SCHOOL OF BUSINESS AND COMMERCE

DEPARTMENT OF BUSINESS ADMINISTRATION

Curriculum

of

BBA (BUSINESS ANALYTICS)

THREE YEAR FULL TIME UNDERGRADUATE

PROGRAMME (BATCH 2023-2026)

From Academic Session 2023-24 and Onwards

BACHELOR OF BUSSINESS ADMINISTRATION

(BUSINESS ANALYTICS)

(2023-2026)

The University reserves the right to amend the curriculum from time to time to meet the changing requirements of business and commerce. The focus of this three-year degree program will be on the student's ability to specialize in the analytics sector. Business Analytics is very much in demand in the present scenario of global corporate structure and the course will prepare them in Marketing, HR, and financial analytics. The focus shall be on the employability of the graduate students for onwards placement in the corporate sector.

PROGRAMME

The program shall be called Bachelor of Business Administration (Business Analytics) which is abbreviated as BBA (Business Analytics). This program is carefully structured and includes pedagogy and andragogy. The program blends academic excellence with industrial requirements. Classroom teaching, group work and field visits with internship and project work forms part of the teaching-learning exercise. Different courses of analytics like inferential statistics, data analytics, python and business research will be covered to blend academic excellence and industrial requirement. A fair amount of industry connection will be enabled through Industrial Visits, Guest Lectures, Seminars and Workshops.

OBJECTIVE

The core objective of this program is to prepare students for successful business careers in a dynamic global environment of Business Analytics. To develop analytical skills and decision-making skills across functional areas of the management.

DURATION OF THE PROGRAMME

The BBA (Business Analytics) programme shall be of three years with six semesters. Each semester will have 13 weeks of course work and 2 weeks for examinations. There will be minor projects, summer internship report and dissertation preparation and presentation in different semesters to enable the student to be able to actualize his learning and communicate it effectively. A student will be required to complete the programme within a maximum of 5 years from the date of registration in the first Semester. The student shall also be required to undergo 45 days Summer Internship at the end of the second year (4th Semester) and shall complete a project study and write a report.

TOTAL CREDIT REQUIREMENTS FOR THE AWARD OF BBA DEGREE ARE 148, SPREAD OVER SIX SEMESTERS IN THREE YEARS. THE SEMESTER-WISE CREDIT DISTRIBUTION IS AS FOLLOWS.

Semester	Total credits per semester	Cumulative Credits
I	25	25
II	26	51
III	25	74
IV	24	100
V	26	126
VI	22	148

ELIGIBILITY FOR ADMISSION

Admission to the BBA (Business Analytics) program is open to all candidates who have passed 10+2 Examination from CBSE/ICSE/State Council or its equivalent in any discipline with minimum 50% marks in aggregate and mathematics/applied mathematics/statistics as one of the compulsory courses. The selection will be based on the marks in 10+ 2 examination and interview with equal weightage.

ATTENDANCE REQUIREMENT

Classroom attendance requirement is mandatory at 75% in each course.

A student with less than 75% attendance in individual course shall **not** be permitted to write the end semester examination in that course and will be given DT (Detained) letter grade in the course. For calculation of 75% attendance of students all lectures, tutorials, practical classes, all assignments including expert lectures workshops and seminars will be counted and must also be 75%.

EVALUATION SCHEME

S.No.		Internal	External / End Semester
1	All Theory Courses	Internal (1 Midterm -30 marks + CWS- 30 marks (Quiz/ Presentation/ Project/Assignment)	40 Marks
2	Summer Internship Report	60 marks	40 Marks (20 Presentation + 20 Viva Voce) Marks
3	Group Discussion/ Soft Skills	60 Marks	40 Marks
4	Project Work	60 Marks	40 Marks (20 Presentation + 20 Viva Voce) Marks

GRADING METHOD:

The academic performance of a student is evaluated internally by the concerned course faculty concerned. The overall performance of a student is expressed in terms of a Letter Grade A to DT as per the following system. The student performance in each course is evaluated out of a maximum of 100 marks and will be converted accordingly in letter grade. The value of different grades is given below:

Grade	A+	A	B	C	D	E	F	I (Incomplete)	DT (Detained)
Grade Point	10	9	8	7	6	5	0	0	0

PERFORMANCE REQUIREMENTS

A student shall obtain a minimum 'E' grade to pass any course.

SUMMER INTERNSHIP & PROJECT WORK

All the students shall undergo a **Summer Internship** for at least 45 working days at the end of the fourth semester and submit a report during fifth semester and they will be evaluated for that during fifth semester. During summer internship the students will undertake internship training in an organization and undertake work on any one functional area of management on real time project and shall submit a report on the work undertaken.

Every student will undertake a **Project Work** during the course of the sixth semester and submit the same during sixth semester itself. The University shall appoint External and Internal Examiners to conduct the viva voce exam for Summer Internship Report and Project Work.

PROGRAM ELECTIVES OFFERED (to be offered in Vth and VIth Semester. The student must choose one elective from Group-1 and one elective from Group-2).

