**University/Academy:** Arab Academy for Science and Technology & Maritime Transport
**Faculty/Institute:** College of Computing & Information Technology
**Program:** B. Sc. In Computer Science

| Course title | **Discrete Structures** |
|---|---|
| Course code | **CS202** |

## Form no. (11A): **Knowledge and skills matrix for a course**

| Course content | Week | Knowledge | Intellectual skills | Professional skills | General skills |
|---|---|---|---|---|---|
| **The Logic of Compound Statements** | 1 | • Distinguish mathematical and philosophical logic<br>• Identify propositions in natural language | • Evaluate propositions | • Use logical operators to construct compound propositions | • Practice Logic Thinking |
| **The Logic of Compound Statements** | 2 | • Understand inverses, converses, and contrapositions for propositions | • Simplify expressions via application of equivalences | • Translate to and from conversational English<br>• Construct inverses, converses, and contrapositions for propositions | |
| **The Logic of Quantified Statements** | 3 | • Learn about quantified statement.<br>• Understand the difference between universal and existential statement. | • Distinguish predicates from propositions<br>• Determine the veracity of expressions | • Convert such expressions to and from logic notation | |
| **The Logic of Quantified Statements** | 4 | • Know the basic rules of inference | • Recognize common fallacious arguments<br>• Distinguish inductive and deductive reasoning<br>• Distinguish valid and sound arguments<br>• | • Use the rules of inference to construct valid arguments | • Verify theory with practice |
| **Elementary Number Theory and Methods of Proof** | 5 | • Learn the Fundamental Theorem of Arithmetic<br>• Learn Odd and even Numbers<br>• Learn Rational Numbers | | | |
| **Elementary Number Theory and Methods of Proof** | 6 | • Learn the Fundamental Theorem of Arithmetic<br>• Identify Prime Numbers<br>• Learn Quotient- | | | |

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|---|---|---|---|---|---|
| | | Remainder theorem | | | |
| **7th week Exam** | 7 | | | | |
| **Counting** | 8 | • Learn basics of probability.<br>• Understand fundamentals of counting (counting elements in a list, possibility trees, multiplication rule, addition rule, difference rule, inclusion/exclusion). | • Recognize when to apply each counting method.<br>• | • Use different counting methods. | • Verify theory with practice |
| **Counting** | 9 | • Understand permutations and combinations.<br>• | • Distinguish combinations from permutations | • Use different counting methods. | • Verify theory with practice |
| **Functions** | 10 | • Know the basic properties of functions | | | |
| **Functions** | 11 | • Identify injective, surjective, and bijective functions | | | |
| **12th week Exam** | 12 | | | | |
| **Relations** | 13 | • Know how binary relations are distinguished from other types | • Identify reflexive, symmetric, and transitive relations<br>• Identify partial and total orders, and equivalence relations | • Construct mathematical induction proof | • Verify theory with practice |
| **Mathematical Induction** | 14 | • Understand why induction works | | | |
| **Mathematical Induction** | 15 | • Understand the distinction between Weak and Strong Induction | | • Construct mathematical induction proofs | |

**Course Instructor**

Name:

**Head of Department**

Name: **Dr. Samah Senbel**