Academic Program Specification Form For The Academic

Universitiy:
College :
Number Of Departments In The College:
Date Of Form Completion: September. 2023

Dean's Name

Date :   /   /

Signature

Dean's Assistant For Scientific Affairs

Date :   /   /
Signature

The College Quality Assurance And University Performance Manager

Date :   /   /
Signature

Quality Assurance And University Performance Manager
Date :   /   /
Signature

TEMPLATE FOR PROGRAMME SPECIFICATION

> HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

PROGRAMME SPECIFICATION

> This Programme Specification provides a concise summary of the main features of the programme 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 is supported by a specification for each course that contributes to the programme.

1. Teaching Institution	University of Baghdad / Al_Khwarizmi College of Engineering
2. University Department/Centre	Information and Communication Department
3. Programme Title	Probability and random process
4. Title of Final Award	BSc degree in Information and Communication Eng.
5. Modes of Attendance offered	Attendance is (Electronic learning) according to 2020
6. Accreditation	Abet
7. Other external influences	
8. Date of production/revision of this specification	2023

9. Aims of the Programmer
The course presents the fundamentals of probability theory and random processes needed by students in communications, signal processing, computer science and other disciplines.

10. Learning Outcomes, Teaching, Learning and Assessment Methods
A. Cognitive goals A 1. Use statistical methodology and tools in the engineering problem-solving process. A 2. Compute and interpret descriptive statistics using numerical and graphical techniques. A3. Understand the basic concepts of probability, random variables, probability distribution, and joint probability distribution and random process.
B. The skills goals special to the programmer. B1. Understand concepts of probability, conditional probability and independence. B 2. Understand random variables and probability distributions B 3. Be familiar with some of the commonly encountered random variables, in particular the Gaussian random variable. B4. Understand the classifications of random processes B5 Understand the concepts of correlation functions and power spectral density
Teaching and Learning Methods
Lectures, Presentations, Recitation and Documentations
Assessment methods
homework 10% quizzes - 30%   final exam +Report - 60%
C. Affective and value goals C1. How to use different techniques with different application requirements C2. Cost effective systems requirements decision C3. Security criterion with Digital communication C4.Ease of implementation
Teaching and Learning Methods
Class handouts, homework problems, and other relevant course materials. This course will be presented by using lectures, in-class exercises, and discussions. Student learning outcomes will be evaluated based on quizzes and exams.

Assessment methods
homework 10% quizzes - 30%   final exam +Report - 60%

D. General and Transferable Skills (other skills relevant to employability and personal development) . General and Transferable Skills (other skills relevant to employability and personal development)

Teaching and Learning Methods
Class handouts, homework problems, and other relevant course materials. This course will be presented by using lectures, in-class exercises, and discussions. Student learning outcomes will be evaluated based on quizzes and exams.

Assessment Methods
homework 10% quizzes - 30%   final exam +Report - 60%

11. Programme Structure

Level/Year	Course or Module Code	Course or Module Title	Credit rating	12. Awards and Credits
2nd		Probability and random process		Bachelor Degree Requires (x) credits

13. Personal Development Planning

IN 13 weeks
Enhance the skills in solving problem statistics, analyzing the experimental evaluations, and finally understanding random process.

14. Admission criteria .

According to the rules of Ministry of Higher Education and Scientific Research in Iraq.

15. Key sources of information about the programmer

1. Books
2. Internet

Curriculum Skills Map

please tick in the relevant boxes where individual Programme Learning Outcomes are being assessed

Year / Level	Course Code	Course Title	Core (C) Title or Option (O)	Knowledge and understanding				Subject-specific skills				Thinking Skills				General and Transferable Skills (or) Other skills relevant to employability and personal development			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4

TEMPLATE FOR COURSE SPECIFICATION COURSE SPECIFICATION

COURSE SPECIFICATION

The course presents the fundamentals of probability theory and random processes needed by students in communications, signal processing, computer science and other disciplines.

1. Teaching Institution	Baghdad University / Al Khwarizmi College of engineering
2. University Department/Centre	Information and Communication Eng. Dept
3. Course title/code	Probability and random process
4. Program(s) to which it contributes	specialization Requirement
5. Modes of Attendance offered	Full time
6. Semester/Year	2023-2024
7. Number of hours tuition (total)	3 hours (3 theoretical) weekly (45 hr.)
8. Date of production/revision of this specification	September 2023
9. Aims of the Course	
Understand the basic concepts of probability, random variables, random process , probability distribution, and joint probability distribution	

10· Learning Outcomes, Teaching ,Learning and Assessment Method

   A- **Knowledge and Understanding**
   After successfully completing the course, students should be able to do the following:
   A 1. Use statistical methodology and tools in the engineering problem-solving process.
   A 2. Compute and interpret descriptive statistics using numerical and graphical techniques.
   A3. Understand the basic concepts of probability, random variables, probability distribution, and joint probability distribution and random process .

B. Subject-specific skills

B1. Understand concepts of probability, conditional probability and independence.

B 2. Understand random variables and probability distributions

B 3. Be familiar with some of the commonly encountered random variables, in particular the Gaussian random variable.

B4. Understand the classifications of random processes

B5 Understand the concepts of correlation functions and power spectral density

Teaching and Learning Methods

Class handouts, homework problems, and other relevant course materials. This course will be presented by using lectures, in-class exercises, and discussions. Student learning outcomes will be evaluated based on quizzes and exams.

Assessment methods

The final course grade will be calculated based on the following:

 Quizzes and home works 40%

 Final Exam and report 60%

C. Thinking Skills

C1. How to use different techniques with different application requirements

C2. Cost effective systems requirements decision

C3. Security criterion with Digital communication

C4.Ease of implementation

11. Course Structure

Week	Hours	ILOs	Unit/Module or TopicTitle	Teaching Method	Assessment Method
1	3		Course Introduction Sets, fields, sample space and events; axiomatic definition of probability	Class room lecture	Scheduled Quizzes
2	3		conditional probabilities, independence, total probability	Class room lecture	
3	3		Bayes' rule and applications	Class room lecture	
4	3		Definition of random variables, continuous and discrete random variables	Class room lecture	
5	3		cumulative distribution function (cdf) for discrete and continuous random variables.	Class room lecture	
6	3		Exam 1 probability mass function (pmf); probability density functions (pdf) and properties	Class room lecture	Exam1
7	3		Expectation: mean, variance and moments of a random variable	Class room lecture	
8	3		covariance and correlation;	Class room lecture	
9	3		Exam2 Random process	Class room lecture	Exam2
10	3		discrete and continuous time processes, examples		
11	3		Exam3 auto-correlation and power-spectral density of the output; examples with white-noise	Class room lecture	Exam3
12	3		Poisson process	Class room lecture	
13	3		Binomial process	Class room lecture	
14	3		Gaussian process;	Class room lecture	
15	3		Exam4		Exam4

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	Probability and statistics and random processes for electrical engineering by Alberto L. Garcia""3rd edition2008. Probability and statistics for engineers and scientists "9th by Ronald E.walpole. "Introduction to Probability Models" by Sheldon Ross (Academic Press, 2010). H. Kobayashi, B. L. Mark, and W. Turin, Probability, Random Processes, and Statistical Analysis, Cambridge, 2012. • Reference Books: R. Gallager, Stochastic Processes: Theory for Applications, Cambridge, 2014.
Special requirements (include for example workshops, periodicals,IT software, websites)	A scientific calculator - Internet access to the course website
Community-based facilities (include for example, guest Lectures , internship,field studies)	Summer training.

13. Admissions	
Pre-requisites	Math1.
Minimum number of students	NA
Maximum number of students	30