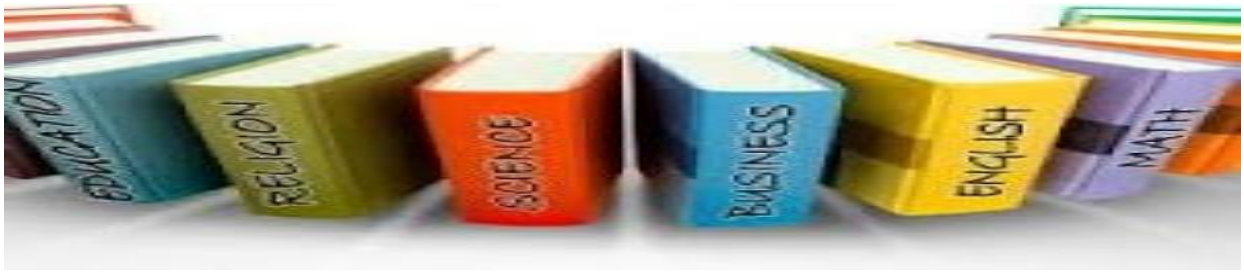
Amity Business School

Master of Business Administration (Business Analytics)

FLEXILEARN
-Freedom to design your degree



Curriculum & Scheme of Examination

2023

AMITY UNIVERSITY HARYANA

GURUGRAM

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Manesar Gurgaon-122413

131108 MBA-Business Analytics (Total Credits-110)

Programme Structure-2023

FIRST SEMESTER

Course Code	Course Title	Lectures (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
BUA4101	Management Process and Organizational Behaviour	3	-	-	3
BUA4102	Accounting for Management	3	-	-	3
BUA4103	Marketing Management	3	-	-	3
BUA4104	Statistical Techniques	3	-	-	3
BUA4105	Excel for Decision Making	1	-	2	2
BUA4106	Optimization Techniques	2	-	2	3
BUA4107	Database Management System	3	-	-	3
BUA4108	Human Resource Management	3	-	-	3
	Open Electives				**5**
CSS4151	Basics of Communication	1	-	-	1
BEH4151	Self Development& Interpersonal Skills	1	-	-	1
LAN4151 LAN4152 LAN4153 LAN4154 LAN4155 LAN4156 LAN4157 LAN4158 LAN4159	Foreign Business Language-I French-I German-I Spanish-I Russian-I Chinese-I Portuguese-I Korean-I Japanese-I Hindi-I **	3	-	-	3
	TOTAL				**28**

** Hindi as Foreign Language for Foreign National Students

SECOND SEMESTER

Course Code	Course Title	Lectures (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
BUA4201	Financial Management	3	-	-	3
BUA4202	Operations and Supply Chain Management	3	-	-	3
BUA4203	Econometrics	2	-	2	3
BUA4204	Business Research Methods	1	-	2	2
BUA4205	Economics for Management	2	-	-	2
BUA4206	Programming for Analytics using	2	-	2	3

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	R				
BUA4207	Programming for Analytics using Python	2	-	2	3
BUA4208	Consumer Behaviour	3	-	-	3
	Open Electives				**5**
CSS4251	Corporate Communication	1	-	-	1
BEH4251	Behavioural Communication & Relationship Management	1	-	-	1
LAN4251 LAN4252 LAN4253 LAN4254 LAN4255 LAN4256 LAN4257 LAN4258 LAN4259	Foreign Business Language-II French-II German-II Spanish-II Russian-II Chinese-II Portuguese-II Korean-II Japanese-II Hindi-II	3	-	-	3
	TOTAL				**27**

SUMMER INTERNSHIP

THIRD SEMESTER

Course Code	Course Title	Lectures (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
BUA4301	Strategic Management	3	-	-	3
BUA4302	Datamining	2	-	2	3
BUA4303	Predictive Analytics-I Machine Learning using R	2	-	2	3
BUA4304	Predictive Analytics-II Machine Learning using Python	2	-	2	3
BUA4305	Big Data Analytics- Hadoop	2	-	2	3
BUA4306	Financial Decision Analysis	2	-	2	3
BUA4307	Visual Analytics- Tablue/ Power BI	2	-	2	3
BUA4335	Summer Internship Evaluation	-	-	-	6
	Open Electives				**4**
CSS4351	Interpersonal Communication	1	-	-	1
BEH4351	Leading Through Teams	1	-	-	1
LAN4351 LAN4352 LAN4353 LAN4354 LAN4355 LAN4356 LAN4357 LAN4358 LAN4359	Foreign Business Language-III French-III German-III Spanish-III Russian-III Chinese-III Portuguese-III Korean-III Japanese-III Hindi-III	2	-	-	2
	TOTAL				**31**

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FOURTH SEMESTER

Course Code	Course Title	Lectures (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
BUA4401	Total Quality Management	2	-	-	2
BUA4402	Financial Analytics	2	-	2	3
BUA4403	Supply Chain Analytics	2	-	2	3
BUA4404	HR Analytics	2	-	2	3
BUA4405	Marketing Analytics	2	-	2	3
BUA4406	Data Privacy and Data Security Laws	2	-	-	2
BUA4437	Dissertation (Analytics Project)	-	-	-	6
	Open Electives				**2**
CSS4451	Cross Cultural Communication	1	-	-	1
BEH4451	Professional Excellence	1	-	-	1
	TOTAL				**24**

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Master of Business Administration (Business Analytics)

Programme Mission:

The mission of the MBA programme is to foster an environment of academic excellence in Business Management through research and innovation, industry integration, internationalization and extension activities and develop highly trained and employable professionals with specialization in the area of Marketing & Sales, Finance, Banking & Finance, Human Resource Management, International Business, Information Technology, E-Commerce and Hospital & Healthcare, who are socially responsible and globally minded professional to meet the current and emerging needs of business and society.

Programme Description:

The two year full time Masters in Business Administration programme is to educate and prepare students with the knowledge, analytical ability, and management perspectives and skills needed to lead, to motivate and to manage diversified workforce, rapid technological change and competitive marketplace while considering the principles of ethical, legal and corporate governance fundamentals.

Programme Outcome (PO):

PO1	Apply the knowledge of marketing, human resource management, finance and other functional areas of management to solve complex management issues in volatile business environment
PO2	Student shall have ability to acquire & evaluate new knowledge through Business Research Methods, have the ability to identify, define, investigate, and solve critical business issues using management principles, analyse data/information and interpret results for reaching optimum solutions.
PO3	Student shall be able to understand global issues from different perspectives, recognize the opportunities to improve the business value chain as an entrepreneur and shall develop and display basic business acumen & business skills and be able to apply different forms of communication in diversified cultural settings.
PO4	Student shall able to critically thinkto assess societal, health, safety, legal, and cultural issues and apply range of strategies for solving a problem and decision making
PO5	Student shall be able to practice ethical principles and commit to professional ethics and responsibilities and norms of the management practice.
PO6	Student shall develop range of Leadership skills and shall demonstrate excellent interpersonal skills, understanding of group dynamics and effective teamwork, including awareness about personal strengths and limitations.
PO7	Student shall be able to communicate effectively on complex management activities with various stakeholders being able to comprehend and write effective reports, design documentation, make effective presentations, and give & receive clear instructions.
PO8	Student shall recognize the need for, and have the ability to engage in independent and life-long learning in the broadest context of technological change.
PO9	Student shall be able to create, select, and apply appropriate techniques, resources, and modern management and IT tools including prediction and modeling to make decisions.

Supporting document for PSOs (Programme Specific Outcomes) of MBA BA

PSO 1			PSO 2	PSO 3		PSO4	
Student shall be able to describe fundamental knowledge of general and functional management courses & relevant technological tools to identify opportunities and apply appropriate business strategies & solutions.			Student shall be able to apply knowledge of business analytics to solve business problems using appropriate technology such as machine learning/artificial intelligence and software solutions such as R, Python, SPSS, SAS to make holistic judgment. Student shall also apply technical skills to design effective advanced analytics models and simulations for effective decision making.	Student shall be able to apply specific and cross functional knowledge to solve critical business and management issues, write effective reports, demonstrate leadership and interpersonal skills, understanding of group dynamics and effective teamwork, including awareness about personal strengths and limitations.		Student shall be able to communicate effectively on complex management issues, make effective presentation with various stakeholders being able to comprehend and shall be able to practice ethical principles, professional values and fulfil social responsibilities and engage in life-long learning	
Fundamental Business Management	**Functional Management domain**	**Research, Analysis and Technical Management Domain**	**Business Analytics**	**NTCC**		**Communication**	**Value Added**
Management Process and Organizational Behaviour	Accounting for Management	Operations and Supply Chain Management	Datamining	Financial Analytics	Summer Internship Evaluation	Basics of Communication	Self Development & Interpersonal Skills
Economics for Management	Marketing Management	Business Research Methods	Predictive Analytics-I Machine Learning using R	Supply Chain Analytics	Dissertation (Analytics Project)	Corporate Communication	Behavioural Communication & Relationship Management
Strategic Management	Human Resource Management		Predictive Analytics-II Machine Learning using Python	HR Analytics		Interpersonal Communication	Leading Through Teams
Total Quality Management	Financial Management		Big Data Analytics-Hadoop	Marketing Analytics		Cross Cultural Communication	Professional Excellence
	Consumer Behaviour		Financial Decision Analysis	Data Privacy and Data Security Laws		**Foreign Business Language**	
			Visual Analytics- Tablue/ Power BI	Statistical Techniques		Chinese	French
			Econometrics	Excel for Decision		Portuguese	German

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				Making			
			Programming for Analytics using R	Optimization Techniques		Korean	Spanish
			Programming for Analytics using Python	Database Management System		Japanese	Russian

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Syllabus – First Semester

BUA4101	**MANAGEMENT PROCESS & ORGANIZATIONAL BEHAVIOR**	L	T	P	C
Version 1.1	Latest Approved	3	0	0	3
Pre-requisites/Exposure	Basic knowledge of general Management				
Co-requisites	Student must have basic understanding of General Management.				

Catalog Description
To help the students to develop cognizance of the importance of human behaviour.

Course Objective:
The objective of this course is to:
1. Help the students in gaining understanding of the functions and responsibilities of the manager.
2. Provide the student understanding of Human Behaviour in organizations so as to improve his/her managerial effectiveness.

Course Outcome:
Upon successful completion of the course a student will be able to:
CO1: Demonstrate the applicability of the concept of organizational behavior to understand the behavior of people in the organization and diversified cultural settings.
CO2: Enable students to describe how people behave under different conditions.
CO3: Analyze the complexities associated, critically evaluate and apply decisions appropriately.
CO4: Enable students to synthesize related information and evaluate options for the most logical and optimal solution so that they would be able to predict and control human behaviour and improve results.

Modules	Blooms level*	Number of hours
Module I: Management vs. Manager Evolution of management thought, Functions of management, Roles and Skills of a manager, Emerging challenges of management.	L1, L2	6
Module II: Organization Nature and structure of organization, Types of organizations, Line and staff relationships, Formal and informal organizations.	L1, L2,	6
Module III: Introduction to Organization Behaviour Overview of organization behaviour and its importance, Organization models.	L1, L2,	6
Module IV: Individual Behaviour Individual behaviour, Perception and learning, Personality, Values	L1, L2, L3, L4,	6

& attitudes, Motivation: Concept theory and application	L5, L6	
Module V: Group Behaviour Group dynamics, Communication, Leadership, Power and politics, Conflicts and negotiation.	L1, L2, L3, L4, L5, L6	6
Module VI: Organizational Culture and Change Management Organisational culture, Organisational change and development, Work stress and its management**.**	L1, L2, L3, L4, L5, L6	6

**Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4: Analysis; L5: Synthesis, L6: Evaluation*

Text Books

1. Luthans, F. (2010), Organizational Behaviour, Mcgraw-Hill Education India Pvt.Ltd - New Delhi.
2. Robbins, S.P. (2016), Organizational Behaviour, Sixteenth Edition, Pearson Education.

Reference Books

1. Greenberg, J. & Baron, R.A. (2005), Behaviour in Organizations, Pearson Education.
2. Newstrom John W. and Davis Keith, (1993), Organizational Behaviour: Human Behaviour at Work, Tata McGraw Hill, New Delhi
3. P. Subba Rao (2010), Management and Organisation and Behaviour, Himalaya Publishing House, New Delhi
4. Pierce Gardner with Dunham (2011) Managing Organizational Behaviour. Cengage Learning India.

Modes of Evaluation: Class Test /Home Assignment/ Power Point Presentation/Written Examination

Examination Scheme:

Components	**CT**	**HA**	**PPT**	**A**	**EE**
Weightage (%)	15	5	5	5	70

CT: Class Test, HA: Home Assignment, PPT: Power Point Presentation, A: Attendance EE: End Semester Examination

CO, PO and PSO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	1	1	-	-	-	-	-	-	-	1	-	-	-
CO2	1	1	-	-	-	-	-	-	-	1	-	-	-
CO3	1	1	-	-	-	-	-	-	-	1	-	-	-
CO4	1	1	-	-	-	-	-	-	-	1	-	-	-

1: strongly related, 2: moderately related and 3: weakly related

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BUA4102	**ACCOUNTING FOR MANAGEMENT**	L	T	P	C
Version 1.1	Latest Approved	3	0	0	3
Pre-requisites/Exposure	Basic knowledge of general Management				
Co-requisites	Student must have basic understanding of General Management.				

Catalog Description

The intent of this course is to acquaint the students with fundamental concepts and processes of accounting so that they are able to appreciate the nature of item presented in the annual accounts of an organization. The student will be able to familiarize with the significant tools and techniques of financial analysis further useful in the interpretation of the financial statements. The aim of this course does not focus on to make the student's expert accountant but to have a good comprehension on the management planning and control systems. However, the principal focus will be related to the interpretation and use of the financial data by non-accounting students to gain the ability of using accounting information as a tool in applying solutions for managerial problems, evaluating the financial performance, and interpreting the financial structure.

Course Objectives

The objective of this course is to:

1. Equip the students to develop the essential ability of all managers, to use complex accounting information as a platform for decision-making. As the course unfolds, students will build an increasingly sophisticated level of understanding of the language of accounting and its key concepts.
2. Develop skills in interpreting earnings statements, balance sheets, and cash flow reports. This ability to analyze financial statements will enable participants to deal more effectively with strategic options for their businesses or business units.

Course Outcome:

On completion of this course, the students will be able to:

CO1: Enable the students to combine practice and theoretical knowledge of financial accounting.

CO2: Demonstrate the decision-making skills to the students in the financial analysis context,

CO3: Develop an ability to identify and analyze complex financial accounting problems and opportunities in real life situations.

CO4: Develop skills in applying management accounting techniques to assist in decision making.

Modules	**Blooms Level**	**Number of Hours**

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Module 1: Introduction The Financial Accounting Framework, Accounting Policies, Need of Accounting. Users of Accounting Information, Accounting Cycle, Accounting and Management Control. Balance sheet- Classification Items of Balance Sheet, Formats of Balance Sheet. Preparation of Balance Sheet. Income Statement- Realization vs. Accrual Principle, Format of Income Statement), Preparation of Income Statement (IAS,GAAP&IFRS), Depreciation Accounting.	L1, L2, L3	8
Module 2: Measuring and Reporting Measuring and Reporting Assets, Liabilities &Equity:Cost of sales and Inventories, Debentures, Investments, Shareholder Equity; Human Resource Accounting: Valuation of Human Resources, Recording and Disclosure in Financial Statements.	L1, L2, L5	8
Module 3: Analyzing and Interpreting Financial Statements Financial Statement Analysis – Basic Relationship, Overall Measures, Profitability Ratios, Investment Utilization Ratios, Financial Condition Ratios, Making Comparisons. The Statement of Cash Flows-Profit versus Cash, Purpose and Use of Cash Flow Statement, Format of Cash Flow Statement (AS-3), Preparation of Cash Flow Statement (IAS,GAAP&IFRS).	L4, L5, L6	9
Module 4: Management Accounting Emergence of Management Account, Managerial costing and Cost-Volume- Profit Analysis, Budgeting and Budgetary control, Variance Analysis .	L1, L2, L5	5
Module 5: Cost Accounting: Elements of Cost, Cost Classification and Allocation, Cost sheet, Process Costing, Job Costing.	L1, L2, L5	5

*Bloom's Level: L1 – Knowledge; L2-Comprehension, L3 – Application, L4 – Analysis, L5 – Synthesis, L6 - Evaluation

Text Books

1. Anthony, N.R; Hawkings, F. D; Merchant, A.K (2014), Accounting Text and Cases, 13th Edition, McGraw Hill.
2. Ramachandran, N (2011), Financial Accounting for Management, 3rd Edition, McGraw Hill.

