# Course Specification
## (Bachelor)

| | |
|---|---|
| **Course Title:** | Advanced Interaction |
| **Course Code:** | HCI4303 |
| **Program:** | BSc in Human Computer Interaction |
| **Department:** | Software Engineering |
| **College:** | Computing |
| **Institution:** | Umm Al Qura University |
| **Version:** | 1.0 |
| **Last Revision Date:** | 22/04/2025 |

# Table of Contents

## A. General information about the course:

### 1. Course Identification

| 1. Credit hours: | | | | | |
|---|---|---|---|---|---|
| 3 Hours | | | | | |
| **2. Course type** | | | | | |
| **A.** | ☐University | ☐College | ☒ Department | ☐Track | ☐Others |
| **B.** | ☒ Required | | ☐Elective | | |
| **3. Level/year at which this course is offered: (4th year/8th level)** | | | | | |
| **4. Course General Description:** | | | | | |
| This course delves into the advanced principles and techniques of interactive system design, focusing on innovative approaches to creating engaging and intuitive user experiences. Students will explore cutting-edge interaction paradigms such as multimodal interfaces, augmented reality (AR), virtual reality (VR), tangible interfaces, and gesture-based interactions. The course emphasizes the importance of designing systems that are accessible, responsive, and aligned with the principles of Human-Computer Interaction (HCI).<br>Using tools such as Unity, Unreal Engine, and advanced sensor technologies, students will develop prototypes and evaluate their effectiveness in real-world contexts. The course includes hands-on projects and discussions about ethical considerations in interaction design | | | | | |
| **5. Pre-requirements for this course** (if any)**:** | | | | | |
| None | | | | | |
| **6. Co-requisites for this course** (if any)**:** | | | | | |
| None | | | | | |
| **7. Course Main Objective(s):** | | | | | |
| 1. Master advanced interaction techniques, including multimodal interfaces, AR, VR, tangible interfaces, and gesture-based interactions.<br>2. Create systems that are responsive, inclusive, and aligned with HCI principles to ensure usability and engagement.<br>3. Gain hands-on experience with tools like Unity, Unreal Engine, and sensor technologies to build and assess interactive system prototypes.<br>4. Analyze and incorporate ethical practices in the design and implementation of interactive systems for real-world applications. | | | | | |

### 2. Teaching mode (mark all that apply)

| No | Mode of Instruction | Contact Hours | Percentage |
|---|---|---|---|
| 1 | Traditional classroom | 60 | 100% |
| 2 | E-learning | | |
| 3 | Hybrid<br>• Traditional classroom | | |

| No | Mode of Instruction | Contact Hours | Percentage |
|---|---|---|---|
| | • E-learning | | |
| 4 | Distance learning | | |

### 3. Contact Hours (based on the academic semester)

| No | Activity | Contact Hours |
|---|---|---|
| 1. | Lectures | 30 |
| 2. | Laboratory/Studio | 30 |
| 3. | Field | |
| 4. | Tutorial | |
| 5. | Others (specify) | |
| **Total** | | 60 |

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

| Code | Course Learning Outcomes | Code of PLOs aligned with the program | Teaching Strategies | Assessment Methods |
|---|---|---|---|---|
| **1.0** | **Knowledge and understanding** | | | |
| 1.1 | Learn the principles of designing for emerging technologies and platforms. | k1 | Lectures, discussions | Assignments, Group project, & Exams |
| **2.0** | **Skills** | | | |
| 2.1 | Develop interactive prototypes using tools like Unity, Unreal Engine, or similar platforms. | S1 | Lectures, discussions | Assignments, Group project, & Exams |
| 2.2 | Implement gesture-based and sensor-driven interactions in interactive systems. | S2 | Lectures, discussions | Assignments, Group project, & Exams |
| 2.3 | Design and evaluate multimodal user interfaces for accessibility and engagement. | S3 | Lectures, discussions | Assignments, Group project, & Exams |
| **3.0** | **Values, autonomy, and responsibility** | | | |

## C. Course Content

| No | List of Topics | Contact Hours |
|---|---|---|
| 1. | Introduction to Advanced Interaction And Environment Setup | 4 |
| 2. | Multimodal Interaction Design | 4 |
| 3. | Gesture-Based Interaction | 4 |
| 4. | Tangible Interaction Design | 4 |
| 5. | Augmented Reality (AR) Basics | 4 |
| 6. | Virtual Reality (VR) Basics | 4 |
| 7. | Accessibility in Advanced Interaction | 4 |
| 8. | Usability Testing for Advanced Systems | 4 |
| 9. | Prototyping Tools and Techniques | 8 |
| 10. | Ethical Considerations in Interaction Design | 4 |
| 11. | Advanced Interaction for Education and Training | 4 |
| 12. | Emerging technologies and their potential impact on interaction design | 8 |
| 13. | AI-driven interfaces and adaptive systems | 4 |
| **Total** | | **60** |

## D. Students Assessment Activities

| No | Assessment Activities * | Assessment timing (in week no) | Percentage of Total Assessment Score |
|---|---|---|---|
| 1. | Assignments | 3-14 | 10 |
| 2. | Project | 3-14 | 30 |
| 3. | Midterm | 7-8 | 20 |
| 4. | Final Exam | 16-17 | 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** | J. Tidwell, 2020 , Designing Interfaces: Patterns for Effective Interaction Design, O'Reilly Media; 3rd edition |
| **Supportive References** | |
| **Electronic Materials** | |
| **Other Learning Materials** | |

## 2. Required Facilities and equipment

| Items | Resources |
|---|---|
| **facilities**<br>(Classrooms, laboratories, exhibition rooms, simulation rooms, etc.) | Traditional Classroom |
| **Technology equipment**<br>(projector, smart board, software) | Multimedia Projector |
| **Other equipment**<br>(depending on the nature of the specialty) | |

## F. Assessment of Course Quality

| Assessment Areas/Issues | Assessor | Assessment Methods |
|---|---|---|
| Effectiveness of teaching | Students | Direct: Survey at the end of the course |
| Effectiveness of Students assessment | Instructor and quality assurance committee | Indirect: Course Report |
| Quality of learning resources | Instructor and quality assurance committee | Direct: Survey at the end of the course |
| The extent to which CLOs have been achieved | Instructor and quality assurance committee | Indirect: Course Report |
| Other | | |

**Assessors** (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

**Assessment Methods** (Direct, Indirect)

## G. Specification Approval

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|---|---|
| **COUNCIL /COMMITTEE** | **SOFTWARE ENGINEERING DEPARTMENT COUNCIL** |
| **REFERENCE NO.** | **THE 17TH MEETING FOR THE ACADEMIC YEAR 1446H** |
| **DATE** | **22/04/2025** |