CSI 222 - Discrete Mathematics for Computer Science (2)**

College: Science in AzZulfi Department: Computer Science & Information Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **MATH 220 - Calculus (2)**[22]

Course Learning Outcomes:

1	Understand the concept of integration and its application to physical problems such as evaluation of areas, volumes of revolution, force, and work; fundamental formulas and various techniques of integration applied to both single variable and multi- variable functions; tracing of functions of two variables.
2	Sketch 3-dimensional regions bounded by several surfaces; and evaluate volumes of 3-dimensional regions bounded by two or more surfaces through the use of the double integral.
3	Determine the indicated sum of the elements in special sequences and series, and recognize the convergence/divergence of general sequence and series.
4	The ability to present mathematical arguments and conclusions from them with clarity and accuracy, in forms suitable for the audiences being addressed.
5	Correctly apply the formulae and techniques of integration, partial differentiation, and linear algebra in solving practical problems.
6	Practice how to apply and manipulate carefully the physical or/and geometric conditions on a set of variables to sketch the locus of these variables.
7	Prepare and sketch clear illustrative graphs that demonstrate and measure the behavior of complicated relations with time or/and location(s).
8	Acquire teamwork communications skills, e.g. Lead and motivate individuals.
9	Work in stressful environment and within constraints

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	**Program Learning Outcomes** **Use LOs Codes**					
	a.1	**b.1**	**b.2**	**b.3**	**c.1**	**d.1**
1						
2						
3						
4						
5						
6						
7						
8						
9						

[22] **MATH 220 - Calculus (2)**

College: Science in Zolfi Department: Computer Science & Information Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map
Course Number: **CSI 223** - **Digital Logic Design** [23]
Course Learning Outcomes:

1	Gain knowledge and understand of Binary Systems, Boolean Algebra, Logic Gates, Canonical and standard forms and Gate level minimization.
2	Gain knowledge of Combinational Logic, Storage elements, and Sequential synchronous circuits
3	Demonstrate the use of number systems and codes as well as explaining the mathematical characteristics of logical gates.
4	Apply truth tables, Boolean algebra, Karnaugh maps, and other methods to the design and characterization of digital circuits as well as to obtain design equations and use them to design combinational systems yielding innovative designs.
5	Utilize decoders and multiplexers in the design of logic gates and descriptions of the operation of basic memory elements.
6	Analyze and design synchronous sequential circuits as well as the use of registers and counters in these circuits.
7	Submit a group final project at the end of the semester that involves the implementation of design theory, and the use of a simulation package to develop a complex digital circuit.
8	Participate and discuss during the lectures through team work activities and use of the internet to search for related topics

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	**Program Learning Outcomes** **Use LOs Codes**					
	a.1	**a.3**	**b.1**	**b.2**	**c.3**	**d.1**
1						
2						
3						
4						
5						
6						
7						
8						

[23] **CSI 223** - **Digital Logic Design**

College: College of Science at Al-Zulfi

Department: Computer Science and Information

Program: Computer Science and Information

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: CSI 224 - Fundamentals of Information Systems[24]

Course Learning Outcomes:

1	Understand theoretical and methodological issues, including psychological and behavior aspects, in organizing information systems.
2	Use and apply current technical concepts and practices in the core information technologies of human computer interaction, information management, programming, networking, web systems and technologies.
3	Adhere to professional, ethical, legal, security, and social issues and their responsibilities that are related to information systems.
4	Function effectively on teams to accomplish a common goal ،Communicate effectively with a range of audiences.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	Program Learning Outcomes Use LOs Codes					
	a1	**a3**	**b3**	**c1**	**d1**	**d2**
1						
2						
3						
4						

[24] CSI 224 - Fundamentals of Information Systems

College: Science in Zolfi Department: Computer Science & Information Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **CHEM 225 - General Chemistry**[25]

Course Learning Outcomes:

1	Know the basic structure of the atom and atomic theories and various electronic distribution of elements
2	Identify the different types of chemical bonds.
3	Identify the different chemical reactions.
4	A gaseous state study of materials and various laws of gases
5	The study of the different types of solutions and their properties and to identify the acids and alkalis and their relationship to the number of acidity
6	The study of chemical equilibrium in adverse reactions and study the effect of common ION and holds melting
7	To identify the thermal interactions and how to measure the amount of heat absorbed or released from interaction and study the laws of thermodynamics and its relation to energy and chemical equilibrium.
8	Ranking of chemical reactions and how to measure the speed of the various interactions and the half-life as well as the effect of temperature on the constants rates.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	**Program Learning Outcomes** Use LOs Codes			
	a.1	**a.3**	**b.1**	**c.3**
1				
2				
3				
4				
5				
6				
7				
8				

[25] **CHEM 225 - General Chemistry**

Matrix 16: Course Student Learning Outcomes to Program Learning Outcomes Map (Level 5)

Course Code	Course Name	Lec	Lab	Ex	Cr	Prerequisite
CSI 311	Visual Programming	2	2	0	3	CSI 221
CSI 312	Data Structure	2	2	0	3	CSI 221, CSI 212
CSI 313	Computer Organization and Assembly Language	2	2	0	3	CSI 223
CSI 314	Database	2	2	0	3	CSI 211
MATH 310	Linear Alg. & Diff. Eq.	3	0	1	3	Math 220
ISL ***	Elective Islamic Course 1	2	0	0	2	--
Total		**17**				

College: Science in Zolfi Department: Computer Science & Information Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **CSI 311- Visual Programming**[26]

Course Learning Outcomes:

1	Using C# data types, class libraries and control constructs.
2	Implement C# classes, objects, and class relationships.
3	Develop and write programs applying Object Oriented principles using C#.
4	Create member functions using C# syntax and exception handling.
5	Building C# classes and inheritance hierarchies
6	Writing GUI applications using the drag-and-drop facilities.
7	Writing and deploying components in an ASP.NET Web application.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	Program Learning Outcomes Use LOs Codes							
	a1	**a2**	**a3**	**b1**	**b2**	**b3**	**c1**	**d1**
1								
2								
3								
4								
5								
6								
7								

[26] **CSI 311- Visual Programming**

College: Science in Zolfi Department: Computer Science & Information Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **CSI 312 - Data structure**[27]

Course Learning Outcomes:

