

Name of Institute: Indus Institute of Management Studies (IIMS)

Name of Faculty: Dr. Neerav Verma

Course Code: MB0202

Course Name: Quantitative Techniques

Pre-requisites: Graduate

Credit Points: 3 Credits

Offered Semester: II

Course Lecturer (Weeks 01 – 15)

Full name: Dr. Neerav Verma

Department with Siting location: Management

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Consultation times: 4:00 PM to 5:00 PM

Students will be contacted throughout the Session via Mail with important information relating to this Course.

Course Objectives

To familiarize students with the types of business problems often faced by corporate entities. To develop understanding about the various tools for research-based hypothesis testing and procedure. To help students develop skills in structuring various operations research problems using mathematical tools.

Course Outcomes (CO)

On successful completion of this course students will be able to:

CO1: To apply research techniques in quantitative and qualitative aspects.

CO2: To analyze probability distribution for various business decisions.

CO3: To develop hypothesis for research and its' testing.

CO4: To minimize the resource allocation for project.

CO5: To maximize the productivity with help of least cost techniques

CO6: To take decisions under uncertainty & risk business environment

Course Outline

Unit-I

Probability Distributions

Introduction to Probability Distributions, Application of Binomial, Poisson & Normal Probability Distributions.

Hypothesis Testing-1

Chi-square for goodness of fit test, test of independence & population variance.

Introduction to Analysis of Variance (ANOVA): One & Two-Way ANOVA.

Unit-II

Hypothesis Testing-2

Testing of hypothesis for single population – testing about mean, proportion and a variance (large and small samples)

Testing of hypothesis for two populations – testing about the difference in means, proportions and variances (large and small samples),

Unit-III

Operations Research

Nature, definition, characteristics and methodology of operations research, role of operations research in managerial decision making. Introduction to various tools of operations research.

Assignment Model

Introduction, advantages, balance, unbalanced and applications of Solving assignment problems by Hungarian method. Traveling Salesman's Problem- a special case of Assignment Model.

Unit-IV

Transportation Model

Introduction, advantages and applications of Transportation Model, Balance & Unbalanced Property, North West Corner Rule, Matrix Minima & VAM Methods of finding basic feasible solution. Degeneracy and its removal, Optimal Solution by Modified Distribution Method. Transshipment Problem- a special case of Transportation Model

Unit-V

Decision making under Uncertainty & Risk

Introduction, Criteria of Maximax, Maximum, Maximax Regret, Laplace & Hurwicz methods. Decision making under Risk-Criteria of EMV & EOL. Decision Tree Analysis.

Method of delivery

Lectures, PPT, Quantitative Case Studies/ Numerical, Experiential Exercises, Active Learning Techniques.

Study time

Three hours per week

CO-PO Mapping:

Programme Outcomes (POs)

PO1: Develop Business Acumen & domain knowledge (With knowledge of management theories & practices)

PO2: Develop Leadership and Team building

PO3: Enhance Critical Thinking, Analysis & Problem Solving

PO4: Build Awareness of Global Business Environment

PO5: Comprehend Legal, Ethical and Social Responsibility

PO6: Develop Communication Skills, Interpersonal and Soft Skills

Course Outcome (COs):

CO1: To apply research techniques in quantitative and qualitative aspects.

CO2: To analyze probability distribution for various business decisions.

CO3: To develop hypothesis for research and its' testing.

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	PO1	PO2	PO3	PO4	PO5	PO6
CO 1	3	2			1	
CO 2	3	2			1	
CO 3		3				
CO 4		3				
CO 5		3	1		1	
CO 6	2				1	

Blooms Taxonomy and Knowledge Retention (For reference)

(Blooms taxonomy has been given for reference)

