Course Specifications

Course Title:	**Probability & Statistics**
Course Code:	**41010132**
Program:	**Computer Science**
Department:	**Computer Science and Engineering**
College:	**Computer Science and Information Technology**
Institution:	**Albaha University**

Table of Contents

A. Course Identification

1. Credit hours: 3
2. Course type **a.** University ☐ College ☑ Department ☐ Others ☐ **b.** Required ☑ Elective ☐
3. Level/year at which this course is offered: 2/ 1st
4. Pre-requisites for this course (if any)**:**None
5. Co-requisites for this course (if any)**:** None

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	45hrs	100
2	**Blended**		
3	**E-learning**		
4	**Correspondence**		
5	**Other**		

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	**Lecture**	45
2	**Laboratory/Studio**	
3	**Tutorial**	
4	**Others** (specify)	
	Total	45
Other Learning Hours*		
1	**Study**	30
2	**Assignments**	15
3	**Library**	-
4	**Projects/Research Essays/Theses**	
5	**Others**(specify)	-
	Total	45

*The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

This course is a basic study of probability and statistical theory with emphasis on CS applications. Students learn about the collection, processing, analysis, and interpretation of numerical data as applied to CS problems. They learn the basic concepts of probability theory and statistical inference.

2. Course MainObjective

The main purpose for this course is to teach students how to:

- Describe discrete data graphically and compute measures of centrality and dispersion
- Compute probabilities by modeling sample spaces and applying rules of permutations and combinations, additive and multiplicative laws and conditional probability
- Construct the probability distribution of a random variable, based on a real-world situation, and use it to compute expectation and variance (a, b)
- Compute probabilities based on practical situations using the binomial and normal distributions.
- Be familiar with statistics and random samples, sampling experiments, the sampling distribution for a sample mean, and the sampling distribution of a sample proportion.
- Interact in groups collaboratively
- Communicate concepts and techniques in oral presentations

3. Course Learning Outcomes

At the end of this course the student should be able to:

CLOs		AlignedPLOs
1	**Knowledge:**	
1.1	Describe discrete data graphically and identify measures of centrality and dispersion	K1
1.2	Identifyprobably and statistics terminologies including sample space, permutations, combinations, probability distribution, random variable, expectation and variance	K2
1.3	Recall the different laws and formulas associated with descriptive statistics and probability basics	K3
2	**Skills :**	
2.1	Calculate measures of tendency and dispersion	S1
2.2	Compute probably problems including events, conditional probability, random variables, probability distribution, expectation and applying Bayes' theorem	S2
3	**Competence:**	
3.1	Choose the right model and measure to solve practical problems and integrate concepts	C1
3.2	Communicate concepts and techniques in person and within a team	C2

C. Course Content

No	List of Topics	Contact Hours
1	**Descriptive Statistics:** Definitions. Need of Statistics & Statistical Problem Solving Methodology & Introduction to Data Collection. Data Organization and Frequency Distributions. Graphic Presentations of Frequency Distributions. Computing Measures of Central Tendency. Computing Measures of Dispersion and Relative Position.	9
2	**Probability:** Some Basic Considerations. Events. Counting Sample Points. Interpretations of Probability. Addition Rules. Conditional Probability. Multiplication and Total Probability Rules. Independence. Bayes' Theorem.	9

3	**Random Variables and Probability Distribution:** Concept of Random Variable. Discrete Random Variables and Probability Distributions. Continuous Random Variables and Probability Distributions. Joint Probability Distributions.	6
4	**Mathematical Expectation:** Mean of Random Variable. Variance and Covariance of Random Variables. Means and Variances of Linear combinations of Random Variables.	6
5	**Discrete Probability Distributions:** Bernoulli & Binomial Distribution. Hypergeometric Distribution. Geometric and Negative Binomial Distributions. Poisson Distribution	6
6	**Continuous Probability Distributions:** Continuous Uniform Distribution, Gamma and Exponential Distribution, Normal Distribution. Areas under the Normal Curve. Applications of the Normal Distribution. Normal Approximation to the Binomial	6
	Review	3
Total		45

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	TeachingStrategies	AssessmentMethods
1.0	**Knowledge**		
1.1	Describe discrete data graphically and identify measures of centrality and dispersion	Lectures Assignments Class Discussions	Homework Midterm Quiz Final Exam
1.2	Identifyprobably and statistics terminologies including sample space, permutations, combinations, probability distribution, random variable, expectation and variance	Lectures Assignments Class Discussions	Homework Midterm Quiz Final Exam
1.3	Recall the different laws and formulas associated with descriptive statistics and probability basics	Lectures Assignments Class Discussions	Homework Midterm Quiz Final Exam
2.0	**Skills**		
2.1	Calculate measures of tendency and dispersion	Lectures Assignments Class Discussions	Homework Midterm Quiz Final Exam
2.2	Compute probably problems including events, conditional probability, random variables, probability distribution, expectation and applying Bayes' theorem	Lectures Assignments Class Discussions	Homework Midterm Quiz Final Exam
3.0	**Competence**		
3.1	Choose the right model and measure to solve practical problems and integrate	Lectures Assignments	Homework Midterm

Code	Course Learning Outcomes	TeachingStrategies	AssessmentMethods
	concepts	Class Discussions Promote Critical Thinking	Quiz Final Exam Instructor Observation
3.2	Communicate concepts and techniques in person and within a team	Groups Discussion Oral presentation	Class Activities Instructor Observation

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Homework	Periodically	10%
2	Midterm	8th Week	20%
3	Quiz	11th week	15%
4	Report, presentation, and Class discussions	Periodically	5%
5	Final Exam	16th week	50%

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

Instructor(s) office hours and contact information are to be announced to students in the 1st meeting and posted on the course webpage, for individual student consultations and academic advice.

