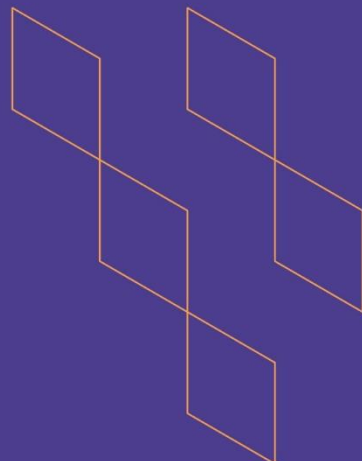




T-104
2022

Course Specification



| |
|--|
| Course Title: Software Engineering |
| Course Code: 371 COMP-3 |
| Program: Bachelor in Computer Science |
| Department: Computer Science |
| College: College of Computer Science and Information Technology |
| Institution: Jazan University |
| Version: V2 |
| Last Revision Date: 12-September-2021 |



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A. General information about the course:

| Course Identification | |
|---|--|
| 1. Credit hours: | 3 |
| 2. Course type | |
| a. | University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Track <input type="checkbox"/> Others <input type="checkbox"/> |
| b. | Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/> |
| 3. Level/year at which this course is offered: | 9/3 |
| <p>Software engineering is a major branch of computing science that deals with the development of software systems as practical and cost-effective solutions for individuals and society. This course covers the fundamentals of software engineering like software life cycle, requirements engineering, system development paradigm, and system modeling using UML. It also covers software verification & validation, important implementation issues, open-source development, and concepts of software re-engineering. The course has a strong technical relation with graduation project providing the opportunity to practice software engineering knowledge, skills, and practices in a realistic development setting with a real client.</p> | |
| 5. Pre-requirements for this course (if any): | |
| None | |
| 6. Co- requirements for this course (if any): | |
| None | |
| 7. Course Main Objective(s) | |
| <ul style="list-style-type: none"> • What is software development life cycle (SDLC)? • How to elicit requirements from a client and their classification? • How to use graphical models (UML diagrams) to represent software architecture? • What are the stages of software testing, and its role in Verification & Validation? • What rules must follow for Re-Engineering? | |

1. Teaching mode (mark all that apply)

| No | Mode of Instruction | Contact Hours | Percentage |
|----|--|---------------|------------|
| 1. | Traditional classroom | 44 | 80% |
| 2. | E-learning | | |
| 3. | Hybrid <ul style="list-style-type: none"> • Traditional classroom • E-learning | | |
| 4. | Distance learning (Self Learning) | 11 | 20% |



2. Contact Hours (based on the academic semester)

| No | Activity | Contact Hours |
|----|-------------------|---------------|
| 1. | Lectures | 22 |
| 2. | Laboratory/Studio | 22 |
| 3. | Field | |
| 4. | Tutorial | |
| 5. | Others (specify) | 8 |
| | Total | 52 |

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

| Code | Course Learning Outcomes | Code of CLOs aligned with program | Teaching Strategies | Assessment Methods |
|------|--|-----------------------------------|--|--|
| 1.0 | Knowledge and understanding | | | |
| 1.1 | Demonstrate the concepts of software engineering and its importance in software industry. | K1 | Class lectures and lecture notes | Midterm/ Assignment 1 / Final Exam/Final Lab |
| 1.2 | Outline the advantages of software evolution to support Software Re-engineering. | K1 | Research papers/ Class lectures/ lecture notes/ Case studies | Midterm/ Assignment 1/ Final Exam |
| ... | | | | |
| 2.0 | Skills | | | |
| 2.1 | Analyze the software requirements to select effective software engineering process based on requirements classification. | S2 | Class lectures/ lecture notes/Case studies | Final Exam/ Group Assignments |
| 2.2 | Analyze and design computer-based systems to meet desired needs. | S3 | Class lectures/ lecture notes/ Case studies / Brainstorming | Final Exam/ Assignments 1 /Group Assignments |
| 2.3 | Critique about the quality of product using Verification &Validation techniques | S3 | Class lectures/ lecture notes | Final Exam/ Group Assignments / |



| Code | Course Learning Outcomes | Code of CLOs aligned with program | Teaching Strategies | Assessment Methods |
|------|--|-----------------------------------|---|--|
| | | | | Final Lab |
| 2.4 | Communicate effectively through presentation to support the work in both verbal and writing. | S5 | [Lectures / Group Activity] | Assign-II (Presentation) |
| 3.0 | Values, autonomy, and responsibility | | | |
| 3.1 | Justify their ability to function as an effective team player to achieve a common goal. | V2 | Small group discussion / Brainstorming/ Class discussion to train students to think independently | Group Assignments/ Final Exam |
| 3.2 | Appraise the correctness of software artifacts by analyzing & designing them in UML. | V3 | Demonstrating real-time examples | Lab Exam, Assign-II (Group Assignment) |
| ... | | | | |