Semester Vth Group- I	Semester VIth Group-II
Financial Analytics	Supply Chain Analytics
Marketing & Retail Analytics	Network Analytics
HR Analytics	Web & Social Media Analytics

SCHOOL OF BUSINESS AND COMMERCE
DEPARTMENT OF BUSINESS ADMINISTRATION

BBA (Business Analytics)

Year	Course Code	Course Name	L	T	P	C	Course Code	Subject Name	L	T	P	C
		FIRST SEMESTER						**SECOND SEMESTER**				
I	BA1101	Business Communication	3	0	0	3	BA1201	Principles of Macro-Economics	3	0	0	3
	BA1102	Fundamentals of Business Analytics and Problem Solving	2	0	2	3	BA1202	Cost Accounting	3	0	0	3
	BA1103	Data Analysis in Excel	2	0	2	3	BA1203	Marketing Management-I	3	0	0	3
	BA1104	Principles of Management	3	0	0	3	BA1204	Human Resource Management-I	3	0	0	3
	BA1105	Business Economics	3	0	0	3	BA1205	Financial Management-I	3	1	0	4
	BA1106	Fundamentals of Financial Accounting	3	1	0	4	MA1207	Introduction to Statistics	3	1	0	4
	MA1106	Introduction to Mathematics	3	1	0	4	IT0025	Python for Data Analytics	3	0	2	4
	AT1011	Yoga & Wellness	0	1	2	2	AT1049	Vedic Management	1	1	0	2
			19	3	6	25			22	3	2	26
	Total Contact Hours (L + T + P)		**28**				Total Contact Hours (L + T + P)		**27**			

		THIRD SEMESTER						FOURTH SEMESTER				
II	BA2101	Marketing Management-II	3	0	0	3	BA2201	Exploratory Data Analysis	2	0	2	3
	BA2102	Business Research Methods	3	0	0	3	BA2202	Business Ethics and Corporate Governance	2	0	0	2
	BA2103	Analyzing Patterns and Data Storytelling	2	0	2	3	BA2203	Big Data Analytics	3	0	2	4
	BA2104	Business and Cyber Laws	3	0	0	3	BA2204	Operations Research	3	0	0	3
	BA2105	Operations Management	3	0	0	3	BA2205	Data Visualization and Business Intelligence	3	0	2	4
	BA2106	Financial Management -II	3	0	0	3	BA2206	Human Resource Management-II	3	0	0	3
	BA2107	Inferential Statistics	2	0	2	3	BA0025	Universal Human Values	2	0	0	2
	DS2005	Introduction to R-Language	3	0	2	4	CY1003	Environmental Science	3	0	0	3
			22	0	6	25			21	0	6	24
	Total Contact Hours (L + T + P)				28		Total Contact Hours (L + T + P)				27	

		FIFTH SEMESTER						SIXTH SEMESTER				
III	BA3101	DBMS with SQL	3	0	2	4	BA3201	Project Management	3	0	0	3
	BA3102	Multivariate Techniques	2	0	2	3	BA3202	Strategic Management	3	0	0	3
	BA3103	Digital Transformation of Business	3	0	0	3	BA3270	Project Work	0	0	12	6
	BA3104	E-Commerce	3	0	0	3	BA32***	Elective (One from Group-II)	2	0	2	3
	BA31***	Elective- (One from Group-1)	2	0	2	3	******	Open Elective	3	0	0	3
	BA3170	**Summer Project**	0	0	12	6	CA****	**Machine Learning-II**	3	0	2	4
	CA****	**Machine Learning-I**	3	0	2	4						
			16	0	20	26			14	0	16	22
	Total Contact Hours (L + T + P)				36		Total Contact Hours (L + T + P) + OE				30	

PROGRAM ELECTIVES & COURSES

Program Elective

	SEMESTER V (GROUP 1)						SEMESTER VI (GROUP 2)						
Course No.	Subject Code	Subject Title	L	T	P	C	Course No.	Subject Code	Subject Title	L	T	P	C
1	BA3140	Financial Analytics	2	0	2	3	4	BA3243	Supply Chain Analytics	2	0	2	3
2	BA3141	Marketing & Retail Analytics	2	0	2	3	5	BA3244	Network Analytics	2	0	2	3
3	BA3142	HR Analytics	2	0	2	3	6	BA3245	Web & Social Media Analytics	2	0	2	3
		TOTAL (for one elective)	**2**	**0**	**2**	**3**			**TOTAL (for one elective)**	**2**	**0**	**2**	**3**

SEMESTER – I

BA1101   **BUSINESS COMMUNICATION**   **[3 0 0 3]**

Course Objectives:
The objective of the course is to acquaint the students with the knowledge of the communication written as well as oral required in the corporate world in its day-to-day functioning.

Course Content:
Meaning and Objectives of Communication, Significance of Communication in business organization and its process, Barriers to communication, Essentials of effective communication, channels of communication. Non – Verbal Communication – Importance of Non-verbal Communication - Types of Non-verbal communication – Listening as a Manager – Types of Listening. Formal Presentations.
Interviews – Objective of Interview – Types of Interviews – Group Communication – Group Discussions – Meetings – Conferences. Formal Business Letter Writing – Purpose – Structure – Principles – Lay outing – Types of Business Letter Writing - Memos - Classification and Purpose - Structure and Layout – Email Writing – Advantages – Limitations – Style – Structure and Content – Dissertation Writing.

Reference Books:
- Bhende Pradhan, Thakur Krishan Namboodiri, Business Communication, Himalaya Publishing House,
- Jha Madhukant, Business Communication, Gen Next publications,

BA1102 FUNDAMENTALS OF BUSINESS ANALYTICS AND PROBLEM SOLVING [2 0 2 3]

Course Objective:
This course is designed to equip students with the knowledge and skills needed to analyse complex business problems, identify opportunities, and make data-driven decisions to improve business performance. Further, it will emphasise on Learning various analytical techniques, developing skills in data visualization and presentation, identification of business problems and formulate research questions, apply analytical techniques to real-world business problems.