Reference Books

1. Bhattacharya, S.K. and Dearden, J, 3rd Edition, Accounting for Management, Text and Cases, Vikas Publishing House
2. Narayanaswamy R (2014), Finanacial Accounting – A Managerial Perspective, Prentice Hall of India.
3. Maheshwari S N; Maheshwari SK and Maheshwari SK, 3rd Edition, A Text Book for Accounting for Management, Vikas Publishing House.
4. Tulsian, P.C (2006), Financial Accounting, Tata McGraw Hill.
5. Banerjee, A (2005), Financial Accounting, Excel Books.
6. Ghosh,T.P (2005), Fundamentals of Management Accounting, Excel Books

7. M.N Arora 10th Edition, A Text Book of Cost and Management Accounting, Vikas Publishing House.

Modes of Evaluation: Quiz/Assignment/Presentation/Written Examination
Examination Scheme:

Components	Group Presentation	In Class Quiz	Class Test/Mid Term Exam	Attendance	External Exam
Weightage (%)	10	5	10	5	70

CO, PO and PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1	-	1	1	--	--	--	--	--	--	1	--	--	--
CO2	1	1	1	--	--	--	1	--	--	1	--	--	--
CO3	1	1	--	1	--	--	--	--	--	1	--	--	--
CO4	1	1	--	--	--	--	--	--	--	1	--	--	--

1: strongly related, 2: moderately related and 3: weakly related

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BUA4103	**MARKETING MANAGEMENT**	L	T	P	C
Version 1.1	Latest Approved	3	0	0	3
Pre-requisites/Exposure					
Co-requisites					

Catalog Description

Marketing management emphasizes upon the practical aspects of marketing concepts and management functions performed by professionals. This is a beginner's course in Marketing and shall cover the basics. The course helps in developing an understanding of the challenges of marketing management in manufacturing and service industries: analyzing marketing environments; evaluating strategic alternatives and designing and implementing marketing programmes involving decisions about products/services, pricing, distribution and promotion. The course serves to familiarize participants with basic marketing concepts, environment, strategies and methodology.

Course Objectives

The objectives of this course are to:

1. Provide the students exposure to modern marketing concepts, tools and techniques.
2. Enhance student's knowledge to prepare for general management responsibilities by focusing on the input of the marketing perspective across all functions.
3. Explain different consumer-specific characteristics as well as certain psychological processes influencing buying behavior.
4. Provide different dimensions of marketing such as STP, business environment, distribution channels, marketing communication, and social media marketing to enable the students to design and analyze the functional aspects in emerging market.

Course Outcomes

On completion of this course, the students will be able to:

CO1: Define the holistic marketing efforts to develop, design and implement marketing programs. They will also be able to examine challenges, responsibilities, and risks managers face in today's workplace.

CO2: Illustrate a comprehensive knowledge about how values are created, communicated and delivered to the target audiences.

CO3: Explain how to control the elements of the marketing mix—product policy, channels of distribution, communication, and pricing—to satisfy customer needs profitably

CO4: Design strategic approaches to manage different marketing dimensions in uplifting the consumer as well as business market.

CO5: Describe the marketing communication and its applicability along with understanding new-age media, advertising, sales promotion, personal selling etc.

Modules	Blooms Level*	Number of hours
Module I: Understanding Marketing in New Perspective Fundamentals of Marketing, Customer Value and Satisfaction, Customer Delight, Conceptualizing Tasks and Philosophies of Marketing Management, Value Chain, Scanning the Marketing Environment, Marketing Mix Elements, Difference between marketing and Selling, Relationship marketing, Social marketing, Strategic Planning in marketing, formulating the marketing plan.	L1, L2	8
Module II: Analyzing Consumers & Selecting Markets The factors influencing consumer behavior. The stages in the buying process, the buying decision making process, factors effecting the buying decision., Market Segmentations, Levels of Market Segmentations, Patterns, Procedures, Requirement for Effective Segmentation, Evaluating the Market Segments, Selecting the Market Segments, Tool for Competitive Differentiation, Developing a Positioning Strategy.	L1, L2, L4	7
Module III: Managing Product & Pricing Strategies Classification of products, New Product development, stages of product development, Adoption process, Product mix decisions and line management, Length, width and depth of a line, line analysis, and brand management, product life cycle, stages in lifecycle and factors affecting each stage, Managing product life cycles. Setting the price, adapting the price, initiating and responding the price changes.	L1, L2, L3	7
Module IV: Designing: Managing the Integrated Communication Channel functions and flows. Channel design decisions. Channel management decisions. Channel dynamics; vertical horizontal and multi channel marketing systems. Market Logistics decisions. Effective Communication, Integrated Marketing Communication, Marketing Communication Process, Promotion mix, Advertising, Personal Selling, Sales Promotion and Publicity and Public Relations, Direct Marketing.	L1, L2, L3	7
Module VI: Emerging Trends in Marketing An Introduction to Internet Marketing, Multi Level Marketing, E-Marketing, Green Marketing, Event Marketing, Types of Events, Sponsorship, Cause Related Marketing, Marketing for Non Profit Organizations Marketing Strategies for Leaders, Challengers, Followers and Nichers.	L1, L2, L5	7

*Bloom's Level: *L1-Knowledge; L2-Comprehension; L3-Application; L4-Anaylysis; L5-Synthesis; L6-Evaluation*

Text Book

Kotler, Keller, Koshi& Jha, (2015), Marketing Management (14th ed.)- A South Asian Perspective, Pearson Education.

Reference Books

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1. V S Ramaswamy & S Namakumari, (2009), Marketing Management; Planning, Implementation & Control (5th ed.)McMillan.
2. S.Neelamegham, (2009) Marketing in India, Vikas publishing house.
3. Saxena, Ranjan (2016), Marketing Management, 5th edition, Tata McGraw Hill, New Delhi.

Modes of Evaluation: Quiz/Assignment/Seminar/Written Examination

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	10	8	7	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; A: Attendance.

CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	1	--	1	1	--	1	1	1	--	1
CO2	1	1	1	1	--	1	1	--	1	1	1	--	1
CO3	1	2	1	1	--	1	1	--	1	1	1	--	2
CO4	1	1	1	1	--	1	2	--	1	1	1	--	1
CO5	1	1	1	2	--	1	2	--	1	1	1	--	2

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BUA4104	**STATISTICAL TECHNIQUES**	L	T	P	C
Version 1.1	Latest Approved	3	0	0	3
Pre-requisites/Exposure					
Co-requisites					

Catalog Description

This course offers the understanding on identification of data, analysis and interpretation of data using basic quantitative tools & techniques. In this course, students can apply the quantitative techniques in the analysis of statistical and economic problems. Probability and hypothesis testing are major topics to be covered. Basic understanding of statistical concepts helps in deciding on the suitable technique for data analysis and also to interpret results.

Course Objectives

The objectives of this course are to

1. Familiarize the students with basic quantitative tools & techniques for data analysis.
2. Equip the students with the concept of probability, hypothesis testing, data identification, and data analysis and interpretation using statistical tools.
3. Facilitate hands on experience to various statistical problems.

Course Outcomes

On completion of this course, the students will be able to

CO1: Explain the basic concepts of probability and Bayes Theorem and manipulate the probability models that are most widely used in economics, and apply them correctly and carry out the appropriate statistical analysis.

CO2: Apply the appropriate statistical tools and techniques for data analysis of economic models.

CO3: Apply graphical, numerical methods and Excel to make calculate and illustrate descriptive statistics and critically evaluate the basis for these calculations.

CO4: Identify the appropriate regression model to apply to an economics dataset and also the problems associated with these models such as autocorrelation. Multicollinearity, heteroscedasticity, non Stationarity data series that may affect regression analyses.

Modules	**Blooms level***	**Number of hours**
MODULE 1: Probability Theory Elements of Probability Theory: Sample space Events, meaning of probability Classical definition of probability, The addition rule, Multiplication Rule, Theorems of total probability, conditional and statistical independence, limitation of classical definition, Bayes formula, random variable, expectation and variance of random variable (for random sampling with or without replacement)	L1, L2,L3	9
MODULE 2: Random Variables and Probability Distributions	L1,	9

Defining random variables; probability distributions; expected values of random variables and of functions of random variables; properties of commonly used discrete and continuous distributions (uniform, binomial, normal, poisson and exponential random variables).	L2,L3	
MODULE 3:Introduction to Estimation Methods of sampling; sampling distribution of a statistic; distribution of the sample mean; sampling error and standard error of a statistic with special reference to the mean; Point and interval estimation of parameters; properties of an estimator; unbiasedness, relative efficiency and consistency.	L1, L2,L3	9
MODULE 4: Hypothesis Testing Testing of Hypothesis; type I and type II errors, power of a test; large sample tests, "t" test for the mean; one tail and two tail tests for difference of means; z-test, f-test, Chi-square test for (i) goodness of fit and (ii) independence of two attributes.	L1, L2,L3	9

**Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4: Analysis; L5:Synthesis, L6:Evaluation*

Text Books

1. Gupta S.C, *Fundamentals of Statistical Methods*, Sultanchand& Sons.
2. Allen Webster, Applied Statistics for Business and Economics, (3rd edition), McGraw Hill, International Edition 1998.
3. Pitman, Australia. M.R. Spiegel (2nd edition), *Theory and Problems of Statistics*, Schaum Series.

Reference Books

1. P.H. Karmel and M. Polasek, *Applied Statistics for Economists* (4th edition)
2. N.G.Das, *Statistical Methods* (Edition 1&2), Tata McGraw Hill

Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

Examination Scheme:

Components	**A**	**CT**	**S/V/Q**	**HA**	**EE**
Weightage (%)	5	10	8	7	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; A: Attendance

CO, PO and PSO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	3	1	2	1	--	--	3	1	1	2	1	--	--
CO2	1	1	3	1	--	--	3	1	2	2	1	--	--
CO3	1	2	2	1	--	--	3	1	1	2	1	--	--
CO4	2	1	3	1	--	--	3	1	2	2	1	--	--

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BUA4105	**EXCEL FOR DECISION MAKING**	L	T	P	C
Version 1.1	Latest Approved	1	0	2	2
Pre-requisites/Exposure					
Co-requisites					

Catalog Description

Microsoft Excel is a very popular business productivity application for the management and manipulation of data. With the right training and understanding of Excel, businesses and individual users can unlock the world of opportunities that this powerful business application offers. This course will provide all the tools necessary to create and use basic and advanced spreadsheets.

Course Objectives

The course enables students to:

1. Explore the Microsoft Excel as a tool for facilitating solutions for business problems/decision making

2. Have an understanding on the advanced functions of excel through guided demonstration.

3. Enhance excel skills of students and develops a set of fundamental skills that are essential for survival in business amid global uncertainty.

Course Outcomes

On completion of this course, the students will be able to

CO1: Manage data in excel.

CO2: Explore the functions of basic and advanced excel.

CO3: Analyze the real time series dataset.

CO4: Explain insights about decision making in business.

Modules	Blooms level*	Number of hours
Module 1: Overview of Excel **Contents:** Introduction to Spreadsheets: data entry using autofill, sort & filter feature, widening rows and columns, inserting & deleting rows and columns, creating lists, wrapping & merging text and cells. Introduction to basic data formatting, saving work in excel. Protecting & sharing workbooks, freeze panes, understanding normal, page layout and page break preview in excel, page orientation and print area in Excel. How to adding hyperlinks to cells, inserting images, objects, equations and symbols. Introduction toFigures and Charts: Inserting bar charts, pie charts, column charts and line charts in spreadsheets,	L1, L3, L4	4

formatting and resizing the chart.		
Module 2: Data Cleansing and Lookups **Contents:** Textual functions- TRIM, SUBSTITUTE, CLEAN, STORED AS TEXT, DE-DUPLICATING, LEN & FIND, CONCATENATE, UPPER, LOWER, REPLACE functions and Data validation; Look up functions- VLookup, multiple VLook up together and HLookup with index and match; Basics of Macros.	L1, L3, L4	4
Module 3: Logical Functions and Pivot Tables **Contents:** Basic functions- ROUNDING, SUM, PRODUCT, MIN, MAX, AVERAGE, CONDITIONAL COUNTS, LARGE, RANK, VAR, Std Dev, CONDITIONAL SUMS. Date functions and Time functions. Logical functions- IF, THEN, AND, OR, NOT, COUNTIFS, SUMIFS, TRUE, FALSE Functions. Financial functions: Time value of money- Present value, Future value, PMT with beginning date, PMT with ending date, NPV, Goal seek, Scenario Manager. Pivot table, pivot charts and conditional formatting.	L1, L3, L4	4
Module 4: Simulation and Decision Making **Contents:** Basics of simulation, Monte Carlo Exoperiment, Decision Analysis (DA): Terminology, DA without probabilities (Maximax, Maximin, Minimax Regret), DA with probabilities: (Decision point / branch, chance event / branch, Decision tree with examples.	L1, L3, L4	4

**Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

Examination Scheme:

Components	Written Test	Practical	Viva	File/Assignment	Attendance
Weightage (%)	20	30	30	15	5

Text Books

1. Carlberg CG, "*Business Analysis with Microsoft Excel* (2nd Edition)", Que Publishing, ISBN 0974415626.
2. Harvey G (2012), "*Excel 2013 for Dummies*" John Wiley & Sons, ISBN 9781118559703

Reference Book

Excel 2013 for Dummies by Greg Harvey, John Wiley & Sons, 2012, ISBN 9781118559703

CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1	1	-	-	-	-	-	-	-	1	-	1	-	-
CO2	-	-	-	-	-	-	-	-	1	-	1	-	-
CO3	-	-	-	-	-	-	-	-	1	-	1	-	-

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CO4	-	-	-	-	-	-	-	-	1	-	1	-	-

1: strongly related, 2: moderately related and 3: weakly related

BUA4106	**OPTIMIZATION TECHNIQUES**	L	T	P	C
Version 1	Latest approved	2	0	2	3
Pre-requisites/Exposure					
Co-requisites					

Catalog Description

The main objective of the course is to provide the students the insight into structures and processes that management science can offer and the enormous practical utility of its various utility. The course is designed to introduce the fundamental tools of MS and their application to real life business problems. It will help students to take well informed decisions in their corporate life.

C**ourse Objective:**

The main objectives of this course are to:

1. Take decision under certain, uncertain and risky environment
2. Understand various business problems and applying a suitable MS model
3. Formulate Linear Programming Problem and solving using graphical and Simplex methods
4. Design the transportation and assignment problem, solve them and interpret the result
5. Design and solving the problems of game theory for the optimal solution
6. Describe the application of simulations.

Course Outcomes

On completion of this course**, s**tudents shell be able to:

CO1. To recall the evolution of OR and specify currently used OR models for different business situations

CO2. To describe a business problem and analyzing it for the optimum solution

CO3. To illustrate different prevailing constraints while finding out optimum solution

CO4. To evaluate various models to take better and improved decisions

Modules	**Blooms level***	**Number of hours**
Module I: Introduction Optimization Techniques: uses, scope, applications in managerial decision making; assumptions of management science models, decision making environments: decisions under certainty, uncertainty and risk situation; decision tree approach and its applications.	L1, L2, L3	6

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Module II: Linear Programming Problems Linear Programming Problems: Modeling and Solution Methods- graphical method, simplex methods, problems with maximization and minimization objects, duality and its managerial interpretation; Sensitivity analysis: meaning, Change in Objective Function Coefficients, Change in Right Hand Side Values, Change in Availability of resources and Addition of a new variable.	L1, L2, L3, L4, L6	8
Module III: Transportation and Assignment Model Transportation model: various methods of finding initial basic feasible solution and optimal solution, MODI method, degeneracy, unbalanced problems, prohibited route problems, maximization transportation problems Assignment Model: Hungarian method for solution, unbalanced assignment problems, restrictions on assignments, travelling salesman problem.	L1, L2, L3, L4, L6	8
Module IV: Game Theory Two-Person Zero Sum Games, Pure Strategies: Games with Saddle Point, Mixed Strategies: Games without Saddle Point, Principle of Dominance, and Solution Methods for Games without saddle point – Algebraic Method, Arithmetic Method, Graphical Method.	L1, L2, L3, L4, L6	8
Module VI: Simulation Simulation: meaning, types of simulation, steps of simulation process, Monte Carlo simulation, applications of simulation	L1, L2, L3, L4, L6	6

**Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

Text Books

1. Vohra, N.D. (2007). *Quantitative Techniques in Management (3rd ed.*). New Delhi, India: Tata McGraw-Hill Publishing Company Limited
2. Sharma, J.K. (2013). *Operation Research: Theory and Applications (5th ed.).* New Delhi, India: Macmillan Publishers India limited
3. Jaishankar, S. (2010). *Operation Research.* New Delhi, India: Excel Books
4. Kalavathy, S. (2002). *Operation Research (2nd ed.).* New Delhi, India: Vikas Publishing House
5. Kapoor, V.K. (2008). *Operation Research: Techniques for Management (7th ed.).* New Delhi, India: Sultan Chand and Sons

Reference Books

1. Frederick Shiller & Gerald J Liberman. *Introduction to Operation Research*. New Delhi, India: Tata McGraw- Hill Education (India) Private Limited
2. Taha, H.A. *Operation Ressearch.* New Delhi, India: Prentice Hall India
3. Gillet, B.E. *Introduction to Business Research*. Tata McGraw Hill

Modes of Evaluation: Class Test/Assignment /Written Examination

Examination Scheme:

Components	ME	A	Q/S	Asn	CT	EE
Weightage (%)	10	5	5	5	5	70

ME- Mid Term Examination; A- Attendance; Q/S- Quiz/Seminar; Asn- Assignment, EE- External Examination, CT- Class test

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CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1	-	1	2	--	--	--	--	--	--	1	1	--	
CO2	-	1	2	--	--	--	--	--	--	1	2	2	
CO3	-	1	--	--	--	--	--	--	--	1	2	2	
CO4	-	1	1	1	--	--	--	--	--	1	3	3	

1: strongly related, 2: moderately related and 3: weakly related

BUA4107	**DATABASE MANAGEMENT SYSTEMS**	L	T	P	C
Version 1.1	Latest Approved	3	0	0	3
Pre-requisites/Exposure					
Co-requisites					

Catalog Description

In this course the students will learn about the importance and usage of database management systems in the modern day organizations. The students shall grasp sound knowledge of various types of databases that exist, creation of data warehouse and application areas of data mining. Also, the students will be learning SQL, the language of databases.