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	- "Probability & Statistics for Engineers and Scientists" by Walpole & Myers. - "A First Course in Probability" by Sheldon Ross
Essential References Materials	None
Electronic Materials	Access to the Saudi Digital Library (SDL). Using the learning management system of the university – Rafid System (https://Rafid.bu.edu.sa/). Any online courses/Youtube videos explain the same subjects are highly recommended
Other Learning Materials	None

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	A classroom or lecture hall with whiteboard for 25 students.
Technology Resources (AV, data show, Smart Board, software, etc.)	• A digital image projection system with connection to desktop computer and laptop computer. • High speed Internet connection. • An instructor computer station.
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	None

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of Teaching	• Students • Peer Reviewers • Program Director/Chair • Course Coordinator	• Students feedback via Course Evaluation Survey and Program Chair/Peer interviews • Class visit by Program Chair • Common exams results
Effectiveness of Assessment	• Students • Peer Reviewers • Program Director/Chair • Course Coordinator • Exam Evaluation Committee	• Students feedback via Course Evaluation Survey and Program Chair/Peer interviews • Assessment evaluation by Peer Reviewers including course coordinator • Comprehensive Course Report (where we can find information about assessment difficulties and action plan, …) • Exam quality evaluation by the Exam Evaluation Committee
Extent of achievement of course learning outcomes	• Quality Assurance Committee in the program • Course Coordinator	• Student Results(Direct measure of CLOs by mapping Assessment items with associated CLOs) • Comprehensive Course report (where we can find the CLO assessment results)
Quality of learning resources	• Students • Faculty • Peer Reviewers • Course Coordinator	• Surveys • Course evaluation by Peer Reviewers (indirect). • Comprehensive Course report (where we can find information about difficulties and challenges about learning resources as well as consequences and action plan, …)

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes,Quality oflearning resources, etc.)
Evaluators (Students,Faculty, Program Leaders,Peer Reviewer, Others (specify)
Assessment Methods(Direct, Indirect)

H. Specification Approval Data

Council / Committee	**Computer science & Engineering department council**
Reference No.	Second meeting 2020-2021 academic year
Date	1-september-2020

Course Specifications

Course Title:	**Discrete Structures**
Course Code:	**41011212**
Program:	**Computer Science**
Department:	**Computer Science and Engineering**
College:	**Computer Science and information technology**
Institution:	**Albaha University**

Table of Contents

A. Course Identification

1. Credit hours 3
2. Course type **a.** University ☐ College ☐ Department ☑ Others ☐ **b.** Required ☑ Elective ☐
3. Level/year at which this course is offered: 3 / 2nd
4. Pre-requisites for this course (if any)**:**None
5. Co-requisites for this course (if any)**:** None

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	30	66.7 %
2	**Blended**	15	33.3
3	**E-learning**		
4	**Correspondence**		
5	**Other**		

7. Actual Learning Hours (based on academic semester) **90 H**

No	Activity	Learning Hours
Contact Hours		
1	**Lecture**	30
2	**Laboratory/Studio**	
3	**Tutorial**	15
4	**Others** (specify)	
	Total	45
Other Learning Hours*		
1	**Study**	15
2	**Assignments**	15
3	**Library**	15
4	**Projects/Research Essays/Theses**	
5	**Others**(specify)	
	Total	45

*The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

Following are the main topics to be covered during this course.
This course provides an overview of Discrete Structure for Computing. Topics to be covered include Explain the Basic Logic, the Sequences, Mathematical Induction, Recursion and Recurrence Relations, Sets, Relations, and Functions, Elementary Number Theory and methods of Proof, and the Basics of Counting. And Graphs and Tree, and Analyzing Algorithm Efficiency – the Big O, Big Theta and Big Omega.

2. Course MainObjective

The main purpose for this course is to teach students how to:

- RecognizeBasic Logic:
- Define the different strategies of Mathematical Proof
- Describe the mathematical concepts Sets, Relations, Functions, Graphs and Trees.
- Justify the Truth of a certain proposition. In addition, prepare a Mathematical Proof of a given problem.
- Differentiate between sets, relations, and functions.
- Calculate matrix addition and multiplication. Evaluate basic counting problems.
- Work both independently and collaboratively
- Communicate concepts and techniques in oral presentations

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge:**	
1.1	RecognizeBasic Logic	K.1
1.2	Define the different strategies of Mathematical Proof	K.1
1.3	Describe the mathematical concepts Sets, Relations, Functions, Graphs and Trees.	K.2
2	**Skills :**	
2.1	Justify the Truth of a certain proposition. In addition, prepare a Mathematical Proof of a given problem.	S.1
2.2	Differentiate between sets, relations, and functions.	S.2
2.3	Calculate matrix addition and multiplication. Evaluate basic counting problems	S.3
3	**Competence:**	
3.1	Work both independently and collaboratively	C.1
3.2	Communicate concepts and techniques in oral presentations	C.2

C. Course Content

No	List of Topics	Contact Hours
1	Logic	6
2	Mathematical Proof	6
3	Sets	6

4	Relations	6
5	Functions	6
6	Matrix algebra	3
7	Basic Counting	6
8	Graphs and Tree	6
Total		**45**

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	TeachingStrategies	AssessmentMethods
1.0	**Knowledge**		
1.1	RecognizeBasic Logic	Lectures Assignments	Homework Midterm exam Quiz
1.2	Define the different strategies of Mathematical Proof	Lectures Assignments	Homework Midterm exam Final Exam Quiz
1.3	Describe the mathematical concepts Sets, Relations, Functions, Graphs and Trees.	Lectures Assignments	Homework Midterm exam Final Exam Quiz
2.0	**Skills**		
2.1	Justify the Truth of a certain proposition. In addition, prepare a Mathematical Proof of a given problem.	Lectures Assignments	Homework Midterm exam Final Exam Quiz
2.2	Differentiate between sets, relations, and functions.	Lectures Assignments	Homework Midterm exam Final Exam Quiz
2.3	Calculate matrix addition and multiplication. Evaluate basic counting problems	Lectures Assignments	Homework Final Exam Quiz
3.0	**Competence**		
3.1	Work both independently and collaboratively	Small groups	Class Discussion

