| Study Plan for Bachelor program - Study Plan Development and Updating Procedures/ Software Engineering Department | QF01/0407-4.0E |
|---|---|

| Course Plan for Software Engineering (Bachelor Program) No.: (2021/2022) | | | |
|---|---|---|---|
| Approved by Deans Council by decision (09/19/2020-2021) dated (28/7/2021) | | | |
| (133) Credit Hours | | Study system / hybrid program | |
| Type of specialty | ☐ Humanitarian | ✓Scientific / technical | ☐ Medical Sciences |

| Teaching style | Percentage of study plan hours / number | Model used (synchronous: asynchronous) |
|---|---|---|
| **Complete e-learning courses** | **10% - 20% Maximum / number( ) C h** | **2:1 (For SUN. TUE. THER) or 1:1 (for MON. WED.)** |
| Blended Learning courses (For Humanity) | 40% - 60% Maximum / number( ) C h | 2:1 (For SUN. TUE. THER) or 1:1 (for MON. WED.) |
| **Blended learning courses (for scientific and medical)** | **30% -50% Maximum / number ( ) C h** | **2:1 (For SUN. TUE. THER) or 1:1 (for MON. WED.)** |
| Traditional learning courses (for humanity) | 20% Minimum / number ( ) C h | 3:0 For all academic divisions |
| **Traditional learning courses (for scientific and medical)** | **30% Minimum / number ( ) C h** | **3:0 For all academic divisions** |

Important note: (The teaching patterns of the subjects are distributed at all academic levels in the program)

Program vision: Building specialized competencies in the field of **Software Engineering** provided with the knowledge, skills and leadership, creative and entrepreneurial competencies necessary to compete in the global labor market, through creative application in the .use of information technology and modern teaching and learning strategies

Program mission and objectives:
1. Achieving the conformity of the learning outcomes in all areas of specialization with the seventh level descriptors (knowledge, skills and competencies) in the National Qualifications Framework.
2. Integrating modern information technology and employing it creatively in the teaching and learning processes in order to achieve more effective learning and take into account the needs of the learner.
3. Promote the principle of self-sustainable, lifelong learning, and highlight the creativity of the learner in light of global changes through the application of various teaching and learning strategies

Program learning outcomes (*(MK= Main Knowledge, MS= Main Skills, MC= Main Competences)*

| | **Main knowledge** |
|---|---|
| MK1 | The knowledge of software engineering principles, including a thorough understanding of software analysis and design, evaluation and testing and software quality and correctness. |
| MK2 | Understanding of software engineering processes, including management of complex software development projects. |
| MK3 | The knowledge of systems fundamentals, including architectures and organization, operating systems, networking and communication, parallel and distributed computation, and security. |
| MK4 | The knowledge of software development fundamentals, including data structures, algorithms, complexity, multiple programming languages, paradigms, and technologies. |
| MK5 | Understanding of mathematics, including discrete structures, probability and statistics. |
| | **Basic skills** |
| MS1 | An ability to analyze, design, verify, validate, implement, apply, maintain, and manage the development of software systems to meet desired needs within realistic constraints. |
| MS2 | An ability to identify, formulates, and solve software engineering problems. |

| | |
|---|---|
| MS3 | An ability to use the techniques, skills, and modern tools necessary for software engineering practice. |
| MS4 | An ability to appropriately apply discrete mathematics, probability and statistics, and relevant topics in computer science and supporting disciplines to complex software systems. |
| **General competencies** | |
| MC1 | An ability to function on multidisciplinary teams to communicate effectively. |
| MC2 | Ability to develop software systems in one or more significant application domains. |
| MC3 | An ability to communicate with, and learn from, experts from different domains throughout their careers. |

