The University of Jordan

Accreditation & Quality Assurance Center

COURSE Syllabus
<table>
<thead>
<tr>
<th></th>
<th><strong>Course title</strong></th>
<th>Theory of Computation and Complexity</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td><strong>Course number</strong></td>
<td>1901717</td>
</tr>
<tr>
<td>3</td>
<td><strong>Credit hours (theory, practical)</strong></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Contact hours (theory, practical)</strong></td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td><strong>Prerequisites/corequisites</strong></td>
<td>N/A</td>
</tr>
<tr>
<td>5</td>
<td><strong>Program title</strong></td>
<td>Computer Science</td>
</tr>
<tr>
<td>6</td>
<td><strong>Program code</strong></td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td><strong>Awarding institution</strong></td>
<td>The University of Jordan</td>
</tr>
<tr>
<td>8</td>
<td><strong>Faculty</strong></td>
<td>King Abdullah II School for Information Technology</td>
</tr>
<tr>
<td>9</td>
<td><strong>Department</strong></td>
<td>Computer Science Department</td>
</tr>
<tr>
<td>10</td>
<td><strong>Level of course</strong></td>
<td>Graduate course</td>
</tr>
<tr>
<td>11</td>
<td><strong>Year of study and semester(s)</strong></td>
<td>2014/2015 – Second Semester</td>
</tr>
<tr>
<td>12</td>
<td><strong>Final Qualification</strong></td>
<td>Master degree</td>
</tr>
<tr>
<td>13</td>
<td><strong>Other department(s) involved in teaching the course</strong></td>
<td>N/A</td>
</tr>
<tr>
<td>14</td>
<td><strong>Language of Instruction</strong></td>
<td>English</td>
</tr>
<tr>
<td>15</td>
<td><strong>Date of production/revision</strong></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td><strong>Required/ Elective</strong></td>
<td>Required</td>
</tr>
</tbody>
</table>

16. **Course Coordinator:**

*Office numbers: KASIT 122*

*Office hours:*
  - Monday: 8:00 – 9:30
  - Tuesday: 8:00 – 9:00
  - Wednesday: 2:00-3:30
  - Thursday: 10:00 – 11:00

*Phone number: 22557*

*Email addresses: k.sabri@ju.edu.jo*

17. **Other instructors:**

N/A

18. **Course Description:**

19. Course aims and outcomes:

A- Aims:

The main objective of this course is to provide an understanding of the concepts of computability and computational complexity.

B- Intended Learning Outcomes (ILOs): Upon successful completion of this course students will be able to ...

- A1) Understand the use of automata, grammars and regular languages to represent languages
- A2) Understand the relationship between regular languages, context free languages, decidable languages and recognizable languages.
- A3) Understand the limitation of computers
- A4) Understand the main complexity classes and their relationship.

B- Intellectual skills: with the ability to ...

- B1) Compare and analyze different types of automata and grammars
- B2) Evaluate problems in computability and complexity

C- Subject specific skills – with ability to ...

- C1) Construct Finite Automata, Nondeterministic Automata, and Turing Machines to describe languages
- C2) Proving the decidability of languages
- C3) specify the complexity classes of languages

D- Transferable skills – with ability to

- D1) Relate problems in real world to formal languages, automata, computability and complexity
- D2) Choose appropriate mathematical model for a various problems in computer science.

20. Topic Outline and Schedule:

<table>
<thead>
<tr>
<th>Topic</th>
<th>Week</th>
<th>Instructor</th>
<th>Achieved ILOs</th>
<th>Evaluation Methods</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>1</td>
<td>Dr. Khair Eddin Sabri</td>
<td></td>
<td>Quiz, Midterm, Final</td>
<td>Chapter 0</td>
</tr>
<tr>
<td>Finite automata, Regular expression, Regular language</td>
<td>2,3</td>
<td>Dr. Khair Eddin Sabri</td>
<td>A1, C1</td>
<td>Quiz, Project, Midterm, Final</td>
<td>Chapter 1</td>
</tr>
<tr>
<td>Context-Free Languages</td>
<td>4</td>
<td>Dr. Khair Eddin Sabri</td>
<td>A1, B1, C1, D1</td>
<td>Quiz, Midterm, Final</td>
<td>Chapter 2</td>
</tr>
</tbody>
</table>
21. Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:

Teaching (T) Strategies: The Course will be delivered using different means like lecture, discussion and presentation of applications.

Learning (L) Methods: Students attend classes, ask questions and participate in discussions, do the home works, solve suggested questions. Students will access the e-learning platform for more instruction and supported learning materials.

22. Evaluation Methods and Course Requirements:

Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:

There will be several assessment methods of evaluation the performance of the students such as attending and class participation; developing and discussing a project; conducting the Midterm and the Final Exams.

23. Course Policies:

A- Attendance policies:

Deliberate abstention from attending 1901204 classes and any other similar acts will lead to student deprivation from the course according to the UJ regulations

B- Absences from exams and handing in assignments on time:

If you miss the midterm, then a makeup exam will not be provided unless you submit a valid absence excuse, within three days from the midterm, to your lecturer. This excuse must be signed and stamped from the UJ hospital in order to be valid. If your lecturer accepts the excuse then you will be able to take the midterm makeup. You need to follow up the departmental announcements regarding the makeup date and time. Please note that the lecturer may either accept or reject your excuse based on UJ regulations
C- Health and safety procedures:
N/A

D- Honesty policy regarding cheating, plagiarism, misbehavior:
All students in this course must read the University policies on plagiarism and academic honesty

E- Grading policy:
- Midterm Exam: 30%
- Problem solving: 10%
- Project and presentation: 20%
- Final Exam: 40%

F- Available university services that support achievement in the course:
N/A

24. Required equipment:

25. References:

A- Required book (s), assigned reading and audio-visuals:
   • Introduction to the theory of computation, Michael Sipser, Thomson, 3rd edition,

B- Recommended books, materials, and media:

26. Additional information:
The University of Jordan                                Course Syllabus                                Accreditation and Quality Assurance Center

Name of Course Coordinator: ------------------- Signature: ------------------- Date: -------------------

Head of curriculum committee/Department: ------------------- Signature: -------------------

Head of Department: ------------------- Signature: -------------------

Head of curriculum committee/Faculty: ------------------- Signature: -------------------

Dean: ------------------- Signature: -------------------

Copy to:
Head of Department
Assistant Dean for Quality Assurance
Course File