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Homework	Every two Weeks	10%
2	Midterm	8	20%
3	Quiz	13	10%

#	Assessment task*	Week Due	Percentage of Total Assessment Score
4	Class Discussion	14	10%
5	Final Exam	16	50%

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

Students are assigned to one of the Academic Advisor for advising purposes
Faculty :6 Hours per week

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	1. "Discrete Mathematics for new Technology" by R GARNIER AND J TAYLOR 2. "Discrete Mathematics with Applications" by Susanna S. Epp, 4th ed., 2011, Thomson Brooks/Cole.
Essential References Materials	Students can update their knowledge by visiting different websites related to discrete structures and their concepts. • "Materials for Teaching Discrete Mathematics", *ACM SIGCSE (Special Interest Group on Computer Science Education)* http://www.sigcse.org/resources/reports/discrete/materials • *"Resources for Teaching Discrete Mathematics"*, Brian Hopkins, Editor, Mathematical Association of America (http://www.maa.org/ebooks/notes/NTE74.html). "Recommended Resources for Teaching Discrete Mathematics", *(*http://dimacs.rutgers.edu/Volumes/schools/paper82/index.html)
Electronic Materials	• ACM (Association for Computer Machinery) web site - http://www.acm.org/ • IEEE Computer Society web site - http://www.computer.org/portal/web/guest/home • Access to the Saudi Digital Library (SDL). • Using the learning management system of the university – Rafid System (https://lms.bu.edu.sa/). • The Math Forum at Drexel - http://mathforum.org/library/topics/discrete/ MathWorld of Wolfram Research - http://mathworld.wolfram.com/
Other Learning Materials	• Proceedings of the Annual ACM-SIAM Symposium on Discrete Algorithms - http://www.siam.org/proceedings/ • SIAM Journal on Discrete Mathematics (SIDMA) -

	http://www.siam.org/journals/sidma.php • Elsevier Discrete mathematics - http://www.journals.elsevier.com/discretemathematics/ • Journal of Discrete Mathematics - http://www.hindawi.com/journals/jdm/

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) • A classroom or lecture hall with whiteboard for 25 students. • A laboratory with 25 computers.
Technology Resources (AV, data show, Smart Board, software, etc.)	• Data Show • Updated version of subject syllabus is uploaded for student reference. • All students shall have • A desktop or laptop computer; • High speed Internet connection; • Power outlets for student's laptop plug-in.
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	• Everything is already provided according to the course requirement. • Data shows are required in the lecture rooms on urgent basis.

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of Teaching	• Students • Faculty • Peer Reviewers • Program Leader • Course Coordinator	• Surveys (indirect). • Direct feedback from students (interview between Program leader and students). • Course evaluation by Peer Reviewers (indirect). • Class visit by Program Leader • Comprehensive Course report (where we can find information about teaching difficulties and action plan, …)
Effectiveness of Assessment	• Students • Faculty • Peer Reviewers • Course Coordinator	• Surveys (indirect). • Direct feedback from students (interview between Program leader and students). • Assessment results (direct) • Course evaluation by Peer Reviewers

Evaluation Areas/Issues	Evaluators	Evaluation Methods
	• Exam Evaluation Committee • Course Coordinator	(indirect). • Comprehensive Course report (where we can find information about assessment difficulties and action plan, …) • Exam evaluation by the Exam Evaluation Committee (indirect)
Extent of achievement of course learning outcomes	• Faculty • Program Leader • Course Coordinator	• Student Results (direct) • Comprehensive Course report (where we can find the CLO assessment results)
Quality of learning resources	• Students • Faculty • Peer Reviewers • Course Coordinator	• Surveys (indirect) • Course evaluation by Peer Reviewers (indirect). • Comprehensive Course report (where we can find information about difficulties and challenges about learning resources as well as consequences and action plan, …)

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes,Quality oflearning resources, etc.)
Evaluators (Students,Faculty, Program Leaders,Peer Reviewer, Others (specify)
Assessment Methods(Direct, Indirect)

H. Specification Approval Data

Council / Committee	**Computer science & Engineering department council**
Reference No.	Second meeting 2020-2021 academic year
Date	1-september-2020

Course Specifications

Course Title:	**Database**
Course Code:	**41011221**
Program:	**Computer Science**
Department:	**Computer Science and Engineering**
College:	**Computer Science and information technology**
Institution:	**Albaha University**

Table of Contents

A. Course Identification

1. Credit hours: 3
2. Course type **a.** University ☐ College ☑ Department ☐ Others ☐ **b.** Required ☑ Elective ☐
3. Level/year at which this course is offered: 3/ 2nd
4. Pre-requisites for this course (if any)**: Introduction to Programming (41011211)**
5. Co-requisites for this course (if any)**: None**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	2H	70%
2	**Blended**		
3	**E-learning**	2H	10%
4	**Correspondence**		
5	**Other**	2H	20%

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	**Lecture**	30
2	**Laboratory/Studio**	30
3	**Tutorial**	
4	**Others** (specify)	
	Total	60
Other Learning Hours*		
1	**Study**	20
2	**Assignments**	20
3	**Library**	
4	**Projects/Research Essays/Theses**	10
5	**Others** (specify)	
	Total	**30**

* The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

Lecture:

This course covers concepts and techniques used in constructing relational databases.
The students learn the rules of modelization and normalization of the databases, the implementation and the use of the SQL DDL language. Then through the relational algebra, they learn to solve the simple and complex queries and then translate them into SQL DML. They also acquire how to convert the Entity Relation Model to a Relational Model.

LAB

The lab is planned to give students practical experiments on Oracle DBMS. Students will also learn how to build database using SQL, how to insert, delete, update rows and/or tables, how to write simple and complex queries (query and sub query, join, group by, exist, all, negation form, etc…).

