

Detailed Course Description - Course Plan Development and Updating Procedures/ Mathematics Department	QF01/0408-3.0E
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Faculty	Science	Department	Mathematics
Course number	0101343	Course title	Applied Probability
Number of credit hours	3	Pre-requisite/co-requisite	Probability theory(0101341)

- Revision of some probability distributions
- Queuing Theory (Description of queuing models, the Poisson process, Birth-Death processes, single server queue and some modifications)
- Reliability Theory (Failure laws and failure rate, reliability of series and parallel systems)
- Quality control (control charts, acceptance sampling, single sampling plan, other sampling plans)
- Information theory and coding (Uncertainty, information measures and entropies, the first coding theorem discrete channels and the second coding theorem)

Course goals and learning outcomes	
Goal 1	Knowledge and Understanding Skills
Learning outcomes	<ol style="list-style-type: none"> 1. Define the random process (especially the Poisson Process). 2. Define the reliability function and the failure rate function. 3. Define the entropy and use it to find the average amount of information.
Goal 2	Intellectual Analytical and Cognitive Skills
Learning outcomes	Classify the failure rate function as increasing, decreasing, constant or bathtub.
Goal 3	Subject- Specific Skills
Learning outcomes	<ol style="list-style-type: none"> 1. Describe the queuing model. 2. Solve Problems on series connections and parallel connections. 3. Draw control charts. 4. Construct the Huffman Encoding and Shannon-Fano code.
Goal 4	Creativity /Transferable Key Skills/Evaluation
Learning outcomes	<ol style="list-style-type: none"> 1. Apply the Poisson process and the birth –death process. 2. Solve Problems on series connections and parallel connections. 3. Apply the single sampling plan and double sampling plan. 4. Construct the Huffman Encoding and Shannon-Fano code. 5. Apply the first and second coding
Textbook	Ian F. Blake, An Introduction to Applied Probability, John Wiley and Sons.
Supplementary references	Bain and Engelhardt, Introduction To Probability And Mathematical Statistics, Second Edition

Course timeline				
Week	Number of hours	Course topics	Pages (textbook)	Notes
01	1 1 1	Revision of Probability Distributions		
02	1 1 1	Revision of Probability Distributions		
03	1 1 1	Queueing Theory Description of Queueing Models Queueing Theory Description of Queueing Models Queueing Theory Description of Queueing Models		
04	1 1 1	The Poisson Process The Poisson Process The Poisson Process		
05	1 1 1	Birth-Death Processes and the Single Server Queue Birth-Death Processes and the Single Server Queue Birth-Death Processes and the Single Server Queue		
06	1 1 1	Modification of the Single Server Queue Modification of the Single Server Queue First Exam		
07	1 1 1	Reliability Theory Failure Laws and Reliability Reliability Theory Failure Laws and Reliability Reliability Theory Failure Laws and Reliability		
08	1 1 1	Reliability Theory Failure Laws and Reliability Series Connections Series Connections		
09	1 1 1	Series Connections Series Connections Parallel Connections		
10	1 1 1	Parallel Connections Parallel Connections Parallel Connections		
11	1 1 1	Control Charts Control Charts Control Charts		
12	1 1 1	Acceptance Sampling by Attributes-Single Sampling Plans Acceptance Sampling by Attributes-Single Sampling Plans Second Exam		
13	1 1 1	Other Acceptance Sampling Plans Other Acceptance Sampling Plans Other Acceptance Sampling Plans		

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14	1	Uncertainty, Information and Entropy		
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15	1	Discrete Sources and the First Coding Theorem		
	1	Discrete Sources and the First Coding Theorem		
	1	Discrete Sources and the First Coding Theorem		
16	1	Discrete Channels and the Second Coding Theorem		
	1	Discrete Channels and the Second Coding Theorem		
	1	Final Exam 50%		

Theoretical course evaluation methods and weight	Participation = 10% First exam 20% Second exam 20% Final exam 50%	Practical (clinical) course evaluation methods	Semester students' work = 50% (Reports, research, quizzes, etc.) Final exam = 50%
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Approved by head of department	Dr. Amjed Zraiqat	Date of approval	
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Extra information (to be updated every semester by corresponding faculty member)

Name of teacher	Dr. Ma'mon AbuHammad	Office Number	9127
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Office hours			