Course Content:
Introduction to Business Analytics: Scope and Significance of Business Analytics: Importance, Job Roles, Trends. **Business Problems**: Introduction, Types of Problems and their advantages, Human Brain and Problem Solving. **Understanding Business Problems**: Framing the problem, Facts and opinions, Business Model Canvas, conducting research without any bias, Building a hypothesis. **Formulating Hypotheses**: Interviewing Frameworks, SPIN, SMART, 5Cs and PESTEL Framework, MECE Approach, analysing possible solutions, Prioritising Options, Considering Implications, Implementing Solutions, Proof of Concept Approach. **Industry Demonstrations**: Issue Tree Framework, 7Ps Framework; Case Studies: Air Crash Investigation, Big Data Consultant, Starbucks. **Wal Store Project**: Use the 5W's+How framework to come up with a list of questions that will help gather relevant facts and data about Wal Store's current state of operations.

Reference Books:
- Fundamentals Of Business Analytics by R. N. Prasad and Seema Acharya, Latest Edition
- Data Analytics Made Accessible by Anil Maheshwari, 2023 edition.

BA1103   **DATA ANALYSIS IN EXCEL**   **[2 0 2 3]**

Course Objectives:
To familiarize students with features of MS Excel with special reference to business context.

Course Content:
Introduction to Excel: Excel Interface, Sort & Filter, Report Making, Printing, Page Layout, Passwords and Naming Files, Shortcuts, Complex Functions, Cell Referencing, Creating and Formatting Charts, Pivot Tables, Common Errors, VLOOKUP, Advanced Excel: Text, Statistical, and Logical Functions, Conditional Formatting, What-If Analysis, Macros, Data Analysis Toolpak, Visual Basics for Applications, Financial Functions: Time Value of Money, Capital Budgeting, Financial Functions: Depreciation, SI, PV, FV, NPV, IRR, Annuity, Superstore Sales Project: Create a report containing a summary of sales for the corporate customer segment at Superstore Sales retail store.

Reference Books:
- Alexander, Kusleika, & Walkerbach; Excel 2019 Bible;Wiley
- John Walkenbach; Excel Charts, Wiley,2019

BA1104   **PRINCIPLES OF MANAGEMENT**   **[3 0 0 3]**

Course Objectives:
To familiarize the students with basic management concepts and processes in the organization.

Course Content:
Introduction to Management: Concept, Scope of Management, Management a Science or Art, Levels of Management, Managerial Skills, Roles of a Manager. Evolution of Management Thoughts: Classical Approach- scientific management, Administrative Management and Bureaucracy. Neo-Classical Approach- Human relations movement and Behavioral approach. Modern Approach- Quantitative approach, Systems approach and Contingency approach. Functions of Management: Planning: Concept, Importance, Strategies, Policies and Planning Premises; Decision making, Management by Objectives (MBO), Management by Exception (MBE), Process of Planning. Organizing: Concept, Importance, Process of Organizing, Types of Organizational Structures, Span of Management, Centralization and Decentralization. Staffing: Concept, Scope of Staffing, Manpower Planning, Recruitment and Selection, Training and Development, Performance Appraisal. Directing: Concept, Importance, Motivation: Concept, Importance, Maslow's Need Hierarchy theory, Leadership- Concept, Characteristics of Leadership, and Leadership styles, Communication- Types, Process and Barriers of Communication. Coordinating: Definition, Characteristics, Principles and Techniques of Coordination. Controlling: Concept, Importance, Process of Controlling

Reference Books:
- Stephen P. Robbins, Mary Coulter, David De Cenzo: Fundamentals of Management, Ninth Edition, Pearson Education India, 2016.
- Mitra, J.K.: Principles of Management, Oxford Publication, Latest Edition.
- Koontz, H.: Essentials of Management, Tata McGraw Hill Education, Latest Edition.
- Bhushan, Y.K.: Fundamentals of Business Organization and Management, Sultan Chand & Sons,

BA1105   **BUSINESS ECONOMICS**   **[3 0 0 3]**

Course Objectives:
To facilitate the students to understand the various principles involved and problems encountered in making economic decisions in Business & Management. To develop the skills & Interest of the students with better comprehension of real business related economic problems.

Course Contents:
Introduction to Managerial Economics- Introduction, Importance, Managerial economics Decision Making Process, Role of Managerial Economist, Fundamental Concepts of Managerial Economics- Opportunity Cost, Time Perspective, Incremental Cost, Time Value of Money, Equi- marginal Concept, Concept of Utility: Cardinal and Ordinal, Marginal Average and Total Utility concepts, Indifference curves, income consumption curve and cost consumption curve, Theory of Demand- Introduction, Factors affecting Demand, Law of Demand and elasticity of Demand, Supply analysis- Introduction, Factors affecting supply, Law of supply, Cost Analysis- Marginal Average and Total Cost concepts, Revenue Analysis- Introduction, Total, marginal and average revenue, Elementary theory of markets- perfect competition, pure monopoly, monopolistic competition and oligopoly.

Reference Books:
- Mankiw Grregory N, Principles of Economics, CENGAGE publication
- Lipsey R G: *Textbook of Positive Economics,* Longman Higher Education;
- Samuelson P A: *Economics,* Harvard University Press; Enlarged edition

BA1106   **FUNDAMENTALS OF FINANCIAL ACCOUNTING**   **[3 1 0 4]**

Course Objective:
To familiarize students with the mechanics of preparation of financial statements, understanding corporate financial statements, their analysis and interpretation.

