هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-151

Program Specification
(Bachelor)

Program:	Bachelor of Science in Computer Science
Program Code (as per Saudi university ranking):	061301
Qualification Level:	Bachelor's Degree (Level 6)
Department:	Computer Science
College	College of Science
Institution:	Northern Border University
Program Specification:	New ☐ updated* ☒
Last Review Date:	January 28, 2023

*Attach the previous version of the Program Specification.

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A. Program Identification and General Information

1. Program's Main Location :

College of Science, Arar

2. Branches Offering the Program (if any):

NIL

3. Partnerships with other parties (if any) and the nature of each:

NIL

4. Professions/jobs for which students are qualified

- Programmer
- Systems Analyst
- Web Developer
- Network Administrator
- Database Developer
- Database Administrator
- Research Assistant
- Instructor
- Programs developer
- Project Manager
- Cloud application developer
- Mobile app developer

5. Relevant occupational/ Professional sectors:

- Ministry
- Hospitals
- Factory

6. Major Tracks/Pathways (if any):

	Major track/pathway	Credit hours (For each track)	Professions/jobs (For each track)
1.	**Software Engineering**	12	Software Engineer Computer programmer
2.	**Cloud Computing**	12	Cloud Engineer Data Engineer

		System Engineer
3. **Game Development**	12	Games developer Senior Game designer Game programmer
4. **General**	12	Programmer Systems Analyst Web Developer Network Administrator Database Developer Database Administrator Research Assistant Instructor Programs developer Project Manager Cloud application developer Mobile app developer

7. Exit Points/Awarded Degree (if any):	
exit points/awarded degree	**Credit hours**
1. **Exit Point**	64
2.	
3.	

8. Total credit hours: (129)

B. Mission, Objectives, and Program Learning Outcomes

1. Program Mission:

To provide quality education of computer science by a combination of theoretical and applied foundations, that enables students to solve real-world problems, conduct scientific research in the field, and prepare them for employment and to serve the local community.

2. Program Goals:

PO1	**Create a distinct academic environment to increase the competitiveness of the students in the Computer Science program.**
PO2	Contribute significantly to scientific research and discovery of new knowledge and methods in Computer Science
PO3	Enable the student to recognize the limits of their knowledge and initiate self-directed learning opportunities.
PO4	Prepare students to satisfy the labor market needs and community services in the field of computer Science
PO5	Engage in life-long learning throughout their lives and show they can successfully adjust to new information quickly.

3. Program Learning Outcomes*

Knowledge and Understanding	
K1	Define and explain fundamentals of computing and mathematics appropriate to the discipline.
K2	Recognize a variety of topics on the basic and advanced computer science disciplines.
Skills	
S1	Analyze a problem and identify the computing requirements appropriate to its solution while being aware of the impact of that solution on individuals, organizations, and society.
S2	Design, implement, and evaluate a computing-based solution to meet a given set of requirements in the context of the program's discipline.
S3	Use current techniques, skills, and tools necessary for Computing practices.
S4	Communicate effectively in a variety of professional contexts.
S5	Apply computer science theory and software development fundamentals to produce computing-based solutions.
S6	Use and apply advanced technical concepts and practices in the core of cloud computing.

Values, Autonomy, and Responsibility	
V1	Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
V2	Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
V3	Acquire and apply recent technology as needed, using appropriate lifelong learning strategies

* Add a table for each track or exit Point (if any)

3.1 Program Learning Outcomes* (Track: Cloud Computing)	
Knowledge and understanding	
K1	Define and explain fundamentals of computing and mathematics appropriate to the discipline.
K2	Recognize a variety of topics on the basic and advanced computer science disciplines.
Skills	
S1	Analyze a problem and identify the computing requirements appropriate to its solution while being aware of the impact of that solution on individuals, organizations, and society.
S2	Design, implement, and evaluate a computing-based solution to meet a given set of requirements in the context of the program's discipline.
S3	Use current techniques, skills, and tools necessary for Computing practices.
S4	Communicate effectively in a variety of professional contexts.
S5	Apply computer science theory and software development fundamentals to produce computing-based solutions.
S6	Use and apply advanced technical concepts and practices in the core of cloud computing.
Values, Autonomy, and Responsibility	
V1	Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
V2	Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
V3	Acquire and apply recent technology as needed, using appropriate lifelong learning strategies

3.2 Program Learning Outcomes* (Track: Software Engineering)
Knowledge and Understanding

K1	Define and explain fundamentals of computing and mathematics appropriate to the discipline.
K2	Recognize a variety of topics on the basic and advanced computer science disciplines.
Skills	
S1	Analyze a problem and identify the computing requirements appropriate to its solution while being aware of the impact of that solution on individuals, organizations, and society.
S2	Design, implement, and evaluate a computing-based solution to meet a given set of requirements in the context of the program's discipline.
S3	Use current techniques, skills, and tools necessary for Computing practices.
S4	Communicate effectively in a variety of professional contexts.
S5	Apply computer science theory and software development fundamentals to produce computing-based solutions.
S6	Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
Values, Autonomy, and Responsibility	
V1	Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
V2	Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
V3	Acquire and apply recent technology as needed, using appropriate lifelong learning strategies

3.3 Program Learning Outcomes* (Track: Game Development)	
Knowledge and understanding	
K1	Define and explain fundamentals of computing and mathematics appropriate to the discipline.
K2	Recognize a variety of topics on the basic and advanced computer science disciplines.
Skills	
S1	Analyze a problem and identify the computing requirements appropriate to its solution while being aware of the impact of that solution on individuals, organizations, and society.
S2	Design, implement, and evaluate a computing-based solution to meet a given set of requirements in the context of the program's discipline.
S3	Use current techniques, skills, and tools necessary for Computing practices.
S4	Communicate effectively in a variety of professional contexts.
S5	Apply computer science theory and software development fundamentals to produce computing-based solutions.
S6	Use and apply advanced technical concepts, practices, and tools in the area of computer game development.

Values, Autonomy, and Responsibility	
V1	Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
V2	Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
V3	Acquire and apply recent technology as needed, using appropriate lifelong learning strategies

3.4 Program Learning Outcomes* (Track: General)	
Knowledge and understanding	
K1	Define and explain fundamentals of computing and mathematics appropriate to the discipline.
K2	Recognize a variety of topics on the basic and advanced computer science disciplines.
Skills	
S1	Analyze a problem and identify the computing requirements appropriate to its solution while being aware of the impact of that solution on individuals, organizations, and society.
S2	Design, implement, and evaluate a computing-based solution to meet a given set of requirements in the context of the program's discipline.
S3	Use current techniques, skills, and tools necessary for Computing practices.
S4	Communicate effectively in a variety of professional contexts.
S5	Apply computer science theory and software development fundamentals to produce computing-based solutions.
Values, Autonomy, and Responsibility	
V1	Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
V2	Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
V3	Acquire and apply recent technology as needed, using appropriate lifelong learning strategies

3.5 Program Learning Outcomes* (Exit Point)	
Knowledge and understanding	
K1	Define and explain fundamentals of computing and mathematics appropriate to the discipline.

