**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. |

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| University of Baghdad | 1. Teaching Institution |
| Electronics and communication | 2. University Department/Centre |
| Probability and statistics | 3. Course title/code |
|  | 4. Programme(s) to which it contributes |
|  | 5. Modes of Attendance offered |
| Year | 6. Semester/Year |
| Two per week | 7. Number of hours tuition (total) |
| 1/3/2016 | 8. Date of production/revision of this specification |
| 9. Aims of the Course | |
| The objective of the course is to provide comprehensive theoretical concepts and practical tools of the probability theory and mathematical statistics that are effectively used in science and engineering. | |

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| 10· Learning Outcomes, Teaching, Learning and Assessment Method. |
| 1. Knowledge and Understanding   A1. Basic probability axioms, continuous and discrete random variables.  A2. How to derive the probability density function, marginal and conditional.  A3. Discrete and continuous distributions.  A4. Moment generating function.  A5. Central limit theorem.  A6. Estimation. |
| B. Subject-specific skills  B1. Study, correctly apply and interpret statistical methods.  B2. Course knowledge can be used in population surveys.  B3.knowledge can be used in surveys, quality control and market research. |
| Teaching and Learning Methods |
| Lectures, discussion, case studies, completion of tutorial and practice questions. |
| Assessment methods |
| Written exam, in lecture review questions on topics completed. |
| C. Thinking Skills  C1.  C2.  C3.  C4. |
| Teaching and Learning Methods |
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| Assessment methods |
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| D. General and Transferable Skills (other skills relevant to employability and personal development)  D1.  D2.  D3.  D4. |

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| 11. Course Structure | | | | | | | |
| Assessment Method | Teaching  Method | | | Unit/Module or Topic Title | ILOs | Hours | Week |
| Quiz/Exam | Lectures | | Events; operation with events | |  | 2 | 1 |
| Quiz/Exam | Lectures | | Counting of sampling points | |  | 2 | 2 |
| Quiz/Exam | Lectures | | Probability laws | |  | 2 | 3 |
| Quiz/Exam | Lectures | | Bayes’ Theorem | |  | 2 | 4 |
| Quiz/Exam | Lectures | | Random variables; discrete and continuous | |  | 2 | 5 |
| Quiz/Exam | Lectures | | Joint probability distribution | |  | 2 | 6 |
| Quiz/Exam | Lectures | | Expectation and variance | |  | 2 | 7 |
| Quiz/Exam | Lectures | | Laws of Expectation and variance | |  | 2 | 8 |
| Quiz/Exam | Lectures | | Chebyshev’s Theorem | |  | 2 | 9 |
| Quiz/Exam | Lectures | | Uniform distribution | |  | 2 | 10 |
| Quiz/Exam | Lectures | | Binomial distribution | |  | 2 | 11 |
| Quiz/Exam | Lectures | | Hypergeometric distribution | |  | 2 | 12 |
| Quiz/Exam | Lectures | | Poisson distribution | |  | 2 | 13 |
| Quiz/Exam | Lectures | | Negative binomial | |  | 2 | 14 |
| Quiz/Exam | Lectures | | Geometric distribution | |  | 2 | 15 |
| Quiz/Exam | Lectures | | Term exam | |  | 2 | 16 |
| Quiz/Exam | Lectures | | Normal distribution | |  | 2 | 17 |
| Quiz/Exam | Lectures | | Binomial approximation to the Normal | |  | 2 | 18 |
| Quiz/Exam | Lectures | | Gamma, Exponential and Chi-square distribution, | |  | 2 | 19 |
| Quiz/Exam | Lectures | | Weibull distribution | |  | 2 | 20 |
| Quiz/Exam | Lectures | Functions of random variables | | |  | 2 | 21 |
| Quiz/Exam | Lectures | Random sampling | | |  | 2 | 22 |
| Quiz/Exam | Lectures | Sampling Theorem | | |  | 2 | 23 |
| Quiz/Exam | Lectures | Sampling distribution of means | | |  | 2 | 24 |
| Quiz/Exam | Lectures | Sampling distribution of (n-1)s2/σ2 | | |  | 2 | 25 |
| Quiz/Exam | Lectures | T-distribution and F-distribution | | |  | 2 | 26 |
| Quiz/Exam | Lectures | Estimation of the mean | | |  | 2 | 27 |
| Quiz/Exam | Lectures | Estimating the variance | | |  | 2 | 28 |
| Quiz/Exam | Lectures | Statistical Hypothesis: type I and type II errors | | |  | 2 | 29 |
| Quiz/Exam | Lectures | Concepts of random process | | |  | 2 | 30 |
| Quiz/Exam | Lectures | Classification of random process | | |  | 2 | 31 |
| Quiz/Exam | Lectures | Term exam | | |  | 2 | 32 |

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| 12. Infrastructure | |
| Probability and statistics for engineers and scientists by Walpole, Myers, and Ye | Required reading:  · CORE TEXTS  · COURSE MATERIALS  · OTHER |
|  | Special requirements (include for example workshops, periodicals, IT software, websites) |
|  | Community-based facilities  (include for example, guest  Lectures , internship , field studies) |

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| 13. Admissions | |
|  | Pre-requisites |
| 10 | Minimum number of students |
| 37 | Maximum number of students |