Course Contents:
Introduction to Financial Accounting: Accounting as a System, – Generally Accepted Accounting Principles; Nature of Accounts, Rules of Debit and Credit; Recording Transactions in Journal; Preparation of Ledger Accounts; Preparation of Trial Balance; Preparation of Trading Account, Profit & Loss Account and Balance Sheet, Adjustment Entries (not very advanced), Introduction to Accounting Standards Annual Report of Public Limited Company - Chairman's Statement, Directors' Report, Management Discussion and Analysis, Report on Corporate Governance, Auditors' Report, Corporate Income Statement and Balance Sheet, Introduction to Corporate Financial Statements: Preparation of Cash Flow Statement, dividends, distributable profits and types of shares. Understanding different types of Profit, viz., PBIT, PBT, PAT, Operating Profit and Distributable Profit. Financial Statement Analysis: Introduction to Accounting Standards on Disclosure of Accounting Policies, Revenue Recognition.

Reference Books:
- Monga, J.R., Financial Accounting: Concepts and Applications, Mayur Paperbacks
- Tulsian, P.C., Financial Accounting, Pearson
- Maheshwari S.N. & Maheshwari S.K., Financial Accounting for B. Com., CA, CS, & ICWA
- (Foundation) Courses, Vikas Publishing House Pvt. Ltd.
- Balwani, N, Accounting and Finance for Managers, Excel Books
- Gupta, A: Financial Accounting for Management, Prentice Hall College, Latest Edition
- Bhattacharyya, A Financial Accounting for Business Managers, PHI
- Jain, S.P. & Narang, K.L., Advanced Accountancy, Kalyani Publishers

MA1106   INTRODUCTION TO MATHEMATICS   [3 1 0 4]

Course Objective:
This course provides an introduction to key topics that form the foundation for further study in mathematics, data analytics, and statistics. Through this course, students will develop both an understanding of the concepts and the ability to apply the concepts and techniques to analysis and problem-solving.

Course Content:
Set Theory: Notation of sets, Singleton set, Finite Set, Infinite Set, Equal Set, Null Set, Sub-Set, Proper subset, Universal set, Union of sets, Intersection of sets, Disjoint sets, Power set, Venn diagram, Complementary set, Uses of set theory is business, Elementary permutations and combinations.

Matrices & Determinants: Introduction, types of matrices, Addition of matrices, Subtraction of matrices, Multiplication of matrices, Transpose of matrix, Expansion of determinants, Minor and Cofactors, Properties of determinant, Adjoint and Inverse of

matrices, System of linear equations, Applications of matrix operations in business decision making.

Commercial Arithmetic and Mathematical Series: Arithmetic progression, Geometric progression (in terms of time, money values) Harmonic progression, relationship among AP, GP and HP.

Differential Calculus: - Concepts of differentiation, Derivative of a function, Differential coefficient of product and quotient of two functions, Differentiation of different forms of functions – Chain rule, Exponential, Logarithmic, Parametric functions and derivatives of higher order, Maxima and Minima, Applications of differentiation in business.

Integral Calculus & Differential Equations: Concept of integration, Elementary integration, (single variable function, logarithmic, trigonometry, exponential, polynomial), integration by substitution, Integration by parts, Applications of integration in business, Linear Differential equations, Order and degree of differential equations, Solution of linear differential equations in variable separable form.

References:

Gupta, KL, Agarwal, Ravi Kant & Jain, Praveen, Business Mathematics, Nirupam Sahitya Sadan.

Sancheti DC & Kapoor VK, Business Mathematics, Sultan Chand & Sons.

Gupta, BN, Business Mathematics, SBPD.

Hazarika, Padmalochan, Business Mathematics, S. Chand Publishing.

Sharma, JK, Business Mathematics, Ane Books.

Singh, JK, Business Mathematics, Himalaya Publishing House.

AT1011   **YOGA AND WELLNESS**   **[0 1 2 2]**

Course Objective:
The course will help students to understand the important of physical and mental fitness. It will make them understand the different exercise and techniques to be healthy.

Course Contents:
Introduction to Physical Fitness and Wellness: Concept of Fitness - Definition and meaning of Fitness, Different Kinds of Fitness; Physical Fitness, Skill Related and Health Related Physical Fitness, Relationship of fitness and health; Basic concept of wellness, Role of various factors in wellness, components of wellness; Physical fitness and wellness, Health benefits of Exercise. Exercise prescription. Introduction to Stress and its management techniques: Yoga and Stress Management; Stress Management and Relaxation Techniques; Asanas and its effects- Padmasana, Hatasana< Bhujangasana, Shalabhasana, Dhanurasana, Shavasana, Vajrasana, Chakrasana, Trikonasana, Padahasthasana; Postural Deformities – Corrective measures.

References Books:
- Concepts of Fitness And Wellness, Charles Corbin, McGraw-Hill Publishing,
- Health, Wellness, and Physical Fitness, Grades 5 – 8 ,Don Blattner, Lisa Blattner Howerton
- Fitness, Wellness and Nutrition, Dr. A. K. Uppal , Dr. P. P.Ranganathan

SEMESTER – II

BA1201   **PRINCIPLES OF MACRO ECONOMICS**   **[3 0 0 3]**

Course Objectives:

The purpose of this course is to familiarize the student with the generally accepted principles of macroeconomics. Macroeconomics is concerned with such things as, economic growth, unemployment, inflation, and the business cycle.