K2	Recognize a variety of topics on the basic and advanced computer science disciplines.
Skills	
S1	Analyze a problem and identify the computing requirements appropriate to its solution while being aware of the impact of that solution on individuals, organizations, and society.
S2	Design, implement, and evaluate a computing-based solution to meet a given set of requirements in the context of the program's discipline.
S3	Use current techniques, skills, and tools necessary for Computing practices.
S4	Communicate effectively in a variety of professional contexts.
Values, Autonomy, and Responsibility	
V1	Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
V2	Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.

C. Curriculum

1. Curriculum Structure

Program Structure	Required/ Elective	No. of courses	Credit Hours	Percentage
Institution Requirements	Required	5	10	%7.87
	Elective	2	4	%3.14
College Requirements	Required	11	36	%26.77
	Elective	0	0	%0.0
Program Requirements	Required	21	63	%49.60
	Elective	2	6	%4.72
Capstone Course/Project		2	4	%3.14
Field Training/ Internship		1	2	%1.57
Residency year				%0.0
Others		2	4	%3.14
Total		46	129	100%

* Add a separated table for each track (if any).

.2. Curriculum Structure (Track: Software Engineering)

Program Structure	Required/ Elective	No. of courses	Credit Hours	Percentage
Institution Requirements	Required	5	10	%7.87
	Elective	2	4	%3.14
College Requirements	Required	11	36	%26.77
	Elective	0	0	%0.0
Program Requirements	Required	21	63	%49.60
	Elective	2	6	%4.72
Capstone Course/Project		2	4	%3.14
Field Training/ Internship		1	2	%1.57
Residency year				%0.0
Others		2	4	%3.14
Total		46	129	100%

1.3. Curriculum Structure (Track: Game Development)

Program Structure	Required/ Elective	No. of courses	Credit Hours	Percentage
Institution Requirements	Required	5	10	%7.87
	Elective	2	4	%3.14
College Requirements	Required	11	36	%26.77
	Elective	0	0	%0.0
Program Requirements	Required	21	63	%49.60
	Elective	2	6	%4.72
Capstone Course/Project		2	4	%3.14
Field Training/ Internship		1	2	%1.57
Residency year				%0.0
Others		2	4	%3.14
Total		46	129	100%

1.4. Curriculum Structure (Track: General)

Program Structure	Required/ Elective	No. of courses	Credit Hours	Percentage
Institution Requirements	Required	5	10	%7.87
	Elective	2	4	%3.14
College Requirements	Required	11	36	%26.77
	Elective	0	0	%0.0
Program Requirements	Required	21	63	%49.60
	Elective	2	6	%4.72
Capstone Course/Project		2	4	%3.14
Field Training/ Internship		1	2	%1.57

Program Structure	Required/ Elective	No. of courses	Credit Hours	Percentage
Residency year				%0.0
Others		2	4	%3.14
Total		46	129	100%

1.5. Curriculum Structure: (Exit Point 1: Intermediate Diploma)

Program Structure	Required/ Elective	No. of courses	Credit Hours	Percentage
Institution Requirements	Required	4	8	%12.90
	Elective	1	2	%3.22
Faculty Requirements	Required	11	36	%54.83
	Elective	0	0	
Program Requirements	Required	6	18	%29.03
	Elective			
Capstone Course/Project				
Field Training/ Internship				
Residency year				
Others	Free			
Total		22	64	100.0%

2. Program Courses

Level	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours	Type of requirements (Institution, College, or Program)
Level 1	LNGT101	English 1	Required		4	College
	MATH101	Calculus 1	Required		4	College
	PHYS101	General physics 1	Required		4	College
		Elective Islamic Culture 1	Required		2	Institution
	IT100	Digital Culture	Required		2	Institution
Level 2	LNGT102	English 2	Required		4	College
	IT101	Introduction to Computing	Required		3	College
	LNGT103	English for scientific and engineering purposes	Required		2	College
	CS101	Programming Fundamentals	Required		3	College
	GNCR100	University Skills	Required		2	Institution
Level	-	University Elective 1	Elective		2	Institution

Level	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours	Type of requirements (Institution, College, or Program)
3	CS210	Digital Logic Design	Required	PHYS101	3	Program
	MATH474	Discrete Mathematics	Required	MATH101	3	College
	CS220	Applied Math for Computation	Required		3	Program
	CS202	Object Oriented Programming	Required	CS101	3	College
	PHYS202	General Physics 2	Required	PHYS101	3	Program
Level 4	CS240	Database	Required	CS202	3	Program
	CS221	Algorithms Design and Analysis	Required	CS202	3	Program
		Islamic Culture 2	Required		2	Institution
	CS203	Data Structures	Required	CS101	3	College
	STAT131	Introduction to Statistics	Required		3	College
	CS223	Theory of Computation	Required	MATH474	3	Program
Level 5	CS311	Computer Architecture and Organization	Required	CS210	3	Program
	CS322	Advance Algorithms Design and Analysis	Required	CS221	3	Program
	CS350	Software Engineering	Required	CS240	3	Program
	CS305	Web programming	Required	CS240	3	Program
	CS380	Computer Graphics	Required	CS202	3	Program
	HR100	Entrepreneurship	Required		2	Institution
Level 6	-	University Elective 2	Elective		2	Institution
	CS370	Computer Networks	Required	CS311	3	Program
	CS304	Advanced Programming	Required	CS202	3	Program
	CS312	Operating Systems	Required	CS311	3	Program
	CSXXX	Program Elective Course 1	Elective		3	Program
	MATH222	Linear Algebra	Required	MATH101	3	Program
Level 7	CS471	Cyber Security	Required	CS370	3	Program
	CS497	Graduation Project 1	Required	90 Units	1	Program
	CS424	Artificial Intelligence	Required	CS221	3	Program
	CSXXX	Program Elective Course 2	Elective		3	Program
	CSXXX	Program Elective Course 3	Elective		3	Program
	CS406	Mobile programming	Required	CS304	3	Program

Level	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours	Type of requirements (Institution, College, or Program)
	-	Free 1	Free		2	
Level 8	-	Free 2	Free		2	
	CS498	Graduation Project 2	Required	CS497	3	Program
	CS407	Compiler Construction	Required	CS223	3	Program
	CSXXX	Program Elective Course 4	Elective		3	Program
	CS499	Field Training	Required	90 Unit & Program Approval	2	Program

Track1: (Cloud Computing)

Track	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours	Type of requirements (Institution, College, or Program)
Cloud Computing	CS460	Fundamentals of cloud computing	Required	CS370	3	Program
	CS461	Web services	Required	CS305	3	Program
	CS462	Network Virtualization Fundamentals	Elective	CS370	3	Program
	CS463	Advanced Linux Administration	Elective	CS312	3	Program
	CS464	Operation and Management of Cloud Computing Systems	Elective	CS460	3	Program
	CS465	Cloud Security and Privacy	Elective	CS471	3	Program
	CS466	Developing Software for the Cloud	Elective	CS461	3	Program
	CS467	Selected topics in Cloud Computing	Elective	CS460	3	Program

Track2: (Software Engineering)