C. Course Content

| No | List of Topics | Contact Hours |
|----|---|---------------|
| 1. | <p>Chapter 1: Introduction and Software processes</p> <ul style="list-style-type: none"> Basic Definitions Role of Management in Software Development SoftwareProducts Essential attributes of good software Importance of Software Engineering practices Challenges for Software Engineering Practices Software Engineering diversity Software life Cycle Software Process Model & Its Types Waterfall Model Incremental Development Process Model Boehm's Spiral Model Reuse Oriented Software Engineering Model Agile Modeling <p>Self-Study: Scrum Methodology</p> | 6T + 4P |



| | | |
|-----|--|---------|
| | | |
| 2. | <p>Chapter 2 : Requirement Engineering</p> <ul style="list-style-type: none"> • Crucial process steps of Requirement Engineering • Types of Requirements • User and System Requirement • Categories of Metric • SRS Document • Requirements Gathering Techniques | 3T + 3P |
| 3. | <p>Chapter 3: System Modeling and Architectural Design</p> <ul style="list-style-type: none"> • System Modeling • Context Models • UML Diagram Types • Interaction Models • Structural Models • Architectural Design • Architectural Views | 3T + 3P |
| 4. | <p>Chapter 4: Design and Implementation</p> <ul style="list-style-type: none"> • An Object-Oriented Design Process • Context And Interaction Models • Implementation Issues <p>Self-Study: Open Source Development</p> | 3T + 3P |
| 5. | <p>Chapter 5: Software Testing and Maintenance</p> <ol style="list-style-type: none"> a) Software Verification and Validation b) Objectives of Software Testing c) Stages of Testing d) Black Box Testing e) White Box Testing f) Problems during Maintenance g) Types of Maintenance h) The Software Maintenance Process i) Maintenance Cost j) Software Re-Engineering <p>Self-Study: Maintenance prediction</p> | 5T + 2P |
| 6. | Lab Exam + Revision | 2T + 2P |
| --- | | |



| | |
|-------|---------|
| Total | 22T+22P |
|-------|---------|

D. Students Assessment Activities

| No | Assessment Activities * | Assessment timing (in week no) | Percentage of Total Assessment Score |
|-----|--|--------------------------------|--------------------------------------|
| 1. | Midterm Exam | 6th-7th week | 15% |
| 2. | Assignment I | 3rd week | 10% |
| 3. | Assignment II (Case Study/ Group assignment) | 6th-7th week | 15% |
| 4. | Lab Exam + Lab Assignment | As per schedule | 20% |
| 5. | Final Theory Exam | As per schedule | 40% |
| ... | | | |

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities

1. References and Learning Resources

| | |
|--------------------------|---|
| Essential References | Software Engineering, 10th Edition, 2015, Ian Sommerville, Pearson Education. ISBN-10: 0-13-703515-2 |
| Supportive References | R. S. Pressman, Software Engineering: A Practitioners Approach, 8th edition, 2015, McGraw Hill International publication. |
| Electronic Materials | <ul style="list-style-type: none"> https://www.slideshare.net/smrutisarang2/software-engineeringstudy-materials https://www.softwaretestinghelp.com/penetration-testing-tools/ https://Software-security-requirements-A-secure-SDLCs-critical-component |
| Other Learning Materials | Online tutorial |

2. Required Facilities and equipment

| Items | Resources |
|--|--|
| facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.) | <ul style="list-style-type: none"> Classroom equipped with projector, whiteboard, and sufficient seating arrangements. Lab with software installed and individual computer terminal for each student. |
| Technology equipment (projector, smart board, software) | <ul style="list-style-type: none"> Whiteboards and projectors for classroom and labs Computer Lab equipped with 30 PCs having Rational Rose, ArgoUml, MS-VISIO An active internet connection. |



| Items | Resources |
|---|-----------|
| Other equipment (depending on the nature of the specialty) | None |

F. Assessment of Course Quality

| Assessment Areas/Issues | Assessor | Assessment Methods |
|---|---------------------|--|
| Effectiveness of teaching | Students | Indirect (Course evaluation survey form) |
| Effectiveness of students assessment | CRC / QAU / HoD | Direct (Course reports / result analysis) |
| Quality of learning resources | Track leaders / CRC | Indirect (Review, meetings and star rating with suggestions for further modification and improvements) |
| The extent to which CLOs have been achieved | CRC / QAU | Direct (CLO assessment template further verified at course coordinator, Track leader and QAU level) |
| Other | | |

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval Data

| | |
|--------------------|--------------------|
| COUNCIL /COMMITTEE | DEPARTMENT COUNCIL |
| REFERENCE NO. | |
| DATE | 15/10/2022 |