Course Contents:

Circular Flow of Income, Economic Sectors, Growth and Development defined. National Income Accounting [GNP, GDPO, NNP and Net Economic Welfare], Business Cycles Theory, Inflation, Deflation and Stagflation. Theory of Unemployment and Income, Elementary Keynesian Economics [Marginal Propensity to consume, Marginal Propensity to Invest, Multiplier, Accelerator], Money Supply, Elementary Monetary policy and Elementary Financial Policy, **Business Environment:** Contemporary Issues – from Complacency to Social Responsibility of Business, Economic Environment: Economic System, Green Initiatives NGT Triple Bottom Line. **Government:** Economic role of Government – Fiscal Policies, Import & Export Policy, Emerging Structure of Indian Economy, Globalization, SEZ. **Business & Legal Environment:** Investors Protection Act 1986, Regulation of Stock exchange, SEBI, FEMA 2000. NRI Investments.

Reference Books:

- Vaish M C, Macro Economic Theory, Vikas Publishing House Pvt. Ltd., Delhi,
- Barro R.J, Macro Economics, PHI Learning Pvt. Ltd., Delhi,
- Shapiro E., Macroeconomic Analysis, Galgotia Publication Pvt. Ltd.,
- Dwivedi D N, Macroeconomics Theory and Policy, Tata McGraw Hill Education Pvt. Ltd., New Delhi,
- Souza E D, Macroeconomics, Pearson, New Delhi,
- Jhingan M L, Macro Economic Theory, Vikas Publishing House Pvt. Ltd., Delhi,

BA1202   **COST ACCOUNTING**   **[3 0 0 3]**

Course Objectives:
To acquaint the students with Elements of Cost, Methods of Costing and Cost Accounting.

Course Content:
Cost Accounting: Concept of Cost, Classification of cost:- Types of Cost, Distinctions between Financial and Cost Accounting, Cost accounting methods, Cost accounting techniques, Alternative cost accounting principles, Elements of Cost. Presenting information: - Purchasing, receiving and storage of material, Pricing of material issues, Material control. Recording of Labour Cost, Direct Expenses. Overhead: Classifications allocation, apportionment, re-apportionment and absorption of overhead costs. Production Account, **Methods of Costing:** Unit costing, Job costing. Contract Costing. Process costing (process losses, Joint and By-products, Inter-Process Profits, Costing of Work-in-Progress) Operating Costing (only for transport services).

Reference Books:
- Jawaharlal & Srivastawas, Cost Accounting, McGraw Hill Education (India) Pvt. Ltd.,
- Arora M N, A Text Book of Cost & Management Accounting, Vikas Publishing House Pvt. Ltd., New Delhi.
- Bhattacharya A K. "Principles & Practice of Cost Accounting" PHI Learning.

BA1203   **MARKETING MANAGEMENT-I   [3 0 0 3]**

Course Objective:
To provide basic understanding to students about different principles of marketing management.

Course Contents:
Introduction to marketing management: Concept, Importance, Scope, Core marketing concepts, Marketing mix, Scanning of marketing environment. Market segmentation, Targeting and Positioning (STP), **Product:** Product levels, Product classification, Product differentiation, Product mix, Product life cycle, new product development. **Pricing:** Concept, Factors influencing pricing, Process and methods of pricing, **Distribution Channels:** Concept, Importance, Marketing flows in marketing channels, Selection and management of distribution channels, marketing systems. Wholesaling and Retailing: - Concept, Functions and types. **Promotion Mix:** Advertising, Sales promotion, Personal selling, Publicity and Public relation, Direct marketing.

Reference Books:
- Kotler, P., Keller, K.L. Koshy, A. & Jha, M. Marketing Management: A South Asian Perspective: 14th Edition, Pearson Publication.
- Ramaswamy, V.S. & Namakumari, S. Marketing Management, 5th Edition Mc Graw Hill India.
- Baines, P. Chris fill, Kelly Page, Piyush Sinha, Marketing, Asian Edition. Oxford University Press.
- Saxena, R. Marketing Management, 4th Edition, Tata McGraw Hill Education.
- Kotler, P., Armstrong, G., Agnihotri, P.Y., Haque, E.U. Principles of Marketing, A South Asian Perspective, Pearson India.

BA1204   HUMAN RESOURCE AMANGEMENT-I   [3 0 0 3]

Course Objective:
This course will be helpful by giving them a solid grounding in HR-related topics, the course is intended to enable the students to address the practices of human resource management in organisations. Additionally, emphasis will be placed on assisting them in growing their communication and decision-making skills through case studies, role plays, and other exercises.

Course Contents:
Basics of HRM: Human resources definition, concept, and scope, evolution, PM vs. HRM, SHRM vs. HRM, HRM: Managerial & Operative Functions, Current Issues & Challenges, HR as Competitive Advantage, Objectives of HRM, Role of HR Manager.**Manpower Planning & Recruitment:** Meaning and implications of Job Analysis, Job Descriptions and Job Specifications. Manpower Planning: Goals and Procedures, Demand and Supply Forecasting, Recruitment Concepts, and its Sources,**Selection & Induction:** Selection Concept- Meaning & Purpose, Selection Process, Induction -- Concept & Process,**Training:** Importance, objectives of training. Difference b/w Education, Training & Development, Methods of Employee Training – On the Job Methods (Apprenticeship, Mentoring & Job Rotation, Training-Off the Job Methods (Lectures, Vestibule Training, Case Analysis),**Performance Appraisal & Compensation:** Rating & Ranking Method, Forced Distribution, 360 Degree Appraisal, Errors in Performance appraisal, Direct & Indirect Compensation components.