Track	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours	Type of requirements (Institution, College, or Program)
Software Engineering	CS451	Software Requirements Engineering	Required	CS350	3	Program
	CS452	Software Architecture and Design	Required	CS350	3	Program
	CS453	Software Security Engineering	Elective	CS350 & CS370	3	Program
	CS454	Software Project Management	Elective	CS350	3	Program
	CS455	Software Maintenance and Evolution	Elective	CS350	3	Program
	CS456	Software Testing and Quality Assurance	Elective	CS350	3	Program

Track3: (Game Development)

Track	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours	Type of requirements (Institution, College, or Program)
Game Development	CS481	Principles of Computer Game Design and Implementation	Required	CPC304	3	Program
	CS482	3d Game Development	Required	CS380	3	Program
	CS483	2d Game Development	Elective	CS482	3	Program
	CS484	Mobile Game Development	Elective	CS481	3	Program
	CS485	Virtual Reality Game Development	Elective	CS482	3	Program
	CS486	Game Networking and Multiplayers	Elective	CS370	3	Program
	CS487	Introduction to Game Development for the Web	Elective	CS406	3	Program
	CS488	Artificial Intelligence in Game Development	Elective	CS424	3	Program
	CS489	Selected Topics in Game Development	Elective	CS481	3	Program

Track4: (General)

Track	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours	Type of requirements (Institution, College, or Program)
General	CS472	Introduction to IoT	Elective	CS370	3	Program
	CS473	Multimedia Technology	Elective	CS380	3	Program
	CS441	Database Administration	Elective	CS240	3	Program
	CS457	IT Entrepreneurship and Innovation	Elective	CS350	3	Program
	CS442	Data Science	Elective	CS240	3	Program
	CS458	E-Business Systems	Elective	CS350	3	Program
	CS443	Data Warehousing	Elective	CS240	3	Program
	CS444	Data Mining	Elective	CS443	3	Program

2.2. Exit Point 1 Courses:

Level	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours	Type of requirements (Institution, College, or Program)
Level 1	LNGT101	English 1	Required		4	College
	MATH101	Calculus 1	Required		4	College

Level	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours	Type of requirements (Institution, College, or Program)
	PHYS101	General physics 1	Required		4	College
		Elective Islamic Culture 1	Required		2	Institution
	IT100	Digital Culture	Required		2	Institution
Level 2	LNGT102	English 2	Required		4	College
	IT101	Introduction to Computing	Required		3	College
	LNGT103	English for scientific and engineering purposes	Required		2	College
	CS101	Programming Fundamentals	Required		3	College
	GNCR100	University Skills	Required		2	Institution
Level 3	-	University Elective 1	Elective		2	Institution
	CS210	Digital Logic Design	Required	PHYS101	3	Program
	MATH474	Discrete Mathematics	Required	MATH101	3	College
	CS220	Applied Math for Computation	Required		3	Program
	CS202	Object Oriented Programming	Required	CS101	3	College
	PHYS202	General Physics 2	Required	PHYS101	3	Program
Level 4	CS240	Database	Required	CS202	3	Program
	CS221	Algorithms Design and Analysis	Required	CS202	3	Program
		Islamic Culture 2	Required		2	Institution
	CS203	Data Structures	Required	CS101	3	College
	STAT131	Introduction to Statistics	Required		3	College
	CS223	Theory of Computation	Required	MATH474	3	Program

* Include additional levels (for three semesters option or if needed.

* Include additional levels (for three semesters option or if needed).
** Add a table for the courses of each track (if any)

3. Course Specifications:

Insert hyperlink for all course specifications using NCAAA template (T-104)

CS Courses

4. Program learning Outcomes Mapping Matrix:

Align the program learning outcomes with program courses, according to the following desired levels of performance *(I = Introduced & P = Practiced & M = Mastered).*

4.1. Cloud Computing Track.

Course Code & No.	Program learning Outcomes													
	Knowledge and understanding					Skills						Values, Autonomy, and Responsibility		
	K1	K2				S1	S2	S3	S4	S5	S6	V1	V2	V3
LNGT 101						I								
MATH101	I													
PHYS101	I	I				I								
IT100	I	I						I				I		
LNGT102	I													
CS101	I					I	I	I						
-														
STAT131	I													
MATH474	I					I	I		I				I	
GNCR100									I				I	
-														
CS102	I					I	I	I						
CS203	I					I	I	I						
PHYS202	I	I						I					I	
MATH222	P					P								
CS220						P		P				I		
CS240	P						P	P				I		
CS221	P	I				P	P	P						
CS210	P					P	P	P					I	
CS211	P	I				P	P	P					P	

CS222	P	P				P	P	P						
CS250	P					P	P	P				P	P	
-														
CS370	P					P		P			I			
CS304	P	P				P	P	P		P		P		
CS323	P					P	P	P					P	
-														
CS312	P					P		P				I		
CS371	M	P				M		M		P		P		
-														
CS305						M	M	M						
CS324	M	P				M	M	M		P		M		
CS406	M	P				M	M					M		
CS480	M					M	M	M					M	
CS497	M	M				M	M		M	M		M	M	M
CS407	M	M				M	M	M		M			M	
CS460	M	M				M	M	M		M	P	M		M
CS461	M	M				M	M	M		M	M	M		M
CS498	M	M					M	M	M	M	M	M	M	M
CS499	M	M				M	M	M	M	M	M	M	M	M

4.2. Software Engineering Track.

Course Code & No.	Program learning Outcomes													
	Knowledge and understanding					Skills						Values, Autonomy, and Responsibility		
	K1	K2				S1	S2	S3	S4	S5	S6	V1	V2	V3
LNGT 101						I								
MATH101	I													

PHYS101	I	I				I								
IT100	I	I						I				I		
LNGT 102	I													
CS101	I					I	I	I						
-														
STAT131	I													
MATH474	I					I	I		I				I	
GNCR100									I				I	
-														
CS102	I					I	I	I						
CS203	I					I	I	I						
PHYS202	I	I						I					I	
MATH222	P					P								
CS220						P		P				I		
CS240	P						P	P				I		
CS221	P	I				P	P	P						
CS210	P					P	P	P					I	
CS211	P	I				P	P	P					P	
CS222	P	P				P	P	P						
CS250	P					P	P	P				P	P	
-														
CS370	P					P		P			I			
CS304	P	P				P	P	P		P		P		
CS323	P					P	P	P					P	
-														
CS312	P					P		P				I		
CS371	M	P				M		M		P		P		
-														
CS305						M	M	M						

CS324	M	P				M	M	M		P		M		
CS406	M	P				M	M					M		
CS480	M					M	M	M					M	
CS497	M	M				M	M		M	M		M	M	M
CS407	M	M				M	M	M		M			M	
CS451	M	M				M	M	M			P	M		M
CS452	M	M				M	M		M	M	M	M	M	
CS498	M	M					M	M	M	M	M	M	M	M
CS499	M	M				M	M	M	M	M	M	M	M	M

4.3. Game Development Track.

Course Code & No.	Program learning Outcomes													
	Knowledge and understanding					Skills						Values, Autonomy, and Responsibility		
	K1	K2				S1	S2	S3	S4	S5	S6	V1	V2	V3
LNGT 101						I								
MATH101	I													
PHYS101	I	I				I								
IT100	I	I						I				I		
LNGT102	I													
CS101	I					I	I	I						
-														
STAT131	I													
MATH474	I					I	I		I				I	
GNCR100									I				I	
-														
CS102	I					I	I	I						
CS203	I					I	I	I						

