

**1. General information about Instructor:**

| **Name**  | Dr. Saleh Salous | **Class Time & Office Hours** |
| --- | --- | --- |
| **Phone** | **Internal** |  | **Day**  | SUN  | MON | TUE | WED | THU |
| **External** |  |  | **✔** |  | **✔** |  | **✔** |
| **Mobile** |  | **Class Time** |  | 2-3.30 |  | 2-3.2 |  |
| **Instructor's E-mail** | **Salous848@hotmail.com** | **Class Room** | E225 |  | E225 |  | E225 |
|  | **Office Hours-E324** |  |  |  |  |  |

**2. General information about the Course**

| **No** | **Requirements** |  |
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| **1** | Course Title  | **Discrete Mathematics** |
| **2** | Course code & Number  |

|  15041221 |
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| **3** | Credit hours | Theo. (CH): **3** | Practical (CH): |
| **4** | Faculty  | Information Technology |
| **5** | Department / Division that offers the course: | CS |
| **6** | Course type | Compulsory  | Elective:  |
| Uni.  | Fac. | Dep. | Uni. | Fac. | Dep.  |
| **7** | Level and Semester  | L2/ 1st semester |
| **8** | Prerequisite(s) – If any | \_  |
| **9** | Co-requisite(s) – if any |  |
| **10** | Program/programs for it/them the course is offered |  |
| **11** | Instruction Medium:  | English **🗹** | Arabic |
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**3. Course description:**

| This course of discrete mathematical structures used in computer science. In this course students study abstract structures used to represent discrete objects and the relationships between these objects. Course topics include principles of logic, incompleteness, diagonal proof, and inductive proof of correctness of simple algorithms. Students will write recurrences to define computable functions and will explore discrete probability and randomness from a Computational viewpoint. |
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**4. General Course Objectives**

| **On successful completion of this course the student will be able to achieve the following objectives:**. Explain and apply logical inference2. Apply set-theoretic concepts, including the notions of relations, functions, and languages3. Apply the basic notions of graph theory, including by means of proof4. Prove properties of trees, describing their applications5. Distinguish countable from uncountable sets, applying the diagonal proof method in number theory, logic, and computability* 6. Apply the basic notions of combinatorics and discrete probability.

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**5. Intended Learning Outcomes/ILO’s (please specify the learning outcomes of the course as outlined below):**

| 1. Use propositional and predicate logic as reasoning tools
2. Explain basic principles of mechanized reasoning, including resolution proof
3. Reason about properties of mathematical objects such as functions and relations
4. Apply discrete mathematical techniques to problems in computer science
5. Design and reason about simple finite-state automata
6. Design and reason about regular expressions and context-free grammars

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**6. Topics covered and Calendar:**

1. **Theoretical parts (Please state the titles of the subjects you intend to cover each week)**

| **(Course** **schedule)** |
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| **COMMENTS** | **Topics to be discussed** | **WEEK** |
|  | **The Logic of Compound Statements** | 1 |
|  | **The Logic of Quantified Statements** | 2 |
|  | **Elementary Number Theory and Methods of Proof** | 3 |
|  | 4 |
|  | **Sequences, Mathematical Induction and Recursion** | 5 |
|  | 6-7 |
|  | EXAM 1 | 7 |
|  | Set theory | 8 |
|  | Functions | 9 |
|  | Relations | 10 |
|  | 11 |
|  | Counting and Probability | 12-13 |
|  | EXAM 2 | 13 |
|  | Graphs and Trees | 14 |
|  | 15 |
|  | Final Exam | 16 |

1. **Practical part (Please state the titles of the experiments you intend to cover each week)**

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**7. Student assessment methods based on ILO,s**

| **No**  | **Assessment method**  | **Week** | **Mark** | **Percentage to overall mark** |
| --- | --- | --- | --- | --- |
|  | Mid Exam  | 7 | 25 | 35% |
|  |  |  |  |  |
|  | Activity, scientific research, Participation, short exams | 8, 13 | 20 | 20% |
|  | Final Exam  | 16 | 45 | 45% |

 **8. References and other resources**

| **Discrete Mathematics with Applications**, 4th Edition by Susanna Epp, Thomson Learning 2010. |
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| 1. **Other references**
2. **Discrete Mathematics and Its Applications,** 7th Edition Kenneth Rosen
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| 1. **Electronic resources, Websites related to the course**

**1.** Internet resources**.** |