Reference Books:
- D.K. Bhattacharya, *Human Resource Planning,* Excels Publications,
- Ramaswamy, *Managing Human Resources*, Oxford University Press,
- Kandula Srinivas, *Strategic Human Resources Development*, Prentice Hall of India,
- Lynton R. Pareek U., *Training for Development,* New Delhi, Vistar,
- Rao T.V. et al, *Alternative Approaches & Strategies of Human Resource* Development, Rawat Publication, Jaipur,
- Human Resource Management: Text and Cases, Rao VSP, Second edition, Excel Books, New Delhi.
- Fundamentals of Human resource Management, Decinzo Robbins, Eleventh Edition, Wiley

Course Objective:

The purpose of the course is to offer 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.

Course Contents:

Meaning, objectives, Scope, and Importance of Financial Management –Finance functions – Role of finance manager in managing finance, Objectives of financial management, Emerging issues in financial management, Time Value of Money- Concept and reasons of time perspective of money, future value and present value, loan amortization and other applications of time value of money, Investment Decision: Concept and Computation of Capital Budgeting, Capital budgeting Techniques. Project selection based on Investment Decisions. Management of Working Capital: Concepts, components, Determinants and need of Working Capital. Computation of Working Capital for a Company, Receivable Management- Concept, credits policies, credit terms, collection policies, Cost of Capital- Computation of cost of debt, preference share, equity, retained earnings and weighted average cost of capital, Dividend Decision

Reference Books:

- Khan & Jain, *Financial Management,* Tata McGraw-Hill,
- Pandey I M, *Financial Management*, Vikas Publishing House,
- Chandra, P *Financial Management,* Tata McGraw-Hill,

MA1207   **Introduction to Statistics**   **[3 1 0 4]**

Course Objective:
This course is designed to provide students with the foundational knowledge and skills needed to effectively analyse and interpret data using statistical methods. It includes Understanding fundamental statistical concepts, developing data analysis skills, learning to use statistical software, and developing critical thinkingskills.

Course Contents:

Descriptive Statistics: Definition, Importance & Limitation, Collection of data and its tabulation, formation of frequency distribution, Grouped frequency distribution, Ungrouped frequency distribution, Cumulative frequency distribution, Relative frequency distribution, Relative cumulative frequency distribution. Graphic presentation of Frequency distribution – Graphics, Pie, Bars, Histogram, Pictograph, Z graph, band graph, cumulative frequency graph, Ogive graph, Diagrammatic; Measures of Central Tendency – Mean, Median and Mode, Partition values – quartiles octiles, deciles and percentiles; Measures of variation – Range, IQR, Semi inter-quartile range, Quartile deviation and its coefficients.

Descriptive Statistics: Measures of dispersion: Mean deviation, Variance, Standard deviation, Coefficient of variation, Concept and measurement of skewness, moments and kurtosis.

Correlation & Regression Analysis: Correlation Coefficient; Assumptions of Correlation Analysis; Coefficients of Correlation; Measurement of Correlation- Karl Person's Methods; Spearman's Rank correlation; Limitations of Correlation Analysis; Applications of correlation analysis in business. Regression Analysis: - Meaning and definition of regression, Utility and applications of regression analysis, Types of regression, Difference between correlation and regression, Regression lines, Regression equations, Regression coefficients.

Index Numbers & Time Series: Meaning and significance. Problems in construction of index numbers. Methods of constructing index numbers - Weighted and Un-weighted (simple aggregative and simple average of price relative methods). Analysis of Time Series: Measurement of trend - Freehand method, Semi-average method, Moving average, Method of least squares.

Probability: Introduction, importance or applications or uses of the theory of probability in business decision making, Meaning and definition of probability, Elementary problems of probability, Addition and Multiplication theorems of probability, Baye's theorem of probability.

References:

1. Jhunjhunwala, Bharat, Business Statistics, S. Chand & Company Ltd.

2. Patri, Digambar & Patri, DN, Business Statistics for Management, Kalyani Publishers.

3. Sharma J.K. Business Statistics, Pearson Education.

4. Gupta S.P., Statistical Method, Sultan Chand & Sons.

5. Gupta S.C., Fundamentals of Statistics, Himalaya Publishing House

IT0025   **PYTHON FOR DATA ANALYTICS**   **[3 0 2 4]**

Course Objective:
The main objective of the course is to provide students with the basic concepts of Python, its syntax, functions and packages to enable them to write scripts for data manipulation and analysis. The course develops skills of writing and running a code using Python.

Course Contents:
Introduction to Python Programming: Basics of Python: Installation, Data Types, String and Arithmetic Operators. Data and Control Structures: Lists, Tuples, Sets, Dictionaries, Loops, Functions. OOP in Python: Objects, Methods, Class Inheritance, Overriding Basic Coding, Strings, Remove Duplicates, Balanced Brackets, Time Complexity, Searching, Sorting, Two Pointers, Recursion, Python for Data Science: NumPy: Basics, 1-D and Multidimensional Arrays, Creating and Manipulating Arrays.Matplotlib: Visualisation, Subplots. Pandas: Basics, Indexing and Slicing, Dataframes, Grouping and Pivoting, Merge and Append
Data Visualisation in Python: Case Study: Analysing Google Playstore Ratings. Data Visualisation with Seaborn: Distribution Plots, Styling Options, Different Types of Charts and Plots, Heatmaps, Plotly
Movies Dataset Project: Find insights for some movies released between 1916 and 2016 by exploring a dataset of the same. Gather insights on entities such as actors, directors etc.