| Teaching style | | | Course No. | Course name | Credit hour | Theory Hours | Practical Hours | Prerequisite Co-requisite | Indicative | |
|---|---|---|---|---|---|---|---|---|---|---|
| Fully electronic learning | Blended learning | Traditional learning | | | | | | | Semester | year |
| **1. Requirements (27) Credit Hours** | | | | | | | | | | |
| **1.1 Mandatory requirement (21 credit hour)** | | | | | | | | | | |
| . | | | 0420101 | Military Sciences | 3 | 3 | 0 | | 1 | 1 |
| . | | | 0420151 | National Education | 3 | 3 | 0 | | 2 | 1 |
| . | | | 0420271 | Life skills | 3 | 3 | 0 | | 1 | 2 |
| . | | | 0420115 | Communication skills in Arabic | 3 | 3 | 0 | Remedial Arabic Language | 1 | 1 |
| . | | | 0420123 | Communication skills in English | 3 | 3 | 0 | Remedial English Language | 2 | 1 |
| . | | | 0420261 | Entrepreneurship and innovation | 3 | 3 | 0 | | 2 | 2 |
| . | | | 0420241 | Leadership and social responsibility | 3 | 3 | 0 | | 1 | 2 |
| **1.2 University elective requirements(06 credit hour)** | | | | | | | | | | |
| . | | | 0420142 | Human Civilization | 3 | 3 | 0 | | 1 | 1 |
| . | | | 0420253 | Development and environment | 3 | 3 | 0 | | 1 | 2 |
| . | | | 0420172 | Digital skills | 3 | 3 | 0 | Remedial computer skills | 2 | 1 |
| . | | | 0420201 | first aid | 3 | 3 | 0 | | 2 | 2 |
| . | | | 0420134 | Sports and health | 3 | 3 | 0 | | 1 | 1 |
| . | | | 0420212 | Islamic culture | 3 | 3 | 0 | | 1 | 2 |

| Teaching style | | | Course No. | Course name | Credit hour | Theory Hours | Practical Hours | Prerequisite Co-requisite | Indicative | |
|---|---|---|---|---|---|---|---|---|---|---|
| Fully electronic learning | Blended learning | Traditional learning | | | | | | | Semester | year |
| **2. Faculty Requirements ( 24 ) Credit Hours** | | | | | | | | | | |
| | | • | 0101140 | Principles of probabilities and Statistics | 3 | 3 | 0 | ..... | 1 | 1 |
| | | • | 0101101 | Calculus | 3 | 3 | 0 | ..... | 2 | 1 |
| | | • | 0112110 | Discrete Mathematics | 3 | 3 | 0 | ..... | 1 | 1 |
| | | • | 0112120 | Principles of Programming | 3 | 3 | 2 | Introduction to Information Technology | 1 | 2 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | • | 0112220 | Object Oriented Programming | 3 | 2 | 2 | Principles of Programming | 2 | 1 |
| | • | | 0114150 | Communication Skills and Professional Ethics | 3 | 2 | 0 | Introduction to Information Technology | 1 | 2 |
| | • | | 0115130 | Introduction to Information Technology | 3 | 3 | 0 | *Remedial computer skills | 1 | 1 |
| | | • | 0115220 | Web Design | 3 | 2 | 2 | Principles of Programming | 2 | 2 |

| Teaching style | | | Course No. | Course name | Credit hour | Theory Hours | Practical Hours | Prerequisite Co-requisite | Indicative | |
|---|---|---|---|---|---|---|---|---|---|---|
| Fully electronic learning | Blended learning | Traditional learning | | | | | | | Semester | year |
| **3. Requirements for a major family (30 ) Credit Hours** | | | | | | | | | | |
| | • | | **0115131** | Computer Networks | 3 | 3 | 0 | Introduction to Information Technology | 1 | 2 |
| | | • | **0114213** | Data Structure and Algorithms | 3 | 2 | 2 | Object Oriented Programming | 2 | 2 |
| | • | | **0112333** | Operating Systems | 3 | 3 | 0 | Digital Logic Design | 1 | 3 |
| | | • | **0114223** | Visual Programming Applications | 3 | 2 | 2 | Object Oriented Programming | 2 | 2 |
| | • | | **0112131** | Digital Logic Design | 3 | 3 | 0 | Discrete Mathematics | 2 | 1 |
| | | • | **0114324** | Web Applications Development | 3 | 2 | 2 | Web Design | 2 | 3 |
| | • | | **0112233** | Computer Architecture | 3 | 3 | 0 | Digital Logic Design | 1 | 3 |
| | | • | 0114341 | Database | 3 | 2 | 2 | Data Structure and Algorithms | 1 | 3 |
| | | • | 0114343 | Systems Analysis and Design | 3 | 2 | 2 | Software architecture | 2 | 2 |
| | | • | 0114442 | Database management system | 3 | 2 | 2 | Database | 2 | 3 |

