

QF01/0408-4.0E	Course Plan for Bachelor program - Study Plan Development and Updating Procedures/ Mathematics Department
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Study plan No.	2021/2022		University Specialization		Bachelor of Mathematics	
Course No.	0101341		Course name		Probability Theory	
Credit Hours	3		Prerequisite/ Co-requisite		Calculus (3)	
Course type	<input type="checkbox"/> MANDATORY UNIVERSITY REQUIREMENT	<input type="checkbox"/> UNIVERSITY ELECTIVE REQUIREMENTS	<input type="checkbox"/> FACULTY MANDATORY REQUIREMENT	<input type="checkbox"/> Support course family requirements	<input checked="" type="checkbox"/> Mandatory requirements	<input type="checkbox"/> Elective requirements
Teaching style	<input type="checkbox"/> Full online learning		<input type="checkbox"/> Blended learning		<input checked="" type="checkbox"/> Traditional learning	
Teaching model	<input type="checkbox"/> 1 Synchronous: 1 asynchronous		<input type="checkbox"/> 1 face to face : 1 asynchronous		<input checked="" type="checkbox"/> 2 Traditional	

Faculty member and study divisions' information (to be filled in each semester by the subject instructor)

Name	Academic rank	Office No.	Phone No.	E-mail	
Division number	Time	Place	Number of students	Teaching style	Approved model

Brief description

Expectations and variance, Moments and moment generating function, Exponential, Normal joint distributions, Joint moment, Conditional distributions, Independence of random variables, Functions of random variables, Transformation technique one variable, Transformation technique several variable, Moment-generating function technique, Sampling distribution.
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Learning resources

Course book information (Title, author, date of issue, publisher ... etc)	1) Introduction to Probability and Mathematical Statistics, 2nd edition. By Bain, Lee, J. and Engelhardt, Max. Publisher Duxbury Press 1987. 2) Mathematical Statistics with applications , 7th edition. By Dennis Wackerly, William Mendenhall and Richard Scheaffer, Publisher Thomson. Brooks /Cole 2008.				
Supportive learning resources (Books, databases, periodicals, software, applications, others)	1) Modern Mathematical Statistics with Applications. By Devore, Jay, L. and Berk, Kenneth, N. Publisher Thomson Brooks/Cole 2007. 2) Mathematical Statistics with applications, seventh edition, by Miller & Miller. Pearson Prentice Hall (2004)				
Supporting websites	https://web.njit.edu/~dhar/math333/math333.html https://math.tntech.edu/e-stat/4470/index.html				
The physical environment for teaching	<input checked="" type="checkbox"/> Class room	<input type="checkbox"/> labs	<input type="checkbox"/> Virtual educational platform	<input type="checkbox"/> Others	
Necessary equipment and software					

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Supporting people with special needs	
For technical support	

Course learning outcomes (S= Skills, C= Competences K= Knowledge.)

No.	Course learning outcomes	The associated program learning output code
Knowledge		
K1	Identify the probability concept.	MK1
K2	Understand the expectation function and properties.	MK2
K3	Combine between different distributions.	MK3
K4	Find the distribution of functions.	MK4
Skills		
S1	Analyze the probability properties.	MS1
S2	understand the meaning of the random variable and distinguish discrete and continuous R.V.	MS2
S3	Apply theorems to solve problems.	MS3
Competences		
C1	Obtain the probability distribution of a function of random variables.	MC1
C2	Develop the individual's ability to communicate and interact with other mathematical courses.	MC2

Mechanisms for direct evaluation of learning outcomes

Type of assessment / learning style	Fully electronic learning	Blended learning	Traditional Learning (Theory Learning)	Traditional Learning (Practical Learning)
First/Second exam	30%	30%	30%	30%
Participation / practical applications	0	0	20%	30%
Asynchronous interactive activities	30%	30%	0	0
Final exam	40%	40%	50%	40%

Schedule of simultaneous / face-to-face encounters and their topics

Week	Subject	learning style*	Reference **
1	Sample Space, Set operations with events Probability of events, Addition Rule.	Lecture	24-39
2	Conditional probability Multiplication Rule, Independent events, Law of Total Probability and Bayes Rule.	Lecture	40-52
3	Concept of a random variable and its probability distribution.	Lecture	69-80
4	Expectations and Variance. Moments and moment generating function.	Lecture	129-147
5	Distribution functions and probability density. Specific Discrete parametric distributions-Univariate: Uniform,	Lecture	164-185

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	Binomial, Poisson, Hypergeometric.		
6	Specific Continuous parametric distributions-Univariate Uniform	Lecture	200-210
7	Exponential, Normal Joint distributions.	Lecture	210-215 92-100
8	Joint distribution function. Joint moment.	Lecture	
9	Conditional distributions, Independence of random variables.	Lecture	100-106
10	Product moments and conditional expectation.	Lecture	148-158
11	Functions of random variables. Transformation technique one variable.	Lecture	246-255
12	Transformation technique several variable. Moment-Generating function technique.	Lecture	246-258
13	Special probability densities	Lecture	201-219
14	Sampling distribution	Lecture	260- 265
15	Distributions of Sample mean and sample variance.	Lecture	266-279
16	Final Exam		