Course Objectives

The course aims to make the students

1. Understand the basic and advanced concepts in databases and database management systems
2. Analyze the importance of databases in day to day life.
3. Get a hands-on experience on the SQL-the language of databases.

Course Outcomes

On completion of this course, the students will be able to

CO1: Define the basic terminology used in databases.

CO2: Describe the concepts related to databases architecture.

CO3: Apply the knowledge of SQL in creating databases using DBMS software for a business organization.

CO4: Compare and contrast various types of keys used in database creation.

CO5: Review and assess the organization's data and network security aspects.

Modules	**Blooms level***	**Number of hours**
Module I: Introduction to DBMS Definition of DBMS, Concept and Goals of DBMS, Data Independence, DBMS Architecture, Levels, Database Administrator, File System Approach Vs DBMS Approach,	L1, L2	6

Advantages of Using a DBMS, Data Models, Schemas, and Instances, Database Languages, Database Users, Database Abstraction.		
Module II: Relational Database & ER Model **Relational Database**: Relational System, Codd's Rule, Relational Model, Optimization, Tables and Views **ER Model:** Entity Type, Entity Set, Relationship type, Relationship sets, Constraints: Cardinality Ratio and Participation Constraint, Keys, Mapping, Design of ER diagrams.	L2, L3	7
Module III: Relational Model Objects Domains and Relations, Relations and predicates, Relational Data Integrity; Primary Key, Candidate Key, Foreign Key and their rules, Relational operators, Relational Algebra	L1, L2	7
Module 4: SQL SQL Language, DDL, DML and DCL commands. Data definition, Data retrieval and update operations on MS ACCESS and SQL Server DBMS.	L1, L2	8
Module 5: Database Applications and Types Distributed Database, Object Oriented Database, Multimedia Database, Data Mining, Digital Libraries. Data Warehouse.	L1, L2	8

**Bloom's Level:*
L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

Text Books

1. Elmasari, Navathe, "Fundamentals of Database Systems", Addision Wesley.
2. Korth, Silbertz, Sudarshan, "Database Concepts". McGraw Hill.

Reference Books

1. Majumdar & Bhattacharya, "Database Management System", Tata McGraw Hill.
2. Date C J." An Introduction to Database Systems", Addision Wesley.

Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

Examination Scheme:

Components	CPA	TP	Q/S	A	ME	EE
Weightage (%)	5	5	5	5	10	70

ME- Mid Term Examination; A- Attendance; Q/S- Quiz/Seminar; Asn- Assignment, EE- External Examination

CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1	1			-				-	-		1		
CO2	1			-				-	-		1		
CO3	2			-				-	1		1		
CO4	-			-				1	2		1		
CO5	-			1				2	-		1		

1: strongly related, 2: moderately related and 3: weakly related

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BUA4108	**HUMAN RESOURCE MANAGEMENT**	L	T	P	C
Version 1.1	Latest Approved	3	0	0	3
Pre-requisites/Exposure					
Co-requisites					

Catalog Description: The course provides insight into managing Human Resources, Recruitment, Selection, Performance Appraisal, Training & Development and Compensation.

Course Objective:
The objective of this course is to help the students develop an understanding of the dimensions of the management of human resources, with particular reference to HRM policies and practices in India.

Course Outcomes:
On completion of the course the students will be able to:
CO1: Explain and apply the concepts of human resources management in the financial sector.
CO2: Demonstrate a basic understanding of different tools and techniques used in forecasting and planning human resource requirements especially in context to the banking industry.
CO3: Interpret the industry regulations of the banking sector that will effect employees and employers and apply them effectively.
CO4: Analyze and solve key issues related to the human elements, both nationally and internationally such as employee acquisition, retention compensation, appraisal, training, career planning and diversity.

Modules	Blooms level*	Number of hours
Module I: Human Resource Management in Perspective Nature and scope of HRM, HRM functions, HRM models, understanding concepts of Personnel Management, Human Resource Development and Strategic Human Resource Management, HR Environment, Changing Role of HR.	L1, L2	7
Module II: Meeting Human Resource Requirements Job Analysis, Job Description, Strategic Human Resource Planning, Recruitment, Selection Process, Methods – Interview, Tests, Placement and Induction	L1, L2	6
Module III: Training & Developing of Employees Training and Development, Understanding of Performance Management Systems, Potential Appraisal, Career Development	L1, L2	8
Module IV: Managing Compensation	L1,L2	4

Job evaluation, Methods of Job Evaluation, Strategic Compensation, Equity Theory, Components of Pay Structure, Designing and Administration of Wage and Salary Structure, Wage Regulations in India		
Module V: Employee Relations Overview of Industrial Relations, Industrial disputes, Collective Bargaining, Workers Participation and Management, Grievance handling	L1, L2	5
Module VI: Emerging Trends in HRM Overview of Human Resource Information System (HRIS), Introduction to HR Audit, IHRM Practices, Cross- Cultural and Diversity Management, Work-life integration, Human Resource Outsourcing	L1, L2	6

**Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

Text & References:

1. David A. Decenzo ,Stephen P. Robbins , Susan L. Verhulst,(2015), Human Resource Management ,eleventh edition , Wiley;
2. Prasad. L.M, (2014) Human Resource Management, Third Edition, Sultan Chand & Sons; New Delhi.
3. Chhabra T.N,(2014) Human Resource Management: Concepts and Issues, Edition 2014,Dhanpat Rai & Co
4. Dessler G (2014) A Framework for Human Resource Management, 7 edition (2014), Pearson Education India;
5. Michael Armstrong , Stephen Taylor,(2017), Armstrong's Handbook of Human Resource Management Practice, 14 edition (3 February 2017), Kogan Page;

Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

Examination Scheme:

Components	CPA	TP	Q/S	A	ME	EE
Weightage (%)	**5**	**5**	**5**	**5**	**10**	**70**

ME- Mid Term Examination; A- Attendance; Q/S- Quiz/Seminar; Asn- Assignment, EE- External Examination

CO, PO and PSO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	1	1	-	-	-	-	-	-	-	1	-	-	-
CO2	2	1	-	-	-	-	-	-	-	1	-	-	-
CO3	2	3	-	-	-	-	-	-	-	2	-	-	-
CO4	1	2	-	-	-	-	-	-	-	1	-	-	-

1: strongly related, 2: moderately related and 3: weakly related

Syllabus – Second Semester

BUA4201	**FINANCIAL MANAGEMENT**	L	T	P	C
Version 1.1	Latest Approved	3	0	0	3
Pre-requisites/Exposure					
Co-requisites					

Catalog Description

This course introduces an investigation of the firm's acquisition and financial activities, to include working capital management, capital budgeting, capital structure strategies, and valuation theory. The practical application of financial policy is stressed for decision-making purposes.

Course Objectives

The objective of this course is to

1. Provide the students relevant, systematic, efficient and actual knowledge of financial management that can be applied in practice with making financial decisions and resolving financial problems.
2. Help the students to acquire the basic knowledge by means of combining theoretical cognitions and practical attitudes to enable them to understand the financial problems in business practice.

Course Outcomes

On completion of this course, the students will be able to

CO1: Describe the financial environment within which organisations must operate.

CO2: Critically evaluate the financial objectives of various types of organisations and the respective requirements of stakeholders

CO3: Explain alternative sources of finance and investment opportunities and their suitability in particular circumstances

CO4: Assess the factors affecting investment decisions and opportunities presented to an organisation.

CO5: Select and apply techniques in managing working capital

CO6: Analyse a company's performance and make appropriate recommendations.

Modules	Blooms level*	Number of hours
Module I: Introduction A Framework for Financial Decision-Making- Financial Environment, Changing Role of Finance Managers, Objectives of the firm.	L1,L2	4
Module II: Valuation Concepts	L1, L2	4

Time Value of Money, Risk and Return, Financial and Operating Leverage.	,L3	
Module III: Financing Decisions Capital Structure and Cost of Capital**,** Marginal Cost of Capital.	L1, L2,L3	7
Module IV: Capital Budgeting Estimation of Cash Flows, Criteria for Capital Budgeting Decisions, Issues Involved in Capital Budgeting, Risk analysis in Capital Budgeting – An Introduction.	L1,L2,L3	10
Module V: Working Capital Management Factors Influencing Working Capital Policy, Operating Cycle Analysis, Management of Inventory, Management of Receivables, Management of Cash and Marketable Securities, Financing of Working Capital.	L1,L2,L3	5
Module VI: Dividend Policy Decisions An introduction**:** Different Schools of Thought on Dividend Policy.	L1,L2,L3	6

**Bloom's Level: L1-Knowledge;L2-Comprehension;L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

Text Books

1. Pandey, I.M. (2016), Financial Management, 11th Edition,Vikas Publishing House**.**
2. Chandra, P. (2017), Financial Management: Theory and Practice, 9th Edition,Tata McGraw Hill
3. Rustagi, R.P,Financial Management: Theory, Concepts and Problems, Galgotia Publishing Company.

Reference Books

1. Damodaran, A.(2007), Corporate Finance: Theory and Practice, Wiley & Sons.
2. Van Horne, J.C. (2011), Financial Management and Policy, Prentice Hall of India.

Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

Examination Scheme:

Components	**CPA**	**TP**	**Q/S**	**A**	**ME**	**EE**
Weightage (%)	5	5	5	5	10	70

ME- Mid Term Examination; A- Attendance; Q/S- Quiz/Seminar; Asn- Assignment, EE- External Examination

CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1	1	1	--	--	--	--	--	--	--	1	2	--	--
CO2	1	1	--	--	--	2	2	--	--	1	--	--	--
CO3	1	1	--	--	--	--	1	--	--	1	2	--	--
CO4	1	1	--	--	--	--	2	--	--	1	2	--	--
CO5	1	1	--	--	--	--	--	--	2	1	2	--	--
CO6	1	1	--	--	--	--	--	2	--	1	--	--	--

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BUA4202	**OPERATIONS AND SUPPLY CHAIN MANAGEMENT**	L	T	P	C
Version 1	Latest approved	3	0	0	3
Pre-requisites/Exposure					
Co-requisites					

Catalog Description

Operations and supply chain management deals with the design and operation of the systems for production of goods and services. It will explore the approaches and analyze strategic decisions in operations management with a focus on designing products and processes, allocating scarce resources to strategic alternatives, and do long-range capacity and facility planning. These operations functions help in achieving the organization's long-range objectives. Subsequent focus will be on medium and short term planning and controlling. Care will be taken to strike a balance between theoretical and practical perspectives in manufacturing and serviceorganizations.

Course Objectives

The main objectives of this course are to:

1. Develop an understanding of how the operations, have strategic importance and can provide a competitive advantage in theworkplace.
2. Understand the relationship between operations and other businessfunctions.
3. Understand techniques of location and facility planning, line balancing, job designing, and capacity-planning in operationsmanagement.
4. Understand the supply chain function starting from Demand Management through InventoryManagement.

Course Outcomes

On completion of this course, the students will be able to

CO1. Define the elements of operations management and various transformation processes to enhance productivity andcompetitiveness

CO2. Classify and apply various facility alternatives and their capacity decisions, develop a balanced line of production & scheduling and sequencing techniques in operation environments

CO3. Illustrate aggregate capacity plans and MPS in operationenvironments

CO4. Analyze suitable supply chain principles and practices in the operations.

CO5. Compare and apply variousinventory control methods

Modules	Blooms level*	Number of hours
Module I: Introduction Operations in manufacturing and services, responsibility of Operations Manager, Operations strategy and competitiveness, process analysis, manufacturing process and service process selection and design, job design and work measurement	L1, L2, L3	6
Module II: Strategic Decisions Facility location decisions, factors affecting location, location techniques: factor rating method, centroid method, facility layout, process layout, systematic layout planning, product layout, line balancing, fixed position layout, service operations layout, types of capacity, capacity planning: long term and short term, economies of scale	L1, L2, L3	8
Module III: Operating Decisions Aggregate Planning, production planning and control (PPC), benefits of PPC, Master Production Scheduling, Operations scheduling: loading, sequencing, priority rules and techniques, Materials Requirement Planning (MRP), concerns in MRP	L1, L2, L3	8
Module IV: Supply Chain Management Recent issues in SCM: Role of IT in SCM, CRM Vs SCM, structure of supply chain, benchmarking concept, features and implementation, outsourcing decisions, value addition in SCM	L1, L2, L4, L5	8
Module V: Inventory Management Inventory management: Objectives, factors, process, inventory costs, inventory models, inventory control techniques: ABC, VED, EOQ, SED analysis, Just-in-Time (JIT), JIT vs traditional systems of operations, JIT in services	L1, L3, L4, L6	6

**Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

Text Books

1. Production and Operations Management, S.N. Cherry, McGraw Hill Publications, 3/e, 4th reprint 2007
2. Production and Operations Management , Sunil Chopra, Peter Meindle, Prentice Hall of India
3. Supply Chain Management, R.B. Handfield, Prentice Hall of India
4. Supply Chain Management, Ajay Garg, McGraw Hill Publications
5. Introduction to Supply Chain Management, Frederick Shiller& Gerald J Liberman , Tata McGraw Hill edition
6. Operation Research, H..A.Taha, Prentice Hall India
7. Introduction to Operation Research, B.E .Gillet ,Tata McGraw Hill:

Reference Books

1. RichardB.Chase,RaviShankarandF.RobertJacobs(2014);Operations&Supply Chain Management; McGraw-Hill - 2014 (14thEdition).
2. CharyS.N.TheoryandProblemsinProduction&OperationsMgt.;TataMcGraw Hill(14th Edition).
3. Krajewski Lee; Operations Mgt. Process for ValueChains; Prentice Hall (8th

Edition)

4. Russell S. Roberta & Taylor, Operations Mgt., Prentice Hall (4thEdition).

Modes of Evaluation: Class Test/Assignment /Written Examination

Examination Scheme:

Components	ME	A	Q/S	Asn	CT	EE
Weightage (%)	10	5	5	5	5	70

ME- Mid Term Examination; A- Attendance; Q/S- Quiz/Seminar; Asn- Assignment, EE- External Examination

CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1	2	1	2	--	--	--	--	--	--	1	1	3	
CO2	2	1	2	--	--	2	--	2	--	1	--	3	
CO3	--	1	--	1	--	1	--	2	--	1	--	--	
CO4	--	1	1	1	--	--	--	3	--	1	2	--	
CO5	--	1	1	1	--	--	--	--	--	1	2	--	

1: strongly related, 2: moderately related and 3: weakly related

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BUA4203	**ECONOMETRICS**	L	T	P	C
Version 1.1	Latest Approved	2	0	2	3
Pre-requisites/Exposure					
Co-requisites					

Catalog Description

This course offers the both fundamental and strategic understanding on identification of business problem and how to approach that problem using econometric techniques. This course facilitates a good learning on the estimation of parameters and forecasting of any indicator/variable related to business/ economy at both micro and macro level. Also, this course covers the quantitative analysis, model building and policy making for any economic/business problem. The course starts with simple and multiple linear regressions, followed by topics of special interest to deal with model specification, endogenous variables, binary choice data, and time series data. The aim of the course is to make the students familiar with statistical techniques and quantitative analysis.

Course Objectives

The objective of this course is to

1. Provide a good understanding on identification of problem, estimation of parameters and interpretation of results.
2. Equip the students with major statistical tools and techniques using various statistical software such as STATA, R, SPSS, Eview, SAS.
3. Explore the mathematical background of these concepts and techniques, and demonstrate their use through practical examples and interactive experiments.
4. Facilitate hands on experience to various real world business problems.

Course Outcomes

On completion of this course, the students will be able to

CO1: Translate data into models to make forecasts and to support decision making in a wide variety of fields, ranging from macroeconomics to finance and marketing.

CO2: Use statistical software or programming languages to combine data sets and estimate econometric models.

CO3: Analyse binary response data, panel and time series data using appropriate statistical models.

CO4: Explain problems imposed by endogeneity and simultaneity bias and how to resolve these problems using appropriate statistical models.

Modules	Blooms level*	Number of hours
MODULE 1: Parametric Tests Nature, meaning and scope of econometrics; Simple and general linear regression model —Assumptions, Estimation (through OLS approach) and properties of estimators; Gauss-Markov theorem;	L1, L2,L3	8

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Concepts and derivation of R2 and adjusted R2; Concept and analysis of variance approach and its application in regression analysis.		
MODULE 2: Autocorrelation Nature, test, consequences and remedial steps of problems of auto-correlation	L1, L2,L3,L4	7
MODULE 3: Heteroscedasticity Nature, test, consequences and remedial steps of problems of heteroscedasticity.	L1, L2,L3,L4	7
MODULE 4: Multicollinearity Nature, test, consequences and remedial steps of problems of Multicollinearity.	L1, L2,L3,L4	7
MODULE 5: Non-Parametric Tests Dummy variable technique, Testing structural stability of regression models, Stationarity Tests, Logit, Probit and Tobit models — Applications.	L1, L2, L3,L4	7

**Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4-Analysis; L5-Synthesis; L6-Evaluation*

Text Books

1. Gujarati, D.N. (1995), *Basic Econometrics* (2nd Edition), McGraw Hill, New Delhi.
2. Theil, H. (1981), *Introduction to Econometrics*, Prentice Hall of India, New Delhi.