2. Course Main Objective

The main purpose for this course is to:

- Describe the concepts of database.
- Explain the relational model.
- Demonstrate an understanding of SQL
- Demonstrate an understanding of the entity-relationship model.
- Demonstrate an understanding of relational database design.
- Interact in groups collaboratively.
- Communicate concepts and techniques in oral presentations.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge:**	
1.1	Describe the concepts of database..	K.1
1.2	Explain the querying concept	K.2
1.3	Explain the relational model.	K.3
2	**Skills :**	
2.1	Understanding of SQL language (SQL-DDL+ SQL-DML simple queries)	S.1
2.2	Advanced SQL querying SQL-DML complex queries)	S.2
2.3	Understanding of the entity-relationship model design and the mapping to the relational database model.	S.3
3	**Competence:**	
3.1	Interact in groups collaboratively	C.1
3.2	Communicate concepts and techniques in oral presentations	C.2

C. Course Content

No	List of Topics	Contact Hours
1	**Introduction to Database**	**2**
2	**The database concepts**	**2**

3	**Basic SQL: SQL DDL language**	**6**
4	**Algebraic and logical query languages (relational algebra)**	**4**
5	**SQL - DML language**	**6**
6	**Database Design and the Entity-Relationship Model**	**6**
7	**Mapping to the Relational Database**	**4**
Total		**30**

No	List of Topics (labs)	Contact Hours
1	**Access DBMS**	**6**
2	**The database language SQL DDL(Data Definition Language), Creating and Inserting queries, data types in SQL , constraints, indexes (Installing ORACLE 11Express edition)**	**4**
3	**The database language SQL DDL: altering and dropping tables, update and delete queries**	**4**
4	**The database language SQL DML(Data Manipulation Language): select query: simple queries, Aggregate functions, Nested subqueries, Join expressions and Views**	**6**
5	**Project**	**10**
Total		**30**

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge**		
1.1	Describe the concepts of database..	Lectures Assignment	Midterm exams
1.2	Explain the querying concept	Lectures Assignment	Homework Midterm exams Final Exam
1.3	Explain the relational model.	Lectures Assignment	Homework Midterm exams Final Exam
2.0	**Skills**		
2.1	Understanding of SQL language (SQL-DDL+ SQL-DML simple queries)	Lectures Assignments	Homework Midterm exams Final Exam Lab exam Project
2.2	Advanced SQL querying SQL-DML complex queries)	Lectures Assignments	Homework Quiz project
2.3	Understanding of the entity-	Lectures	Homework

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
	relationship model design and the mapping to the relational database model.	Assignments	Final exams Project
3.0	**Competence**		
3.1	Interact in groups collaboratively	Small Groups	Project evaluation Class discussions

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	**Homework**	Every two weeks	5%
2	**Lab work**	Week 10	10%
3	**Midterm exam**	Within the 8th Week	15%
4	**Project**	Week 14	20%
5	**Quiz**	Week 13	10%
6	**Final Exam**	Week 16	40%

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

Faculty - 3 hours per week

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	1. *Database System Concepts Publisher: McGraw-Hill Author: Abraham Silberschatz, Henry Korth, S. Sudarshan Edition Number: 6 ISBN:0073523321* 2. *Database Systems: The Complete Book Publisher: Pearson Prentice Hall Author: Hector Garcia-Molina, Jeffrey D. Ullman, Jennifer Widom Edition Number: 2 ISBN: 0131873253* 3. *Database Management Systems Publisher: McGraw-Hill Author: Raghu-Ramakrishnan, Johannes Gehrke Edition Number: 3 ISBN: 0072465638* 4. *"Database Management Systems," (3rd Ed.) by Raghu Ramakrishan* and Johannes Gehrke 5. "*Database System Concepts*," (6th Ed.) by Avi Silberschatz, Henry Korth, and S. Sudarshan

Essential References Materials	Computer Science Curriculum 2013 – http://cs2013.org ACM (Association for Computer Machinery) Curricula Recommendations - http://www.acm.org/education/curricula-recommendations
Electronic Materials	ACM (Association for Computer Machinery) web site - http://www.acm.org/ • ACM SIGMOD (Special Interest Group on Management of Data) - http://www.sigmod.org/ • IEEE Computer Society web site - http://www.computer.org/portal/web/guest/home • Open access course material online
Other Learning Materials	none

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	A classroom or lecture hall with whiteboard. • An instructor computer station with o High speed Internet connection o A desktop computer with a common database managements system access o Power outlets for instructor's laptop plug-in o A digital image projection system with connection and switches to desktop computer and laptop computer o All laboratories should have computers with access to at least one major database management system
Technology Resources (AV, data show, Smart Board, software, etc.)	All students shall have o A laptop or access to a desktop computer with access to a major database management system o High speed Internet connection o Power outlets for student's laptop plug-in o Microsoft Access o Oracle Database Express Edition (11*g* Release 2)
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	A laboratory with multiple computers, with a variety of operating systems: • Windows

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of Teaching	• Students • Faculty • Peer Reviewers • Program Leader • Course Coordinator	• Surveys (indirect). • Direct feedback from students (interview between Program leader and students). • Course evaluation by Peer Reviewers (indirect). • Class visit by Program Leader • Comprehensive Course report (where we can find information about teaching difficulties and action plan, …)
Effectiveness of Assessment	• Students • Faculty • Peer Reviewers • Course Coordinator • Exam Evaluation Committee • Course Coordinator	• Surveys (indirect). • Direct feedback from students (interview between Program leader and students). • Assessment results (direct) • Course evaluation by Peer Reviewers (indirect). • Comprehensive Course report (where we can find information about assessment difficulties and action plan, …) • Exam evaluation by the Exam Evaluation Committee (indirect)
Extent of achievement of course learning outcomes	• Faculty • Program Leader • Course Coordinator	• Student Results (direct) • Comprehensive Course report (where we can find the CLO assessment results)
Quality of learning resources	• Students • Faculty • Peer Reviewers • Course Coordinator	• Surveys (indirect) • Course evaluation by Peer Reviewers (indirect). • Comprehensive Course report (where we can find information about difficulties and challenges about learning resources as well as consequences and action plan, …)

