Course Specifications

Course Title:	Introduction to Problem Solving
Course Code:	**501110-2**
Program:	**Bachelor in Computer Science**
Department:	**Department of Computer Science**
College:	**College of Computers and Information Technology**
Institution:	**Taif University**

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A. Course Identification

1. **Credit hours: 3**

2. Course type

a.	University ☐	College **x**	Department ☐	Others ☐
b.		Required **x**	Elective ☐	

3. **Level/year at which this course is offered:** 3rd **Level/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**	3	100
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	30
2	**Laboratory/Studio**	
3	**Tutorial**	
4	**Others** (specify)	
	Total	30

B. Course Objectives and Learning Outcomes

1. Course Description

The course presents fundamental concepts of problem-solving techniques in computer science and other computational sciences. Topics include: Problem-solving approaches and process, Arithmetic Expression, Debugging, Decision structures, Repetition Structures.

2. Course Main Objective

- In this course, student view, consider, analyze, design, plan, work, and solve problems from a computational perspective.
- To gain general knowledge about modern computing and the concepts and thinking processes underlying modern digital technologies.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
2	**Skills :**	
2.1	To introduce concepts, techniques, and problem-solving skills in the field of computing.	S1
2.2	Ability to apply problem solving skills to solve common real-life problems.	S1
2.3	Ability to select appropriate solutions to problems.	S1
2.4	Ability to write pseudo code and use other problem-solving tools to illustrate solutions.	S1
3	**Values:**	

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to Computers and Programming	1
2	Problem-solving process -I (Input and output, programming process)	2
3	Problem-solving process-II (System development, pseudo-code)	2
4	Problem-solving process-III (Flowchart)	2
5	Arithmetic Expression-I (Variables and basic types, mathematical expressions, Order of Operations, Associativity of Operators, Grouping with Parentheses)	3
6	Arithmetic Expression-II (Algebraic Expressions, Postfix expression, Prefix expression, Multiple Assignment and Combined Assignment)	2
7	Tracing a Program (Focus on debugging: Hand tracing a Program, Focus problem solving: A case study)	4
8	Decision Structures-I (Relational Operators, Relational Expressions, Logical Operators)	2
9	Decision Structures-II (Flowchart for Evaluating a Decision- (Single, double, multi-way, nested), Solving problems using decisions structures)	3
10	Repetition Structures-I (The Increment and Decrement Operators, Repetition Flowchart (Pre-test loop (e.g., while loop), Post-test loop (e.g., do-while loop))	3
11	Repetition Structures-II (Repetition Flowchart (Counting loop (e.g., for loop), Nested loop structures))	3
12	Repetition Structures-III (Deciding which repetition structure to use, solving problems using repetition structures)	3
	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 and Understanding**		

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
2.0	**Skills**		
2.1	To introduce concepts, techniques, and problem-solving skills in the field of computing.	Lectures	**Direct** Quizzes / Homework Exams **Indirect** Course Exit Survey
2.2	Ability to apply problem solving skills to solve common real-life problems.	Lectures	**Direct** Quizzes / Homework Exams **Indirect** Course Exit Survey
2.3	Ability to select appropriate solutions to problems.	Lectures	**Direct** Quizzes / Homework Exams **Indirect** Course Exit Survey
2.4	Ability to write pseudo code and use other problem-solving tools to illustrate solutions.	Lectures	**Direct** Quizzes / Homework Exams **Indirect** Course Exit Survey
3.0	**Values**		

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Homework / Student Participation-Attendance	Every Week	10%
2	Quizzes	Week 3 and 8	10%
3	Mid-Term	Week 5	30%
4	Final Examination	Week 11	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:
- 6 hours per week in pre-determined office hours
- Consultation by appointment (as needed)
- Through emails
- Through BlackBoard Learn

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Sprankle, Maureen, and Jim Hubbard. Problem solving & programming concepts. Upper Saddle River, NJ: Pearson Prentice Hall, 9th edition, 2011.
Essential References Materials	Wang, Paul S. From computing to computational thinking. Chapman and Hall/CRC, 2016.
Electronic Materials	None
Other Learning Materials	http://www.flowgorithm.org/download/index.htm

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	● Classroom with 25 chairs
Technology Resources (AV, data show, Smart Board, software, etc.)	● Video projector / data show ● White board
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 members ● Coordinator ● Council ● Curriculum Committees	● Course exit survey ● Feedback from Faculty members ● Feedback from Course Coordinator ● Feedback from council ● Feedback from Curriculum Committees
Effectiveness of assessment	● Students ● Faculty members ● Coordinator ● Council ● Curriculum Committees	● Course exit survey ● Feedback from Faculty members ● Feedback from Course Coordinator ● Feedback from council ● Feedback from Curriculum Committees
Extent of course achievement	● Students ● Faculty members ● Coordinator	● Course exit survey ● Feedback from Faculty members

Evaluation Areas/Issues	Evaluators	Evaluation Methods
	● Council ● Curriculum Committees	● Feedback from Course Coordinator ● Feedback from council ● Feedback from Curriculum Committees
Extent of course learning outcomes	● Students ● Faculty members ● Coordinator ● Council ● Curriculum Committees	● Course exit survey ● Feedback from Faculty members ● Feedback from Course Coordinator ● Feedback from council ● Feedback from Curriculum Committees
Quality of learning resources	● Students ● Faculty members ● Coordinator ● Council ● Curriculum Committees	● Course exit survey ● Feedback from Faculty members ● Feedback from Course Coordinator ● Feedback from council ● Feedback from Curriculum Committees

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	CS council
Reference No.	Meeting #12
Date	1443-10-23