Reference Books

1. Suresh K. Ghoshe, *Econometrics*, Prentice Hall of India Private Limited, New Delhi (2003)
2. A. Koutsoyiannis, *The theory of Econometrics: An introduction exposition of econometric methods*, Educational low-priced books scheme, McMillan Education (1992)
3. Christopher Dougherty, *Introduction to Econometrics*, Oxford University Press (3rd edition)
4. Amemiya, T. (1985), *Advanced Econometrics*, Harvard University Press, Cambridge, Mass.
5. Baltagi, B.H. (1998), *Econometrics*, Springer, New York.
6. Dongherty, C. (1992), *Introduction to Econometrics*, Oxford University Press, New York.
7. Goldberger, A.S. (1998), *Introductory Econometrics*, Harvard University Press, Cambridge

Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	10	8	7	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance

CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1	3	1	2	1	--	--	3	1	1	2	1	--	--
CO2	1	1	3	1	--	--	3	1	2	2	1	--	--
CO3	1	2	2	1	--	--	3	1	1	2	1	--	--
CO4	2	1	3	1	--	--	3	1	2	2	1	--	--

1: strongly related, 2: moderately related and 3: weakly related

BUA4204	**BUSINESS RESEARCH METHODS**	L	T	P	C
Version 1.1	Latest Approved	1	0	2	2
Pre-requisites/Exposure					
Co-requisites					

Catalog Description:
The main objective of the course is to equip the students with the basic understanding of research methodology in changing business scenario. It will also provide them an insight into the application of dynamic analytical tools to face the stormy challenges aimed at fulfilling the purpose of business decision making.

Course Objectives:
The objectives of this course are to ensure that students are able to:

1. Understand the basic framework of research process.
2. Comprehend of various research designs and techniques.
3. Identify various sources of information for literature review and data collection.
4. Understand some basic concepts of research and its methodologies
5. Understand as how to organize and conduct research in a more appropriate manner and write a research report, thesis and a research proposal

Course Outcomes (CO):
On completion of this course, the students will be able to:
CO1: Apply a range of quantitative and / or qualitative research techniques to business and management problems / issues
CO2: Determine and apply research approaches, techniques and strategies in the appropriate manner for managerial decision making
CO3: Demonstrate knowledge and understanding of data analysis and interpretation in relation to the research process
CO4: Develop necessary critical thinking skills in order to evaluate different research approaches utilised in the different industries and be able to critically assess the overall process of designing a research study from its inception to its final report preparation.

Modules	**Blooms level***	**Number of hours**
Module I: Introduction Meaning of research, importance of scientific research in business decision making, types of research, complete research process, research methodology, criterion for good research, Identification of research problem and formulation of hypothesis, research designs, drafting a research proposal	L1, L2	2
Module II: Measurement and Data Collection Primary data, secondary data, design of questionnaire, sampling fundamentals and sample designs, Qualitative and	L1, L2,L3,L4, L5	8

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quantitative research, measurement and scaling techniques, measures of central tendency mean, median, mode; measures of dispersion, data processing		
Module III: Data Analysis I Cross tabulation, univariate analysis, bivariate analysis: Correlation, Karl Pearson's coefficient of correlation, Spearman's coefficient of correlation, hypothesis testing, t-test, Z test, F-test, Chi- square test, Analysis of variance, Non-parametric tests: Sign test, Run test, Krushall-Wallis test	L1, L2,L3,L4,L5	6
Module IV: Data Analysis-II Simple linear regression: coefficient of determination, significance tests, residual analysis, Multivariate techniques: multiple linear regression: Multiple coefficient of determination, interpretation of regression coefficients, heteroscedasticity, multicollinearity, outliers, auto regression, factor analysis, cluster analysis (concept)	L1,L2,L3,L4, L5	4
Module V: Report Writing Pre-Writing Considerations, structure of research report, common problems encountered while preparing the research report, presentation of research report, ethical issues while preparing a research report	L1,L2,L3,L4, L5	4

*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

Text Book:

Cooper, R.D., Schindler, S. P. and Sharma, J.K. (2015). Business Research Methods. New Delhi, India: McGraw Hill Education (India) Private Limited

Reference Books:

1. Zikmund, William C (1997). Business Research Methods (5th Ed.). The Dryden Press, Harcourt Brace College Publishers
2. Levin & Rubin (2004), Statistics for Management, 8th Ed, Prentice Hall of India

Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

Examination Scheme:

Components	CT	HA	Q/S	A	ME	EE
Weightage (%)	5	5	5	5	10	70

CT: Class Test, HA: Home Assignment, Q/S: Seminar/Viva/Quiz, ME: Mid Term Exam EE: End Semester Examination; A: Attendance

CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1	1	1	--	-	--	--	--	-	--	1	3	-	-
CO2	1	1	-	--	--	-	--	-	-	1	2	-	-
CO3	1	2	--	-	--	--	-	--	--	1	3	-	-
CO4	1	1	--	--	3	-	2	--	--	1	3	2	2

1: strongly related, 2: moderately related and 3: weakly related

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BUA4205	**ECONOMICS FOR MANAGEMENT**	L	T	P	C
Version 1.1	Latest Approved	2	0	0	2
Pre-requisites/Exposure	Basic knowledge of economic science preferred but not compulsory				
Co-requisites					

Catalog Description

In this course the students are introduced with various concepts of economic science that relates to decision making process in management of business organization. To begin with, introductory concepts of economic theory and their implications on managerial decision process are analyzed. Thereafter concepts related to demand analysis, demand forecasting supply analysis, and equilibrium market conditions are discussed in detail. The next phase deals extensively concepts related to production theory, cost theory and revenue aspects. Third, various concepts related to market structure are discussed in detail. Finally, various macroeconomic concepts, policy perspectives of government and other institutions are explored in detail. The overall aim of this course is to make the students familiar with working knowledge of economic decision process based on rational choice approach in workplace.

Course Objectives:

The objective of this course is to:

1. Equip the students with theoretical concepts of economic science so that they can analyze situations and improve upon their managerial decision making process in workplace.
2. Provide students with extensive exposure about the micro and macro level variables and government policies that influence business operations and strategies of the firm under dynamic business environment in an increasingly globalized and integrated business architecture.

Course Outcomes

On completion of this course, the students will be able to:

CO1: Explain basic concepts of economic analysis, demand and supply dynamics, demand forecasting techniques and their application, and analyze the working of free market mechanism and appreciate how forces of demand and supply reinforce each other for attaining market equilibrium.

CO2: Analyze rationally the dynamics of production and cost aspects in order to make a holistic assessment of the complexities inherent in production system.

CO3: Describe the various forms of market structure and their implications in managerial decision process.

CO4: Discuss holistically the various macroeconomic aspects of business, economic variables affecting business operations, and implications of government policies in shaping the dynamics of business environment.

Modules	Blooms level*	Number of hours
MODULE 1: Introduction to Managerial Economics, Demand Analysis and Demand Forecasting: *Introduction to Managerial Economics:* Meaning and Nature of Managerial Economics, Significance of Managerial Economics, Scope of Managerial Economics. *Demand Analysis:* Meaning of Demand, Determinants of Demand, Individual and Market Demand Functions, Individual and Market Demand Curves, Law of Demand, Exception of Law of Demand. *Elasticity of Demand:*Types of Elasticity of Demand, Significance of Elasticity of Demand. *Demand Forecasting*: Purpose of Demand Forecasting , Steps Involved in Forecasting, Determinants of Demand Forecasting, Methods of Demand Forecasting.	L1, L2	7
MODULE 2: Theory of Supply, Production, Cost and Revenue Analysis: *Supply:* Law of Supply, Determinants of Supply, Shift of Supply and Change in Supply, Elasticity of Supply, Kinds of Elasticity of Supply, Determinants Elasticity of Supply. *Theory of Production:* Meaning of Production, Short –run Analysis of Production, Law of Variable Proportion, the Three Stages of Production, Returns to Scale. *Analysis of Cost*: Cost and Managerial Decision-making, Types of Cost, Cost Function, Relationship between Production and Cost, Short Run Cost Function, Long Run Cost Function, Relation between Short-run and Long-run Cost Curves,.*Economies of Scale.* Break-Even Analysis. Concept of Revenue.	L1, L2	11
MODULE 3:Market Structure and Price Determination *Perfect Competition:* Introduction of Perfect Competition, Characteristics of Perfect Competition, Demand Curve of Firm and Industry, Equilibrium of the Firm in the Short Run and Long Run. Effects of Tax Imposition under Perfect Competition. *Monopoly:* Assumptions, Causes of Monopoly, Demand, Average Revenue and Marginal Revenue of a Monopolistic, Profit Maximization Price Determinants of the Monopolist in Short-run and Long-run. Measures of Monopoly Power. *Monopolistic Competition:* Assumptions, Product Differentiation, Demand Curve, Equilibrium of the Firm in Short-run and Long-run, Selling cost and Monopolistic Competition. *Oligopoly:* Assumptions, Non-collusive Oligopoly and Collusive Oligopoly, Kinked Demand Curve Analysis.	L1, L2, L3	8
MODULE 4: Macroeconomics Analysis *National Income:* An Indicator of Economic Activity, The Parameters that Influence Level of Economic Activity. *Business Cycles:* Characteristics of Business Cycle, Phases of Business Cycle, Ill Effects of Business Cycles, General Measure to Control Business Cycles.	L1, L2, L3, L4	10

The Role of Government in Market Economy and Strategic Business Implications: Rationale of Government Intervention, Government Macroeconomic Policy Measures – GST, Demonetization – and their impact on Business; Macro Economic variables and their functional relationship; Economic Functions of Government in a Market Economy, Legal and Social Framework, Restraining Unfair Competition and Increasing Market Power, Reallocation of Resources in the Presence of Externalities, Redistribution of Income, Regulation of Natural Monopoly, Stabilization of Economy; *Macroeconomic Variables affecting Business:*Consumption Function, Saving Function, Investment Multiplier; Transaction, Precautionary, Speculative Demand for Money; Liquidity Preference; Components of Money Supply; Fiscal Policy & Monetary Policy and their implications on business and management; Inflation and Deflation - Demand pull and Cost push inflation; Government policies to control inflation. *International Trade Regime and its implications on Business:* GATT, World Trade Organization, Regional Trade Agreements – EU, NAFTA, ASEAN, SAFTA, MERCUSOR		

**Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

Text Books

1. Thomas, Christopher R., S. Charles Maurice, Sumit Sarkar, Managerial Economics, 9th Edition, Tata McGraw Hills.
2. Samuelson, Paul A., and William Nordhaus, Economics, 19th Edition, McGraw Hills India Pvt. Ltd.
3. Krugman, Paul and Maurice Obstfeld (2008), International Trade Policy, Pearsons.
4. Salvatore, D (2010), Managerial Economics, Oxford University Press

Reference Books

1. Peterson, H.C and Lewis, W.C. (2005), Managerial Economics, Prentice Hall of India
2. Bhattacharya, Govind and Debasis Bhattacharya. (2018), GST and Its Aftermath: Is Consumer Really the King, SAGE Publications.
3. Gupta, G.S. (2006), Managerial Economics, Tata McGraw Hill
4. Mishra, S.K., and V.K. Puri. (2009), Indian Economy, Himalaya Publishing House.

Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	15	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; A: Attendance

CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1	1	1	2	--	--	--	--	--	2	1	1	--	--

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CO2	1	1	2	--	--	--	--	2	--	1	1	--	--
CO3	1	1	2	--	--	--	--	--	--	1	1	2	--
CO4	1	1	1	--	--	--	2	2	2	1	1	2	2

1: strongly related, 2: moderately related and 3: weakly related

BUA4206	**PROGRAMMING FOR ANALYTICS USING R**	L	T	P	C
Version 1.1	Date of Approval: Latest Approved	2	0	2	3
Pre-requisites/Exposure					
Co-requisites					

Catalog Description

This course offers the specialization on R (powerful language used widely for data analysis and statistical computing). This course facilitates a good understanding on the process of data manipulation and visualization. The course provides ample working examples on statistical data analysis using R.

Course Objectives

The objective of this course is to:

1. Provide learning on how to program in R, how to use R for effective data analysis, how to install and configure software necessary for a statistical programming environment.
2. Provide applications on statistical computing which includes programming in R, reading data into R, accessing R packages, writing R functions, debugging, profiling R code, and organizing and commenting R code.
3. Facilitate hands on experience to various real world business problems using R.

Course Outcomes

On completion of this course, the students will be able to:

CO1: Analyze different datasets using R

CO2: Explore real time data at various levels using appropriate visualizations

CO3: Apply critical programming language concepts such as data types, iteration, control structures, functions, and boolean operators by writing R programs and through examples

Modules	**Blooms level***	**Number of hours**
MODULE 1: Introduction: Introducing to R , R Data Structures , Help functions in R , Vectors , Scalars , Declarations , recycling , Common Vector operations , Using all and any, Vectorized operations , NA and NULL values , Filtering , Vectorized if-then else , Vector Equality , Vector Element names	L1, L2,L3	8
MODULE 2: Matrices, Arrays And Lists: Creating matrices , Matrix operations , Applying Functions to Matrix Rows and	L1, L2,L3	7

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Columns , Adding and deleting rows and columns , Vector/Matrix Distinction , Avoiding Dimension Reduction , Higher Dimensional arrays , lists , Creating lists , General list operations , Accessing list components and values , applying functions to lists , recursive lists		
MODULE 3: Data Frames: Creating Data Frames , Matrix-like operations in frames , Merging Data Frames , Applying functions to Data frames , Factors and Tables , factors and levels , Common functions used with factors , Working with tables - Other factors and table related functions - Control statements , Arithmetic and Boolean operators and values , Default values for arguments - Returning Boolean values , functions are objects , Environment and Scope issues , Writing Upstairs - Recursion , Replacement functions , Tools for composing function code , Math and Simulations in R	L1, L2,L3	7
MODULE 4: OOP: S3 Classes , S4 Classes , Managing your objects , Input/ Output , accessing keyboard and monitor , reading and writing files , accessing the internet , String Manipulation , Graphics , Creating Graphs , Customizing Graphs , Saving graphs to files , Creating three-dimensional plots	L1, L2,L3	7
MODULE 5: Interfacing: Interfacing R to other languages , Parallel R , Basic Statistics , Linear Model , Generalized Linear models , Non-linear models , Time Series and Auto-correlation , Clustering	L1, L2, L3	7

**Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4-Analysis; L5-Synthesis;L6-Evaluation*

Text and Reference Books

1. Beginning R – The Statistical Programming Language by Mark Gardener, Wiley, 2013
2. Introductory R: A Beginner's Guide to Data Visualisation, Statistical Analysis and Programming in R
3. ByRobert Knell, Amazon Digital South Asia Services Inc, 2013

Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

Examination Scheme:

Components	**A**	**IP**	**EE**	**EP**
Weightage (%)	5	25	50	20

IP: Internal Practical, EE: End Semester Examination; EP: External Practical; A: Attendance

CO, PO and PSO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	3	1	2	1	--	--	3	1	1	2	1	--	--
CO2	1	1	3	1	--	--	3	1	2	2	1	--	--
CO3	1	2	2	1	--	--	3	1	1	2	1	--	--

1: strongly related, 2: moderately related and 3: weakly related

BUA4207	**PROGRAMMING FOR ANALYTICS USING PYTHON**	L	T	P	C
Version 1.1	Latest Approved	2	0	2	3
Pre-requisites/Exposure					
Co-requisites					

Catalog Description

This course is designed in such a way that leads the students from the basics of writing and running Python scripts to more advanced features such as file operations, regular expressions, working with binary data, and using the extensive functionality of Python modules.

Course Objectives

The objective of this course is to:

1. Equip students with the concepts of thefundamental programming concepts including data structures, networked application program interfaces, and databases, using the Python programming language.
2. Provide applications on statistical, machine learning, information visualization, text analysis, and social network analysis techniques through popular python toolkits such as pandas, matplotlib, scikit-learn, nltk, and networkx to gain insights into data analysis process.

