**TEMPLATE FOR COURSE SPECIFICATION**

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| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

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| This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification. | |
| Al-Maarif University College | **1. Teaching Institution** |
| Computer Engineering Techniques | **2. University Department/Centre** |
| Digital Signal Processing | **3. Course title/code** |
| Bachelor in Computer Engineering Techniques | **4. Programme(s) to which it Contributes** |
| Face-to-face and online presence | **5. Modes of Attendance offered** |
| Year | **6. Semester/Year** |
| 120 | **7. Number of hours tuition (total)** |
| 22.06.2021 | **8. Date of production/revision of this specification** |
| **9. Aims of the Course** | |
| * Introduce the student to the basics of signal processing and the use of processing methods in the analysis and processing of sound and image signals and the use of digital filters. | |

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| **10· Learning Outcomes, Teaching ,Learning and Assessment Method** |
| **A. Knowledge and Understanding**  A1. Mathematical analysis and signal processing methods  A2. Recognize the types of digital signals and methods of their analysis  A3. Mathematical calculations and design of digital filters |
| **B. Subject-specific skills**  B1. Read and understand the topic in a way that achieves the required scientific benefit  B2. Developing the student's mental ability in the field of scientific and academic specialization |
| **Teaching and Learning Methods** |
| * The direct method is through lectures * Practical application in the laboratory * The subjective method by preparing research papers and discussing them collectively |
| **Assessment methods** |
| * Feedback from students * Daily and quarterly exams * Preparing scientific reports and assignments |
| **C. Thinking Skills**  C1. Providing the student with analysis skills and an understanding of how to process signals in digital systems  C2. Statement of accreditation of communications systems to process the signal in all its forms |
| **Teaching and Learning Methods** |
| * Knowledge of questions and inquiries distinctive depth and accuracy. * Simulate the student towards understanding the cause and cause. * Increase digital sense of expression. * Brainstorming. |
| **Assessment methods** |
| * Individualizing part of the exam questions that require depth of thinking, explanation and accuracy of observation. * Student participation in the classroom. * extra-curricular duties |

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| **11. Course Structure** | | | | | |
| **Assessment Method** | **Teaching Method** | **Unit/Module or Topic Title** | **ILOs** | **Hours** | **Week** |
|  |  | Introduction to digital signal processing |  | 4 | 1 |
|  |  | Basic elements of DSP, DSP vs. ASP, application of DSP |  | 4 | 2 |
|  |  | Continues time signal vs. discrete time signals |  | 4 | 3 |
|  |  | Discrete time signals and sequences |  | 4 | 4 |
|  |  |  | 4 | 5 |
|  |  |  | 4 | 6 |
|  |  | Standard of discrete time signals (sequences), Unit sample sequence |  | 4 | 7 |
|  |  | Unit step sequence |  | 4 | 8 |
|  |  | Unit ramp sequence |  | 4 | 9 |
|  |  | Exponential sequence |  | 4 | 10 |
|  |  | Classification of discrete time signals, system properties |  | 4 | 11 |
|  |  | Static and dynamic system, shift invariant and shift variant system |  | 4 | 12 |
|  |  | Causal and non-causal system, linear and nonlinear system, Stable and unstable system |  | 4 | 13 |
|  |  | Convolution : direct form method, graphical method, side rule method |  | 4 | 14 |
|  |  | Correlation of discrete time sequence |  | 4 | 15 |
|  |  | Cross correlation and auto correlation |  | 4 | 16 |
|  |  | Frequency domain representation |  | 4 | 17 |
|  |  | Find frequency response |  | 4 | 18 |
|  |  | Discrete Fourier transform DFT, linear convolution using DFT, Invers Fourier transform (IDFT) |  | 4 | 19 |
|  |  |  | 4 | 20 |
|  |  |  | 4 | 21 |
|  |  | Fast Fourier transform (FFT), Butterfly computation, Invers Fast Fourier transform (IFFT) |  | 4 | 22 |
|  |  |  | 4 | 23 |
|  |  | Introduction to Z transform |  | 4 | 24 |
|  |  |  | 4 | 25 |
|  |  |  | 4 | 26 |
|  |  | Realization of digital filter: Basic FIR filter structure, direct form of FIR structure, Cascaded form of FIR structure, basic IIR filter structure Cascaded form of IIR structure. |  | 4 | 27 |
|  |  |  | 4 | 28 |
|  |  |  | 4 | 29 |
|  |  |  | 4 | 30 |

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| **D. General and Transferable Skills (other skills relevant to employability and personal development)**  D1. Improve debating skills  D2. Raising research perceptions and transferring students from the stage of education to learning |

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| **12. Infrastructure** | |
| * “ Digital Signal Processing”, C. Ramesh Babu Durai “Digital Signal Processing”, schaum. * “Digital Signal Processing”, Dr. Sanjay Sharma | Required reading:  · CORE TEXTS  · COURSE MATERIALS  · OTHER |
| * E-Learning / The official page of the College of Knowledge | Special requirements (include for example workshops, periodicals, IT software, websites) |
| * Guest Lectures * Internship | Community-based facilities  (include for example, guest  Lectures , internship , field studies) |

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| 13. Admissions | |
| None | Pre-requisites |
| 8 | Minimum number of students |
| 100 | Maximum number of students |