**Course Specification**

(IT 433 Multimedia**)**

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| **University:** | Helwan University |
| **Faculty:** | Faculty of Computers & Information |
| **Department:** | Information Technology |

**1. Course Data**

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| --- | --- |
| **Code:** | **IT 433** |
| **Course title:** | Multimedia |
| **Level:** | 4 |
| **Specialization:** | Information Technology |
| **Credit hours:** | 3 hours |
| **Number of learning units (hours):** | (3) theoretical (2) practical |

**2. Course Objective**

The course aims at providing students with theoretical and technical understanding on multimedia components and systems.  The course covers contemporary, interactive multimedia technology systems, focusing on types, applications, and theories of operation.  Basic technologies such as multimedia data representation, compression, retrieval and communication will be covered in an integrated manner.  On the completion of the course, students should be able to understand the fundamental concepts and the technologies associated with various multimedia data types such as image, video, audio, graphics and animation.

**3. Intended Learning Outcomes:**

1. **Knowledge and Understanding**

A13. Identify the basics of multimedia systems.

1. **Intellectual Skills**

B18. Perform Creative Thinking.

B22. Negotiate advanced technologies.

B23. Formulate and implement IT systems.

1. **Professional and Practical Skills**

C27. Work efficiently with software systems.

1. **General and Transferable Skills**

D3. Use different Problem Solving techniques.

D13. Use Designing skills to solve problems effectively.

D14. Support Engineering skills.

**4. Course contents**

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| **Topic** |
| * Introduction to multimedia systems |
| * Digital Audio; Digital Video * Lossless and Lossy Compression |
| * predictive coding technique ; * Scalar and vector quantization; entropy Encoding |
| * JPEG Image Compression Standard; m * Motion estimation and compensation in video. |
| * Video Coding Standards: H.26X and MPEG * Wavelet coding |
| * Huffman Coding; Arithmetic Coding * Adaptive techniques |
| * Dictionary based coding (LZ77-LZ78-LZw) |
| * Introduction to multimedia Database * Network consideration for multimedia transmission |

**Mapping contents to ILOs**

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| --- | --- | --- | --- | --- |
| **Topic** | Intended Learning Outcomes (ILOs) | | | |
| Knowledge and understanding | Knowledge and understanding | Knowledge and understanding | Knowledge and understanding |
| Introduction to multimedia systems | A13 |  |  |  |
| Digital Audio; Digital Video Lossless and Lossy Compression | A13 | B22,B23,B18 | C27 | D3,D13 |
| predictive coding technique ; Scalar and vector quantization; entropy Encoding |  | B18,B22 | C27 | D13,D14 |
| JPEG Image Compression Standard Motion estimation and compensation in video. | A13 | B18,B22,B23 | C27 | D13,D3 |
| Video Coding Standards: H.26X and MPEG Wavelet coding | A13 | B22,B18 | C27 | D3 |
| Huffman Coding; Arithmetic Coding Adaptive techniques |  | B22,B23 | C27 | D3,D13,D14 |
| Dictionary based coding (LZ77-LZ78-LZw) |  | B18,B22,B23 |  | D3 |
| Introduction to multimedia Database Network consideration for multimedia transmission | A13 | B22 |  |  |

**5. Teaching and Learning Methods**

Lectures, Tutorial, Assignment, Project

**6. Teaching and Learning Methods for students with limited capability**

Using data show

e-learning management tools

**7. Students Evaluation**

**a) Used Methods**

**b) Time**

Assessment 1: Declared In the faculty

Assessment 2 : Declared In the faculty

Assessment 3 : Declared In the faculty

Assessment 4 : Declared In the faculty

**c) Grades Distribution**

Mid-Term Examination 20%

Final-term Examination 50%

Practical Examination 10%

Semester Work and Project 20%

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Total 100%

**List of Books and References**

**a) Notes**

**b) Mandatory Books**

"Multimedia: Making It Work" By: Tay Vaughan

"Information Technology: Principles and Applications"

By: Ajoy Kumar Ray & Tinku Acharya

"Digital Compression for Multimedia" By: Jerry D.Gibson and Toby Berger

**c) Suggested Books**

**d) Other publications**

**Course Coordinator:**  Dr.Nahla El\_Haggar

**Chairman of the Department:**

**Course Specification**

**(**IT 241 Signals and Systems**)**

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| --- | --- |
| **University:** | Helwan University |
| **Faculty:** | Faculty of Computers & Information |
| **Department:** | Information Technology |

**1. Course Data**

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| --- | --- |
| **Code:** | **IT 241** |
| **Course title:** | Signals and Systems |
| **Level:** | 2 |
| **Specialization:** | Information Technology |
| **Credit hours:** | 3 hours |
| **Number of learning units (hours):** | (3) theoretical (2) tutorial |

**2. Course Objective**

The aim of this course is to introduce the fundamental concepts of signals and systems to students in such a way as to enable them to specialize in diverse areas like communication systems, control systems, and signal processing.

**3. Intended Learning Outcomes:**

1. **Knowledge and Understanding**

A14. Describe Techniques of interactions.

1. **Intellectual Skills**

B23. Formulate and implement IT systems.

B24. Investigate different data formats.

B25. Apply Communications skills.

1. **Professional and Practical Skills**

C21. Choose appropriate Data Modeling.

C25. Use of communications tools and technologies.

1. **General and Transferable Skills**

D14. Support Engineering skills.

**4. Course contents**

|  |
| --- |
| **Topic** |
| Functions and Signals |
| Linear Time-Invariant (LTI) Systems |
| Fourier Analysis for Continuous-Time Signals and Systems |
| Fourier Analysis for Discrete-Time Signals and Systems |
| The Laplace Transform |
| The z-Transform |
| Applications |

**Mapping contents to ILOs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Topic** | Knowledge and understanding | | | |
| Knowledge and understanding | Intellectual Skills | Professional and practical skills | General and Transferable skills |
| Functions and Signals | A14 | B24,B23 |  | D14 |
| Linear Time-Invariant (LTI) Systems | A14 | B23 | C25 | D14 |
| Fourier Analysis for Continuous-Time Signals and Systems | A14 | B24,B23 | C25,C21 | D14 |
| Fourier Analysis for Discrete-Time Signals and Systems | A14 | B24,B23 | C21,C25 | D14 |
| The Laplace Transform | A14 | B24,B23 | C25 |  |
| The z-Transform | A14 | B24,B23 | C25 | D14 |
| Applications |  | B24,B23,B25 |  |  |

**5. Teaching and Learning Methods**

Lecturing, work-along exercise, chapter preview and review, think-pair-share, one minute paper, in-class exercise, lab work, problem Q&A, case study and reporting, guided on-line exercise through Blackboard, self-study of circuit responses using simulation software, self-test multiple choice and short questions

**6. Teaching and Learning Methods for students with limited capability**

Using data show

e-learning management tools

**7. Students Evaluation**

**a) Used Methods**

Assignments, Test

**b) Time**

Assessment 1

Assessment 2

Assessment 3

Assessment 4

**c) Grades Distribution**

Mid-Term Examination 20%

Final-term Examination 60%

Semester Work and Project 20%

Total 100%

**List of Books and References**

**a) Notes**

Course Notes

**b) Mandatory Books**

**c) Suggested Books**

**d) Other publications**

**Course Coordinator:**  Dr. Hossam

**Chairman of the Department:**