Course Outcomes

On completion of this course, the students will be able to

CO1: Create applications for data retrieval and processing
CO2: Conduct an inferential statistical analysis of various business problems
CO3: Explain fundamental Python functionality and features used for data science
CO4: Apply techniques such as lambdas and manipulate csv files

Modules	Blooms level*	Number of hours
MODULE 1: Installing Python; basic syntax, interactive shell, editing, saving, and running a script, Concept of data types; variables, assignments; immutable variables; numerical types; arithmetic operators and expressions; comments in the program; understanding error messages Conditions, boolean logic, logical operators; ranges; Control statements: if-else, loops (for, while); short-circuit (lazy) evaluation	L1, L2,L3	8
MODULE 2: Strings and text files; manipulating files and directories, os and sys modules; text files: reading/writing text and numbers from/to a file; creating and reading a formatted file (csv or tab-separated).String manipulations: subscript operator, indexing, slicing a string; strings and number system: converting strings to numbers and vice versa. Binary, octal, hexadecimal numbers	L1, L2,L3	7

MODULE 3: Lists, tuples, and dictionaries; basic list operators, replacing, inserting, removing an element; searching and sorting lists; dictionary literals, adding and removing keys, accessing and replacing values; traversing dictionaries. Design with functions: hiding redundancy, complexity; arguments and return values; formal vs actual arguments, named arguments, Program structure and design, Recursive functions	L1, L2,L3	7
MODULE 4: Simple Graphics and Image Processing: "turtle" module; simple 2d drawing - colors, shapes; digital images, image file formats, image processing Simple image manipulations with 'image' module (convert to bw, greyscale, blur, etc).Classes and OOP: classes, objects, attributes and methods; defining classes; design with classes, data modeling; persistent storage of objects OOP, continued: inheritance, polymorphism, operator overloading (_eq_, _str_, etc); abstract classes; exception handling, try block	L1, L2,L3	7
MODULE 5: Graphical user interfaces; event-driven programming paradigm; tkinter module, creating simple GUI; buttons, labels, entry fields, dialogs; widget attributes - sizes, fonts, colors layouts, nested frames Multithreading, Networks, and Client/Server Programming; introduction to HTML, interacting with remote HTML server, running html-based queries, downloading pages; CGI programming, programming a simple CGI form. Searching, Sorting, and Complexity Analysis	L1, L2, L3	7

**Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4-Analysis; L5-Synthesis;L6-Evaluation*

Text and Reference Books

1. Core Python Programming by Wesley Chun,Prentice Hall
2. Fundamentals of Python: First Programs By Kenneth Lambert,Course Technology, Cengage Learning
3. Learning Python by David Ascher and Mark Lutz,Oreilly

Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

Examination Scheme:

Components	**A**	**IP**	**EE**	**EP**
Weightage (%)	5	25	50	20

IP: Internal Practical, EE: End Semester Examination; EP: External Practical; A: Attendance

CO, PO and PSO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	3	1	2	1	--	--	3	1	1	2	1	--	--
CO2	1	1	3	2	--	--	3	1	2	2	1	--	--
CO3	1	2	2	1	--	--	3	1	1	2	1	--	--
CO4	2	1	3	2	--	--	3	1	2	2	1	--	--

1: strongly related, 2: moderately related and 3: weakly related

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BUA4208	**CONSUMER BEHAVIOR**	L	T	P	C
Version 1.1	Latest Approved	3	0	0	3
Pre-requisites/Exposure	Basic Marketing concepts				
Co-requisites	NA				

Catalog Description:
The increasing trend of customer centric organizations makes it imperative to understand the psyche of consumer to the fullest. Virtually all companies are striving to gain maximum knowledge about the way consumer thinks and behave so that proper direction can be given to the marketing strategy. This paper on consumer behaviour aims to familiarize students about the importance of understanding consumers for the success of an organization. It makes a connection between customer behaviour principles and the elements of marketing strategy.

Course Objectives:
The objectives of this course are to:
1: Make the student understand the concepts/theories pertaining to consumer behaviour and reveal its importance in the context of marketing.
2: Make the student well versed with the various factors that influence consumer behaviour.
3: Enable the student to examine the consumer decision-making process.
4: Provide with knowledge to the student so that he may describe the target market and determine the positioning strategy according to consumer characteristics and behaviour.

Course Outcomes (CO):
On completion of this course, the students will be able to:
CO1: Memorize the various concepts and discuss the rationale for studying consumer behaviour.
CO2: Identify and explain factors which influence consumer behaviour inclusive of society and culture.
CO3: Demonstrate how knowledge of consumer behaviour can be applied to marketing.
CO4: Employ communication skills both orally and in writing within marketing contexts.

Modules	Blooms level*	Number of hours
Module I Consumer Behavior: Understandings and Applications, Consumer Research	L1, L2	5
Module II Consumer as an Individual: Consumer Motivation, Consumer Personality, Consumer Perception, Consumer Learning, Consumer Attitude formation and change.	L1, L2,L3,L4	13

Module III Consumers in their Social Setting: Reference Groups and Family Influences, Social Class and Consumer Behavior, Influence of Culture and Sub Cultures on Consumer Behavior.	L1, L2,L3,L4	13
Module IV Consumer Decision Making Process	L1,L2,L3,L4,L5	3
Module V Opinion Leadership, Diffusions of Innovations and Adoption	L1,L2	2

**Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

Text Books:

1. Schiffman, L.G., Wisenblit,J, J.& Kumar, S.R.(2016). *Consumer Behavior* (11th ed.*).* Noida, India: Pearson
2. Loudon, D. L. &Bitta, A. J.(2002). *Consumer Behavior*. N. Delhi, India: Tata-McGraw-Hill
3. Gupta, S.L. & Pal, S (2006).*ConsumerBehavior*. N. Delhi, India: Sultan Chand &Sons.

Reference Book:

Blackwell, R.D., Miniard, P.W. &.Engel, J.F.(2007). *Consumer Behavior*.Kundli, India: Thomsons South-Western.

Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

Examination Scheme:

Components	**CT**	**HA**	**Q/S**	**A**	**ME**	**EE**
Weightage (%)	5	5	5	5	10	70

CT: Class Test, HA: Home Assignment, Q/S: Seminar/Viva/Quiz, ME: Mid Examination, EE: End Semester Examination; A: Attendance

CO, PO and PSO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	1	-	--	2	--	--	--	--	--	2	1	--	--
CO2	1	-	-	--	--	2	--	--	--	2	1	--	--
CO3	1	-	--	2	--	--	--	--	--	-	1	3	-
CO4	1	-	--	--	--	--	2	--	--	-	1	3	1

1: strongly related, 2: moderately related and 3: weakly related

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BUA4301	**STRATEGIC MANAGEMENT**	L	T	P	C
Version 1.1	Latest Approved	3	0	0	3
Pre-requisites/Exposure					
Co-requisites					

Catalog Description

This course introduces the key concepts, tools, and principles of strategy formulation and competitive analysis. It is concerned with managerial decisions and actions that affect the performance and survival of business enterprises. The course is focused on the information, analyses, organizational processes, and skills and business judgment managers must use to devise strategies, position their businesses, define firm boundaries and maximize long-term profits in the face of uncertainty and competition.

Course Objectives

The objective of this course is to

1. Introduce students to the key concepts, tools and principles of business policy and strategic management.
2. Expand the student's capacity to integrate and appreciate the changes in the environment that shape the strategy of a business and lead to developing a competitive edge.
3. Develop the perspective of students towards understanding the culmination of different functional areas into building up of a corporate strategy.
4. Expose the students to the various approaches in crafting business strategy, tools that aid in reasoning carefully about strategic options, and learning how companies use what-if analysis to evaluate action alternatives and make sound strategic decisions.

Course Outcomes

On completion of this course, the students will be able to

CO1: Identify and recognise the various levels at which strategic decision making happens in an organization.

CO2: Analyse the internal and external environment of businessthat will lead to formulation of strategic plans.

CO3: Analyze the suitability of strategies that firms have developed in the real world scenario to achieve valueable outcomes.

CO4: Prepare strategic analysis and choice in order to determine alternative courses of action that could best enable the firm to achieve its mission and objectives.

CO5: Analysis of strategy implementation and evaluation to gain competitive advantage.

Modules	**Blooms level***	**Number of hours**
Module I: Introduction and Purpose of Strategy Formulation Evolution and Introduction of strategic management, Concept of	L1,L2	7

Strategy, corporate, Business and Functional Levels of Strategy, Mission, Vision, Objectives, Approaches to four Phases in Strategic Management Process, Stakeholders in business and their roles in strategic management, Strategic decision making.		
Module II: Environmental Analysis Analysing company's External Environment: PESTLE Analysis; Preparing an Environmental Threat and Opportunity Profile (ETOP), Analysing Industry Environment: Industry Analysis – Porter's Five Forces Model of competition, Strategic Group analysis.	L1, L2 ,L3	7
Module III: Analysis of Organizational Competencies Analysing Company's Internal Environment Resource based view of a firm, meaning, types & sources of competitive advantage, analysing company's Resources and Competitive Position, VRIO Framework; Benchmarking as a method of comparative analysis, Competitive advantage; Concept of a Core competence and Distinctive competitiveness, Characteristics of Core Competencies; Value Chain Analysis Using Porter's Model; Organizational Capability Profile: Strategic Advantage Profile.s	L1, L2,L3	7
Module IV: Strategic Analysis and Choice Generic Competitive Strategies: Meaning of Generic competitive strategies, Low cost, Differentiation, Focus – when to use which strategy; Grand Strategies: Stability, Growth (Diversification Strategies, Vertical Integration Strategies, Mergers, Acquisition & Takeover Strategies, Strategic alliances & Collaborative Partnerships), Retrenchment – Turnaround, Divestment, Liquidation, Outsourcing Strategies; Offensive and Defensive Strategies, Blue Ocean Strategy, Strategy in the age of Internet and E-commerce; Portfolio Analysis Business Portfolio Analysis – BCG Matrix – GE 9 Cell Model; Evaluation of Strategic Alternatives: SWOT Analysis, Grand Strategy Selection Matrix.	L1,L2,L3	8
Module V: Strategy Implementation and Evaluation Strategy Implementation, Barriers to implementation of strategy, Mc Kinsey's 7s Framework; Organization Structures for Strategy Implementation, Leadership Implementation, Functional Implementation, Strategic evaluation review and control.	L1, L2	7

**Bloom's Level: L1-Knowledge;L2-Comprehension;L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

Text Books

1. Kazmi, A. (2015), Business Policy and Strategic Management 4th edition), Tata Mc Graw Hill.
2. Wheelen and Hunger, (2018), Strategic Management and Business Policy: Globalisation, Innovation and Sustainability, Pearson Education.

Reference Books

1. Pearce and Robinson (2017),Strategic Management :Formulation, Implementation and Control, Tata McGraw Hill.
2. David Fred R.(2018)Strategic Management Concepts: A Competitive Advantage Approach, Pearson Education.

Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

Examination Scheme:

Components	CPA	TP	Q/S	A	ME	EE
Weightage (%)	5	5	5	5	10	70

CT: Class Test, HA: Home Assignment, Q/S: Seminar/Viva/Quiz, ME: Mid Examination, EE: End Semester Examination; A: Attendance

CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1	1	1	--	2	--	--	--	--	--	1	--	--	--
CO2	1	1	--	--	--	2	2	--	--	1	2	--	--
CO3	1	1	--	2	--	--	1	--	--	1	--	--	--
CO4	1	1	--	--	--	--	2	--	--	1	--	--	--
CO5	1	1	--	--	--	--	2	--	--	1	--	--	--

1: strongly related, 2: moderately related and 3: weakly related

BUA4302	**DATA MINING**	L	T	P	C
Version 1.1	Latest Approved	2	0	2	3
Pre-requisites/Exposure					
Co-requisites					

Catalog Description

Every business organization is realizing the importance of data. They are harnessing the benefits offered by Data Mining as it allows them to see hidden patterns from the data and helps in framing business policies. This course emphasizes on utilizing the techniques offered by Data Mining.

Course Objectives

This course enable students to:

1. Understand the basic concepts, principles, methods, implementation techniques, and applications of data mining, with a focus on major data mining functions such as cluster analysis.
2. Develops skills to use data mining software and other data mining techniques to solve business problems.

Course Outcomes

On completion of this course, the students will be able to

CO1: Evaluate and implement a wide range of emerging and new technologies to facilitate the knowledge discovery.

CO2: Assess raw input data, and process it to provide suitable input for a range of data mining algorithms.

CO3: Compare and evaluate different data mining techniques like classification, prediction, clustering and association rule mining

CO4: Discover and measure interesting patterns from different kind of databases.

CO5: Determine data mining functionalities.

CO6: Identify appropriate data mining algorithms, and apply and interpret and report the output appropriately.

CO7: Describe complex data types with respect to spatial and web mining

CO8: Analyze data using the powerful data mining tool Weka.

Modules	Blooms level*	Number of hours
Module I: Introduction to Data Mining What is data mining? Related technologies - Machine Learning, DBMS, OLAP, Statistics, Data Mining Goals, Stages of the Data Mining Process, Data Mining Techniques, Knowledge Representation Methods, Applications, Example: weather data, Data Warehouse and DBMS, Multidimensional data model, OLAP operations, Example: loan data set. Data cleaning, Data	L1, L2	6

transformation, Data reduction, Discretization and generating concept hierarchies, Installing Weka 3 Data Mining System, Experiments with Weka - filters, discretization		
Module II: Data mining knowledge representation and Attribute oriented Analysis **Data mining knowledge representation** Task relevant data, Background knowledge, Interestingness measures, Representing input data and output knowledge, Visualization techniques, Experiments with Weka – visualization. **Attribute oriented Analysis:** Attribute generalization, Attribute relevance, Class comparison, Statistical measures, Experiments with Weka - using filters and statistics.	L2, L3	7
Module III: Data mining algorithms **Association rules:** Motivation and terminology, Example: mining weather data , Basic idea: item sets, Generating item sets and rules efficiently, Correlation analysis, Experiments with Weka - mining association rules **Classification:** Basic learning/mining tasks, Inferring rudimentary rules: 1R algorithm, Decision trees, Covering rules, Experiments with Weka - decision trees, rules **Prediction:** The prediction task, Statistical (Bayesian) classification, Bayesian networks, Instance-based methods (nearest neighbor), Linear models, Experiments with Weka - Prediction	L1, L2, L3	7
Module IV: Cluster Analysis: Concepts and Methods Basic issues in clustering, First conceptual clustering system: Cluster/2, Partitioning methods: k-means, expectation maximization (EM), Hierarchical methods: distance-based agglomerative and divisible clustering, Density Based, Grid based Methods, Conceptual clustering: Cobweb, Experiments with Weka - k-means, EM, Cobweb	L1, L2, L3	8
Module V: Advanced techniques- Data Mining software and applications Text mining: extracting attributes (keywords), structural approaches (parsing, soft parsing), Bayesian approach to classifying text, Web mining: classifying web pages, extracting knowledge from the web, Data Mining software and applications	L1, L2, L3	8

**Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

Text & References:

1. Han, J., Kamber, M., & Pei, J. (2011). Data mining: Concepts and techniques (3rd ed.). Waltham: Morgan Kaufmann.
2. Alex Berson, Data Warehousing, Data Mining, and Olap, Tata McGraw Hill.
3. George M Marakas, Modern Data Warehousing, Mining & Visualization Core Concepts, Pearson Education.
4. (Berry, Michael)Data Mining Techniques.
5. (Sharma, Gajendra)Data Mining, Data Warehousing and OLAP.
6. (Gupta, GK) Data Mining with Case Studies.
7. (Han &Kamber)Data Mining: Concepts and Techniques.

8. (PaulrajPonniah) Datawarehousing Fundamentals

Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

Examination Scheme:

Components	**A**	**IP**	**EE**	**EP**
Weightage (%)	5	25	50	20

IP: Internal Practical, EE: End Semester Examination; EP: External Practical; A: Attendance

CO, PO and PSO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	1							1			1		
CO2	1							1			1		
CO3	2							1	1		1		
CO4	1							1	2		1		
CO5	1			1				2			1		
CO6	1										1		
CO7	1										1		
CO8	1										1		

1: strongly related, 2: moderately related and 3: weakly related

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BUA4303	**PREDICTIVE ANALYTICS-I MACHINE LEARNING USING R**	L	T	P	C
Version 1.1	Latest Approved	2	0	2	3
Pre-requisites/Exposure					
Co-requisites					

Catalog Description

This course offers fundamental and applied evidence based knowledge to improve professional practice of students. It provides a detailed understanding of both supervised and unsupervised learning as it is vital for a data scientist. This course offer insight on text mining using "tidytext."

Course Objectives

The objective of this course is to:

1. Facilitate an introduction to machine learning techniques using several popular algorithms.
2. Internalize a core set of practical and effective machine learning methods and concepts, and apply them to solve some real world problems.

Course Outcomes

On completion of this course, the students will be able to:

CO1: Explain and apply a set of unsupervised learning concepts and methods, classification methods of increasing complexity (rules, trees, random forests), and associated optimization methods (gradient descent and variants)

CO2: Explain the common idioms of large-scale graph analytics, including structural query, traversals and recursive queries, PageRank, and community detection

CO3: Apply the popular algorithms of machine learning using R

CO4: Analyze and interpret the results using specific statistical tools and techniques in R.