PHYS202	I	I						I					I	
MATH222	P					P								
CS220						P		P				I		
CS240	P						P	P				I		
CS221	P	I				P	P	P						
CS210	P					P	P	P					I	
CS211	P	I				P	P	P					P	
CS222	P	P				P	P	P						
CS250	P					P	P	P				P	P	
-														
CS370	P					P		P			I			
CS304	P	P				P	P	P		P		P		
CS323	P					P	P	P					P	
-														
CS312	P					P		P				I		
CS371	M	P				M		M		P		P		
-														
CS305						M	M	M						
CS324	M	P				M	M	M		P		M		
CS406	M	P				M	M					M		
CS480	M					M	M	M					M	
CS497	M	M				M	M		M	M		M	M	M
CS407	M	M				M	M	M		M			M	
CS481	M	M				M	M	M		M	P	M	M	M
CS482	M	M				M	M	M		M	M	M	M	M
CS498	M	M					M	M	M	M	M	M	M	M
CS499	M	M				M	M	M	M	M	M	M	M	M

4.4. General Track.

Course Code & No.	Program learning Outcomes													
	Knowledge and understanding					Skills						Values, Autonomy, and Responsibility		
	K1	K2				S1	S2	S3	S4	S5	S6	V1	V2	V3
LNGT 101						I								
MATH101	I													
PHYS101	I	I				I								
IT100	I	I						I				I		
LNGT102	I													
CS101	I					I	I	I						
-														
STAT131	I													
MATH474	I					I	I		I				I	
GNCR100									I				I	
-														
CS102	I					I	I	I						
CS203	I					I	I	I						
PHYS202	I	I						I					I	
MATH222	P					P								
CS220						P		P				I		
CS240	P						P	P				I		
CS221	P	I				P	P	P						
CS210	P					P	P	P					I	
CS211	P	I				P	P	P					P	
CS222	P	P				P	P	P						
CS250	P					P	P	P				P	P	
-														
CS370	P					P		P			I			

CS304	P	P				P	P	P		P		P		
CS323	P					P	P	P					P	
-														
CS312	P					P		P				I		
CS371	M	P				M		M		P		P		
-														
CS305						M	M	M						
CS324	M	P				M	M	M		P		M		
CS406	M	P				M	M					M		
CS480	M					M	M	M					M	
CS497	M	M				M	M		M	M		M	M	M
CS407	M	M				M	M	M		M			M	
CS498	M	M					M	M	M	M	P	M	M	M
CS499	M	M				M	M	M	M	M	M	M	M	M

4.5. Exit Point 1.

Course Code & No.	Program learning Outcomes													
	Knowledge and understanding					Skills						Values, Autonomy, and Responsibility		
	K1	K2				S1	S2	S3	S4	S5	S6	V1	V2	V3
LNGT 101						I								
MATH101	I													
PHYS101	I	I				I								
IT100	I	I						I				I		
LNGT102	I								I					
CS101	I					I	I	I						
-														
STAT131	I													

MATH474	I					I	I		I				I	
GNCR100									I				I	
-														
CS102	I					I	I	I						
CS203	I					I	I	I						
PHYS202	I	I						I					I	
MATH222	P					P								
CS220						P		P				I		
CS240	P						P	P				I		
CS221	P	I				P	P	P						
CS210	P					P	P	P					I	
CS211	P	I				P	P	P					P	
CS222	P	P				P	P	P						
CS250	P					P	P	P				P	P	

* Add a separated table for each track (if any).

5. Teaching and learning strategies applied to achieve program learning outcomes.

Describe teaching and learning strategies, including curricular and extra-curricular activities, to achieve the program learning outcomes in all areas.

5.1 Cloud computing Track

PLOs		Teaching& Learning Strategies
Knowledge:		
K1	Define and explain the fundamentals of computing and mathematics appropriate to the discipline	Class / Group discussion Problem-based learning Reciprocal teaching Self-learning Collaborative learning Observation Storytelling Peer learning
K2	Recognize a variety of topics on the basic and advanced computer science disciplines.	
Skills:		
S1	Analyze a problem and identify the computing requirements appropriate to its solution while being aware of the impact of	Problem-based learning Reciprocal teaching

	that solution on individuals, organizations, and society.	Lab-based learning Model-based learning Self-learning Observation Peer learning Collaborative learning Storytelling Generative learning
S2	Design, implement, and evaluate a computing-based solution to meet a given set of requirements in the context of the program's discipline.	
S3	Use current techniques, skills, and tools necessary for computing practices.	
S4	Communicate effectively in a variety of professional contexts	
S5	Apply computer science theory and software development fundamentals to produce computing-based solutions.	
S6	Use and apply advanced technical concepts and practices in the core of cloud computing.	
Values, Autonomy and Responsibility:		
V1	Recognize professional, ethical, legal, security and social issues and responsibilities.	Problem-based learning Model-based learning Collaborative learning Self-learning Peer learning Generative learning
V2	Function effectively in teams to accomplish a common goal	
V3	Acquire and apply recent technology as needed, using appropriate lifelong learning strategies.	

5.2 Software Engineering Track

PLOs		Teaching& Learning Strategies
Knowledge:		
K1	Define and explain the fundamentals of computing and mathematics appropriate to the discipline	Class / Group discussion Problem-based learning Reciprocal teaching Self-learning Collaborative learning Observation Storytelling Peer learning
K2	Recognize a variety of topics on the basic and advanced computer science disciplines.	
Skills:		
S1	Analyze a problem and identify the computing requirements appropriate to its solution while being aware of the impact of that solution on individuals, organizations, and society.	Problem-based learning Reciprocal teaching Lab-based learning Model-based learning

S2	Design, implement, and evaluate a computing-based solution to meet a given set of requirements in the context of the program's discipline.	Self-learning Observation Peer learning Collaborative learning Storytelling Generative learning
S3	Use current techniques, skills, and tools necessary for computing practices.	
S4	Communicate effectively in a variety of professional contexts	
S5	Apply computer science theory and software development fundamentals to produce computing-based solutions.	
S6	Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	
Values, Autonomy and Responsibility:		
V1	Recognize professional, ethical, legal, security and social issues and responsibilities.	Problem-based learning Model-based learning Collaborative learning Self-learning Peer learning Generative learning
V2	Function effectively in teams to accomplish a common goal	
V3	Acquire and apply recent technology as needed, using appropriate lifelong learning strategies.	

