



## **Probability and Statistics Course Definition Form**

## 1. Basic Information:

<b>Course Name</b>	Probability and Statistics
<b>Course ID</b>	GMA205
<b>Contact Hours (Registered Sessions)</b>	36
<b>Contact Hours (Synchronized Sessions)</b>	18
<b>Mid Term Exam</b>	1.5
<b>Exam</b>	1.5
<b>Registered Sessions Work Load</b>	42
<b>Synchronized Session Work Load</b>	24
<b>Credit Hours</b>	6

## 2. Pre-Requisites:

<b>Course</b>	<b>ID</b>
Mathematical Algebra	GMA101
Mathematical Analysis	GMA102

### 3. Course General Objectives:

This course aims at introducing students to the basic concepts in statistics and various methods of representation and displaying and describing data, measures of central tendency and dispersion. Students will be introduced to basic concepts in possibility including events and operations on events, fundamental principle of counting, permutation and combinations, to random variables and probability distributions discrete and continuous, to mathematical expectation and dispersion, to some discrete and continuous distributions where we focus on the normal distribution, Finally students will recognizes the distributions of the sample mean and the estimating of population parameters.

### 4. Intended Learning Outcomes (ILO):

Code	Intended Learning Outcomes
ILO1	Identify collecting, organization and display of data and measures of central tendency and measures of variability
ILO2	Identify basic concepts in probability
ILO3	Identify random variables and probability distributions
ILO4	Identify discrete probability distributions
ILO5	Identify continuous probability distributions
ILO6	Identify sampling distributions and estimation

### 5. Course Syllabus (18 hours of total synchronized sessions)

- **RS:** Recorded Sessions; **SS:** Synchronized Sessions;

ILO	Course Syllabus	RS	SS	Type	Additional Notes
ILO1	<p>Collecting, organization and display of data</p> <ul style="list-style-type: none"> <li>• Basic concepts in statistics</li> <li>• organization and display of data</li> </ul>	3	1.5	<input checked="" type="checkbox"/> Exercises	
ILO1	<p>Measures of central tendency and measures of variability</p> <ul style="list-style-type: none"> <li>• Measures of central tendency</li> <li>• Measures of variability</li> </ul>	6	3.0	<input checked="" type="checkbox"/> Exercises	
ILO2	<p>Basic concepts in probability</p> <ul style="list-style-type: none"> <li>• Events operations on events</li> <li>• Fundamental principle of counting</li> <li>• Probability of an event</li> </ul>	6	3.0	<input checked="" type="checkbox"/> Exercises	
ILO3	<p>Random variables and probability distributions</p> <ul style="list-style-type: none"> <li>• Discrete probability distributions</li> <li>• Continuous probability distributions</li> <li>• joint probability distributions</li> </ul>	3	1.5	<input checked="" type="checkbox"/> Exercises	
ILO3	<p>Mathematical expectation and variance of a random variable</p> <ul style="list-style-type: none"> <li>• Mathematical expectation</li> <li>• Variance of a random variable</li> </ul>	6	3.0	<input checked="" type="checkbox"/> Exercises	

<p><b>ILO4</b></p>	<p>Some discrete probability distributions</p> <ul style="list-style-type: none"> <li>• Binomial distribution</li> <li>• Geometric distribution</li> <li>• Hypergeometric distribution</li> <li>• Poisson distribution</li> </ul>	<p>3</p>	<p>1.5</p>	<p><input checked="" type="checkbox"/> Exercises</p>	
<p><b>ILO5</b></p>	<p>Some continuous probability distributions</p> <ul style="list-style-type: none"> <li>• Uniform distribution</li> <li>• Normal distribution</li> <li>• Lognormal distribution</li> <li>• Weibull distribution</li> <li>• Rice distribution</li> </ul>	<p>6</p>	<p>3.0</p>	<p><input checked="" type="checkbox"/> Exercises</p>	
<p><b>ILO6</b></p>	<p>Sampling distributions and estimation</p> <ul style="list-style-type: none"> <li>• Sampling distributions</li> <li>• Estimation of population parameters</li> </ul>	<p>3</p>	<p>1.5</p>	<p><input checked="" type="checkbox"/> Exercises</p>	

### 6. Assessment Criteria (Related to ILOs)

ISC	Interactive Synchronized Collaboration	Ex	Exams	Rpt	Reports
PF2F	Presentations and Face-to-Face Assessments	PW	Practice Work		

ILO Code	ILO	Intended Results	Assessment Type	
			ISC	Ex
ILO1	Identify collecting, organization and display of data and measures of central tendency and measures of variability	<ol style="list-style-type: none"> <li>1. display of data using versus types of distributions</li> <li>2. display of data using graphical representation</li> <li>3. Finding measures of central tendency</li> <li>4. Finding measures of variability</li> </ol>	X	X
ILO2	Identify basic concepts in probability	<ol style="list-style-type: none"> <li>1. Fundamental principle of counting and counting methods</li> <li>2. Finding probability of a simple, compound, conditional probability</li> <li>3. Using total probability law</li> </ol>	X	X
ILO3	Identify random variables and probability distributions	<ol style="list-style-type: none"> <li>1. Finding probability and cumulative distribution function of a discrete random variable</li> <li>2. Finding probability and cumulative distribution function of a continuous random</li> </ol>	X	X

		<p>variable</p> <p>3. Finding joint and marginal probability distribution of 2 random variables</p> <p>4. Finding mathematical expectation and variance of a random variable</p>		
<b>ILO4</b>	Identify discrete probability distributions	<p>1. Finding probability of events following: binomial, geometric, hypergeometric, Poisson distributions</p>	X	X
<b>ILO5</b>	Identify continuous probability distributions	<p>1. Finding probability of events following: normal, lognormal, exponential distributions</p> <p>2. Using standard normal distribution table</p>	X	X
<b>ILO6</b>	Identify sampling distributions and estimation	<p>1. Finding sample mean distribution of a normal population</p> <p>2. Finding sample mean distribution of a population</p> <p>3. Finding estimation of the mean of a population with known variance</p> <p>4. Finding estimation of the mean of a population with unknown variance</p>	X	X

## 7. Practice Tools:

Tool Name	Description

## 8. Main References

Probability & Statistics for Engineers & Scientists, 9th.Edition.Jun.2011

## 9. Additional References

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