Modules	Blooms level*	Number of hours
MODULE 1: Linear Methods for Regression and Classification: Overview of supervised learning, Linear regression models and least squares, Multiple regression, Multiple outputs, Subset selection, Ridge regression, Lasso regression , Linear Discriminant Analysis , Logistic regression, Perception learning algorithm	L1, L2,L3,L4	8
MODULE 2: Model Assessment and Selection: Bias, Variance, and model complexity, Bias-variance trade off, Optimism of the training error rate, Estimate of In-sample prediction error, Effective number of parameters, Bayesian approach and BIC, Cross- validation, Boot strap methods, conditional or expected test error	L1, L2,L3,L4	7
MODULE 3: Additive Models, Trees and Boosting: Generalized additive models, Regression and classification trees, Boosting	L1, L2,L3,L4	7

methods-exponential loss and AdaBoost, Numerical Optimization via gradient boosting		
MODULE 4: Neural Networks (NN), Support Vector Machines (SVM), and K-nearest Neighbor: Fitting neural networks, Back propagation, Issues in training NN, SVM for classification, Reproducing Kernels, SVM for regression, K-nearest –Neighbour classifiers (Image Scene Classification)	L1, L2,L3,L4	7
MODULE 5: Implementation of following methods using R Simple and multiple linear regression, Logistic regression, Linear discriminant analysis, Ridge regression, Cross-validation and boot strap, Fitting classification and regression trees, K-nearest neighbours, Principal component analysis, K-means clustering	L1, L2, L3,L4	7

**Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4-Analysis; L5-Synthesis; L6-Evaluation*

Text and Reference Books

1. Trevor Hastie, Robert Tibshirani, Jerome Friedman , *The Elements of Statistical Learning-Data Mining, Inference, and Prediction* ,Second Edition , Springer Verlag, 2009.
2. G.James, D.Witten,T.Hastie,R.Tibshirani-*An introduction to statistical learning with applications in R*,Springer,2013.
3. E.Alpaydin, *Introduction to Machine Learning*, Prentice Hall Of India, 2010

Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

Examination Scheme:

Components	**A**	**IP**	**EE**	**EP**
Weightage (%)	5	25	50	20

IP: Internal Practical, EE: End Semester Examination; EP: External Practical; A: Attendance

CO, PO and PSO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	2	--	3	--	--	--	--	2	1	3	1	--	--
CO2	3	2	1	2	--	2	1	--	1	2	1	3	--
CO3	2	1	1	2	--	--	1	3	1	2	1	3	--
CO4	3	1	2	1	--	--	1	--	1	2	1	3	--

1: strongly related, 2: moderately related and 3: weakly related

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BUA4304	**PREDICTIVE ANALYTICS-II MACHINE LEARNING USING PYTHON**	L	T	P	C
Version 1.1	Latest Approved	2	0	2	3
Pre-requisites/Exposure					
Co-requisites					

Catalog Description

This course offers the specialization of Python staring with data strategy. This course covers the two core paradigms that account for most business applications of predictive modeling: classification and prediction. It also covers the use of partitioning to divide the data into training data (data used to build a model), validation data (data used to assess the performance of different models, or, in some cases, to fine tune the model) and test data (data used to predict the performance of the final model).

Course Objectives

The objective of this course is to:

1. Facilitates a good learning to students on how to make meaningful predictions for a wide range of business purposes.
2. Provide provides a sufficient understanding on development of statistical models and how to devise data-driven workflows.

Course Outcomes

On completion of this course, the students will be able to:

CO1: Apply data science techniques to extract insights from a wide range of data sources and to provide an assessment basis for predictive models. Also, students shall be able to explain how ensemble models improve predictions

CO2: Visualize and explore data to better understand relationships among variables

CO3: Identify and implement appropriate performance measures for predictive models with popular algorithms

Modules	**Blooms level***	**Number of hours**
MODULE 1: Data Cleaning: Reading the data – variations and examples, Data frames, Delimiters, Various methods of importing data in Python: csv method, open method in Pyton, reading data form a URL, reading .xlsor .xlsx files, Reading from an .xls or .xlsx file, Writing to a CSV or Excel file. Handling missing values, Creating dummy variables, Visualizing a dataset by basic plotting, Scatter plots, Histograms, Boxplots	L1, L2,L3,L4	8
MODULE 2: Data Wrangling: Subsetting a dataset, Selecting columns, Selecting rows, Selecting a combination of rows and columns, Creating new columns, Generating random numbers and their usage, Seeding a random number, Generating random	L1, L2,L3	7

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numbers following probability distributions, Probability density function, Cumulative density function, Uniform distribution, Normal distribution, Using the Monte-Carlo simulation to find the value of pi, Geometry and mathematics behind the calculation of pi, Generating a dummy data frame, Grouping the data: aggregation, filtering, and transformation		
MODULE 3: Statistical Concepts for Predictive Modelling, Random sampling and the central limit theorem, Hypothesis testing, Null versus alternate hypothesis, Linear Regression with Python: Understanding the math behind linear regression, Linear regression using simulated data, Fitting a linear regression model and checking its efficacy, Finding the optimum value of variable coefficients ,Making sense of result parameters, p-values, F-statistics, Residual Standard Error, Implementing linear regression with Python, Linear regression using the stats model library, Multiple linear regression, Multi-collinearity, Variance Inflation Factor, Model validation, Training and testing data split , Handling categorical variables, Transforming a variable to fit non-linear relations	L1, L2,L3,L4	7
MODULE 4: Logistic Regression with Python, Linear regression versus logistic regression, Understanding the math behind logistic regression, Contingency tables, Conditional probability, Odds ratio, Moving on to logistic regression from linear regression, Estimation using the Maximum Likelihood Method, Likelihood function: Log likelihood function, Building the logistic regression model from scratch, Making sense of logistic regression parameters, Wald test, Likelihood Ratio Test statistic, Chi-square test, Implementing logistic regression with Python, Processing the data, Data exploration, Data visualization, Creating dummy variables for categorical variables, Feature selection, Implementing the model, Model validation and evaluation, Cross validation, Model validation, The ROC curve, Confusion matrix.	L1, L2,L3,L4	7
MODULE 5: Trees and Random Forests with Python: Introducing decision trees, A decision tree Understanding the mathematics behind decision trees, Homogeneity, Entropy, Information gain, ID3 algorithm to create a decision tree, Gini index, Reduction in Variance, Pruning a tree, Handling a continuous numerical variable, Handling a missing value of an attribute, Implementing a decision tree with scikit-learn, Visualizing the tree, Cross-validating and pruning the decision tree, Understanding and implementing regression trees, Regression tree algorithm, Implementing a regression tree using Python, Understanding and implementing random forests, The random forest algorithm, Implementing a random forest using Python, Why do random forests work?, Important parameters for random forests	L1, L2, L3,L4	7

**Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4-Analysis; L5-Synthesis;L6-Evaluation*

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Text and Reference Books

1. A. I. Khuri. Introduction to linear regression analysis, by Douglas C. Montgomery, Elizabeth A. Peck, G. Geoffrey Vining. International Statistical Review, 81(2):318–319, 2013.
2. A. Toescher, M. Jahrer, and R. M. Bell. The bigchaos solution to the netflix grand prize. Netflix prize documentation, 2009.
3. C. J. Burges. A tutorial on support vector machines for pattern recognition. Data mining and knowledge discovery, 2(2):121–167, 1998.
4. D. H. Wolpert and W. G. Macready. No free lunch theorems for optimization. Evolutionary Computation, IEEE Transactions on, 1(1):67–82, 1997.
5. D. H. Wolpert. Stacked generalization. Neural networks, 5(2):241–259, 1992.

Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

Examination Scheme:

Components	**A**	**IP**	**EE**	**EP**
Weightage (%)	5	25	50	20

IP: Internal Practical, EE: End Semester Examination; EP: External Practical; A: Attendance

CO, PO and PSO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	2	1	--	2	--	2	1	--	1	2	1	--	--
CO2	2	1	--	2	--	2	1	--	1	--	1	--	--
CO3	2	1	--	2	--	2	1	--	1	2	1	--	--

1: strongly related, 2: moderately related and 3: weakly related

BUA4305	**BIG DATA ANALYTICS- HADOOP**	L	T	P	C
Version 1.1	Latest Approved	2	0	2	3
Pre-requisites/Exposure					
Co-requisites					

Catalog Description

This course familiarizes the students on how to perform analytical operations on structured and unstructured data to gain insights from data processed through Hadoop. This offers a specialization on Big Data Platform and its use cases providing an overview of Apache Hadoop.

Course Objectives

The objective of this course is to:

1. Equip students with the concepts of how to use Pig, Hive, and Impala to practice and examine tremendous datasets stored in the HDFS, and use Sqoop and Flume for data ingestion.
2. Provide applications on components of Hadoop and Hadoop Eco-System such as Hadoop Cluster Architecture, Important Configuration files in a Hadoop Cluster, Data Loading Techniques, how to setup single node Hadoop clusterl installation of VM player and Hadoop, Important Configuration files in a Hadoop Cluster, Linux commands, Importing Hadoop Jars, Data Loading Techniques

Course Outcomes

On completion of this course, the students will be able to:

CO1: Identify Big Data and its Business Implications
CO2: Access and Process Data on Distributed File System
CO3: Manage Job Execution in Hadoop Environment
CO4: Develop Big Data Solutions using Hadoop Eco System

Modules	Blooms level*	Number of hours
MODULE 1: Introduction to Big Data Definition of Big Data, The 5 V's of Big Data(Volume, Variety, Velocity, Veracity, Value), Comparison of Traditional Data with Big Data, Management of Big Data, Analyzing Big Data, and Technology Challenges for Big Data. Big Data Sources, Big Data Applications, Big Data Architecture	L1, L2,L3	8
MODULE 2: Technologies for Handling Big Data Introduction to Traditional RDBMS, OLTP, OLAP, Data Mining, Data Warehouse, Basic SQL Commands and queries: CREATE, INSERT, DELETE, UPDATE, SELECT Cloud Computing : Definition, Characteristics, Applications, Deployment Model, Service Models	L1, L2,L3	7

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MODULE 3:Distributed Computing Using Hadoop Introduction, Hadoop Framework, Hadoop Distributed File System, Map Reduce, Hive, Pig Sample Map Reduce Application, HIVE language capabilities, Pig Language capabilities, HIVE query examples, Pig Scripts examples	L1, L2,L3	7
MODULE 4: Big Data in Business Case Studies: Big Data in Marketing, Retail Hospitality, Customer Services, Decision Support using Big Data. Developing a Big Data Strategy/ Defining a Big Data strategy for your organization, Big Data Platform for Internet of Things	L1, L2,L3	7
MODULE 5:Visualization and Analytics Visualizations - Visual Data Analysis Techniques - Interaction Techniques; Systems and Analytics Applications - Analytics using Statistical packages-Approaches to modeling in Analytics – correlation, regression, decision trees, classification, association-Intelligence from unstructured information	L1, L2, L3	7

**Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4-Analysis; L5-Synthesis;L6-Evaluation*

Text and Reference Books

1. Michael Berthold, David J. Hand, "Intelligent Data Analysis", Springer, 2007
2. Anand Rajaraman and Jeffrey David Ullman, "Mining of Massive Datasets", Cambridge University Press, 2012
3. Bill Franks, "Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics", John Wiley & sons, 2012
4. Glenn J. Myatt, "Making Sense of Data", John Wiley & Sons, 2007
5. Pete Warden, "Big Data Glossary", O'Reilly, 2011
6. Jiawei Han, MichelineKamber "Data Mining Concepts and Techniques", Second Edition, Elsevier, Reprinted 2008.

Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

Examination Scheme:

Components	**A**	**IP**	**EE**	**EP**
Weightage (%)	5	25	50	20

IP: Internal Practical, EE: End Semester Examination; EP: External Practical; A: Attendance

CO, PO and PSO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	3	1	2	1	--	--	3	1	1	2	1	--	--
CO2	1	1	3	2	--	--	3	1	2	2	1	--	--
CO3	1	2	2	1	--	--	3	1	1	2	1	--	--
CO4	2	1	3	2	--	--	3	1	2	2	1	--	--

1: strongly related, 2: moderately related and 3: weakly related

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BUA4306	**FINANCIAL DECISION ANALYSIS**	L	T	P	C
Version 1.1	Latest Approved	2	0	2	3
Pre-requisites/Exposure					
Co-requisites					

Catalog Description

Financial decision making involves analyzing the financial problems that the company faces and deciding which course of action should be taken. In order to make financial decisions, you must be able to identify potential financial problems and analyze the effects of alternative courses of action.

Course Objectives

This course provides a specialization on financial tools to apply to decision-making within organizations. The course helps the student to

1. Develop a range of financial analysis skills through a combination of class discussions and analyses of case studies of specific organizations.
2. Demonstrates the complex relationships between finance, impact, strategy, and governance in business organizations.

Course Outcomes

By the end of the course the participants should be better able to:

CO1: Explain how organisations make value optimising financial decisions, and reflectively and critically assess the ethical issues arising from these decisions.

CO2: Critically analyse and evaluate various financial models and decision making techniques and their impact on different constituencies of stakeholder. Apply financial analysis skills in the facilitation of strategic decision making.

CO3: Review Assess the features of alternative and diverse sources of finance and critically evaluate their appropriateness under different circumstances and evaluate elements of risk, return and value in a range of strategic operational financial decisions and understand the implications in regulatory and governance terms of the consequences of doing so.

Modules	Blooms level*	Number of hours
Module I : Financial governance: objectives and environment The role of shareholder wealth maximisation in modern financial management, Shareholder v stakeholder perspectives, Role of the finance , function Balancing risk and return, Shareholder wealth maximisation and ethical behaviour Ethics and the finance function, Corporate Governance *:* Corporate Governance and the agency problem, Financial aspects of the Indian Corporate Governance Code New public management, Listing requirements	L1,L2, L3	5

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in the Stock Exchanges.		
Module II: Management performance measurement Financial ratio analysis – Profitability – Efficiency – Liquidity - Investment performance. Operating, Financial and Combined Leverage. Financial distress and insolvency, including the use of financial ratios based on univariate and multivariate analysis to predict financial failure. Analysis of Risk and Uncertainty in Capital Budgeting, Description and Measurement of Risk; and Risk Evaluation Approaches. Risk and Return - Conceptual Framework of Risk and Return: Type of Risks; Risk and Return of a Single Asset; Risk and Return of Portfolio (only two asset portfolio); Portfolio Selection; and Capital Asset Pricing Model (CAPM)	L1, L2, L3	6
Module III:-Making distributions to shareholders Dividend policy and shareholder wealth – Traditional v Modigliani and Miller arguments Reasons for the importance of dividends, Factors determining the level of dividends Scrip dividends, Special dividends and share buybacks, Tax Aspects associated with Dividend Decision	L1, L3	6
Module IV: - Long term investment decisions The nature of investment decisions - Investment appraisal methods - Payback period (including discounted payback period) - Accounting rate of return - Net present value - Internal rate of return – MIRR – XIRR- CAGR, Investment opportunities and risk - Risk and Return preferences of investors. Risk appraisal methods – Sensitivity analysis – Scenario analysis –Simulations - Expected net present value - Risk-adjusted discount rate. **Shareholder value analysis:** Shareholder value and the need for new forms of measurement-Shareholder value analysis and net present value -Comparison of shareholder value analysis and Economic value added -Total shareholder return (TSR) and market value added (MVA) , Cash Value added, Market to Book Value , Evaluation of the shareholder value approach. **Analysis of securities**: Cost method and market method. Equity method of accounting and analysis of minority interest.	L1, L3,L4	7
Module V: Business combinations and share valuation **Business Valuation**: Conceptual Framework of Valuation; Approaches/Methods of Valuation; and other Approaches to Value Measurement, **Corporate Restructuring**: Conceptual Framework; Financial Framework; Tax Aspect of Amalgamation; Merger and Demergers; Legal and Procedural Aspects of Mergers/Amalgamations and Acquisition/Takeovers; and other forms of Corporate Restructuring. Economic rationale for mergers and acquisitions, forms of purchase consideration with DCF model. **Option Valuation**: Concept and Types of Options; Option Payoffs; Call Option Boundaries; Factors Influencing Option Valuation; and The Black-Scholes Option Pricing Model. **Valuation and forecasting -** Valuation models: Asset based models, DCF models and abnormal earnings or	L1, L3,L4	5

Edwards-Bells-Ohlson model. Forecasting models: Extrapolative models and index models, Forecasting with disintegrated data, Comparison with financial analysts' forecast.		
Module VI: Capital markets and long-term financing decisions Financial markets and institutions-The role of the Stock Exchange Advantages and disadvantages of a Stock Exchange listing Stock market efficiency – Long term sources of financing – Shares– Debts - Debentures – Personal financing -		7

**Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

Text and Reference Books:

1. Khan, M.Y & Jain, P.K.: Financial Management; Tata McGraw Hill, New Delhi, 2015.
2. Pandey, I. M.: Financial Management; Vikas Publishing House, New Delhi, 2015.
3. Chandra, Prasana: Financial Management; Tata McGraw Hill, New Delhi, 2008.
4. Brealey and Meyers: Principles of Corporate Finance: Tata McGraw Hill, New Delhi, 2008.
5. Keown, Martin, Petty and Scott (Jr): Financial Management: Principles and Applications; Prentice Hall of India, New Delhi, 2002.
6. Gitman, L.J: Principles of Managerial Finance; Addison Wasley, 2009.
7. Vanhorne, James C: Financial Management and Policy; Prentice Hall of India, New Delhi, 2015.
8. Kishore Ravi, M: Financial Management; Taxman, 2018.
9. Gerald I. White, Ashinpaul C. Sondhi and Dov Fired , "The Analysis and use of Financial Statements", (3rd Ed.), , Wiley-India

Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

Examination Scheme:

Components	CT	HA	P	A	EE
Weightage (%)	**10**	**5**	**10**	**5**	**70**

C - Case Discussion/ Presentation; HA - Home Assignment; P - Project; S - Seminar; V - Viva; Q - Quiz; CT - Class Test; A - Attendance; EE - End Semester Examination

CO, PO and PSO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	1	1	--	--	--	--	--	--	1	1	1	--	--
CO2	1	1	--	--	--	--	--	--	1	1	1	--	--
CO3	1	1	--	--	--	--	--	--	1	1	1	--	--

1: strongly related, 2: moderately related and 3: weakly related

BUA4307	**VISUAL ANALYTICS- TABLUE /POWER BI**	L	T	P	C
Version 1.1	Latest Approved	2	0	2	3
Pre-requisites/ Exposure					
Co-requisites					

Catalog Description

This course familiarizes the students on data visualization tools. This course is designed to provide a fundamental and strategic understanding on the concepts of Business Intelligence using Tablue.