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	**Computer science & Engineering department council**
Reference No.	Second meeting 2020-2021 academic year
Date	1-september-2020

Course Specifications

Course Title:	Digital logic design
Course Code:	**41012213**
Program:	**Computer Science**
Department:	**Computer Science and Engineering**
College:	**Computer Science and information technology**
Institution:	**Albaha University**

Table of Contents

A. Course Identification

1. Credit hours: 3
2. Course type **a.** University ☐ College ☐ Department ☑ Others ☐ **b.** Required ☑ Elective ☐
3. Level/year at which this course is offered: 3 / 2nd
4. Pre-requisites for this course (if any)**: none**
5. Co-requisites for this course (if any)**: none**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	30	50%
2	**Blended**	-	-
3	**E-learning**	-	-
4	**Correspondence**	-	-
5	**Other (Lab)**	30	50%

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	**Lecture**	30
2	**Laboratory/Studio**	30
3	**Tutorial**	-
4	**Others** (specify)	-
	Total	60
Other Learning Hours*		
1	**Study**	30
2	**Assignments**	10
3	**Library**	-
4	**Projects/Research Essays/Theses**	6
5	**Others**(specify)	-
	Total	46

*The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

Lecture:

This is an introductory level course that gives its participants ability to analyze and design digital circuits. Students learn procedural approaches to designing digital circuits starting from specification of the problem. Students become familiar with the number systems that are used in computers and other digital circuits. They learn to use Boolean algebra and logic gates. Methods of manipulating and simplifying Boolean expressions are learned. Basic combinational logic function models are designed. Students become familiar with arithmetic functional blocks, latches, flip-flops, counters, and registers. Sequential circuits are also designed, and students are introduced to PLD programming. In addition to the classroom portion of the course, there are several laboratory sessions where students build and test their logic designs.

Lab:

The Experiments in the Lab have been divided into two major portions: • Hardware Labs• Simulation labs.Both have been designed to familiarize students with the Combinational Digital Logic Design and Sequential Digital Logic Design through the implementation of Digital Logic Circuits using ICs of basic logic gates and some simple digital logic circuits.

2. Course Main Objectives

The main purpose for this course is to teach students how to:

- Recognize fundamental principles of designing digital circuits.
- Describe combinational and sequential circuits
- Minimize combinational logic circuits
- Analyze combinational and sequential logic circuits
- design combinational and sequential logic circuits
- Implement logic circuits using PLD's
- Work both independently and collaboratively.
- Communicate concepts and techniques in oral presentations.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge:**	
1.1	Recognize fundamental principles of designing digital circuits.	K1
1.2	Describe combinational and sequential circuits	K2
2	**Skills :**	
2.1	Minimize combinational logic circuits	S1
2.2	Analyze combinational and sequential logic circuits	S3
2.3	Design combinational and sequential logic circuits	S2
2.4	Implement logic circuits using PLD's	S2
3	**Competence:**	
3.1	Work both independently and collaboratively	C1
3.2	Communicate concepts and techniques in oral presentations	C2

C. Course Content

No	List of Topics (Lecture)	Contact Hours
1	Digital Systems and Binary Numbers	4
2	Boolean Algebra and Logic Gates	4

3	Gate-Level Minimization	4
4	Combinational Logic	4
5	Synchronous Sequential Logic	6
6	Registers and Counters	4
7	Memory and Programmable Logic	4
Total		30

No	List of Topics (Lab)	Contact Hours
1	Digital Logic Gates	2
2	Simplification of Boolean Functions	2
3	Combinational Circuits	4
4	Code Converters	4
5	Design with Multiplexers	2
6	Adders and Subtractors	2
7	Flip-Flops	2
8	Sequential Circuits	4
9	counters	4
10	Shift Registers	4
Total		30

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	TeachingStrategies	AssessmentMethods
1.0	**Knowledge**		
1.1	Recognize fundamental principles of designing digital circuits.	- Lectures - Assignments	- Homework - Midterm - Final exam
1.2	Describe combinational and sequential circuits	- Lectures - assignments	- Homework - Midterm - Final exam
2.0	**Skills**		
2.1	Minimize combinational logic circuits	- Lectures - Assignments - Lab exercises	- Homework - midterm - Final exam - Lab exam
2.2	Analyze combinational and sequential logic circuits	- Lectures - Assignments	- Homework - midterm - Final exam
2.3	Design combinational and sequential logic circuits	- Lectures - Assignments - Lab exercises - Course Project	- Homework - midterm - Final exam - Lab exam - Course project presentation and report

Code	Course Learning Outcomes	TeachingStrategies	AssessmentMethods
2.4	Implement logic circuits using PLD's	- Lectures - Assignments - Lab exercises	- Homework - midterm - Final exam - Lab exam
3.0	**Competence**		
3.1	Work both independently and collaboratively	- Small groups	- Course project presentation and report
3.2	Communicate concepts and techniques in oral presentations	- Oral presentation	- Course project presentation and report

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Homework	Every two Weeks	10%
2	Midterm	8	20%
3	Course Project	14	10%
4	Lab Exam	15	20%
5	Final Exam	16	40%

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

- Faculty 3 hours per week

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	- "Digital DesignWith an Introduction to the Verilog HDL", M. Morris Mano, Michael D. Ciletti - *Digital Design*,Wakerly, Fourth Edition, Prentice Hall
Essential References Materials	- Computer Science Curriculum 2013 – http://cs2013.org - ACM (Association for Computer Machinery) Curricula Recommendations - http://www.acm.org/education/curricula-recommendations
Electronic Materials	• ACM (Association for Computer Machinery) web site - http://www.acm.org/ • IEEE Computer Society web site - http://www.computer.org/portal/web/guest/home • Access to the Saudi Digital Library (SDL). • Using the learning management system of the university – Rafid System (https://lms.bu.edu.sa/).