5.3 Game Development Track

PLOs		Teaching& Learning Strategies
Knowledge:		
K1	Define and explain the fundamentals of computing and mathematics appropriate to the discipline	Class / Group discussion Problem-based learning Reciprocal teaching Self-learning Collaborative learning Observation Storytelling Peer learning
K2	Recognize a variety of topics on the basic and advanced computer science disciplines.	
Skills:		
S1	Analyze a problem and identify the computing requirements appropriate to its solution while being aware of the impact of that solution on individuals, organizations, and society.	Problem-based learning Reciprocal teaching Lab-based learning Model-based learning

S2	Design, implement, and evaluate a computing-based solution to meet a given set of requirements in the context of the program's discipline.	Self-learning Observation Peer learning Collaborative learning Storytelling Generative learning
S3	Use current techniques, skills, and tools necessary for computing practices.	
S4	Communicate effectively in a variety of professional contexts	
S5	Apply computer science theory and software development fundamentals to produce computing-based solutions.	
S6	Use and apply advanced technical concepts, practices, and tools in the area of computer game development.	
Values, Autonomy and Responsibility:		
V1	Recognize professional, ethical, legal, security and social issues and responsibilities.	Problem-based learning Model-based learning Collaborative learning Self-learning Peer learning Generative learning
V2	Function effectively in teams to accomplish a common goal	
V3	Acquire and apply recent technology as needed, using appropriate lifelong learning strategies.	

5.4 General Track

PLOs		Teaching& Learning Strategies
Knowledge:		
K1	Define and explain the fundamentals of computing and mathematics appropriate to the discipline	Class / Group discussion Problem-based learning Reciprocal teaching Self-learning Collaborative learning Observation Storytelling Peer learning
K2	Recognize a variety of topics on the basic and advanced computer science disciplines.	
Skills:		
S1	Analyze a problem and identify the computing requirements appropriate to its solution while being aware of the impact of that solution on individuals, organizations, and society.	Problem-based learning Reciprocal teaching Lab-based learning Model-based learning Self-learning Observation
S2	Design, implement, and evaluate a computing-based solution to meet a given	

	set of requirements in the context of the program's discipline.	Peer learning Collaborative learning Storytelling Generative learning
S3	Use current techniques, skills, and tools necessary for computing practices.	
S4	Communicate effectively in a variety of professional contexts	
S5	Apply computer science theory and software development fundamentals to produce computing-based solutions.	
Values, Autonomy and Responsibility:		
V1	Recognize professional, ethical, legal, security and social issues and responsibilities.	Problem-based learning Model-based learning Collaborative learning Self-learning Peer learning Generative learning
V2	Function effectively in teams to accomplish a common goal	
V3	Acquire and apply recent technology as needed, using appropriate lifelong learning strategies.	

5.5 Exit Point 1:

PLOs		Teaching& Learning Strategies
Knowledge:		
K1	Define and explain the fundamentals of computing and mathematics appropriate to the discipline	Class / Group discussion Problem-based learning Reciprocal teaching Self-learning Collaborative learning Observation Storytelling Peer learning
K2	Recognize a variety of topics on the basic and advanced computer science disciplines.	
Skills:		
S1	Analyze a problem and identify the computing requirements appropriate to its solution while being aware of the impact of that solution on individuals, organizations, and society.	Problem-based learning Reciprocal teaching Lab-based learning Model-based learning Self-learning Observation Peer learning Collaborative learning Storytelling Generative learning
S2	Design, implement, and evaluate a computing-based solution to meet a given set of requirements in the context of the program's discipline.	
S3	Use current techniques, skills, and tools necessary for computing practices.	
S4	Communicate effectively in a variety of professional contexts	

Values, Autonomy and Responsibility:		
V1	Recognize professional, ethical, legal, security and social issues and responsibilities.	Problem-based learning Model-based learning Collaborative learning Self-learning Peer learning Generative learning
V2	Function effectively in teams to accomplish a common goal	
V3	Acquire and apply recent technology as needed, using appropriate lifelong learning strategies.	

6. Assessment Methods for program learning outcomes.

Describe assessment methods (Direct and Indirect) that can be used to measure the achievement of program learning outcomes in all areas.

The program should devise a plan for assessing Program Learning Outcomes (all learning outcomes should be assessed at least twice in the bachelor program's cycle and once in other degrees).

6.1 Cloud computing Track

PLOs		Assessment Methods (Direct and Indirect)
Knowledge:		
K1	Define and explain the fundamentals of computing and mathematics appropriate to the discipline	**Direct:** • Written exams (essay) • Objective exams • Checklist. • Case Study. • self-assessment • Oral exams • Reports • Presentations **Indirect:** Program assessment survey
K2	Recognize a variety of topics on the basic and advanced computer science disciplines.	
Skills:		
S1	Analyze a problem and identify the computing requirements appropriate to its solution while being aware of the impact of that solution on individuals, organizations, and society.	**Direct:** Objective Structured Practical Examination (OSPE).

S2	Design, implement, and evaluate a computing-based solution to meet a given set of requirements in the context of the program's discipline.	Laboratory Exams. Checklist. Case Study. Discussion self-assessment Presentations Reports Problem-based Assessment Projects Oral exams **Indirect:** Program assessment survey
S3	Use current techniques, skills, and tools necessary for computing practices.	
S4	Communicate effectively in a variety of professional contexts	
S5	Apply computer science theory and software development fundamentals to produce computing-based solutions.	
S6	Use and apply advanced technical concepts and practices in the core of cloud computing.	
Values, Autonomy and Responsibility:		
V1	Recognize professional, ethical, legal, security and social issues and responsibilities.	**Direct:** Objective Structured Practical Examination (OSPE). Checklist. Case Study. Discussion self-assessment Presentations Reports Problem-based Assessment Projects Oral exams **Indirect:** Program assessment survey
V2	Function effectively in teams to accomplish a common goal	
V3	Acquire and apply recent technology as needed, using appropriate lifelong learning strategies.	

6.2 Software Engineering Track

PLOs		**Assessment Methods** (Direct and Indirect)
Knowledge:		
K1	Define and explain the fundamentals of computing and mathematics appropriate to the discipline	**Direct:** • Written exams (essay)

K2	Recognize a variety of topics on the basic and advanced computer science disciplines.	• Objective exams • Checklist. • Case Study. • self-assessment • Oral exams • Reports • Presentations **Indirect:** Program assessment survey
Skills:		
S1	Analyze a problem and identify the computing requirements appropriate to its solution while being aware of the impact of that solution on individuals, organizations, and society.	**Direct:** Objective Structured Practical Examination (OSPE). Laboratory Exams. Checklist. Case Study. Discussion self-assessment Presentations Reports Problem-based Assessment Projects Oral exams **Indirect:** Program assessment survey
S2	Design, implement, and evaluate a computing-based solution to meet a given set of requirements in the context of the program's discipline.	
S3	Use current techniques, skills, and tools necessary for computing practices.	
S4	Communicate effectively in a variety of professional contexts	
S5	Apply computer science theory and software development fundamentals to produce computing-based solutions.	
S6	Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	
Values, Autonomy and Responsibility:		
V1	Recognize professional, ethical, legal, security and social issues and responsibilities.	**Direct:** Objective Structured Practical Examination (OSPE). Checklist. Case Study. Discussion self-assessment Presentations Reports Problem-based Assessment
V2	Function effectively in teams to accomplish a common goal	
V3	Acquire and apply recent technology as needed, using appropriate lifelong learning strategies.	