 Reference Books:
- Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython 2nd EditioN by William McKinney (Author)
- Automate the Boring Stuff with Python: Practical Programming for Total Beginners 1st Edition by Al Sweigart

AT1049   **VEDIC MANAGEMENT**   **[1 1 0 2]**

Course Objective:
The goal is to make Vedic knowledge available to everyone and integrate it into regular management concerns for the students.

Course Content:
Concept of Management as enshrined in Vedas- vision, leadership, motivation, excellence in work, achieving goals, attitude toward work, nature of individual, decision making, planning discussed by great gurus like Achary Vidura, Chanakya, Parshuram. The Concept of Sthit Pragya in Gita, The Concept of Nishkamkarma in Gita, Positive effect of Vedas: better perception of life, clarity of thought, positive attitude, Message of Vedas for Inner peace and ability to better deal with stress, Vedas as Problem solving and satisfaction with themselves, Other effects of Gita: sense of well-being, physical fitness References:Vasudha-ev-kutumbakam,(accepting the whole world as one and one's family), Samarpan Bhav (dedication), Loksangrah(Wellfare of all beings), Shubh Labh (Ethical Profits), Varnashram Vyastha, Ashtang Yoga.

References Books:
- Harold, T. Living Issues in Philosophy, Oxford University Press, New York,
- Perumalil, A. An Introduction to Philosophy, ISPCK, New Delhi.
- 3.Banerjee, B. P. Foundations of Ethics in Management. New Delhi: Excel Books.
- 4.Bhatia, V. P. Ethical and Spiritual Values in Indian Scriptures. Chennai: Notion Press.

SEMESTER III

BA2101   **MARKETING MANAGEMENT-II**   **[3 0 0 3]**

Course Objective:

To provide knowledge to students about different practices of marketing management and understanding the emerging trends in marketing.

Course Contents:

Core Marketing Concepts, Marketing realities in dynamic environment, Developing Marketing Strategies and Plans – Marketing and Customer Value, Corporate and division strategic planning, Business unit strategic planning - Value delivery process, Value chain, Strategic marketing. Conducting Market Research: Marketing Research System, Marketing Research Process, Barriers, Competitive Dynamics- Introduction, Competitive strategies for market leaders, Expanding total market demand, protecting market share, increasing market share, other competitive strategies.Designing and Managing Services: Nature of Services, achieving service excellence, improving service quality. Designing and Managing Integrated Marketing Communications. Emerging Trends and Issues in Marketing: Socially responsible marketing, Ethical aspects in Marketing, Online Marketing, International marketing, Holistic Marketing

Reference Books:

- Philip Kotler, Kevin Keller – Marketing Management, 14th edition, Pearson Education India.
- V.S.Ramaswamy & S. Namakumari – Marketing Management in Indian Context, Global Perspective, 5th Edition, McGraw Hill.
- Rajan Saxena - Marketing Management, 3rd Edition, McGraw Hill.
- Marketing Management : Indian context by Ramaswami & Namakumari Macmillan(India) Limited ,New Delhi
- Marketing management by Tapan panda Excel Books
- Strategic Marketing Management by Khurana & Ravihandran Global Business Press ,N Delhi

BA2102   **BUSINESS RESEARCH METHODS**   **[3 0 0 3]**

Course Objective:

The primary objective of this course is to develop a research orientation among the scholars and to acquaint them with fundamentals of research methods. Specifically, the course aims at introducing them to the basic concepts used in research and to scientific social research methods and their approach.

Course Content:

Business Research: Introduction & Process. research process, constructs & concepts, variables & its types, Literature survey & finding research gaps, formulating research problem & determining research objectives, Research Design. Sampling Techniques and Procedures: sampling procedure, types/methods of sampling, sample size determination, confidence interval. Confidence Level and Significance Level. Measurement & Scaling Techniques: Types of data, Ratio, Interval, Ordinal and Nominal, Types of Scales: Comparative and Non -comparative scales, Data Collection: Primary and Secondary data, Observation and Survey (Structured & Unstructured), Methods of Survey: Interviews, Schedule, Data Collection Instruments, Questionnaire method. Data Processing data for analysis: editing, coding, classification & tabulations. Hypothesis & Testing of Hypothesis. Analysis of Data (Statistical Tools). Parametric & non -parametric tests. Practical application of all tests in SPSS. Writing the research report & Publication: preparing synopsis & summary of research work. reference writing: foot note, end note, in-text citation, bibliography, citation styles.

Reference Books:

- William G, Business Research Methods, 8th edition, Cengage Learning.
- Allan Bryman & Emma Bell, Business Research Methods 3rd Oxford publication, Kenneth S. Bordens & Bruce B. Abbitt. Research Design & Methods, A process approach. McGraw Hill, 8th edition,
- Cooper Donald, Schindler Pamela, Business Research Methods, MCG raw Hill,

BA2103   ANALYSING PATTERNS AND DATA STORYTELLING   [2 0 2 3]

Course Objectives:

This course aims to provide skills to Detect and understand the stories within datasets and extract insights from that data. Effectively present data visually to enhance audience comprehension of findings and insights.

Course Content:

Importance of Data Storytelling, Characteristics of a Good Story with Data, What Makes Data Storytelling Difficult, Essential Components of a Good Story with Data, Importance of Objective and Agenda. Five Patterns of Insights, Analysis Approach - Deriving New Columns and Summarizing Rows, Insight Overview, Introduction to Narrative Design Patterns, Patterns of: Argumentation, Flow, Framing, Emotion, Engagement. Structure and Flow, Pyramid Principle, Visuals, Importance of Visualization, visualization of: Quantitative Data, Qualitative Variables, Other Types of Variables, Advanced Analytical Techniques, Visual Design Principles and Storyboarding, Best Practices for Data Storytelling.