Other Learning Materials	None

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	• A classroom or lecture hall with whiteboard for 25 students. • A digital circuit's laboratory.
Technology Resources (AV, data show, Smart Board, software, etc.)	• A digital image projection system with connection to desktop computer and laptop computer. • High speed Internet connection. • An instructor computer station.
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	• None

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of Teaching	• Students • Faculty • Peer Reviewers • Program Leader • Course Coordinator	• Surveys (indirect). • Direct feedback from students (interview between Program leader and students). • Course evaluation by Peer Reviewers (indirect). • Class visit by Program Leader • Comprehensive Course report (where we can find information about teaching difficulties and action plan, …)
Effectiveness of Assessment	• Students • Faculty • Peer Reviewers • Course Coordinator • Exam Evaluation Committee • Course Coordinator	• Surveys (indirect). • Direct feedback from students (interview between Program leader and students). • Assessment results (direct) • Course evaluation by Peer Reviewers (indirect). • Comprehensive Course report (where we can find information about assessment difficulties and

		action plan, …) • Exam evaluation by the Exam Evaluation Committee (indirect)
Extent of achievement of course learning outcomes	• Faculty • Program Leader • Course Coordinator	• Student Results (direct) • Comprehensive Course report (where we can find the CLO assessment results)
Quality of learning resources	• Students • Faculty • Peer Reviewers • Course Coordinator	• Surveys (indirect) • Course evaluation by Peer Reviewers (indirect). • Comprehensive Course report (where we can find information about difficulties and challenges about learning resources as well as consequences and action plan, …)

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes,Quality oflearning resources, etc.)
Evaluators (Students,Faculty, Program Leaders,Peer Reviewer, Others (specify)
Assessment Methods(Direct, Indirect)

H. Specification Approval Data

Council / Committee	**Computer science & Engineering department council**
Reference No.	Second meeting 2020-2021 academic year
Date	1-september-2020

Course Specifications

Course Title:	**Foundation of Information Systems**
Course Code:	**41021211**
Programs:	**Computer Information Systems**
Department:	**Computer Information Systems**
College:	**College of Computer Science and Information Technology**
Institution:	**Albaha University**

Table of Contents

A. Course Identification

1. Credit hours: 3 Hours	
2. Course type	
a. University ☐ College ☑ Department ☐ Others ☐	
b. Required ☑ Elective ☐	
3. Level/year at which this course is offered: 3rd Level/2nd year	
4. Pre-requisites for this course (if any)**: None**	
5. Co-requisites for this course (if any)**: None**	

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	**45**	100%
2	**Blended**		
3	**E-learning**		
4	**Correspondence**		
5	**Other**		

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	**Lecture**	**45**
2	**Laboratory/Studio**	**0**
3	**Tutorial**	**0**
4	**Others** (specify)	**0**
	Total	**45**
Other Learning Hours*		
1	**Study**	**21**
2	**Assignments**	**15**
3	**Library**	**05**
4	**Projects/Research Essays/Theses**	**02**
5	**Others** (specify)	**02**
	Total	**45**

* The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

The objective of this course is to introduce the main components of the Information System i.e. people, software, hardware, data, and communication technologies. Furthermore, it is also discussing the different types of Application Software used in an organization for creating and managing the Information System. It also introduces the organizational structures, and how information systems support these organizational structures. Moreover, it also discuss the usage of the Information System at different levels in government and business organizations.

2. Course Main Objective

Upon successful completion of the course, the student will develop fundamental nderstanding and competency in the following topics

- Recognize the components of information systems
  - Hardware: Input, Processing, and Output Devices.
  - Software: Systems and Application Software
  - Organizing of Data and Information
  - Telecommunications and Networks
- Explain Organizational structures, and how information systems support those structures
- Recognize how information systems fit into organizations, and how organizations use information systems to accomplish their goals.
- Explain how organizations acquire information systems and technologies.
- Explain Application software commonly used in information systems

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge:**	
1.1	- Recognize the components of information systems: Hardware, Software, Organizing of Data and Information, Telecommunications and Networks - Explain Organizational structures, and how information systems support those Structures	K1
1.2	Recognize how information systems fit into organizations, and how organizations use information systems to accomplish their goals	K2
1.3	- Explain how organizations acquire information systems and technologies. Explain Application software commonly used in information System	K3
2	**Skills :**	

CLOs		Aligned PLOs
2.1	Recognize to demonstrate basic knowledge of essential facts, concepts	S1
2.2	Recognize to identify the uses of information technology, and how it provides speed and accuracy to business processes	S2
2.3	Recognize and be guided by the social, professional, legal and ethical and cultural issues involved in the use of computer technology	S3
3	**Competence:**	
3.1	Recognize to meet deadlines on assignments and projects and recognize to work independently and collaboratively	C1
3.2	Recognize to give and receive constructive comments of their written work and oral presentations and recognize to initiate independent research project or presentation and follow through to completion	C2

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to Information Systems	3
2	Information Systems in Organizations	3
3	Hardware: Input, Processing, and Output Devices	3
4	Organizing Data and Information	3
5	Organizing Data and Information (Continue)	3
6	Telecommunications and Networks	6
7	The Internet, Intranets, and Extranets	3
8	Electronic and Mobile Commerce.	3
9	Enterprise Information Systems and Information and	3
10	Management Information System	3
11	Decision Support Systems	3
12	Knowledge Management and Specialized Information Systems	3
13	Systems Development: Investigation and Analysis	3
14	Systems Design: Implementation, Maintenance, and Review	3
Total		45

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge**		
1.1	- Recognize the components of information systems: Hardware, Software, Organizing of Data and Information, Telecommunications and Networks - Explain Organizational structures, and how information systems support those Structures	- Lectures - Assignments	- Homework - Quiz - Midterm - Final exam
1.2	Recognize how information systems fit into organizations, and how organizations use information systems to accomplish their goals	- Lectures - Assignments	- Homework - Quiz - Midterm - Final exam
1.3	- Explain how organizations acquire information systems and technologies. Explain Application software commonly used in information System	- Lectures - Assignments	- Homework - Quiz - Midterm - Final exam
2.0	**Skills**		
2.1	Recognize to demonstrate basic knowledge of essential facts, concepts	- Lectures - Course project	- Homework - Final exam - Course project presentation and report
2.2	Recognize to identify the uses of information technology, and how it provides speed and accuracy to business processes	- Lectures - Course project	- Homework - Final exam - Course project presentation and report
2.3	Recognize and be guided by the social, professional, legal and ethical and cultural issues involved in the use of computer technology.	- Lectures - Course project	- Homework - Final exam - Course project presentation and report
3.0	**Competence**		
3.1	Recognize to meet deadlines on assignments and projects and recognize to work independently and collaboratively	- Small groups	Course project presentation and report
3.2	Recognize to give and receive constructive comments of their written work and oral Presentations and recognize to initiate independent research project or	- Small groups	Course project presentation and report

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
	presentation and follow through to completion.		

