



مركز الاعتماد
وإضمان الجودة
ACCREDITATION & QUALITY ASSURANCE CENTER



The University of Jordan

Accreditation & Quality Assurance Center

COURSE Syllabus

Course Name: Applied Probability

1	Course title	Applied Probability
2	Course number	0301338
3	Credit hours (theory, practical)	3
	Contact hours (theory, practical)	3
4	Prerequisites/corequisites	0301333
5	Program title	B.Sc.
6	Program code	
7	Awarding institution	The University of Jordan
8	Faculty	Science
9	Department	Mathematics
10	Level of course	College requirement
11	Year of study and semester (s)	3 st year, all Semesters
12	Final Qualification	B.Sc. in Mathematics
13	Other department (s) involved in teaching the course	None
14	Language of Instruction	English
15	Date of production/revision	November,9,2017

16. Course Coordinator:

Dr. Morad Ahmad

Office numbers: 317

office hour:, Sun, Tues: 9:00-10:00, 11:00-12:00

Thur. 9:00-10:00

phone numbers: 22089

email addresses : morad.ahmad@ju.edu.jo

17. Other instructors:

Office numbers, office hours, phone numbers, and email addresses should be listed.

18. Course Description:

- 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)

19. Course aims and outcomes:

Aims:

1. Define the random process (especially the Poisson Process).
2. Describe the queuing model.
3. Apply the Poisson process and the birth –death process.
4. Define the reliability function and the failure rate function.
5. Classify the failure rate function as increasing, decreasing, constant or bathtub.
6. Solve Problems on series connections and parallel connections.
7. Draw control charts.
8. Apply the single sampling plan and double sampling plan.
9. Define the entropy and use it to find the average amount of information.
10. Construct the Huffiman Encoding and Shannon-Fano code.
11. Apply the first and second coding.

B- Intended Learning Outcomes (ILOs): Upon successful completion of this course students will be able to ...**A. Knowledge and Understanding Skills:** Student is expected to

- A1) Define the random process (especially the Poisson Process).
- A2) Define the reliability function and the failure rate function.
- A3) Define the entropy and use it to find the average amount of information.

B. Intellectual Analytical and Cognitive Skills: Student is expected to

- B1) Classify the failure rate function as increasing, decreasing, constant or bathtub.

C. Subject- Specific Skills: Student is expected to

- C1) Describe the queuing model.
- C2) Solve Problems on series connections and parallel connections.
- C3) Draw control charts.
- C4) Construct the Huffiman Encoding and Shannon-Fano code.

D. Creativity /Transferable Key Skills/Evaluation: Student is expected to

- D1) Apply the Poisson process and the birth –death process.
- D2) Solve Problems on series connections and parallel connections.
- D3) Apply the single sampling plan and double sampling plan.
- D4) Construct the Huffiman Encoding and Shannon-Fano code.
- D5) Apply the first and second coding

20. Topic Outline and Schedule:

1.					
Topic	Week	Instructor	Achieved ILOs	Evaluation Methods	Reference
1. Revision of Probability Distributions	1-2			Exam	
2. Queueing Theory Description of Queueing Models The Poisson Process Birth-Death Processes and the Single Server Queue Modification of the Single Server Queue	3-6		A1 C1 D1	Exam	
3. Reliability Theory Failure Laws and Reliability Series Connections Parallel Connections	7-10		A1, A2 B1 C2 D2	Exam	
4. Quality Control and Acceptance Sampling Control Charts Acceptance Sampling by Attributes-Single Sampling Plans Other Acceptance Sampling Plans	11-13		C3 D3	Exam	
5. Information Theory and Coding Uncertainty, Information and Entropy Discrete Sources and the First Coding Theorem Discrete Channels and the Second Coding Theorem	14-15		A3 C4 D4, D5	Exam	

21. Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:

In order to succeed in this course, each student needs to be an active participant in learning – both in class and out of class.

- The instructor will spend most of the class time on presenting the new material as well as on discussing homework problems.
- Group work in this class is encouraged.
- To actively participate in class, you need to prepare by reading the textbook and to do all assigned problems before class. (Problems will be assigned each class period, then to be discussed the following period).
- You should be prepared to discuss your homework at each class meeting.
- You are encouraged to work together with other students and to ask questions and seek help from your professor, both in and out of class.
- Students are also encouraged to use graphing calculators extensively and to use computer software supplements.

22. Evaluation Methods and Course Requirements:

Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:

ILO/s	Learning Methods	Evaluation Methods	Related ILO/s to the program
	Lectures	Exam	

23. Course Policies:

1. Attendance is absolutely essential to succeed in this course. You are expected to attend every class; please notify your instructor if you know you are going to be absent. All exams must be taken at the scheduled time. Exceptions will be made only in extreme circumstances, by prior arrangement with the instructor.
2. If a student is absent for more than 10% of lectures without an excuse of sickness or due to other insurmountable difficulty, then he/she shall be barred from the final examination also he/she will get a failing grade in this course.
3. Medical certificates shall be given to the University Physician to be authorized by him. They should be presented to the Dean of the Faculty within two weeks of the student's ceasing to attend classes.
4. Test papers shall be returned to students after correction. His/her mark is considered final after a lapse of one week following their return.
6. Cheating is prohibited. The University of Jordan regulations on cheating will be applied to any student who cheats in exams or on homeworks.

24. Required equipment:

Data Shows

25. References:

A- Required book (s), assigned reading and audio-visuals:

Ian F. Blake, An Introduction to Applied Probability, John Wiley and Sons.

B- Recommended books, materials, and media:

- (1) Lecture Notes
- (2) Bain and Engelhardt, Introduction To Probability And Mathematical Statistics, Second Edition

26. Additional information:

Name of Course Coordinator: Dr. Morad Ahmad Signature: ----- Date:

Head of curriculum committee/Department: Dr. Emad Abu Osba Signature: -----

Head of Department: Dr. Baha Al Zaleq Signature: -----

Head of curriculum committee/Faculty: Dr. Amal Aboudi Signature: -----

Dean: Dr. Sami Mahmoud Signature: -----

Copy to:
Head of Department
Assistant Dean for Quality Assurance
Course File