1	Recall the basic data structures and their relative advantages and disadvantages.
2	Describe data structure types and their process (insertion, deletion , and search).
3	Describe the common search algorithms techniques.
4	An ability to implement and use common data structures
5	An ability to implement and use data structure types (linked list, tree , stack, and queue) in storing , insertion, deletion , and searching data on a disk file.
6	Apply the common search algorithms techniques on data structures types types (linked list, tree , stack, and queue) .
7	Work in a group and learn time management.
8	Learn how to search for information through library and internet.
9	Present a short report in a written form and orally using appropriate scientific language

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	**Program Learning Outcomes** **Use LOs Codes**							
	A1	**A3**	**B1**	**B3**	**B5**	**C2**	**C3**	**D2**
1								
2								
3								
4								
5								
6								
7								
8								
9								

[27] **CSI 312 - Data structure**

College: College of Science at AZ-Zulfi Department: Computer Science & Information
Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **CSI 313** - **Computer Organization and Assembly Language**[28]

Course Learning Outcomes:

1	Understand the major blocks of a computing system and how they interact to perform a specific task.
2	Understand how information is represented and stored in a computer and how it is processed.
3	Show an understanding of how different functions of a computer are performed using different sub-components.
4	Writing assembly programs for different application.
5	Learn how to search for information through library and internet.
6	Present a short report in a written form and orally using appropriate scientific language.
7	Communicate with teacher, ask questions, solve problems, and use computers.
8	Operate questions during the lecture, work in groups, and communicate with each other and with me electronically, and periodically visit the sites I recommended.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	Program Learning Outcomes Use LOs Codes				
	a1	**b2**	**c1**	**d1**	**d2**
1					
2					
3					
4					
5					
6					
7					
8					

[28] **CSI 313** - **Computer Organization and Assembly Language**

College: Science in Zolfi Department: Computer Science & Information Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map
Course Number: **CSI 314 - Databases** [29]

Course Learning Outcomes:

1	Be able to discuss/ explain the importance of database systems and the difference between file management and database.
2	Be able to design a suitable database components and environments.
3	Employ analytical skills as appropriate during database design and manipulation process.
4	Design and implement practical database system. In particular be able to discuss explain and apply the relational model and mappings from conceptual designs. In particular normalizations.
5	Identify a range of DB-solutions and critically evaluate them and justify proposed design and development solutions.
6	Analyse a wide range of database design issues and provide solutions through suitable Design, structures, diagrams, and other appropriate design methods.
7	Be able to apply and evaluate suitable database security and integrity levels.
8	Work in a group and learn time management.
9	Communicate with teacher, ask questions, solve problems, and use computers.
10	Operate questions during the lecture, work in groups, communicate with each other and with me electronically, and periodically visit the sites I recommended.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	**Program Learning Outcomes** **Use LOs Codes**					
	a.1	**a.2**	**b.1**	**b.2**	**C.3**	**d.1**
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

[29] **CSI 314 - Databases**

College: Science in AzZulfi Department: Computer Science & Information Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **MATH 310 - Linear Algebra & Diff. Equations**[30]

Course Learning Outcomes:

1	Analysis and determination of the general solution of linear systems of equations.
2	Modelling and Simplifying real life complicated systems.
3	Presenting mathematical arguments and conclusions with clarity and accuracy.
4	To learn independently.
5	Effective communications and presentation orally.
6	Grasp how mathematical processes may be applied to problems including an understanding that might give only a partial solution.
7	Demonstrate Knowledge of key mathematical concepts and topics, both explicitly and by applying them to the solution of problems.
8	Sketch Flowcharts or/and apply Pseudo code to modify computer program(s) that execute the solution(s) of the manipulated problem(s).
9	Acquire teamwork communications skills, e.g. Lead and motivate individuals.
10	Work in stressful environment and within constraints

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	Program Learning Outcomes Use LOs Codes							
	a.1	a.2	a.3	b.1	c.1	c.3	d.1	d.2
1				■				
2	■							
3			■					
4		■						
5								■
6						■		
7								
8								
9							■	
10					■			

[30] **MATH 310 - Linear Algebra & Diff. Equations**

Matrix 16: Course Student Learning Outcomes to Program Learning Outcomes Map (Level 6)

Course Code	Course Name	Lec	Lab	Ex	Cr	Prerequisite
CSI 321	Design & Analysis of Algorithms	2	0	2	3	CSI 312
CSI 322	Computer Networks	2	2	0	3	CSI 224
CSI 323	Computer Architecture	3	1	0	3	CSI 313
CSI 324	Advanced Database	1	4	0	3	CSI 314
CSI 325	Software Engineering 1	2	2	0	3	CSI 221
STAT 320	Probability & Statistics	3	0	1	3	MATH 212
Total		**18**				

College: Science in AzZulfi Department: Computer Science & Information Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **CSI 321** - **Design and Analysis of Algorithms**[31]

Course Learning Outcomes:

1	Recognize the role of algorithms relative to other technologies used in computer science.
2	Name the key algorithmic design paradigms: brute force, divide and conquer, decrease and conquer, transform and conquer, greedy, dynamic programming.
3	define the language, notation, and concepts of algorithmic design.
4	Predict the resources that the algorithm requires.
5	Develop, analyze and compare existing algorithms for a wide variety of problems: sorting, searching, graphs, and binary search tree.
6	Justify and analyze algorithmic tradeoffs: time vs. space, deterministic vs. randomized, and exact vs. approximate.
7	Write efficient algorithms of certain selected problems.
8	work cooperatively in a small group environment.
9	Save time and space in each task.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	**Program Learning Outcomes** **Use LOs Codes**					
	a.1	**b.1**	**b.2**	**c.2**	**c.3**	**d.1**
1						
2						
3						
4						
5						
6						
7						
8						
9						

[31] **CSI 321** - **Design and Analysis of Algorithms**

College: Science in AzZolfi Department: Computer Science & Information Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **CSI322** - **Computer Networks**[32]

Course Learning Outcomes:

1	Introduction: overview of computer networks
2	Fundamentals of data transmission: wired/wireless media, digital vs. analog transmission, data coding.
3	Multi-user communication and multiplexing
4	LAN technology and data link protocols: point-to-point links and sliding window flow control, Ethernet and CSMA/CD, switched and carrier Ethernet, Wireless LAN and CSMA/CA, cellular networks and advanced multi-user communication
5	Ask questions and discuss concepts during the lectures.
6	Work in a team to perform course activities and solve problems.
7	Use the internet to search for related topics

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	**Program Learning Outcomes** **Use LOs Codes**				
	a.3	**b.1**	**b.5**	**c.3**	**d.1**
1					
2					
3					
4					
5					
6					
7					