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Homework	Every two Weeks	10%
2	Midterm	8	20%
3	Quiz	13	10%
4	Course Project presentation and report	14	10%
5	Final Exam	16	50%
6	**Total**		**100%**

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

The faculty offered 3 hours per week for each group of students as office hour. In addition, the students are welcomed to send their enquires via the official email or the LMS (Rafid).

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	• Principles of Information Systems, 11th Edition, by Ralph M. Stair and George Reynolds , ISBN-10: 1133629660, ISBN-13: 9781133629665, 712 Pages Hardcover, ©2014 Published by Cengage
Essential References Materials	• Computer Science Curriculum 2013 – http://cs2013.org • ACM (Association for Computer Machinery) Curricula Recommendations -http://www.acm.org/education/curricula-recommendations
Electronic Materials	Students can update their knowledge by visiting different related websites. • ACM (Association for Computer Machinery) web site - http://www.acm.org/ • IEEE Computer Society web site - http://www.computer.org/portal/web/guest/home • Access to the Saudi Digital Library (SDL). • Using the learning management system of the university – Rafid System (https://lms.bu.edu.sa/).
Other Learning Materials	None

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Each class room size is provided with 20-25 seats which are more enough to accommodate registered students
Technology Resources (AV, data show, Smart Board, software, etc.)	Class room with smart boards Desk tops with genuine Operating systems and Anti-virus Smart Podiums
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Needed Internet facility to explain real time examples by on line

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of Teaching	• Students • Faculty • Peer Reviewers • Program Leader Course Coordinator	• Surveys (indirect). • Direct feedback from students (interview between Program leader and students). • Course evaluation by Peer Reviewers (indirect). • Class visit by Program Leader Comprehensive Course report (where we can find information about teaching difficulties and action plan, …)
Effectiveness of Assessment	• Students • Faculty • Peer Reviewers • Course Coordinator • Exam Evaluation Committee Course Coordinator	• Surveys (indirect). • Direct feedback from students (interview between Program leader and students). • Assessment results (direct) • Course evaluation by Peer Reviewers (indirect). • Comprehensive Course report (where we can find information about assessment difficulties and action plan, …) Exam evaluation by the Exam Evaluation Committee (indirect)
Extent of achievement of course learning outcomes	• Faculty • Program Leader	• Student Results (direct)

Evaluation Areas/Issues	Evaluators	Evaluation Methods
	• Course Coordinator	Comprehensive Course report (where we can find the CLO assessment results)
Quality of learning resources	• Students • Faculty • Peer Reviewers Course Coordinator	• Surveys (indirect) • Course evaluation by Peer Reviewers (indirect). Comprehensive Course report (where we can find information about difficulties and challenges about learning resources as well as consequences and action plan, …)

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	Computer Information Systems department council
Reference No.	Second meeting 2020/2021 academic year
Date	2 September 2020

Course Specifications

Course Title:	**Advanced Programming**
Course Code:	**41021231**
Program:	**Computer Science**
Department:	**Computer Science and Engineering**
College:	**Computer Science and information technology**
Institution:	**Albaha University**

Table of Contents

A. Course Identification

1. Credit hours: 3
2. Course type **a.** University ☐ College ☐ Department ☑ Others ☐ **b.** Required ☑ Elective ☐
3. Level/year at which this course is offered: 3/ 2nd
4. Pre-requisites for this course (if any)**: Scientific Programming (41011156)**
5. Co-requisites for this course (if any)**:**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	30	50%
2	**Blended**		
3	**E-learning**		
4	**Correspondence**		
5	**Other(lab)**	30	50%

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	**Lecture**	30
2	**Laboratory/Studio**	30
3	**Tutorial**	
4	**Others** (specify)	
	Total	60
Other Learning Hours*		
1	**Study**	50
2	**Assignments**	10
3	**Library**	
4	**Projects/Research Essays/Theses**	
5	**Others** (specify)	
	Total	60

* The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

Lecture:

The course will introduce some of the advanced programming topics to increase students programming skills. Some of the suggested topics are:

- Multidimensional arrays.
- Java methods.
- Classes and Objects.
- String type.
- Files I/O.
- Error and exceptions handling.
- Overview of other advanced topics (e.g. Introduction to testing and debugging techniques, Generics, Recursion, and Multithreading, ... etc.)

Lab:

The lab is planned to give students practical experiments on programming to increase students programming skills. Students will also learn how to:

- Write programs that use multidimensional arrays from different data types.
- Write programs that use value and void methods and choose the appropriate access modifier.
- Write programs that based on classes and objects principles.
- Write programs that have string type.
- Write programs that read, write and modify text files.

Recognize code errors and handling them.

