**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 program specification. |

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| Baghdad University | 1. Teaching Institution |
| College of Engineering/Department of Electrical Engineering | 2. University Department/Centre |
| Communication II | 3. Course title/code |
| Electrical Engineering | 4. Program(s) to which it contributes |
| Internal | 5. Modes of Attendance offered |
| Fourth Year Class | 6. Semester/Year |
| 60 | 7. Number of hours tuition (total) |
| 2016 | 8. Date of production/revision of this specification |
| 9. Aims of the Course | |
| Build strong electrical engineers able to design digital communication system for the entire communication channel chain, source coding and decoding, channel coding and decoding, modulation, demodulation and detection. | |
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| 10· Learning Outcomes, Teaching, Learning and Assessment Method |
| 1. Knowledge and Understanding   A1. Understanding academic texts and try to solve the problems in the end of each chapter.  A2. Learn how to reflect the theoretical functions and definitions to practical applications.  A3. Finding and understanding information about digital communications problems and theories. |
| B. Subject-specific skills  B1. Solving some specific problems with different ideas related to the subject courses.  B2. Explore the web pages that concerned on Digital Communications.  B3. Manipulating some powerful software like Matlab in order to solve some channel coding problems with specific modulation scheme.  B4. Making an oral presentation and seminars. |
| Teaching and Learning Methods |
| Lecturing and Exercises and Homework. |
| Assessment methods |
| Exams |
| C. Thinking Skills  C1. Being able to form personal opinions about issues through attempting to solve different problems. |
| Teaching and Learning Methods |
| Lecturing & Class discussions |
| Assessment methods |
| Exams that involve problem-solving skills and critical thinking skills |

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| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1. Effective communication to understand and imagine the idea behind the problem want to be solved.  D2. Team work |

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| 11. Course Structure | | | | | |
| Assessment Method | Teaching  Method | Unit/Module or Topic Title | ILOs | Hours | Week |
| Exam | Lecturing, Discussions & Exercises | Source of information (Entropy) |  | 2 | 1 |
| Exam | Lecturing, Discussions & Exercises | Discrete memory-less channels, Memory channel and Channel model |  | 2 | 2 |
| Exam | Lecturing, Discussions & Exercises | Joint and conditional entropies |  | 2 | 3 |
| Exam | Lecturing, Discussions & Exercises | Capacity and efficiency of symmetric and non-symmetric discrete channels |  | 2 | 4 |
| Exam | Lecturing, Discussions & Exercises | Optimum threshold mutual information |  | 2 | 5 |
| Exam | Lecturing, Discussions & Exercises | Channel capacity, entropy, and capacity of a continuous channel |  | 2 | 6 |
|  |  | New Year Holiday |  |  | 7 |
|  |  | Exam (1) |  | 1 | 8 |
| Exam | Lecturing, Discussions & Exercises | Source Coding Theorem with Mathematical model of information source |  | 1 | 8 |
| Exam | Lecturing, Discussions & Exercises | Channel Coding, Types of Channel coding |  | 2 | 9 |
| Exam | Lecturing, Discussions & Exercises | Linear Block Code (LBC) |  | 2 | 10 |
| Exam | Lecturing, Discussions & Exercises | Binary Cyclic Code (BCC) |  | 2 | 11 |
| Exam | Lecturing, Discussions & Exercises | Conventional Codes, conventional decoder |  | 2 | 12 |
|  |  | Mid-Year Break |  |  | 13 |
|  |  | Exam (2) |  | 1 | 14 |
| Exam | Lecturing, Discussions & Exercises | Digital Modulation System, ASK, FSK and PSK Modulation and demodulation |  | 1 | 14 |
| Exam | Lecturing, Discussions & Exercises | Multilevel Modulation Techniques, MFSK, |  | 2 | 15 |
| Exam | Lecturing, Discussions & Exercises | Multilevel Modulation Techniques, MPSK, QAM |  | 2 | 16 |
| Exam | Lecturing, Discussions & Exercises | Performance of Digital Communications |  | 2 | 17 |
|  |  | Exam (3) |  | 1 | 18 |
| Exam | Lecturing, Discussions & Exercises | Spread Spectrum (SS) Systems, Types of SS Techniques (DSSS and FHSS) |  | 1 | 18 |
| Exam | Lecturing, Discussions & Exercises | Representation of Spread Spectrum (SS) Systems |  | 2 | 19 |
| Exam | Lecturing, Discussions & Exercises | Applications of Spread Spectrum (SS) Systems. CDMA |  | 2 | 20 |
| Exam | Lecturing, Discussions & Exercises | Optical fiber Communications, Introduction, Total Internal Reflection, Acceptance angle, Numerical Aperture Phase and group velocity, Mode coupling, Step index, Graded index fibers |  | 2 | 21 |
| Exam | Lecturing, Discussions & Exercises | Attenuation, Material absorption Intrinsic absorption, Extrinsic absorption |  | 2 | 22 |
|  |  | Exam (4) |  | 1 | 23 |
|  |  | Dispersion, Chromatic dispersion |  | 1 | 23 |
| Exam | Lecturing, Discussions & Exercises | Material dispersion, Waveguide dispersion |  | 2 | 24 |
| Exam | Lecturing, Discussions & Exercises | Laser, Absorption, Spontaneous Emission, Stimulated Emission. |  | 2 | 25 |
| Exam | Lecturing, Discussions & Exercises | Optical Sources, LED, Laser Diode |  | 2 | 26 |
|  |  | Optical Detectors, Photodiode PIN, APD  Fiber Optic Systems Design Considerations, Link Power Budget. |  | 2 | 27 |
|  |  | Final Exam |  | 3 | 28 |

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| 12. Infrastructure | |
| 1. William Stallings, Data and Computer Communications. (Pearson Education, Inc. 7th edition, 2007). 2. K. Sam Shanmugam - Digital and Analog Communication Systems. (John Wiley & Sons, 1979). 3. John M. Senior, Optical Fiber Communications (Pearson Education Limited 2009) | Required reading:  · CORE TEXTS  · COURSE MATERIALS  · OTHER |
| Internet links related to the topics discussed in the book and class. | Special requirements (include for example workshops, periodicals, IT software, websites) |
| None | Community-based facilities  (include for example, guest  Lectures , internship , field studies) |

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| 13. Admissions | |
| ---------- | Pre-requisites |
| 40 | Minimum number of students |
| 50 | Maximum number of students |