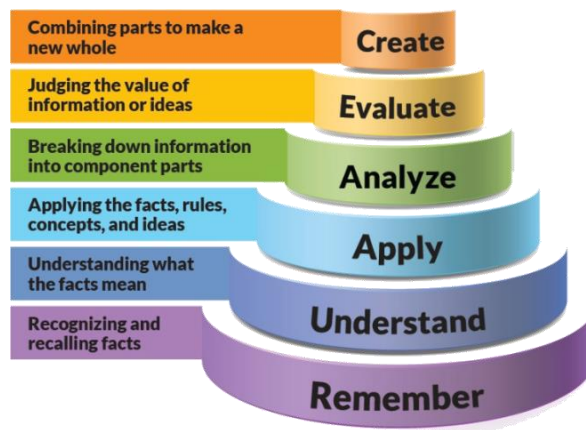


Figure 1: Blooms Taxonomy

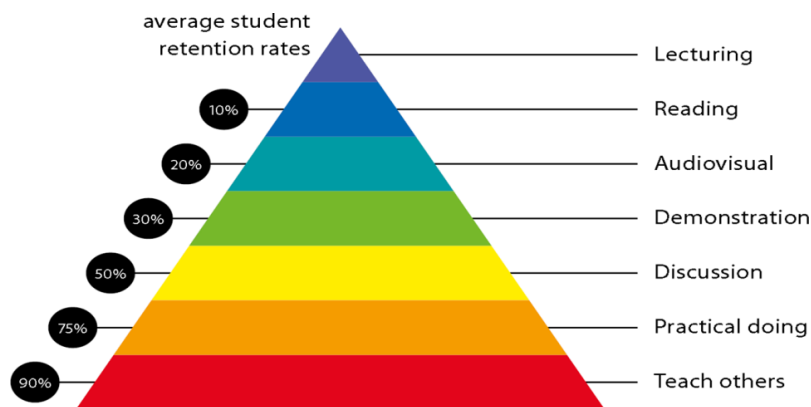


Figure 2: Knowledge retention

Graduate Qualities and Capabilities covered

(Qualities graduates harness crediting this Course)

General Graduate Qualities	Specific Department of Management Graduate Capabilities
Informed Have a sound knowledge of an area of study or profession and understand its current issues, locally and internationally. Know how to apply this knowledge. Understand how an area of study has developed and how it relates to other areas.	1 Professional knowledge, grounding & awareness

<p>Independent learners</p> <p>Engage with new ideas and ways of thinking and critically analyze issues. Seek to extend knowledge through ongoing research, enquiry and reflection. Find and evaluate information, using a variety of sources and technologies. Acknowledge the work and ideas of others.</p>	<p>2 Information literacy, gathering & processing</p>
<p>Problem solvers</p> <p>Take on challenges and opportunities. Apply creative, logical and critical thinking skills to respond effectively. Make and implement decisions. Be flexible, thorough, innovative and aim for high standards.</p>	<p>3 Problem solving skills</p>
<p>Effective communicators</p> <p>Articulate ideas and convey them effectively using a range of media. Work collaboratively and engage with people in different settings. Recognize how culture can shape communication.</p>	<p>4 Written communications</p>
	<p>5 Oral communication</p>
	<p>6 Teamwork</p>
<p>Responsible</p> <p>Understand how decisions can affect others and make ethically informed choices. Appreciate and respect diversity. Act with integrity as part of local, national, global and professional communities.</p>	<p>7 Sustainability, societal & environmental impact</p>

Practical work:

1. ASSIGNMENT -1: Unit 1 & 2
2. ASSIGNMENT -2: Unit 3 & 4

Lecture/ Tutorial Times:

1hr / lecture or tutorial

Attendance Requirements:

The University norms states that it is the responsibility of students to attend all lectures, tutorials, seminars and practical work as stipulated in the Course outline. Minimum attendance requirement as per university norms is compulsory for being eligible for mid and end semester examinations.

Details of referencing system to be used in written work

Text Books:

1. Gary Dessler and Biju Varkkey. Human Resources Management. Pearson Latest Edition
2. Sinha, Sinha and Shekhar Industrial Relations, Trade unions and Labour Legislations Pearson Education Latest Edition
3. Mirza S Saiyadain. Human Resource Management. Tata McGraw-Hill Latest Editions

Reference Books:

1. Snell, Bohlander, Vohra. Human Resource Management. Cengage Learning
2. P. Jyothi and D.N.Venkatesh. Human Resource Management. Oxford University Press Latest Edition
3. P. Subba Rao. Essential of Human Resource Management and Industrial Relations. Himalaya Latest Edition
4. K. Aswasthapa Human Resource Management TATA McGraw Hill Latest Edition
5. C.B. Mamoria & S .V. Gankar. Human Resource Management. Himalaya Publishing House Latest Edition

ASSESSMENT GUIDELINES

Final course mark will be calculated from the following:

Assignment 1 & 2	(5 + 5) Marks
Presentation	5 Marks
Attendance	5 Marks
Mid Semester Exam	40 Marks
Final Exam	40 Marks

SUPPLEMENTARY ASSESSMENT

Students who receive an overall mark less than 50% in mid semester or end semester will be considered for supplementary assessment in the respective components (i.e. mid semester or end semester) of semester concerned. Students must make themselves available during the supplementary examination period to take up the respective components (mid semester or end semester) and need to obtain the required minimum 50% marks to clear the concerned components.

Practical Work Report/Laboratory Report:

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Late Work

Late assignments will not be accepted without specific reasons and supporting documents.

Format

All assignments must be presented in a neat, legible format with all information sources correctly referenced. **Assignment material handed in throughout the session that is not neat and legible will not be marked and will be returned to the student.**

Retention of Written Work

Written assessment work will be retained by the Course coordinator/lecturer for two weeks after marking to be collected by the students.

University and Faculty Policies

Students should make themselves aware of the University and/or Faculty Policies regarding plagiarism, special consideration, supplementary examinations and other educational issues and student matters.

Plagiarism - Plagiarism is not acceptable and may result in the imposition of severe penalties. Plagiarism is the use of another person's work, or idea, as if it is his or her own - if you have any doubts at all on what constitutes plagiarism, please consult your Course coordinator or lecturer. Plagiarism will be penalized severely.

Do not copy the work of other students.

Do not share your work with other students (except where required for a group activity or assessment)

Course Schedule (subject to change)

(Mention quiz, assignment submission, breaks etc as well in the table under the Teaching Learning Activity Column)

Week #	Topic & contents	CO Addressed	Teaching Learning Activity (TLA)
Weeks 1	Introduction to Probability Distributions	CO1, CO2 & CO3	Lecture
Weeks 2	Application of Binomial & Poisson	CO1, CO2, CO3 & CO4	Lecture
Week 3	Normal Probability Distributions.	CO1, CO2 & CO3, CO6	Lecture
Week 4	Chi-square for goodness of fit test, test of independence & population variance. Introduction to Analysis of Variance (ANOVA).	CO2, CO5 & CO6	Lecture
Week 5	Testing of hypothesis for single population – testing about mean, proportion and a variance (large and small samples)	CO1, CO3 & CO4	Lecture
Week 6	Testing of hypothesis for two populations – testing about the difference in means, proportions and variances (large and small samples),	CO2, CO3 & CO4	Lecture
Week 7	Nature, definition, characteristics and methodology of operations research, role of operations research in managerial decision making. Introduction to various tools of operations research.	CO2, CO4 & CO5	Lecture
Week 8	Introduction, advantages, balance, unbalanced and applications of Solving assignment problems by Hungarian method. Traveling Salesman's Problem	CO2, CO3 & CO6	Lecture
Week 9	Introduction, advantages and applications of Transportation Problem (TP) Mode and its' formulation	CO1, CO2 & CO4	Lecture
Week 10	TP: North West Corner Rule, Matrix Minima & VAM Methods of finding	CO2 & CO4	Lecture

		basic feasible solution		
	Week 11	TP: Degeneracy and its removal, Modified Distribution Method, Transshipment Problem	CO1, CO2 & CO4	Lecture
	Week 12	Decision making under Uncertainty: Criteria of Maximax, Maximin, Maximax Regret	CO4 & CO5	Lecture
	Week 13	Decision making under Uncertainty: Laplace & Hurwicz methods	CO2, CO3, CO5 & CO6	Lecture
	Week 14	Decision making under Risk: Criteria of EMV & EOL	CO2, CO3, CO5 & CO6	Lecture
	Week 15	Decision making under Risk: Decision Tree Analysis	CO1, CO2 & CO4	Lectures