2. Course Main Objective

The main purpose for this course is to teach students how to:

- Create and use multidimensional arrays from different data types.
- Create value and void methods; this involves using multiple parameters and choose the appropriate access modifier.
- Develop programs that use classes and objects.
- Write program that has string type; this involves comparing two string variables, and string manipulation.
- Write program that read, write and modify text files.
- Recognize code errors and handling them.
- Work both independently and collaboratively.
- Communicate concepts and techniques in discussions.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge:**	
1.1	Recognize code errors and handling them.	K1
2	**Skills :**	
2.1	Create and use multidimensional arrays from different data types.	S1
2.2	Create value and void methods; this involves using multiple parameters.	S1
2.3	Develop programs that use classes and objects.	S1

CLOs		Aligned PLOs
2.4	Write program that has string type; this involves comparing two string variables, and string manipulation.	S1
2.5	Write program that read, write and modify text files.	S1
3	**Competence:**	
3.1	Work both independently and collaboratively.	C1
3.2	Communicate concepts and techniques in discussions	C2

C. Course Content

No	List of Topics	Contact Hours
Lectures		
1	Multidimensional arrays	**4**
2	Subroutines (methods/functions)	**6**
3	Classes and Objects (defining, creating and using)	**6**
4	String type	**4**
5	Files I/O (text files)	**6**
6	Error and exception handling	**4**
Labs		
1	Lab Multidimensional arrays	**4**
2	Lab Subroutines (methods/functions)	**6**
3	Lab Classes and Objects (defining, creating and using)	**6**
4	Lab Strings in Java	**4**
5	Lab Files I/O (text files)	**6**
6	Lab Error and exception handling	**4**
Total		**60**

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge**		
1.1	Recognize code errors and handling them.	▪ Lecture ▪ Tutorials ▪ Exercises	▪ Final Exam
2.0	**Skills**		
2.1	Create and use multidimensional arrays from different data types.	▪ Tutorials ▪ Lectures ▪ Exercises	▪ Homework ▪ Midterm exam ▪ Lab Exam
2.2	Create value and void methods; this involves using multiple parameters.	▪ Tutorials ▪ Lectures ▪ Exercises	▪ Quiz ▪ Lab Exam ▪ Final Exam
2.3	Develop programs that use classes and objects.	▪ Tutorials ▪ Lectures ▪ Exercises	▪ Group Project ▪ Lab Exam ▪ Final Exam

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
2.4	Write program that has string type; this involves comparing two string variables, and string manipulation.	▪ Tutorials ▪ Lectures ▪ Exercises	▪ Final Exam
2.5	Write program that read, write and modify text files.	▪ Tutorials ▪ Lectures ▪ Exercises	▪ Group Project ▪ Lab Exam ▪ Final Exam
3.0	**Competence**		
3.1	Work both independently and collaboratively.	▪ Small Groups. ▪ Roleplay (taking responsibility as a teacher to teach other students and criticize others works). ▪ flipped classroom	▪ Group project ▪ Homework
3.2	Communicate concepts and techniques in discussions	▪ Class/lab Discussions	▪ Class/lab Discussions

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Class/lab Discussions	[3:13]	5 %
2	Homework	6	5%
3	Midterm exam	8	10%
4	Quiz	11	10%
5	Group Project	14-15	10%
6	Lab exam	16	20%
7	Final exam	17	40%
	Total		**100%**

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :
The faculty offered 3 hours per week for each group as office hours. In addition, the students are welcomed to send their enquires via email or the LMS (Rafid).

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	• *"Introduction to Java Programming and Data Structures , Comprehensive Version, Loose Leaf Edition"* by D. Liang, Pearson, 2019. • *"Introduction to Programming Using Java"* by D. J. Eck, 2019.
Essential References Materials	• Computer Science Curriculum 2013 – http://cs2013.org • ACM (Association for Computer Machinery) Curricula Recommendations

	- http://www.acm.org/education/curricula-recommendations • *"Java How To Program"* by H.M. Deitel & P.J.Deitel, Pearson, 2017
Electronic Materials	• ACM (Association for Computer Machinery) web site - http://www.acm.org/ • IEEE Computer Society web site - http://www.computer.org/portal/web/guest/home • Access to the Saudi Digital Library (SDL). • Using the learning management system of the university – Rafid System (https://lms.bu.edu.sa/). • **For API**: o https://docs.oracle.com/javase/8/docs/api/ • **For tutorials:** o **Java:** ▪ https://docs.oracle.com/javase/tutorial/ ▪ https://www.tutorialspoint.com/java/ ▪ https://www.javatpoint.com/java-tutorial ▪ https://www.codecademy.com/learn/learn-java ▪ https://netbeans.org/kb/index.html ▪ https://www.udemy.com/java-tutorial/
Other Learning Materials	• Sololearn (mobile app)

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	All the lectures should be in a well prepared lab that can accommodate 25 students at most.
Technology Resources (AV, data show, Smart Board, software, etc.)	• A digital image projection system with connection to desktop computer and laptop computer. • High speed Internet connection. • An instructor computer station. • An application to manage labs and learning sessions (NetSupport School).
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	None

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of Teaching	• Students • Faculty • Peer Reviewers • Program Leader • Course Coordinator	• Surveys (indirect). • Direct feedback from students (interview between Program leader and students). • Course evaluation by Peer Reviewers (indirect). • Class visit by Program Leader • Comprehensive Course report (where we

Evaluation Areas/Issues	Evaluators	Evaluation Methods
		can find information about teaching difficulties and action plan, …)
Effectiveness of Assessment	• Students • Faculty • Peer Reviewers • Course Coordinator • Exam Evaluation Committee • Course Coordinator	• Surveys (indirect). • Direct feedback from students (interview between Program leader and students). • Assessment results (direct) • Course evaluation by Peer Reviewers (indirect). • Comprehensive Course report (where we can find information about assessment difficulties and action plan, …) • Exam evaluation by the Exam Evaluation Committee (indirect)
Extent of achievement of course learning outcomes	• Faculty • Program Leader • Course Coordinator	• Student Results (direct) • Comprehensive Course report (where we can find the CLO assessment results)
Quality of learning resources	• Students • Faculty • Peer Reviewers • Course Coordinator	• Surveys (indirect) • Course evaluation by Peer Reviewers (indirect). • Comprehensive Course report (where we can find information about difficulties and challenges about learning resources as well as consequences and action plan, …)

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	**Computer science & Engineering department council**
Reference No.	Second meeting 2020-2021 academic year
Date	1-september-2020