[32] **CSI322** - **Computer Networks**

College: College of Science at Al-Zulfi

Department: Computer Science and Information

Program: Computer Science and Information

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: CSI 323 - Computer Architecture [33]

Course Learning Outcomes:

1	Recognize the need for and an ability to engage in continuing professional development.
2	Define and integrate the operation of constituent parts of a computer.
3	Investigating modern design structures of Pipelined and Multiprocessors systems.
4	Analyze a range of architectural and technological concepts for computer operation.
5	Become acquainted with recent computer architectures and I/O devices, as well as the low-level language required to drive/manage these types of advanced hardware.
6	Apply advanced numerical methods.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	Program Learning Outcomes Use LOs Codes				
	a1	**a2**	**b1**	**c1**	**d3**
1					
2					
3					
4					
5					
6					
7					

[33] **CSI 323 - Computer Architecture**

College: Science at AzZulfi Department: Computer Science & Information Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **CSI324** – **Advanced Database**[34]

Course Learning Outcomes:

1	Students will have an appreciation of ER diagrams and evolution of Database design
2	Students will have an understanding of normalization including: 1NF, 2NF, 3NF and BCNF. They will be able to implement these strategies.
3	Students will understand the concepts of and techniques, for relational algebra and how to apply it to solve problems.
4	The students will be exposed to the modern programmable database queries.
5	Apply solutions for problems from our live.
6	Work in a group and learn how to manage the time.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	**Program Learning Outcomes** **Use LOs Codes**					
	a.1	**a.2**	**a.3**	**b.1**	**b.2**	**d.1**
1						
2						
3						
4						
5						
6						

[34] **CSI324** – **Advanced Database**

College: **Science at Az Zulfi**
Department: **Computer Science and Information**
Program: **Computer Science and Information**

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: CSI 325 - Software Engineering[35]

Course Learning Outcomes:

1	Acquire knowledge of software engineering fundamentals and their practical application.
2	Understand of best practices and standards in the field of software engineering, including all the activities of the software development life cycle activities and CASE tools.
3	Identify and analyze user needs, design, implement, develop and evaluate computer-based systems to meet desired needs.
4	Present a short report in a written form and orally using appropriate scientific language, and use current techniques, skills, and tools necessary for software engineering.
5	Work in groups and Communicate effectively with a range of audiences.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	Program Learning Outcomes Use LOs Codes							
	a1	**a3**	**b2**	**b4**	**c1**	**c3**	**d1**	**d2**
1								
2								
3								
4								
5								

[35] **CSI 325 - Software Engineering**

College: Science at AzZolfi Department: Computer Science & Information Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **STAT 320** - **Probability & Statistics**[36]

Course Learning Outcomes:

1	The student will have the knowledge and understanding of how to apply statistical concepts into real world problems.
2	The course also serves as a prerequisite to other statistics courses such as probability theory and mathematical statistics.
3	The course assists the student in the understanding and application of many statistical methods and how to analyse real world data.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)			
Course LOs #	**Program Learning Outcomes Use LOs Codes**		
	a.1	**a.2**	**a3**
1			
2			
3			

[36] **STAT 320** - **Probability & Statistics**

Matrix 16: Course Student Learning Outcomes to Program Learning Outcomes Map (Level 7)

Course Code	Course Name	Le	Lb	Ex	Cr	Prerequisite
CSI 411	Artificial Intelligence	2	2	0	3	CSI 321
CSI 412	Operating Systems	2	2	0	3	CSI 313
CSI 413	Compiler Design	2	2	0	3	CSI 222
***	Elective Course 1	*	*	*	3	***
ARAB ***	Elective Arabic Course	2	0	0	2	--
ISL***	Elective Islamic Course 2	2	0	0	2	--
CSI 400	Summer Training	1	0	0	1	72 Cr. Hrs
Total		**17**				

College: Science at AzZolfi Department: Computer Science & Information Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: CSI 411 - Artificial Intelligence [37]

Course Learning Outcomes:

1	Have an understanding of space search and search algorithms, logic based knowledge representation of issues in reasoning methods.
2	Have an understanding of the limitations of current symbolic AI paradigm.
3	Be able to select appropriate search paradigms for appropriate problems
4	Be able to design a simple agent system and associated ontology and justify the design
5	Be able to study on-line.
6	Be able to design and implement a forward chaining knowledge based system including rule base.
7	Communicate effectively with a range of audiences.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	Program Learning Outcomes Use LOs Codes							
	a1	a2	a3	b1	b2	c3	d1	d2
1								
2								
3								
4								
5								
6								
7								

[37] CSI 411 - Artificial Intelligence

College: Science at AzZolfi Department: Computer Science & Information Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map
Course Number: CIS 412 - Operating Systems [38]
Course Learning Outcomes:

1	Computer system structures: - I/O sub-systems. - Storage hierarchy. - Discuss/explain the concepts of Hardware protection.
2	Process management. - Discuss/explain the different techniques in Process schedule. -Tune and optimize some Operation on processes
3	Deadlock and CPU scheduling - Definition and Detection Algorithm. - Carefully explain the concepts of Single and multiprocessor scheduling.
4	Explain the core issues of cloud computing such as security, privacy, and interoperability.
5	Identify problems, and explain, analyze, and evaluate various cloud computing solutions.
6	Work in a group and learn time management
7	Present a short report in a written form and orally using appropriate scientific language.
8	Operate questions during the lecture, work in groups, and communicate with each other and with me electronically, and periodically visit the sites I recommended.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	Program Learning Outcomes Use LOs Codes				
	a1	**a3**	**b1**	**b2**	**d1**
1					
2					
3					
4					
5					
6					
7					
8					

[38] CIS 412 - Operating Systems

College: Science at AzZolfi Department: Computer Science & Information Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **CSI 413** - **Compiler Design**[39]

Course Learning Outcomes:

1	To be able to understand the structure of compilers
2	To understand the basic techniques used in compiler construction such as lexical analysis, top-down, bottom-up parsing, context-sensitive analysis, and intermediate code generation
3	To understand the basic data structures used in compiler construction such as abstract syntax trees, symbol tables, three-address code, and stack machines
4	To be able to explain the core issues of Compiler design.
5	To be able to design and implement a small compiler using a software engineering approach
6	To be able to identify problems, and explain, analyse, and evaluate various design strategies of compilers.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	Program Learning Outcomes Use LOs Codes					
	a1	**a3**	**b1**	**b2**	**c3**	**d1**
1						
2						
3						
4						
5						
6						