		Projects Oral exams **Indirect:** Program assessment survey

6.3 Game Development Track

PLOs		Assessment Methods (Direct and Indirect)
Knowledge:		
K1	Define and explain the fundamentals of computing and mathematics appropriate to the discipline	**Direct:** • Written exams (essay) • Objective exams • Checklist. • Case Study. • self-assessment • Oral exams • Reports • Presentations **Indirect:** Program assessment survey
K2	Recognize a variety of topics on the basic and advanced computer science disciplines.	
Skills:		
S1	Analyze a problem and identify the computing requirements appropriate to its solution while being aware of the impact of that solution on individuals, organizations, and society.	**Direct:** Objective Structured Practical Examination (OSPE). Laboratory Exams. Checklist. Case Study. Discussion self-assessment Presentations Reports Problem-based Assessment Projects
S2	Design, implement, and evaluate a computing-based solution to meet a given set of requirements in the context of the program's discipline.	
S3	Use current techniques, skills, and tools necessary for computing practices.	
S4	Communicate effectively in a variety of professional contexts	
S5	Apply computer science theory and software development fundamentals to produce computing-based solutions.	

S6	Use and apply advanced technical concepts, practices, and tools in the area of computer game development.	Oral exams **Indirect:** Program assessment survey
Values, Autonomy and Responsibility:		
V1	Recognize professional, ethical, legal, security and social issues and responsibilities.	**Direct:** Objective Structured Practical Examination (OSPE). Checklist. Case Study. Discussion self-assessment Presentations Reports Problem-based Assessment Projects Oral exams **Indirect:** Program assessment survey
V2	Function effectively in teams to accomplish a common goal	
V3	Acquire and apply recent technology as needed, using appropriate lifelong learning strategies.	

6.4 General Track

PLOs		Assessment Methods (Direct and Indirect)
Knowledge:		
K1	Define and explain the fundamentals of computing and mathematics appropriate to the discipline	**Direct:** • Written exams (essay) • Objective exams • Checklist. • Case Study. • self-assessment • Oral exams • Reports • Presentations **Indirect:** Program assessment survey
K2	Recognize a variety of topics on the basic and advanced computer science disciplines.	

Skills:		
S1	Analyze a problem and identify the computing requirements appropriate to its solution while being aware of the impact of that solution on individuals, organizations, and society.	**Direct:** Objective Structured Practical Examination (OSPE). Laboratory Exams. Checklist. Case Study. Discussion self-assessment Presentations Reports Problem-based Assessment Projects Oral exams **Indirect:** Program assessment survey
S2	Design, implement, and evaluate a computing-based solution to meet a given set of requirements in the context of the program's discipline.	
S3	Use current techniques, skills, and tools necessary for computing practices.	
S4	Communicate effectively in a variety of professional contexts	
S5	Apply computer science theory and software development fundamentals to produce computing-based solutions.	
Values, Autonomy and Responsibility:		
V1	Recognize professional, ethical, legal, security and social issues and responsibilities.	**Direct:** Objective Structured Practical Examination (OSPE). Checklist. Case Study. Discussion self-assessment Presentations Reports Problem-based Assessment Projects Oral exams **Indirect:** Program assessment survey
V2	Function effectively in teams to accomplish a common goal	
V3	Acquire and apply recent technology as needed, using appropriate lifelong learning strategies.	

6.5 Exit Point 1:

PLOs	Assessment Methods (Direct and Indirect)

Knowledge:		
K1	Define and explain the fundamentals of computing and mathematics appropriate to the discipline	**Direct:** • Written exams (essay) • Objective exams • Checklist. • Case Study. • self-assessment • Oral exams • Reports • Presentations **Indirect:** Program assessment survey
K2	Recognize a variety of topics on the basic and advanced computer science disciplines.	
Skills:		
S1	Analyze a problem and identify the computing requirements appropriate to its solution while being aware of the impact of that solution on individuals, organizations, and society.	**Direct:** Objective Structured Practical Examination (OSPE). Laboratory Exams. Checklist. Case Study. Discussion self-assessment Presentations Reports Problem-based Assessment Projects Oral exams **Indirect:** Program assessment survey
S2	Design, implement, and evaluate a computing-based solution to meet a given set of requirements in the context of the program's discipline.	
S3	Use current techniques, skills, and tools necessary for computing practices.	
S4	Communicate effectively in a variety of professional contexts	
Values, Autonomy and Responsibility:		
V1	Recognize professional, ethical, legal, security and social issues and responsibilities.	**Direct:** Objective Structured Practical Examination (OSPE). Checklist. Case Study. Discussion self-assessment
V2	Function effectively in teams to accomplish a common goal	

		Presentations Reports Problem-based Assessment Projects Oral exams **Indirect:** Program assessment survey

D. Student Admission and Support:

1. Student Admission Requirements

To be considered for admission, the applicant shall meet the following requirements:

1) The applicant shall hold a high school certificate or an equivalent certificate from inside or outside the Kingdom of Saudi Arabia.

2) The applicant shall have obtained the secondary school certificate, or its equivalent, in a period of less than five years. Nonetheless, the University Council may exempt applicant from this condition if a convincing reason presented.

3) The applicant should have a certificate of good conduct.

4) The applicant should successfully pass any examination or interview deemed necessary by the University Council.

5) The applicant shall be medically fit.

6) An approval shall be obtained from the applicant's employer, if the applicant is an employee in any government or private institution.

7) The applicant shall meet any other requirements specified by the University Council and announced at the time of application.

2. Guidance and Orientation Programs for New Students

(Include only the exceptional needs offered to the students of the program that differ from those provided at the institutional level).

- The new students will be invited to an academic guidance meeting, in the first week, aimed to shed some light on the regulations and the registration process at the faculty of science, computer science department.
- An agenda will be introduced to the new students that provide an introduction to student's rights and responsibilities. In addition, some information about the university life through

campus; visits, meetings, lectures, and other activities. This could be done via the cooperation with different academic & support departments in the faculty.

3. Student Counseling Services

(Academic, professional, psychological and social)
(Include only the exceptional needs offered to the students of the program that differ from those provided at the institutional level).

- Each student is assigned an academic advisor at the start of the program to ensure that students enrolled in the program fulfill all the university, faculty and department requirements and graduate on time. To realize this, academic performance and progress of the students is continuously monitored.

  The advisor meets with the student's multiple times during a semester to discuss the following tasks.
  - Selection of courses to meet the degree requirements.
  - Credit transfer processes.
  - Adding/Dropping courses.
  - Withdrawing from a course or a complete semester.
  - Selecting the appropriate elective courses.
  - Resolving any scheduling conflicts
- During their years of enrollment, students are invited to visit other universities and local companies to provide them with a better understanding of their future professional role and potential career paths.
- To facilitate the students as per the latest demands, we have career guidance counselors, one for the boy's section and one for the girl's section. The students can discuss their career goals and aspirations with the career guidance counselors. They can additionally receive career advice from their supervisor during their graduation project.

4. Special Support

(Low achievers, disabled, gifted, and talented students).

1. The teaching staff member should take into account the individual differences between the students who are low achievers and talented ones during their lectures.
2. The low achievers' students can take advantage of the office hours of the teaching staff member which have been defined since the beginning of the semester.
3. The talented students have the chance to finish their studies in short times compared to their peers
4. Urged the employees of the college not to use the facilities and equipment meant for people with special needs. Besides, the availability of facilities for people with special needs in all buildings of the college and parking.