| Teaching style | | | Course No. | Course name | Credit hour | Theory Hours | Practical Hours | Prerequisite Co-requisite | Indicative | |
|---|---|---|---|---|---|---|---|---|---|---|
| Fully electronic learning | Blended learning | Traditional learning | | | | | | | Semester | year |
| **4. Major requirements ( 52 ) Credit Hours** | | | | | | | | | | |
| 4.1 **Mandatory requirements ( 37 ) credit hours** | | | | | | | | | | |
| | • | | 0114151 | Software Engineering Principles | 3 | 3 | 0 | *Remedial computer skills | 1 | 1 |
| | • | | 0114152 | Software specification and design | 3 | 3 | 0 | Software Engineering Principles | 2 | 1 |
| | • | | 0114453 | Software testing | 3 | 2 | 2 | Systems Analysis and Design | 2 | 3 |
| | • | | 0114354 | Software architecture | 3 | 3 | 0 | Software specification and design | 1 | 2 |
| | | • | 0114455 | Software development and documentation | 3 | 2 | 2 | Systems Analysis and Design | 1 | 3 |
| | | • | 0114456 | Software project management | 3 | 2 | 2 | Systems Analysis and Design | 1 | 4 |
| | • | | 0114357 | Software economics | 3 | 3 | 0 | Systems Analysis and Design | 1 | 4 |
| | • | | 0114458 | Software quality management | 3 | 3 | 0 | Software testing | 1 | 4 |

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|---|---|---|---|---|---|---|---|---|---|---|
| | • | | 0114381 | Human computer interaction | 3 | 3 | 0 | Systems Analysis and Design | 1 | 4 |
| | • | | 0114471 | Software documentation techniques | 1 | 1 | 0 | Software development and documentation | 4 | 1 |
| | | • | 0114443 | Object oriented Systems Analysis and Design | 3 | 2 | 2 | Systems Analysis and Design | | |
| | | • | 0114490 | Filed Training | 3 | 0 | 6 | Department Approval | 4 | 2 |
| | | • | 0114472 | Final Project | 3 | 0 | 6 | Department Approval | 4 | 2 |
| **4.2 electives requirements ( 9 ) credit hours** | | | | | | | | | | |
| | | • | 0114382 | Intelligent System engineering | 3 | 3 | | Systems Analysis and Design | 1 | 4 |
| | | • | 0114494 | Special topics in SE | 3 | 2 | | Department Approval | 1 | 3 |
| | | • | 0114495 | Software Security | 3 | 3 | | Algorithms | 2 | 3 |
| | | • | 0114496 | Special programming language | 3 | 2 | | Department Approval | 2 | 4 |
| | | • | 0114391 | User experience Design | 3 | 3 | | Human computer interaction | 1 | 4 |
| | | • | 0114486 | Software configuration management | 3 | 3 | | Systems Analysis and Design | 1 | 4 |
| | | • | 0114392 | Mobile application Engineering and development | 3 | 3 | | Visual Programming Applications | 1 | 2 |
| | | • | 0114489 | Software maintenance and re-engineering | 3 | 2 | | Software development and documentation | 2 | 4 |
| | | • | 0114497 | Cloud computing and Big data | 3 | 3 | | Database management system | 1 | 3 |
| **4.3 supporting requirements ( 6 ) credit hours** | | | | | | | | | | |
| | | • | 0101221 | Linear Algebra 1 | 3 | 3 | 0 | Principles of Mathematics and Statistics | 1 | 2 |
| | | • | 0101272 | Numerical Analysis 1 | 3 | 3 | 0 | Principles of Mathematics and Statistics | 1 | 4 |

The end of the study plan for the major students

Subjects taught in the major for students of other majors (university requirements, college requirements, major family requirements, support requirements)

| Teaching style | | | Course No. | Course name | Credit hour | Theory Hours | Practical Hours | The type of requirement and the recipient |
|---|---|---|---|---|---|---|---|---|
| Fully electronic learning | Blended learning | Traditional learning | | | | | | |
| | | | 0114251 | Software Engineering Principles | 3 | 3 | 1 | Mandatory Major requirements for Computer Information Technology/Computer Information Technology,<br><br>Supporting Requirements for computer science /computer science |