[39] **CSI 413** - **Compiler Design**

Matrix 16: Course Student Learning Outcomes to Program Learning Outcomes Map (Level 8)

Course Code	Course Name	Lec	Lab	Ex	Cr	Prerequisite
CSI 421	Distributed Systems & Parallel Processing	2	2	0	3	CSI 321
CSI 422	Software Engineering 2	2	2	0	3	CSI 325
CSI423	Cryptography and Information Security	3	1	0	3	CSI 321
CSI 425	Computer Graphics	2	2	0	3	Math 310
***	Elective Course 2	*	*	*	3	***
ISL ***	Elective Islamic Course 3	2	0	0	2	--
Total		**17**				

College: Science at AzZolfi Department: Computer Science & Information Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **CSI 421 - Distributed Systems & Parallel Processing**[40]

Course Learning Outcomes:

1	Understand the fundamental aspects of parallel and distributed processing, taxonomies of parallel systems, and performance measures for parallel systems.
2	Understand the theoretical limitations of parallel computing such as intractability.
3	Design, implement, develop and evaluate efficient parallel application programs.
4	Apply the common sort algorithms techniques on data structures types using the MPI.
5	Learn how to search for information through library and internet and Present a short report in a written form and orally using appropriate scientific language.
6	Function effectively on teams to accomplish a common goal, and ccommunicate with teacher, ask questions, solve problems, and use computers.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	Program Learning Outcomes Use LOs Codes					
	a1	**a3**	**b2**	**b3**	**c1**	**d1**
1						
2						
3						
4						
5						
6						

[40] **CSI 421 - Distributed Systems & Parallel Processing**

College: Science at AzZolfi Department: Computer Science & Information Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: CSI 422 - Software Engineering (2) [41]

Course Learning Outcomes:

1	Acquire knowledge of computing and mathematics appropriate to software engineering including simulation and modelling, and Understand of best practices and standards and their application related to software engineering.
2	Identify and analyze user needs and take them into account in the selection, creation, evaluation and administration of computer-based systems.
3	Apply software engineering principles and practices to the planning and development of actual software projects, and expert proficiency in the UML2 superstructure to design software architectures.
4	Use current techniques, skills, and tools necessary for software engineering practice.
5	Function effectively on teams to accomplish a common goal, and Communicate effectively with a range of audiences.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	Program Learning Outcomes Use LOs Codes						
	a1	**a3**	**b3**	**b4**	**c3**	**d1**	**d2**
1							
2							
3							
4							
5							

College: Science in AzZulfi Department: Computer Science & Information Program: CSI

[41] CSI 422 - Software Engineering (2)

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **CSI 423** - **Cryptography and Information Security**[42]

Course Learning Outcomes:

1	Assess the implications of cryptography in terms of privacy, security, and ethical issues.
2	Evaluate and compare encryption standards and techniques.
3	Define the basic terminology, notation, and concepts of computer security.
4	Compile, integrate and appraise various methods of encryption information.
5	Measure and determine appropriate encryption standards and techniques to suite specific business and technological needs.
6	Analyze strengths and weaknesses in different systems.
7	Design security protocols and methods to solve specified security problem.
8	Work cooperatively in a small group environment.
9	Keep your computer safe from different threats.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	**Program Learning Outcomes** **Use LOs Codes**					
	a.1	**a.3**	**b.1**	**b.2**	**c.1**	**d.2**
1						
2						
3						
4						
5						
6						
7						
8						
9						

College: Science in AzZulfi Department: Computer Science & Information Program: CSI

[42] **CSI 423** - **Cryptography and Information Security**

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: CSI 425 - Computer Graphics [43]

Course Learning Outcomes:

1	Acquire knowledge of the history and evolution of computer graphics, both hardware and software.
2	Understand the 2D graphics and algorithms including: line drawing, polygon filling, clipping, and transformations. They will be able to implement these concepts.
3	Understand the concepts and techniques used in 3D computer graphics, including viewing transformations, hierarchical modeling, colour, lighting and texture mapping.
4	Use matrix algebra in computer graphics application and draw the basic primitives (e.g., point, line, polygons) using OpenGL.
5	Apply the 2D transformations and 3D transformations, and Explain how simple line and polygon clipping algorithms work.
6	Implement simple animations using OpenGL.
7	Learn how to search for information through library and internet, and Present a short report in a written form and orally using appropriate scientific language.
8	Function effectively on teams to accomplish a common goal, and ccommunicate with teacher, ask questions, solve problems, and use computers.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	Program Learning Outcomes Use LOs Codes				
	a1	**b2**	**b3**	**c1**	**d1**
1					
2					
3					
4					
5					
6					
7					
8					

[43] CSI 425 - Computer Graphics

Matrix 16: Course Student Learning Outcomes to Program Learning Outcomes Map (Level 9)

Course Code	Course name	Le	Lb	Ex	Cr	Prerequisite
CSI 510	Graduation Project 1	2	0	0	2	120 Cr. Hrs
CSI 511	Web Programming & Internet Technology	2	2	0	3	CSI 322
CSI 512	Data Mining	2	2	0	3	CSI 314
CSI 513	Concepts of Prg. Lang.	2	2	0	3	CSI 222
***	Elective Course 3	*	*	*	3	***
***	Elective Prerequisite Univ.	2	0	0	2	***
Total					**17**	

College: Science Department: Computer science Program: Computer science and information

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number **CSI 510 - Graduation Project (1)**[44]

Course Learning Outcomes:

1	Introduction: overview of computer networks
2	Fundamentals of data transmission: wired/wireless media, digital vs. analog transmission, data coding.
3	Multi-user communication and multiplexing
4	LAN technology and data link protocols: point-to-point links and sliding window flow control, Ethernet and CSMA/CD, switched and carrier Ethernet, Wireless LAN and CSMA/CA, cellular networks and advanced multi-user communication
5	Ask questions and discuss concepts during the lectures.
6	Work in a team to perform course activities and solve problems.
7	Use the internet to search for related topics

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	**Program Learning Outcomes** **Use LOs Codes**				
	a.3	**b.1**	**b.5**	**c.3**	**d.1**
1					
2					
3					
4					
5					
6					
7					

[44] **CSI 510 - Graduation Project (1)**

College: Science at Az-Zolfi Department: Computer Science & Information Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **CSI 511 - Web Programming & Internet Technology**[45]

Course Learning Outcomes:

1	Students will develop an understanding of the core concepts of computer network and network protocols such as OSI and TCP/IP
2	Explain the technology infrastructure and network requirements for local LAN.
3	Understand the legal, ethical, and managerial requirements of internet usage
4	Select, configure, and operate the principal components of Internet and network infrastructure and tools, safely and effectively;
5	Developing strong technical skills in combination with the of network management.
6	Work in a group and learn time management.
7	Learn how to search for information through library and internet.
8	Present a short report in a written form and orally using appropriate scientific language.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	Program Learning Outcomes Use LOs Codes					
	a.3	**b.1**	**b.5**	**c.1**	**c.3**	**d.1**
1						
2						
3						
4						
5						
6						
7						
8						

[45] **CSI 511 - Web Programming & Internet Technology**

College: Science at Az-Zolfi Department: Computer Science & Information Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **CSI 512 - Data Mining**[46]

Course Learning Outcomes:

1	Recall concepts, instances, and attributes; data preparation.
2	Describe knowledge representation; decision tables and trees.
3	Recognize the implementations of software Matlab
4	An ability to extract rules involving relations, trees for numeric prediction, instance based classification.
5	An ability to implement and use rules for numeric prediction, instance based representation and cluster data.
6	Apply classification algorithms for prediction of unknown clusters
7	Work in a group and learn time management.
8	Learn how to search for information in the library and over the internet.
9	Present a short report in a written form and present orally using appropriate scientific language

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	**Program Learning Outcomes** **Use LOs Codes**							
	A2	**A3**	**B3**	**B4**	**C2**	**C3**	**D1**	**D3**
1								
2								
3								
4								
5								
6								
7								
8								
9								

[46] **CSI 512 - Data Mining**

College: Science at Az-Zolfi Department: Computer Science & Information Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **CSI 513** – **Concepts of Programming Language**[47]

Course Learning Outcomes:

1	Understand the fundamental programming constructs: Names, Bindings, and Scopes, Data Types, Expressions and Assignment Statements, Statement-Level Control Structures, subprograms.
2	Name the key programming language concepts: syntax, semantic.
3	Improved background for choosing appropriate languages
4	Increased ability to learn new languages
5	Better understanding of significance of implementation
6	Better use of languages that are already known
7	Work cooperatively in a small group environment.
8	Save time and space in each task.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	Program Learning Outcomes Use LOs Codes					
	A1	**A2**	**B1**	**B2**	**C3**	**D1**
1						
2						
3						
4						
5						
6						
7						
8						

[47] **CSI 513** – **Concepts of Programming Language**

Matrix 16: Course Student Learning Outcomes to Program Learning Outcomes Map (Level 10)

Course Code	Course	Le	Lb	Ex	Cr	Prerequisite
CSI 520	Graduation Project 2	3	0	0	3	CSI 510
CSI 522	Human Computer Interaction	2	2	0	3	CSI 511
CSI 525	Professional Ethics	2	0	0	2	CSI 422
***	Elective Course 4	*	*	*	3	***
***	Free Elective Course	*	*	*	3	***
Total		**14**				

College: Science at Az-Zolfi Department: Computer Science & Information Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **CSI 520 - Graduation Project (2)**[48]

Course Learning Outcomes:

1	Learn new tools and technologies and understand of best practices and standards and their application.
2	Design, implement, develop and evaluate the computer-based system of the project to meet desired needs.
3	Use and apply current technical concepts and practices in the core information technologies of human computer interaction, information management, programming, networking, web systems and technologies.
4	Integrate IT-based solutions into the user environment effectively.
5	Use current techniques, skills, and tools necessary for computing practice.
6	Function effectively on teams to accomplish a common goal and communicate effectively with a range of audiences.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	Program Learning Outcomes Use LOs Codes						
	a3	**b2**	**b3**	**b5**	**c3**	**d1**	**d2**
1							
2							
3							
4							
5							
6							

[48] **CSI 520 - Graduation Project (2)**

College: Science at Az-Zolfi Department: Computer Science & Information Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **CSI 522 - Human Computer Interaction** [49]

Course Learning Outcomes:

1	Explain why it is important to design Interactive products that are usable.
2	Explain key theories used in the design of interactive products
3	Explain the importance of iteration, evaluation design and prototyping in interaction.
4	Understand different types of data (qualitative and quantitative)
5	Define and describe usability and usability goals
6	Demonstrate an understanding of what a case study in HCI and ID is, and what it entails
7	Able to conduct HCI evaluations and usability studies
8	Work cooperatively in a small group environment.
9	Save time and space in each task.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	**Program Learning Outcomes** Use LOs Codes							
	a.1	**a.3**	**b.1**	**b.4**	**c.2**	**c.3**	**d.1**	**d.2**
1								
2								
3								
4								
5								
6								
7								
8								
9								

[49] **CSI 522 - Human Computer Interaction**

College: Science at Az-Zolfi Department: Computer Science & Information Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: CSI 525 - Professional Ethics [50]

Course Learning Outcomes:

1	Recognize the need for and an ability to engage in continuing professional development.
2	Understand of best practices and standards and their application.
3	Identify and analyze user needs and take them into account in the selection, creation, evaluation and administration of computer-based systems.
4	Adhere professional, ethical, legal, security, and social issues and their responsibilities.
5	Function effectively on teams to accomplish a common goal.
6	Communicate effectively with a range of audiences.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	**Program Learning Outcomes** **Use LOs Codes**					
	a2	**a3**	**b4**	**c1**	**d1**	**d2**
1						
2						
3						
4						
5						
6						

[50] **CSI 525 - Professional Ethics**

Matrix 16: Course Student Learning Outcomes to Program Learning Outcomes Map (Track I)

Track I: Computer Graphics & Multimedia

Course Number	Course Title	Credits Hours	Weekly Hours		Prerequisite
			Lecture	Lab	
CSI 414	Digital Image Processing	3	2	2	MATH 310
CSI 424	Computer Vision	3	2	2	CSI 414
CSI 514	Interactive Computer Graphics	3	2	2	CSI 425
CSI 521	Multimedia Technology	3	2	2	CSI 425
CSI 530	Digital Photography	3	2	2	MATH 220

College: Science at Az-Zolfi Department: Computer Science & Information Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **CIS 414 - Digital Image Processing**[51]

Course Learning Outcomes:

1	A good understanding of the basic fundamentals of the digital image processing.
2	An understanding of the various effects and tools that can be applied on the stile images like (image segmentation, image filters and so on).
3	How to think in Digital image processing and its wide applications
4	How to imagine and create new tools for image processing (new filters, coding, representation...)
5	Apply different techniques of image processing.
6	Develop new algorithms for image enhancements.
7	The ability to implement different algorithms of image processing.
8	The ability to be creative when working with mages.
9	The ability to analysis image with software tools and packages in image processing.(Matlab)

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	Program Learning Outcomes Use LOs Codes						
	A1	**A3**	**B1**	**B3**	**C3**	**D2**	**D3**
1							
2							
3							
4							
5							
6							
7							
8							
9							

[51] **CIS 414 - Digital Image Processing**

College: Science at Az-Zolfi Department: Computer Science & Information Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **CSI 424 – Computer Vision**[52]

Course Learning Outcomes:

1	Have an understanding of the theoretical and practical capabilities of Computer Vision.
2	Be able to formulate solutions to problems in Computer Vision.
3	Students will be able to implement fundamental spatial filtering algorithms using correlation and convolution techniques
4	Choose the appropriate technologies, algorithms, and approaches for the related issues.
5	Students will be able to segment objects in an image based on texture and colour features
6	Work in a group and learn time management.
7	Use Information technology and computer skills to gather information about a selected topic.
8	Operate questions during the lecture, work in groups, and communicate with each other and with me electronically, and periodically visit the sites I recommended.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)								
Course LOs #	**Program Learning Outcomes Use LOs Codes**							
	a.1	**a.2**	**a.3**	**b1**	**b2**	**c3**	**d1**	**d3**
1								
2								
3								
4								
5								
6								
7								
8								

[52] **CSI 424 – Computer Vision**

College: Science at Az-Zolfi Department: Computer Science & Information Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: CSI 514 - Interactive Computer Graphics [53]

Course Learning Outcomes:

1	Acquire knowledge of computing and mathematics appropriate to interactive computer graphics including simulation and modelling and ،Understand of best practices and standards and their application related to interactive computer graphics.
2	Apply mathematics, physics, and theories and models of human perception to computer graphics applications and problem solving.
3	Use appropriate APIs to exploit the graphics pipeline architecture to produce interactive programs modelling and rendering dynamic environments, interactions of light and object surfaces, shadows and reflections.
4	Use current techniques, skills, and tools necessary for interactive computer graphics practice.
5	Function effectively on teams to accomplish a common goal and ،apply advanced numerical methods necessary for interactive computer graphics practice.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	Program Learning Outcomes Use LOs Codes					
	a1	**a3**	**b3**	**c3**	**d1**	**d3**
1						
2						
3						
4						
5						

[53] CSI 514 - Interactive Computer Graphics

College: Science at Az-Zolfi Department: Computer Science & Information Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **CSI 521 - Multimedia Technology**[54]

Course Learning Outcomes:

1	Understand possible uses and applications of multimedia.
2	Understand the basic forms of multimedia contents including digital images, audio, video, animations etc.
3	Understand the basic tools and technologies that are involved in Multimedia Design.
4	To be able to explain the core issues involved in Multimedia Design.
5	To be able to design and implement multimedia contents in various forms.
6	To be able to design and generate animations.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	**Program Learning Outcomes Use LOs Codes**					
	a1	**a3**	**b1**	**b2**	**c3**	**d1**
1						
2						
3						
4						
5						
6						

[54] **CSI 521 - Multimedia Technology**

College: Science at Az-Zolfi Department: Computer Science & Information Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **CSI 530 - Digital Photography**[55]

Course Learning Outcomes:

1	An introduction to the scientific, artistic, and computing aspects of digital photography - how digital cameras work, how to take good pictures using them, and how to manipulate these pictures afterwards.
2	Topics include lenses and optics, light and sensors, optical effects in nature, perspective and depth of field, sampling and noise, the camera as a computing platform, image processing and editing,
3	History of photography, and computational photography
4	Ask questions and discuss concepts during the lectures.
5	Work in a team to perform course activities and solve problems.
6	Use the internet to search for related topics

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	Program Learning Outcomes Use LOs Codes							
	a.1	**a.3**	**b.1**	**b.2**	**b.3**	**c.1**	**c.3**	**d.1**
1								
2								
3								
4								
5								
6								

[55] **CSI 530 - Digital Photography**

Matrix 16: Course Student Learning Outcomes to Program Learning Outcomes Map (Track II)

Track II: Computer Networks

Course Number	Course Title	Credit Hours	Weekly Hours		Prerequisite
			Lecture	Lab	
CSI 431	Advanced Computer Networks	3	2	2	CSI 322
CSI 432	Network Security	3	2	2	CSI 431
CSI 531	Wireless & Mobile Computing	3	2	2	CSI 322
CSI 532	Network Programming	3	2	2	CSI 431
CSI 533	Cloud Computing	3	2	2	CSI 322 , CSI 321

College: Science at Az-Zolfi Department: Computer Science & Information Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: CSI 431 - Advanced Computer Networks[56]

Course Learning Outcomes:

1	the basic concepts associated with network security
2	Analyze and implement some of the most advanced routing and congestion control algorithms
3	Evaluate the performances of computer networks (through mathematical modelling and simulation)
4	Understand basics and principles of new generation of computer networks (VPN, wireless networks, mobile networks…).
5	Practice network simulators
6	work in a group to practice managing wireless networks
7	work in a group to recognize network performance

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	Program Learning Outcomes Use LOs Codes							
	a1	**a3**	**b1**	**b2**	**c1**	**c3**	**d1**	**d2**
1								
2								
3								
4								
5								
6								
7								

[56] CSI 431 - Advanced Computer Networks

College: Science at Az-Zolfi Department: Computer Science & Information Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: CSI 432 - Network Security [57]

Course Learning Outcomes:

1	Understand the basic concepts associated with network security
2	Understand the concepts of confidentiality, integrity, authentication, non-repudiation, and availability
3	distinguish between different network threats
4	Asses the threats, vulnerabilities, and risks to a computer network b
5	Understand Transport-Level Security such as, Web Security Issues, Secure Sockets Layer (SSL) and Transport Layer Security (TLS).
6	Understand the generic issues of Electronic Mail Security and IP security.
7	Understand Transport-Level Security such as, Web Security Issues, Secure Sockets Layer (SSL) and Transport Layer Security (TLS). C
8	work in a group to write the specifications of a network attacks

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	Program Learning Outcomes Use LOs Codes							
	a1	**a2**	**b2**	**b4**	**b5**	**c1**	**d1**	**d2**
1								
2								
3								
4								
5								
6								
7								
8								