Course Objectives

The objective of this course is to:

1. Equip students with the concepts of BIs and its types and how to connect to and import data, author reports using Power BI Desktop, and publish those reports to the Power BI service
2. Emphasize on how to create dashboards and share with business users—on the web and on mobile devices

Course Outcomes

On completion of this course, the students will be able to:

CO1: Connect, import, shape, and transform data for business intelligence (BI)
CO2: Visualize data, author reports, and schedule automated refresh of your reports
CO3: Create and share dashboards based on reports in Power BI desktop and Excel
CO4: Use natural language queries and create real-time dashboards

Modules	Blooms level*	Number of hours
MODULE 1: Tableau: Introduction, Getting Started with Tableau, Connecting to Data, Data Prep with Excel, Overview of the Tableau User Interface, Working with Discrete vs. Continuous Data, Calculated fields **Power BI**: Understanding key concepts in business intelligence, data analysis, and data visualization, Importing data and automatically creating dashboards from services such as Marketo, Salesforce, and Google Analytics, Connecting to and importing your data, then shaping and transforming that data, Enriching your data with business calculations.	L1, L2,L3	8
MODULE 2: Tableau: Introduction to data visualization, the evolution of the BI industry, Understanding the business value of visual analytics, Data visualization best practices (overview), Power BI: Visualizing your data and authoring reports, Scheduling automated refresh of your reports, Creating dashboards based on	L1, L2,L3	7

reports and natural language queries, Sharing dashboards across your organization, Consuming dashboards in mobile apps		
MODULE 3:Tableau: Basic charts, Design considerations for effective data visualization, Human cognition and visual perception, Using Maps to Visualize Spatial Data, **Power BI:** Leveraging your Excel reports within Power BI, Creating custom visualizations that you can use in dashboards and reports, Collaborating within groups to author reports and dashboards, Sharing dashboards effectively based on your organization's needs.	L1, L2,L3	7
MODULE 4: Tableau: The visual storytelling framework, the business value of visual stories, Creating dashboards and story points, Formatting worksheets and dashboards. **Power BI:** Exploring live connections to data with Power BI, Connecting directly to SQL Azure, HD Spark, and SQL Server Analysis Services, Introduction to Power BI Development API, Leveraging custom visuals in Power BI	L1, L2,L3	7
MODULE 5: Common pitfalls of data visualization, Common pitfalls of data narratives, Share and critique an example of a data visualization, Provide your Tableau Public URL, Share data visualization on Tableau Public, Building a Dashboard in Tableau and Power BI, Develop a data story pitch	L1, L2, L3	7

**Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4-Analysis; L5-Synthesis;L6-Evaluation*

Text and Reference Books

1. Microsoft Business Intelligence Tools for Excel Analysts: Michael Alexander, Jared Decker, Bernard Wehbe, John Wiley & Sons, 2014
2. Introducing Microsoft Power BI: Alberto Ferrari and Marco Russo, Microsoft Press 2016
3. Getting started with Watson Analytics: IBM Corporation 2015
4. Tableau Your Data! Fast and Easy Visual Analysis with Tableau Software: Daniel G. Murray and the InterWorks BI Team, John Wiley & Sons 2013
5. Beginning Big Data with Power BI and Excel 2013: Neil Dunlop, Apress 2015
6. IBM Watson Content Analytics Discovering Actionable Insight from Your Content: Wei-Dong (Jackie)
7. Zhu Bob Foyle, Daniel Gagné, Vijay Gupta, Josemina Magdalen, Amarjeet S Mundi, Tetsuya Nasukawa Mark Paulis, Jane Singer, Martin Triska, ibm.com/redbooks, IBM Corporation July 2014

Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

Examination Scheme:

Components	**A**	**IP**	**EE**	**EP**
Weightage (%)	5	25	50	20

IP: Internal Practical, EE: End Semester Examination; EP: External Practical; A: Attendance

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CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1	3	1	2	1	--	--	3	1	1	2	1	--	--
CO2	1	1	3	2	--	--	3	1	2	2	1	--	--
CO3	1	2	2	1	--	--	3	1	1	2	1	--	--
CO4	2	1	3	2	--	--	3	1	2	2	1	--	--

1: strongly related, 2: moderately related and 3: weakly related

BUA4335	**SUMMER INTERNSHIP EVALUATION**	**L**	**T**	**P**	**C**
Version 1.1	Latest Approved	0	0	0	6
Pre-requisites/Exposure					
Co-requisites					

Catalog Description

There are certain phases of every Intern's professional development that cannot be effectively taught in the academic environment. These facets can only be learned through direct, on-the-job experience working with successful professionals and experts in the field. The internship programme can best be described as an attempt to institutionalize efforts to bridge the gap between the professional world and the academic institutions. Entire effort in internship is in terms of extending the program of education and evaluation beyond the classroom of a university or institution. The educational process in the internship course seeks out and focuses attention on many latent attributes, which do not surface in the normal class room situations. These attributes are intellectual ability, professional judgment and decision making ability, inter-disciplinary approach, skills for data handling, ability in written and oral presentation, sense of responsibility etc.

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Course Objectives

The objective of this course is to:

1. Offer students the opportunity to apply their knowledge in real-life environments through an industry placement for eight-weeks.
2. Providedesired skills to students that will help them perform better on their jobs after graduation.

Course Outcomes

On completion of Summer Internship,the students will be able to:

CO1: Get hands-on experience about real world problems in a field relevant to their major of studies.

CO2: Acquire confidence for employment after graduation.

CO3: Acquire skills important for time management, discipline, self-learning, effective communication and so on.

CO4: Learn practically about team-work, collaboration, and leadership.

Credit Hours: 6 hours

Course Duration: Six-Eight weeks

Semester Offered: Summer

Format for Report Writing	**Blooms level***	**Number of hours**
1. Title of the project 2. About the organization 3. Introduction and objectives of the project/	L1, L2 ,L3,L4,L5,L6	6hours (Duration-6-8 weeks

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programme / organization 4. Funding agency—about the agency, how to get funding, Nature of funding agency 5. Staffing pattern of the project with their functions 6. Major activities going under project 7. Results achieved so far (target Vs achievement) 8. Role of the candidate in the project/programme / organization 9. Evaluation by the candidate		during summer)

**Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4-Analysis; L5-Synthesis; L6-Evaluation*

SIP Guidelines

1.Every student is required to write an Internship report upon completion of their internship and required to submit two copies (student copy + department copy) of the report to concerned department HOD (along with internal marks certificate given by the company) for final evaluation and awarding of end examination marks.

2.Before submitting the report to the HOD, the student required to go through multiple rounds of revision in collaboration with the industry guide and department internship mentor/coordinator/supervisor.

The Internship Report serves multiple purposes:

• Help the student develop written communication skills. • Serve as an archival record of the internship experience. • Give the student an opportunity to reflect on the professional aspects of the internship experience and the skills that were learned. • Allow the student to describe the science content of the internship. • Have the student to reflect on the initial goals of the internship and how they were (or were not) achieved during the internship.

Modes of Evaluation: Presentation/Viva/ Report /Assignment Examination

Examination Scheme:

Components	Content & Layout of Report	Conceptual Framework	Objectives & Methodology	Implications & Conclusions	Presentation
Weightage	30	10	15	15	30

CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1	1	--	--	--	--	--	--	1	--	--	--	1	--
CO2		1	--	--	--	--	--	--	--	--	--	1	--
CO3	--	--	1	--	--	1	1	--	--	--	--	1	2
CO4	--	--	--	--	--	--	1	--	--	--	--	1	2

1: strongly related, 2: moderately related and 3: weakly related

Syllabus – Fourth Semester

BUA4401	**TOTAL QUALITY MANAGEMENT**	L	T	P	C
Version 1.1		2	0	0	2
Pre-requisites/Exposure					
Co-requisites					

Catalog Description: This course teaches the students the methodology and system of tools aimed to create and maintain mechanism of organization's continuous improvement.

Course Objective:
The aim of this course is to:

1. Provide a structured learning framework to students in order that they can understand that total quality management is a philosophy, methodology and system of tools aimed to create and maintain mechanism of organization's continuous improvement.
2. Help the students to understand the main principles of business and social excellence; generate knowledge and skills to use models and quality management methodology for the implementation of total quality management in any sphere of business and public sector**.**

Course Outcomes:
On completion of the course the students will be able to:
CO1: Evaluate the principles of quality management and to explain how these principles can be applied within quality management systems.
CO2: Identify the key aspects of the quality improvement cycle and to select and use appropriate tools and techniques for controlling, improving and measuring quality.
CO3: Critically appraise the organizational, communication and teamwork requirements for effective quality management.
CO4: Critically analyze the strategic issues in quality management nationally and internationally, including current issues and developments, and use the appropriate statistical techniques to evaluate quality implementation plans.

Modules	Blooms level*	Number of hours
Module I: Introduction Definition of quality, brief history, quality in manufacturing and service industries, quality and price, quality and market share, quality and cost, quality and competitive advantage Evolution of the concept of total quality management, elements of total quality management, benefits of total quality management, the Deming management philosophy, the Juran philosophy, the Crosby philosophy	L1, L2	7
Module II: Organization for Quality Quality objectives, quality policy, leadership for quality, quality and	L1, L2	5

organization culture, cross functional teams, quality circles, suppliers/customers partnership		
Module III: Quality Control Concept of quality control, quality assurance, concept of process variation, sampling inspection vs. 100% inspection, acceptance sampling by attributes: Operating Characteristics (OC) curves; producer risk: AQL, RQL, TQL, AOQL Statistical Process Control: advantages of SQC, construction of control charts: X-R chart, np chart, C- chart, U chart, Pareto analysis (20/80 rule)	L1, L2	6
Module IV: Benchmarking and Kaizen Benchmarking, rationale of benchmarking, approach and process, prerequisite of benchmarking, obstacles of successful benchmarking, perceptual benchmarking, concept of Kaizen, kaizen vs innovation, Kaizen practice	L1,L2	3
Module V: Quality Management Systems Quality certification, quality management principles, ISO 9001:2000, ISO 14000, Capability Model Maturity Integration (CMMI): Fundamentals and Concepts, quality system audit, types of quality audit	L1, L2	3

**Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

Text and Reference Books:

1. Garg, Ajay K. (2012). *Production and Operations Management.* McGraw-Hill, New Delhi
2. Cherry, S.N. (2012). *Production and Operations Management (5th ed.)*. McGraw-Hill, New Delhi
3. Crosby, Philip B., Completeness: Quality for 21stCentuary, Dutton, New York, 1992
4. Drummond, Helga, The TQM Movement: What Total Quality Management is All Movement, UBS Publication, New Delhi, 1992
5. Juran, J.M. &Gryna, F.M., Quality Planning and Analysis
6. Lock, Dennis, Handbook of Quality, Jaico Publishing House, Mumbai, 1996
7. Ross, Joel E., TQM: Text, Cases and Readings, St. Lucie Press, New York, 1993

Modes of Evaluation: Presentation/Viva/ Report /Assignment Examination

Examination Scheme:

Components	CPA	TP	Q/S	A	ME	EE
Weightage (%)	5	5	5	5	10	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance

CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1	1	1	-	-	2	-	-	1	2	1	-	-	2
CO2	2	1	-	-	3	-	-	1	1	1	-	-	3
CO3	2	2	-	-	3	-	-	1	2	2	-	-	1

CO4	1	2	-	-	1	-	-	1	1	1	-	-	2

1: strongly related, 2: moderately related and 3: weakly related

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BUA4402	**FINANCIAL ANALYTICS**	L	T	P	C
Version 1.1	Latest Approved	2	0	2	3
Pre-requisites/Exposure					
Co-requisites					

Catalog Description

Every business in the industry is generating loads of financial data and they understand the significance of deriving logical inferences out of it to streamline their decision making process. Lately, accurate financial data analysis is not enough for a business to sail through. They need predictive insights which can improve their real time day to day decision making. Financial analytics helps in combining internal and external financial information by using social media and big data to provide predictive insights. Whether it is with respect to stock market prediction or customer profitability, finance analytics enables to provide a direction in predicting all.This course blends easy-to-use statistical tools with complex machine learning tools and algorithms to equip the participants with the requisite skill set in analysing data. By the end of this course, the participants should be able to perform financial analysis using powerful tools like R and Python.

Course Objectives

The objective of this course is to:

1. Make students understand and diagnose the information contained in financial statement with a view to judge the profitability and financial soundness of the firm, and to make forecast about future prospects of the firm.
2. Provide understanding on diverse needs of the traditional financial department, and advancements in technology, all point to the need for financial analytics.
3. Help students to shape up the business' future goals and to improve the decision-making strategies for various business situations.
4. Emphasize on measuring and managing business' tangible assets such as cash and equipment.
5. Provides an in-depth insight into the organization's financial status and improves the cash flow, profitability, and business value.

Course Outcomes

On completion of this course, the students will be able to:

CO1: Understand and interpret the financial data about the company

CO2: Forecast the firm financial position and interpret accordingly

CO3: Evaluate the financial position with the support of various financial tools like financial statement analysis, time value of money, bond valuation and valuation of the firm

CO4: Equip the requisite skill set in analyzing data in terms of finance

Modules	Blooms level*	Number of hours
Module I: Introduction to Financial Analytics and Time Series Data Subjective Forecasting, Business Forecasting and Time Series Data, Introduction to Financial Analytics, Forecasting Performance Measurements: Distance, Forecasting Performance Measurements: Metrics.	L1,L2,L3	7
Module II: Performance Measures and Holt-Winters Model Introduction to Forecasting: Average Method, Naive Method, Linear regression, R example, Moving Averages, Introduction to Exponential Smoothing, Simple Exponential Smoothing, R example on Simple exponential smoothing, Holt's Exponential Smoothing, Holt-Winter's Forecasting Model, Holt-Winter's Model: R Example, Autoregression: Introduction, Autoregression: R Example	L1, L2, L3,L4, L6	8
Module III : Financial Statement Analysis Balance Sheet, Income Statement, Cash Flow Statement, Understanding the Financial Statements and their interlinking, Financial Ratios, Ratio Analysis Present Value (single and multiple cash flows), Future Value (single and multiple cash flows), Annuity, Perpetuity, Growing Annuity. Application: Loan Amortization, Compounding the interest rate	L1, L2, L4, L6	7
Module IV: Modern Portfolio Theory and Introduction to Algorithmic Trading Portfolio Theory: Introduction, Expected Returns, Risk of a Security, Efficient Frontier, Portfolio Weights, Capital Allocation Line, Diversification, Introduction to Algorithmic Trading, Trend Following Strategy, Backtesting, R Example	L1, L2, L3,L4	7
Module V:Linear Regression, Predicting Binary Outcomes (Credit Prediction) Single and Multiple Linear Regression, Modelling and Prediction (Examples using financial data), Logistic Regression, Multiple Logistic Model, Historical Simulation, Simple Variance based approach, Risk Metrics, Monte Carlo Simulation, Value-at-Risk Estimation and Backtesting	L1, L2, L3,L4	7

**Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

Text Books:

Edward E Williams (Author), John A Dobelman , Quantitative Financial Analytics: The Path To Investment Profits, 2017, Publisher: WSPC, ISBN-10: 9813224258I

Reference Books:

1. Thomas Mazzoni , A First Course in Quantitative Finance, 2018, Cambridge University Press (March 22, 2018)ISBN-10: 9781108411431
2. Mark J. Bennett and Dirk L. Hugen, Financial Analytics with R: Building a Laptop Laboratory for Data Science, 2016 by Cambridge University Press

Modes of Evaluation: Presentation/Viva/ Report /Assignment Examination
Examination Scheme:

Components	**A**	**IP**	**EE**	**EP**
Weightage (%)	5	25	50	20

IP: Internal Practical, EE: End Semester Examination; EP: External Practical; A: Attendance

CO, PO and PSO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	1	1	--	--	--	2	--	2	1	2	1	--	--
CO2	1	1	--	--	--	2	--	2	1	2	1	--	--
CO3	1	1	--	--	--	2	--	2	1	2	1	--	--
CO4	1	1	--	--	--	2	--	2	1	2	1	--	--

1: strongly related, 2: moderately related and 3: weakly related

BUA4403	**SUPPLY CHAIN ANALYTICS**	L	T	P	C
Version 1.1	Latest Approved	2	0	2	3
Pre-requisites/Exposure					
Co-requisites					

Catalog Description

This course provides foundational knowledge associated with the operations analytics. The course offers insights on the various tools and techniques for implementation of analytics based on the supply chain drivers such as location, logistics and inventory.