5. Preparing and approving plans for preventive and curative awareness programs
6.Each academic advisor, through periodic meetings with students, follows up on psychological and social problems and raises them to the Academic Advising Committee

E. Faculty and Administrative Staff:

1. Needed Teaching and Administrative Staff

Academic Rank	Specialty		Special Requirements / Skills (if any)	Required Numbers		
	General	Specific		M	F	T
Professor	Computer Science	-AI - Programming Language		**1**	**0**	**1**
Associate Professor	Computer Science	-Software Engineering -Compiler Theory - Algorithms - Networking - Programming Language		**2**	**0**	**2**
Assistant Professor	Computer Science	-Operating systems, -- Computer Architecture, -Computer Graphics, - Networking		**7**	**2**	**9**

		Security -Cloud Computing -Game developer				
Lecturer	Computer Science	-Operating systems, -Computer Architecture, -Computer Graphics, -Networking -Computer Security		**1**	**4**	**5**
Teaching Assistant	Computer Science	-Programming Language -Operating systems, -Computer Architecture, -Computer Graphics, -Networking -Computer Security -HCI -Software Engineering -Cloud Computing -Game developer		**0**	**1**	**1**
Technicians and Laboratory Assistant	Computer Science	Networking	Computer networking and communication tools	**1**	**1**	**2**

Administrative and Supportive Staff	Computer Science	Machine learning AI	Software Engineering, problem-solving proficiency	1	1	2
Others (specify)						

F. Learning Resources, Facilities, and Equipment:

1. Learning Resources

Learning resources required by the Program (textbooks, references, and e-learning resources and web-based resources, etc.)

- Required Textbook
- Essential Reference Material
- Electronic Resources- Websites, Blackboard

Communications between students and faculty members is usually done via Blackboard (BB) web portal (www. https://lms.nbu.edu.sa/) . Blackboard is a very powerful tool that allows posting course materials, announcements, assignments, discussion forums and virtual classes.

2. Facilities and Equipment

(Library, laboratories, classrooms, etc.)

- Library

The boys' and girls section of the campus contains a main library. The Main library contains a variety of information resources such as books, periodicals, digital libraries, documents, manuscripts and digital resources. For students it is the main source of accessing their required reading materials. The library is responsible for organizing (classifying, cataloging, indexing, and shelving) books, and making them available to the University faculty and students in both boys' and girls' sections, through a range of services such as reading areas and a digital library system. Accounts are provided to both faculty members and students to access these online resources. The Deanship of Library Affairs is the governance body for the main library. The Deanship of Library affair arranges all the latest required books and reading materials.

• Facilities and Equipment

The computer science department is enriched with many facilities such as well-equipped laboratories and classrooms. There are 14 labs in both the boy and girls' sections. These labs are suitable for teaching almost all subjects of computer science program such as:

- Computer Programming
- Computer Networking
- Database Systems
- Digital logic systems

The classrooms are spacious, well-ventilated, Wi-Fi enabled, and provided with smart boards and data shows. A lot of libraries introduce their services such as the faculty of science library, the central library of the university and the Saudi Digital Library (SDL). Finally, the faculty cafeteria is a popular meeting place for students.

3. Procedures to ensure a healthy and safe learning environment

(According to the nature of the program)

(According to the nature of the program)

The facilities, computing resources, and equipment comply with the national legislation and regulations pertaining to fire, building, and safety requirements and health codes. The compliance to these standards is verified on a regular basis by the authorized services of the University. The University additionally includes a safety department and an emergency response team that regularly carries out fire drills and lockdown procedures. Finally, in case of a health hazard or emergency, the University possesses medical facilities and can also request the assistance of public hospital which includes an emergency service. Both health facilities are located at a walking distance from the campus.

G. Program Quality Assurance:

1. Program Quality Assurance System

Provide a link to quality assurance manual.

Quality System is used to evaluate and measure the promises and achievements of any institution provided in mission and vision statement and reflected in the strategic directions of that institution. The main idea is to evaluate the satisfaction level of various stakeholders and increase their confidence by established procedures and methods. The Faculty of Computing and Information Technology is committed to quality education to fulfill the published mission and vision

Quality System manual for Computer Sciences program has been designed in line with the Quality System Manual (QS) of Northern Border University (NBU) as well as considering the guidelines of NCAAA stated in Quality Handbook.

The Quality System described in this manual defines the various policies and procedures that ensure the quality assurance and management activities in line with good practices of NCAAA standards are implemented and evaluated. It clearly describes the responsibilities, scope, and domain of various activities.

This manual considers the application of a system of processes throughout the college as well as the identification and interaction of these processes, and their management. This Quality Management System is in line with the regulations and requirements described by the NCAAA .

The policies and procedure defined here are applicable throughout all the activities and level of organization and various units, committees and members are responsible for ensuring the implementation of this Quality System.

The Quality System manual for Faculty of Computing and Information Technology has been designed in line with the Quality System Manual (QS) of Northern Border University (NBU) as well as considering the guidelines of NCAAA stated in Quality Handbook. (The Link)

2. Procedures to Monitor Quality of Courses Taught by other Departments

1. Courses are reviewed periodically every year via the courses reports to ensure the continuity of their relevance to the needs of computer sciences students.
2. The department is coordinating with all departments concerned, both within the College of Computer Science and with departments outside the College.
3. The quality committee ensures that the course outcomes of other department courses are compatible with the mission, goals and objectives of the program
4. The course specifications of other department courses are collected and verified by the quality committee at the beginning of the semester. The CLOs of other courses are mapped to the PLOs of program in program specification.
5. The teaching & learning activities and assessment of students are done by the course coordinators / HOD of other departments.

The course reports of other department courses are collected and verified by the quality committee at the end of the semester, and these are duly considered in preparation of annual program report

3. Procedures Used to Ensure the Consistency between Main Campus and Branches (including male and female sections).

1. The syllabus of all courses is available online to all instructors and students.
2. Checking the course outlines for both male and female sections for all university branches to ensure the consistency.

3. Identify a coordinator for each course to maintain quality and consistency for all sections in all branches.
4. For all sections opened to a given course, it's mandatory to follow the same assessment plan.

4. Assessment Plan for Program Learning Outcomes (PLOs),

1. Assessment plan for Program Learning Outcomes (PLOs):
    - The department council has approved a two-year cycle where each PLO is assessed each semester.
    - The timeline illustrated in the following table demonstrates the assessment plan that provides four cycles of PLOs assessment for the two academic years.