[57] CSI 432 - Network Security

College: Science at Az-Zolfi Department: Computer Science & Information Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **CSI531** - **Wireless and Mobile Computing** [58]

Course Learning Outcomes:

1	Be able to understand wireless communication and wireless networking concepts.
2	Be able to understand principles, concepts and protocols of computer network design and building.
3	Be able to understand wireless computer networks' standards, protocols.
4	To recognize wireless internetworking concepts, architecture and protocols.
5	To compare between alternative mobile networks design approaches with wired ones.
6	To analyze wireless network protocols designs.
7	Quantify the values of protocol parameters and indicate their advantages and disadvantages in a wireless environment.
8	Work cooperatively in a small group environment.
9	Save time and space in each task.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	**Program Learning Outcomes** **Use LOs Codes**				
	a.1	**a.3**	**b.1**	**d.1**	**d.3**
1					
2					
3					
4					
5					
6					
7					
8					
9					

[58] **CSI531** - **Wireless and Mobile Computing**

College: Science at Az-Zolfi Department: Computer Science & Information Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: CSI 532 - Network Programming [59]

Course Learning Outcomes:

1	Acquire knowledge of the basic concepts associated with network programming and the advantages of multithreaded applications.
2	Acquire knowledge of the role of a protocol in controlling the communication between hosts in a network.
3	Design and implement new simple network protocols, and recognize the significance of flexibility, extendibility, simplicity, and efficiency in protocol design and implementation.
4	Implement practical network protocols, for clients and servers, using Java networking API.
5	Work in a group to write the specification of a simple protocol.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	Program Learning Outcomes Use LOs Codes				
	a1	**b2**	**b5**	**c3**	**d1**
1					
2					
3					
4					
5					

[59] CSI 532 - Network Programming

College: Science at Az-Zolfi Department: Computer Science & Information Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: CSI 533 - Cloud Computing [60]

Course Learning Outcomes:

1	Demonstrate the knowledge of architecture, service models, economics, scaling and recovering of cloud computing.
2	Understand the core concepts of the cloud computing paradigm: how and why this paradigm shift came about and the influence of several enabling technologies in cloud computing.
3	Understand the technology infrastructure and network requirements for cloud computing.
4	Understand the legal, ethical, and managerial requirements of cloud computing.
5	Choose the appropriate technologies, algorithms, and approaches for the related issues.
6	Identify problems, analyze, and evaluate various cloud computing solutions.
7	Use the appropriate cloud computing solutions and recommendations according to the applications used.
8	Learn how to search for information through library and internet.
9	Work in groups, operate questions during the lecture and communicate with each other and with me electronically, and periodically visit the sites the lecturer recommended.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	Program Learning Outcomes Use LOs Codes						
	a1	**a3**	**b1**	**b3**	**b4**	**c1**	**d1**
1							
2							
3							
4							
5							
6							
7							
8							
9							

[60] CSI 533 - Cloud Computing

Matrix 16: Course Student Learning Outcomes to Program Learning Outcomes Map (Track III)

Track III: Individual Track :

Course Number	Course Title	Credit Hours	Weekly Hours		Prerequisite
			Lecture	Lab	
CSI 441	Machine Learning	3	2	2	CSI 411
CSI 442	Introduction to Robotics	3	2	2	CSI 411
CSI 443	Expert Systems	3	2	2	CSI 411
CSI 444	Computational Methods	3	2	2	Math 310
CSI 445	Operational Research	3	2	2	STAT320,MATH 310
CSI 446	Information System Management	3	2	2	CSI 314
CSI 447	Information Security	3	2	2	CSI 423
CSI 448	Project Management	3	2	2	CSI 422
CSI 449	Geographic Information Systems (GIS)	3	2	2	CSI 324

College: Science at Az-Zolfi Department: Computer Science & Information Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **CSI 441 - Machine Learning**[61]

Course Learning Outcomes:

1	Understand the principles, advantages, limitations and possible applications of machine learning.
2	Students will have an understanding of basic knowledge about the key algorithms and theory that form the foundation of machine learning and computational intelligence.
3	Work in a group and learn time management.
4	Evaluate the strengths and limitations of learning procedures and select an appropriate learning algorithm for a given problem.
5	Be able to apply machine learning methods to particular target problems and evaluate and report the results appropriately.
6	Use Information technology and computer skills to gather information about a selected topic.
7	The ability to implement some basic machine learning algorithms.
8	Operate questions during the lecture, work in groups, and communicate with each other and with me electronically, and periodically visit the sites I recommended.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	**Program Learning Outcomes** **Use LOs Codes**					
	a2	**a3**	**b3**	**b4**	**c3**	**d1**
1						
2						
3						
4						
5						
6						
7						
8						

[61] **CSI 441 - Machine Learning**

College: Science at Az-Zolfi Department: Computer Science & Information Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **CSI 442 – Introduction to Robotics**[62]

Course Learning Outcomes:

1	The know-how of the fundamentals of robotics in the core areas of mechanics, control, perception, artificial intelligence, and autonomy.
2	Perform spatial transformations associated with rigid body motions.
3	Perform kinematics analysis of robot systems
4	Understand concept of sensors and actuators and Identify sensors and actuators required for specific applications.
5	Perform basic calculation associated with trajectory planning.
6	Understand basic issues and programming principles associated with robot control.
7	Implement hardware and software to build a robot that can perform a task.
8	Work cooperatively in a small group environment.
9	Save time and space in each task.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	Program Learning Outcomes Use LOs Codes							
	A1	**A2**	**A3**	**B1**	**B2**	**B4**	**C3**	**D1**
1								
2								
3								
4								
5								
6								
7								
8								
9								

[62] **CSI 442 – Introduction to Robotics**

College: Science at Az-Zolfi Department: Computer Science & Information Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **CSI 443** - **Expert Systems**[63]

Course Learning Outcomes:

1	To be able to understand knowledge representation, common knowledge representation paradigms and the issues involved in knowledge representation (e.g. knowledge based systems, ontology and decision support system)
2	To be familiarize with different AI – expert system Tools & an awareness of the issues involved in building such systems.
3	To understand the types of systems that can be built using expert system techniques, in particular knowledge based systems, rule-based expert systems and ontology based systems.
4	Attempt to understand the issues involved in building the expert systems.
5	Should be able to analyze practical cases from real life scenario and map them to feasible solutions with more productivity.
6	Should be able to understand the foundation of expert system techniques and logic, particularly as related to knowledge representation and decision support system..
7	Ability of students to work within a team/ group and understand the theoretical concepts in order to develop small applications in real life scenario.
8	Apply derived knowledge using internet and other sources of Library reference materials.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	**Program Learning Outcomes** **Use LOs Codes**							
	a1	**a3**	**b1**	**b2**	**b3**	**b4**	**b5**	**d1**
1								
2								
3								
4								
5								
6								
7								
8								