Course Objectives

The objective of this course is to:

1. Manage uncertainty and risk within supply chain management
2. Segment different customers, products, and channels and design an optimal portfolio of logistics approaches and strategies for these various segments
3. Understand the appropriate forecasting methodology for each segment

Course Outcomes

On completion of this course, the students will be able to:

CO1: Describe the various techniques for analytics based on the Multi Attribute Decision Making (MADM) and risk.
CO2: Identify the inventory techniques for analytics and the different network models.
CO3: Analyze the inventory using aggregate production model.
CO4: Illustrate the transportation problems for analytics in network design.
CO5: Analyze the different dimensions using Analytic Hierarchy Process.

Modules	**Blooms level***	**Number of hours**
Module I: Warehousing Decisions, Mathematical Programming Models, P-Median Methods, Guided LP Approach, Balmer – Wolfe Method, Greedy Drop Heuristics, Dynamic Location Models, Space Determination and Layout Methods.	L1, L2	7
Module II:Inventory Management, Inventory aggregation Models, Dynamic Lot sizing Methods, MultiEchelon Inventory models, Aggregate Inventory system and LIMIT, Transportation Network Models, Notion of Graphs, Minimal Spanning Tree.	L1, L2	8

Module III: Shortest Path Algorithms, Maximal Flow Problems, Multistage Transshipment and Transportation Problems, Set covering and Set Partitioning Problems, Traveling Salesman Algorithms, Advanced Vehicle Routing Problem Heuristics, Scheduling Algorithms-Deficit function Approach and Linking Algorithms.	L1, L2	6
Module IV: Analytic Hierarchy Process, Data Envelopment Analysis, Risk Analysis in Supply Chain, Measuring transit risks, supply risks, delivering risks	L1,L2	5
Module V: Risk pooling strategies, Fuzzy Logic and Techniques-Application in SCM	L1, L2	6

**Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

Text Books:

1. Gerad Feigin, Supply Chain planning and analytics – The right product in the right place at the right time, Business Expert Press, 2011
2. Peter Bolstorff, Robert G. Rosenbaum, Supply Chain Excellence: A Handbook for Dramatic Improvement Using the SCOR Model, AMACOM Div American MgmtAssn, 2007
3. Robert Penn Burrows, Lora Cecere, Gregory P. Hackett, The Market-Driven Supply Chain: A Revolutionary Model for Sales and Operations Planning in the New On Demand Economy, AMACOM Div American Mgmt Assn, 2013.

Reference Books:

1. Hamdy A. Taha, "Operations Research An Introduction", Prentice Hall India. Sixth, Edition
2. Anderson, Sweeney and Williams, "An Introduction to Management Science: Quantitative Approaches to Decision Making", Cengage Learning, Fifth India Edition
3. Barry Render, Ralph M. Stair Jr. "Quantitative Analysis for Management, Rearson Education, Eighth Edition
4. Frederick S. Hillier and Mark S. Hillier, Introduction to Management Science: A Modeling and Case Studies Approach with Spreadsheets, Tata McGrow-Hill Edition, Second Edition

Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

Examination Scheme:

Components	**A**	**IP**	**EE**	**EP**
Weightage (%)	5	25	50	20

IP: Internal Practical, EE: End Semester Examination; EP: External Practical; A: Attendance

CO, PO and PSO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	1	1	-	-	-	-	-	-	3	-	1	--	3
CO2	1	1	-	-	-	-	-	-	3	-	1	--	3

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CO3	1	1	-	-	-	-	-	-	3	-	1	--	3
CO4	1	1	-	-	-	-	-	-	3	-	1	--	3
CO5	1	2	-	-	-	-	-	-	3	-	1	--	3

1: strongly related, 2: moderately related and 3: weakly related

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BUA4404	HR ANALYTICS	L	T	P	C
Version 1.1	Latest Approved	2	0	2	3
Pre-requisites/Exposure					
Co-requisites					

Catalogue Description:
Developing the right HR metrics and analytics for your specific context which support long-term performance and improving the decision making is a key competitive edge in the modern economy. HR is increasingly difficult in an era of talent wars, complex environments and a deluge of information.

Course Objective:
The course aims to:
1. Give students a good understanding on the concepts and techniques of human resource analytics.
2. Familiarize the students on how to prepare HR reports and identify decision technologies.
3. Develop a structured approach among students to apply judgment, and generate insight from data for enhanced decision making.

Course Outcomes:
On successful completion of the course a student will be able to:
CO1. Explain internal and external human resource metrics benchmarks and indicators.
CO2. Reproduce knowledge on relational databases and make recommendations regarding the appropriate HRIS to meet organization's human resource needs.
CO3. To identify appropriate software to record, maintain, retrieve and analyze human resources information (e.g., staffing, skills, performance ratings and compensation information).
CO4. To describe both the quantitative and qualitative analysis to understand trends and indicators in human resource data.

Modules	Blooms level*	Number of hours
Module I:Introduction to HR Analytics Basics of HR Analytics: Concept and Evolution of HR Analytics & data sources - HCM: 21Model, Use of workforce analytics to improve decision making, Analytics and Prediction, Introduction to HR Metrics and predictive analytics, Importance of HR Analytics, Data Analytic techniques using software packages, Future of Human Resource Analytics.HR Metrics and HR Analytics; Intuition versus analytical thinking.	L1, L2	7

Module II: Creating business understanding for HR initiatives Workforce segmentation and search for critical job roles; Statistical driver analysis – association and causation; Linking HR measures to business results; choosing the right measures for scorecards; Identifying and using key HR Metrics.	L1, L2	6
Module III:Forecasting budget numbers for HR costs Workforce planning including internal mobility and career pathing; training and development requirement forecasting and measuring the value and results of improvement initiatives; optimizing selection and promotion decisions	L1, L2	8
Module IV:Predictive modelling in HR Employee retention and turnover; workforce productivity and performance; scenario planning.	L1,L2	6
Module V:Communicating with data and visuals Data requirements; identifying data needs and gathering data; HR data quality, validity and consistency; Using historical data; Data exploration; Data visualization; Association between variables; Insights from reports; Root cause analysis of HR issues	L1, L2	4

**Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

Text and Reference Books:

1. Fitz-Enz, J (2010)*The New HR Analytics: Predicting the Economic Value of Your Company's Human Capital Investments*, Amacom.
2. Pease,G Byerly, B& Fitz-enz, J(2012).*Human Capital Analytics: How to Harness the Potential of Your Organization's Greatest Asset*, John Wiley & Sons

Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

Examination Scheme:

Components	**A**	**IP**	**EE**	**EP**
Weightage (%)	5	25	50	20

IP: Internal Practical, EE: End Semester Examination; EP: External Practical; A: Attendance

CO, PO and PSO mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	2									1	1		
CO2	1						1			2	1		
CO3								2	1		1		
CO4	2	1									1		

1: strongly related, 2: moderately related and 3: weakly related

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BUA4405	MARKETING ANALYTICS	L	T	P	C
Version 1.1	Latest Approved	2	0	2	3
Pre-requisites/Exposure					
Co-requisites					

Catalog Description

This course provides an understanding on the use of analytics in Marketing Management. The course offers insights to the students on the use of predictive analysis in decision making. The course familiarizes the students on the concept of the market place, various segments of products and services in the markets, and changing consumer needs in the markets.

Course Objectives

The objective of this course is to

1. Develop the ability to critically evaluate business problems and to determine the most appropriate analytical technique address marketing problems.
2. Acquaint the students to develop and implement the marketing strategy by providing a framework from which to identify and evaluate strategic options and programs.
3. Enable students to solve real-world marketing problems across a wide range of industries, giving them a competitive edge.

Course Outcomes

On completion of this course, the students will be able to:

CO1: Identify various methods followed build CRM practices and various positioning strategies followed by the companies.

CO2: Contrast the characteristics of industrial and consumer goods.

CO3: Identify and apply the various techniques of predictive analysis in the different market situations.

CO4: Explain the need for digital evolution in marketing.

Modules	Blooms level*	Number of hours
Module 1: Introduction to Marketing Understanding the marketplace and consumer needs, Designing a Customer Driven Marketing Strategy, Building Customer Relationships, Consumer Behaviour and Business Buyer Behaviour	L2,L5	7
Module 2: Marketing Strategy Market Segmentation and Product Positioning, Market Segmentation, Market Targeting, Target Market Strategies, Product Positioning and Differentiation, Choosing a Differentiation and Positioning Strategy.	L1, L4	8
Module 3: Product and Service Products and services, product and service classifications, consumer	L2,L4	7

products, industrial products, product and service decisions, product and service attributes, product support services, services marketing – the nature and characteristics of a service.		
Module 4: Retail Analytics – I Customer Analytics Overview; Quantifying Customer Value, Using Stata for Basic Customer Analysis, Predicting Response with RFM Analysis, Statistics Review, Predicting Response with Logistic Regression, Predicting Response with Neural Networks, Predicting Response with Decision Trees.	L2,L3, L5	6
Module 5: Retail Analytics – II The digital evolution of retail marketing, Digital natives, Constant connectivity Social interaction, Predictive modelling, Keeping track, Data availability, Efficiency optimization.	L2,L4	8

**Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

Text Books:

1. Kotler, P., Keller, K. L. ,Koshy, A., Jha, M. Marketing Management: A South Asian Perspective. New Delhi: Pearson Education , 14th edn,.2013
2. Rajan, S. Marketing Management. India: New Delhi: Tata McGraw-Hill Education. 4th edn,2005

Reference Books:

1. Karunakaran, K..Marketing Management. New Delhi: Himalaya Publishing House. 3rd edition, 2013.
2. Kumar, A., Meenakshi. Marketing Management. New Delhi: Vikas Publishing House Pvt Ltd. , 2nd edition,2013
3. Ramaswamy, V. S., Namakumari, S. Marketing Management Global Perspective, Indian Context. New Delhi: Macmillan India Limited. 3rd edition, 2009

Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

Examination Scheme:

Components	**A**	**IP**	**EE**	**EP**
Weightage (%)	5	25	50	20

IP: Internal Practical, EE: End Semester Examination; EP: External Practical; A: Attendance

CO, PO and PSO mapping:

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PSO1**	**PSO2**	**PSO3**	**PSO4**
CO1	-	-	1	1	-	-	1	1	1	1	1	-	-
CO2	-	-	1	1	-	-	1	1	1	1	1	-	-
CO3	-	-	1	1	-	-	1	1	1	1	1	-	-
CO4	-	-	1	1	-	-	1	1	1	1	1	-	-

1: strongly related, 2: moderately related and 3: weakly related

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BUA4406	**DATA PRIVACY AND DATA SECURITY LAWS**	L	T	P	C
Version 1.1	Latest Approved	2	0	0	2
Pre-requisites/Exposure					
Co-requisites					

Catalog Description

This course is designed to familiarize the students with the basic concepts of data privacy issues and security laws including current and proposed laws and regulations that govern data security and privacy.

Course Objectives

The objective of this course is to:

1. Provide the foundational knowledge based on data security investigation and data policy questions concerning the value of data security and data privacy regulations.
2. Emphasize on the real world effects of data breaches on individuals and businesses.
3. Provide an understanding on how to secure data and balancing of interests among individuals, government, and enterprises from the technical and legal perspective.

Course Outcomes

On completion of this course, the students will be able to:

CO1: Explain the fundamental concepts of data security and security laws.
CO2: Explain the business needs for data privacy and security investigation.
CO3: Assess the risk for data security.
CO4: Identify the legal, professional and ethical issues related to data.

Modules	Blooms level*	Number of hours
MODULE 1: Introduction to Data Security History of data security, Meaning of data Security and data privacy, Critical Characteristics and components of Data security, Need for Security, Business Needs, Threats, Attacks, Meaning of term personal data, data processing, data protection, NSTISSC Data Security Model, Balancing Security and Access to data, The SDLC model, The Security SDLC	L1, L2	6
MODULE 2: Introduction to Data Security Laws Introduction of the General Data Protection Regulation (GDPR), rationale for the introduction of the GDPR , primary objectives of the General Data Protection Regulation, scope of data processing activities covered by the GDPR, territorial scope of the GDPR regarding the location of personal data processing and data subjects, GDPR impact on Indian Companies, Data protection Laws in India	L1, L2	6

MODULE 3: Data Privacy: Legal Issues and Landscape Development of Privacy Laws (historical and legal context), Fair Information Principles, The Statutory Landscape in the US, Indian IT Act, Adjudication under Indian IT ACT, IT Service Management Concept, IT Audit standards, ISO/IEC 27000 Series, COBIT, HIPPA, SOX, System audit, Information security audit, ISMS, SoA (Statement of Applicability), BCP (Business Continuity Plan), DR (Disaster Recovery), RA (Risk Analysis/Assessment)	L1, L2	6
MODULE 4: Data Security Analysis and Risk Management **Risk Management:** Identification, Assessment and controlling of Risk **Logical Design:** Blueprint for Security, Information Security Policy, Standards and Practices, ISO17799/BS 7799, NIST Models, VISA International Security Model, Design of Security Architecture, Planning for Continuity **Physical Design:** Security Technology, IDS, Scanning and Analysis Tools, Cryptography, Access Control Devices, Physical Security, Security and Personnel	L1, L2	6

**Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4-Analysis; L5-Synthesis; L6-Evaluation*

Text and Reference Books

1. Micki Krause, Harold F. Tipton, "Handbook of Information Security Management", Vol 1-3 CRC Press LLC, 2004.
2. Stuart McClure, Joel Scrambray, George Kurtz, "Hacking Exposed", Tata McGraw-Hill, 2003.
3. Matt Bishop, " Computer Security Art and Science", Pearson/PHI, 2002.
4. International Guide to Privacy – American Bar Association (Privacy)
5. International Guide to Cyber Security – American Bar Association (Cyber Security)
6. Roadmap to an Enterprise Security Program - American Bar Association (Roadmap)
7. The Executive Guide to Information Security – Egan and Mather (Guide)
8. Case studies from the Harvard Business School; http://cb.hbsp.harvard.edu/cb/access/5263390

Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	10	8	7	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; A: Attendance

CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1	2	3	2	1	3	--	2	2	2	--	1	--	3
CO2	2	2	--	1	3	--	2	2	--	--	1	--	2
CO3	2	3	1	1	2	--	2	--	2	--	1	--	3
CO4	2	2	2	1	1	--	2	2	2	--	1	--	--

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1: strongly related, 2: moderately related and 3: weakly related

BUA4437	**DISSERTATION (ANALYTICS PROJECT)**	L	T	P	C
Version 1.1		0	0	0	6
Pre-requisites/Exposure					
Co-requisites					

Catalog Description

Under this, it is usual to give the student some discretion in the choice of topic for the dissertation and the approach to be adopted. The dissertation topic is related to the field of specialization. Deciding this is often the most difficult part of the dissertation process, and requires thorough preparation and background research.

The aim of the dissertation is to provide the students with an opportunity to further their intellectual and personal development in their chosen field by undertaking a significant practical unit of activity, having an educational value at a level commensurate with the award of their degree.

Course Objectives

The objective of this course is to:

1. Understand and apply theoretical frameworks to the chosen area of study.
2. Produce a coherent and logically argued piece of writing that demonstrates competence in research and the ability to operate independently.

Course Outcomes

On completion of Dissertation, the students will be able to

CO1: Describe a relevant area of career development, career coaching, coaching or work-related learning studies.

CO2: Identify research methods and state research questions.

CO3: Critically analyze and evaluate the knowledge and understanding in relation to the agreed area of study.

CO4: Integrate theory and practice for the development of responses on the basis of the evaluation and analysis undertaken.

CO5: Communicate in written form by integrating, analyzing and applying key texts and practices.

CO6: Demonstrate advanced critical research skills in relation to career development or work-related learning studies.

Planning the dissertation	**Blooms level***	**Number of hours**
• Selecting a topic for investigation. • Establishing the precise focus of the study by deciding on the aims and objectives of the dissertation, or formulating questions to be investigated. Consider very carefully what is worth investigating and its feasibility.	L1, L2 ,L3,L4,L5,L6	6hours a Week

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• Drawing up initial dissertation outlines considering the aims and objectives of the dissertation. Workout various stages of dissertation • Devising a timetable to ensure that all stages of dissertation are completed in time. The timetable should include writing of the dissertation and regular meetings with your dissertation guide.		

**Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4-Analysis; L5-Synthesis; L6-Evaluation*

Modes of Evaluation: Viva/ Report Examination

Examination Scheme:

Components	Content & Layout of Report	Conceptual Framework	Objectives & Methodology	Implications & Conclusions	Viva-Voce
Weightage	30	10	15	15	30

CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4
CO1	1	--	--	--	--	--	--	1	--	--	--	1	--
CO2	--	1	--	--	--	--	--	--	--	--	--	1	--
CO3	--	1	2	--	--	--	--	--	--	--	--	1	--
CO4	1	--	--	--	--	--	--	--	--	--	--	1	--
CO5	--	--	--	--	--	--	1	--	--	--	--	1	2
CO6	--	--	--	--	--	--	--	--	1	--	--	1	--

1: strongly related, 2: moderately related and 3: weakly related

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