PLOs	Academic Year 1		Academic Year 2	
	Term 1	Term 2	Term 1	Term 2
K1	X		X	
K2	X		X	
S1		X		X
S2		X		X
S3		X		X
S4		X		X
S5		X		X
S6		X		X
V1	X		X	
V2	X		X	
V3	X		X	

Mechanisms of Using its Results in the Development Processes

- The CLO-PLO based assessment provides summary of PLOs attainments during a semester. This summary is used by Assessment and Evaluation Committee to identify possible following corrective course of actions:
  - Revision in pre-requisite as inadequate pre-requisite knowledge.
  - Revision in course or course material or provide more helping material, modification in text or reference material.
  - Modifications in course assessment methods.
  - Revision of the learning accomplishments of a course.
  - The graduation project addresses most of the Program Learning Outcomes and missing in the presented evaluation. It is the terminal comprehensive activity and provides students with the opportunity to exhibit the acquired skills and knowledge during the program.
- The Quality and Academic Accreditation Unit (QAAU) of the faculty of Computing and Information Technology (FCIT) have implemented the required forms for direct and indirect assessment with the help of Assessment and Evaluation Committee.
  - The assessment committee is looking into the CLO based assessment method for the student outcomes and determines the reasons of non-achievements. The trigger is initiated with not achievement of PLO in a particular course.
  - Later, details analysis of course files to assess the achievement of CLO is performed. Then, the Assessment and Evaluation Committee requires from the instructor to provide Continuous Improvement Plan and Strategies.
- Track program graduates and taking their feedback and suggestions and use these suggestions for making decision regarding any plan modification.
- Holding regular surveys for current and graduated students to evaluate the program, and to focus on problems that they faced during studying and after graduation.
- Consulting organizations in the field of this program to find out their requirements and what they expect from our graduates.

5. Program Evaluation Matrix

Evaluation Areas/Aspects	Evaluation Sources/References	Evaluation Methods	Evaluation Time
Teaching performance	Students	Surveys	End of each semester
Leadership	Faculty members	Surveys	End of each semester
Learning Resources	Students and faculty members	Meetings and surveys	During the semester
Graduates' performance	Faculty members	Meetings and surveys	End of academic years
Program plan	Faculty members graduates, external reviewers from the industry	Meetings and surveys	End of academic years
Student field training	Faculty members	Visits	During the training program

Evaluation Areas/Aspects (e.g., leadership, effectiveness of teaching & assessment, learning resources, services, partnerships, etc.)
Evaluation Sources (students, graduates, alumni, faculty, program leaders, administrative staff, employers, independent reviewers, and others.
Evaluation Methods (e.g., Surveys, interviews, visits, etc.)
Evaluation Time (e.g., beginning of semesters, end of the academic year, etc.)

6. Program KPIs*

The period to achieve the target (1) year.

No.	KPIs Code	KPIs	Targeted Level	Measurement Methods	Measurement Time
1	KPI-P-01	Percentage of achieved indicators of the program operational plan objectives	80%	Data regarding the achievement rate of all the indicators as in the program operational plan should be collected and the overall achievement percentage should be calculated.	End of each academic year
2	KPI-P-02	Students' Evaluation of quality of learning experience in the program	3.75	Exit survey should be conducted among the final year students to assess the quality of learning experiences. The percentage of students who strongly agree or agree to the statements in the survey is to be calculated.	End of each academic year
3	KPI-P-03	Students' evaluation of the quality of the courses	4	Online Course Survey should be conducted to the students towards the end of the semester to assess their registered courses. The percentage of respondents who strongly agree or agree is to be calculated from the survey	End of each semester

No.	KPIs Code	KPIs	Targeted Level	Measurement Methods	Measurement Time
4	KPI-P-04	Completion rate	90%	Data regarding the number of students who registered in the 1st semester of the year 1 (N1) and number of students who completed the graduation in the end of the year 5 (N2) are to be collected. The percentage (N1/N2)*100 has to be calculated.	End of each academic year
5	KPI-P-05	First-year students retention rate	90%	Data regarding the number of students who registered in the start of the first academic program year (N1) and number of students who registered in the start of the second academic program year (N2) are to be collected. The percentage (N1/N2)*100 has to be calculated	End of each academic year
6	KPI-P-06	Students' performance in the professional and/or national examinations	85%	Data regarding the number of students who participated in the national and professional exam (N1) and number of students who have succeeded the	End of each academic year

No.	KPIs Code	KPIs	Targeted Level	Measurement Methods	Measurement Time
				exam (N2) are to be collected. The percentage (N1/N2)*100 has to be calculated	
7	KPI-P-07	Graduates' employability and enrolment in postgraduate programs	40%	Data regarding the number of students who graduated (N) at the end of each year, and number of students who are employed (N1) and the number of students enrolled in graduate studies programs (N2) are to be collected. The percentage ((N1+N2)/N)*100 has to be calculated.	Start of each next academic year
8	KPI-P-08	Average number of students in the class	15	Data regarding the number of students who registered in the current semester (N) and number of active sections (N1) are to be collected. The average number of students in a class (N/N1) has to be calculated.	Each semester
9	KPI-P-09	Employers' evaluation of the program graduates' proficiency	80%	Employer survey (Q-GA) should be conducted to assess the proficiency of	End of each academic year

No.	KPIs Code	KPIs	Targeted Level	Measurement Methods	Measurement Time
				the graduates. The percentage of employers who strongly agree or agree to the statements in the survey has to be calculated.	
10	KPI-P-10	Students' satisfaction with the offered services	75%	The survey (Q-SS) should be conducted among the students to assess their satisfaction level with the offered services. The percentage of students who strongly agree or agree to the statements in the survey has to be calculated	End of each academic year
11	KPI-P-11	Ratio of students to teaching staff	10:1	Data should be collected regarding the number of faculty members and the number of students assigned for each course. The ratio between the number of teachers and the students assigned for each course has to be calculated.	End of each academic year
12	KPI-P-12	Percentage of teaching staff distribution	10 % (Prof) 10%	Data should be collected regarding the number of	End of each academic year

No.	KPIs Code	KPIs	Targeted Level	Measurement Methods	Measurement Time
			(Asso. Prof) 50% (Assist. Prof) 25% (Lect)	teaching staff based on the gender (male/female), based on academic rankings (Prof., associate prof., asst prof, lecturers) and the percentage has to be calculated out of the total teaching staff	
13	KPI-P-13	Proportion of teaching staff leaving the program	<5%	Data is to be collected from the HoD regarding the number of teaching staff leaving the institution for reasons other than age retirement and the total number of teaching staff in the department. Percentage of number of teaching staff leaving the institution out of the total number of teaching staff has to be calculated	End of each academic year
14	KPI-P-14	Percentage of publications of faculty members	80%	Data regarding the total number of teaching staff and number of teaching staff who have at least one research publications	End of each academic year

No.	KPIs Code	KPIs	Targeted Level	Measurement Methods	Measurement Time
				should be collected and thereby percentage is calculated.	
15	KPI-P-15	Rate of published research per faculty member	2	Data regarding the total number of teaching staff and the total number of research publications should be collected from NBU research deanship and percentage should be calculated	End of each academic year
16	KPI-P-16	Citations rate in refereed journals per faculty member	4	Data regarding the total number of teaching staff who have research publications and the total number of citations in research publications should be collected from NBU research deanship and percentage should be calculated.	End of each academic year
17	KPI-P-17	Satisfaction of beneficiaries with the learning resources	90%	Survey (Q-LS) should be conducted among the students to assess the satisfaction level with the learning resources. The percentage of	End of each academic year

No.	KPIs Code	KPIs	Targeted Level	Measurement Methods	Measurement Time
				students who strongly agree or agree to the statements in the survey has to be calculated	

*including KPIs required by NCAAA

H. Specification Approval Data:

Council / Committee	DEPARTMENT COUNCIL
Reference No.	MEETING NO. 11, ACADEMIC YEAR 2022-2023
Date	09-03-2023