**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** |
| Computer Networks Simulators | **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** | |
| * The course aims to introduce the student to the use of simulation programs that are used in building the network structure and calculating the main network measurements and characteristics using the programs: NS2 and Packet tracer. | |

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| **10· Learning Outcomes, Teaching ,Learning and Assessment Method** |
| **A. Knowledge and Understanding**  A1. Knows network simulation software  A2. There are many types of programs that simulate networks  A3. Differentiate between types of simulations |
| **B. Subject-specific skills**  B1. Analyze the performance of networks and protocols in the network  B2. Distinguish simulation methods |
| **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. Opening the way for students to think logically about problems that require software solutions that contribute to accelerating the finding of solutions |
| **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 networks simulation |  | 4 | 1 |
|  |  | Simulator vs. emulator |  | 4 | 2 |
|  |  | Why simulation |  | 4 | 3 |
|  |  | Benefits and limitation of simulations |  | 4 | 4 |
|  |  | Simulation techniques as an engineering tools |  | 4 | 5 |
|  |  | Event driven vs. time driven |  | 4 | 6 |
|  |  | The use of measurement data |  | 4 | 7 |
|  |  | Networking terminology |  | 4 | 8 |
|  |  | Common physical and logical topologies |  | 4 | 9 |
|  |  | Networking architectures |  | 4 | 10 |
|  |  | OSI |  | 4 | 11 |
|  |  | HUBs, SWITCHs, Routers |  | 4 | 12 |
|  |  | Understating IP. IPv6 |  | 4 | 13 |
|  |  | Routing techniques |  | 4 | 14 |
|  |  | Remote management, network monitoring tools |  | 4 | 15 |
|  |  | Troubleshooting |  | 4 | 16 |
|  |  | Systematic methodology |  | 4 | 17 |
|  |  | Tools to troubleshoots |  | 4 | 18 |
|  |  | Troubleshooting name resolution |  | 4 | 19 |
|  |  | Introduction to system models |  | 4 | 20 |
|  |  | Event probability |  | 4 | 21 |
|  |  | Discrete probability models |  | 4 | 22 |
|  |  | Continuous probability models |  | 4 | 23 |
|  |  | Basic queuing models |  | 4 | 24 |
|  |  | Introduction to discrete-event |  | 4 | 25 |
|  |  | Statistical estimation |  | 4 | 26 |
|  |  | Computer and network performance |  | 4 | 27 |
|  |  | Model building |  | 4 | 28 |
|  |  | Verification of simulation models |  | 4 | 29 |
|  |  | Calibration and validation of models |  | 4 | 30 |

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| **D. General and Transferable Skills (other skills relevant to employability and personal development)**  D1. Develop the student's ability to use multiple sources of the curriculum.  D2. Develop the student's ability to deal with modern technologies related to the course vocabulary.  D3. Develop the student's ability to face problems and dilemmas and find appropriate solutions to them.  D4. Develop the student's ability to translate academic information into practical reality |

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| **12. Infrastructure** | |
| * Modeling and Simulation of Computer Networks and Systems - 1st Edition * Introduction to Network Simulator NS2 * Network Modeling and Simulation: A Practical Perspective | 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 |