[63] **CSI 443** - **Expert Systems**

College: Science at Az-Zolfi Department: Computer Science & Information Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **CSI 444 – Computational Methods**[64]

Course Learning Outcomes:

1	Explain the mathematical theory underlying numerical methods for solutions of the concerned problems.
2	Match correctly the appropriate techniques of solutions with the concerned problems.
3	Categorizing problems into appropriate complexity classes.
4	Identify the essential mathematics relevant to computer science.
5	Perform error and stability analysis to investigate applicability of numerical methods for solving the concerned problems.
6	Analyse and evaluate the solution's Efficiency and effectiveness.
7	Develop an appropriate numerical scheme.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	Program Learning Outcomes Use LOs Codes							
	a.1	a.3	b.1	b.3	c.2	c.3	d.1	d.3
1								
2								
3								
4								
5								
6								
7								

[64] **CSI 444 – Computational Methods**

College: Science at Az-Zolfi Department: Computer Science & Information Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **CSI 445 – Operation Research**[65]

Course Learning Outcomes:

1	Describe exactly and in a formal manner the type of a considered optimization problem.
2	Recall and list different methods to attack a problem.
3	Recognize the concepts and mathematical models of Linear programming.
4	Plan and explain how to solve an optimization problem.
5	Reorganize the relationships between a linear programming problem and other objects.
6	Differentiate and compare between the alternative solutions of a linear programming problem to justify the optimal one.
7	Use the available commercial software systems/packages in application to the suggested solution/plan.
8	Demonstrate the feasibility of an applied solution/plan
9	Team working skills: cooperative working in groups inside the class, or/and efficient participation in take-home-assignments.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course ILOs #	Program Learning Outcomes Use LOs Codes							
	a1	a2	a3	b3	b4	c3	d1	d3
1								
2								
3								
4								
5								
6								
7								
8								
9								

[65] **CSI 445 – Operation Research**

College: Science at Az-Zolfi Department: Computer Science & Information Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: CSI 446 - Information Systems Management [66]

Course Learning Outcomes:

1	Understand of best practices and standards and their applications that related to the management of information systems.
2	Integrate into business situations and analysis, and evaluate both theory and practice relevant to Management information systems.
3	Implement new or replacement management information systems through understanding and evaluating how resistance to change can affect MIS implementation.
4	Integrate IT-based solutions into the user environment effectively.
5	Adhere professional, ethical, legal, security, and social issues and their responsibilities that related to the management of information systems.
6	Analyze the local and global impact of information systems management on individuals, organization, and society, and use current techniques, skills, and tools necessary for information systems management practice.
7	Function effectively on teams to accomplish a common goaland c ‹communicate effectively with a range of audiences.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	Program Learning Outcomes Use LOs Codes					
	a3	**b5**	**c1**	**c2**	**d1**	**d2**
1						
2						
3						
4						
5						
6						
7						

[66] CSI 446 - Information Systems Management

College: Science at Az-Zolfi Department: Computer Science & Information Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **CSI 447 – Information Security**[67]

Course Learning Outcomes:

1	Explain the objectives of information security.
2	Discuss the importance and applications of each of confidentiality, integrity, and availability.
3	Understand the basic categories of threats to computers and networks.
4	Analyze issues for creating security policy for a large organization.
5	Evaluate vulnerability of an information system and establish a plan for risk management.
6	Present issues and solutions in appropriate form to communicate effectively with peers and clients from specialist and non-specialist backgrounds.
7	Creatively apply contemporary theories, processes, and tools in the development and evaluation of solutions to problems of information security.
8	Analyze the local and global impact of information security on individuals, organizations, and society
9	Function effectively on teams to accomplish a common goal.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	**Program Learning Outcomes** **Use LOs Codes**						
	A1	**A2**	**B1**	**B2**	**B3**	**C2**	**D1**
1							
2							
3							
4							
5							
6							
7							
8							
9							

[67] **CSI 447 – Information Security**

College: Science at Az-Zolfi Department: Computer Science & Information Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: CSI 448 - **Project Management** [68]

Course Learning Outcomes:

1	Demonstrate knowledge of project management concepts, methodologies and techniques.
2	Identify contrasting and related characteristics of project management, strategic management, operations management, and crisis management.
3	Apply Project Management principles through class exercises in project scope management, project time management and teaming.
4	Develop detailed project plan to include: Defining a project's scope and tasks by using the different technique, estimating task resource needs, assessing project risk and response strategies, a communications plan.
5	Learn how to search for information through library and internet, and present a short report in a written form and orally using appropriate scientific language.
6	Work in groups, operate questions during the lecture and communicate with each other and with me electronically, and periodically visit the sites the lecturer recommended.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	**Program Learning Outcomes** **Use LOs Codes**					
	a1	**b2**	**b3**	**b4**	**c1**	**d1**
1						
2						
3						
4						
5						
6						

[68] CSI 448 - **Project Management**

College: Science at Az-Zolfi Department: Computer Science & Information Program: CSI

Code MUP16

Course Student Learning Outcomes to Program Learning Outcomes Map

Course Number: **CSI 449 – Geographic Information Systems (GIS)**[69]

Course Learning Outcomes:

1	Define the fundamentals of GIS and develop basic geospatial data manipulation skills.
2	Identify GIS components, roles, and applications.
3	Define fundamental skills in querying geo-databases.
4	Interpret and analyze data qualitatively and qualitatively.
5	Identify the principles and techniques of a number of application areas informed by the research directions of GIS.
6	Justify and analyze geospatial data.
7	Develop GIS applications for different fields
8	Work cooperatively in a small group environment.

Mapping:

Map course LOs with the program LOs. (Place course LO #s in the left column and program LO #s across the top.)

Course LOs #	Program Learning Outcomes Use LOs Codes							
	A1	**A2**	**A3**	**B1**	**B2**	**B3**	**C1**	**D1**
1								
2								
3								
4								
5								
6								
7								
8								

[69] **CSI 449 – Geographic Information Systems (GIS)**