Airbnb Case Study: Visualize data related to Airbnb in New York and present insights to various stakeholders.

Reference Books:

- Storytelling with Data: A Data Visualization Guide for Business Professionals by Cole Nussbaumer Knaflic (ISBN: 9781119002253)
- Tableau Your Data! Fast and Easy Visual Analysis with Tableau Software (1st or 2nd Edition) By Daniel Murray (ISBN: 9781119001195)

BA2104   **BUSINESS AND CYBER LAWS**   **[3 0 0 3]**

Course Objective:

To keep pace with the swift changes one needs to have an acquaintance of the functioning of the information technology ecosystem. This syllabus endeavors to give an insightful understanding of fundamental nuances of the information technology ecosystem, its legal concerns, statutory provisions related to cyberspace, social, intellectual property issues, and legal analysis of new emerging technologies of Cyberspace. The capital idea of this syllabus is to professionally equip students with a detailed understanding of national and international regulatory framework and mechanics of cyber law.

Course Content:

Introduction: Origin and meaning of Cyberspace; Legal Issues in Cyberspace; Need of Regulation for Cyberspace; Different Models of Cyberspace Regulation. Cyber Jurisdiction: Concept of Jurisdiction, Jurisdiction in Cyberspace, Issues, and concerns of Cyberspace Jurisdiction in India. Information Technology Act: A brief overview of Information Technology Act, 2000, concept of electronic signature and digital signature, Cryptography, Public Key and Private Key. Data Protection and Privacy Concerns in Cyberspace: Need to protect data in cyberspace, Legal framework of data protection ,Privacy concerns of cyberspace Cyber Crimes : Definitions ,Nature ,Types of Cyber Crimes ,Cyber offences covered under the Information Technology Act, 2000, Issues relating to investigation of cybercrimes in India ,Civil Liabilities and Adjudication New emerging issue in: Brief introduction about Cloud Computing, Big Data, Internet of Things, Artificial Intelligence and Robotics, Blockchain.

Reference Books:

- Ian J Lloyd, Information Technology Law, Oxford University Press,
- Pavan Duggal Cyber Law 3.0, Universal Law Publishing Company Private Limited,
- Rodney D Ryder & Nikhil Naren, Internet Law-Regulating Cyberspace and emerging Technologies, Bloomsbury
- Talat Fatima, Cybercrimes, Eastern Book Company, Lucknow, Second Edition,

BA2105   **OPERATION MANAGEMENT**   **[3 0 0 3]**

Course Objectives:

To understand the operation function in production and familiarize students with the technique for planning and control.

Course Content:

Introduction to Operations Management: Definition, key decisions of OM, goods vs. services. Operation Strategies-Definition, relevance, strategy formulation process. Forecasting-Definition, needs, importance, qualitative (grass roots, market research and Delphi method) and quantitative methods (simple moving average method, weighted moving average and single exponential smoothing method), forecast error. Process Selection: Definition, Characteristics that influence the choice of alternative processes (volume and variety), type of processes- job shop, batch, mass and continuous. Production Planning & Scheduling: Aggregate Planning, definition, nature, strategies of aggregate planning, methods of aggregate planning (level plan, chase plan and mixed plan, keeping in mind demand, workforce, and average inventory), Scheduling: Operation scheduling, goals of short-term scheduling, job sequencing (FCFS, SPT, EDD, LPT, CR) & Johnson's rule on two machines, Gantt charts, Just in Time (JIT).Facility and Capacity Planning: Layout planning – of layouts (Process, Product, Group technology and Fixed position layout). Location Decisions & Models: Facility Location – Objective, factors that influence location decision, location evaluation methods- factor rating method. Capacity Planning: Definition, and measures of capacity (input and output). Material Planning: issues in material management, independent demand system, dependent demand system. Emerging Issues in Planning/ Operations Management: Total Productive Maintenance, Advanced Manufacturing System, Role of computers in planning.

Reference Books:

- Mahadevan B, Operations Management Theory & Practice, Pearson Education, 2015.
- Heizer J and Render B, Production & Operations Management, Pearson Education
- Chase R B, Aquilano N J , Jacobs F R and Agarwal N, Production & Operations Management Manufacturing and Services, Tata McGraw Hill.
- Gupta S.P., Statistical methods, Sultan Chand & Sons.

BA2106   **FINANCIAL MANAGEMENT- II**   **[3 0 0 3]**

Course Objective:

The purpose of the course is to offer 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.

Course Contents:

Introduction to Security Analysis: Introduction, approaches to investment decisions and portfolio management process, Fundamental Analysis(Economic Analysis, Industry Analysis and Company Analysis), Efficient Market Theory, Technical Analysis (Charting techniques & technical indicators),Introduction to Portfolio Management, Portfolio Analysis Capital Asset Pricing Theory(CML &SML), Arbitrage Pricing Theory, An introduction to risk management- concept, risk management strategies, techniques to mitigating risk, Financial Derivatives – Concept and Features, Financial Derivatives Market in India – Need for Derivative, Types of derivatives, Uses of Derivatives Forward, Futures, options and swaps

Reference Books:

- Khan & Jain, Financial Management, Tata McGraw-Hill
- Pandey I M, Financial Management, Vikas Publishing House.
- Chandra, P Financial Management, Tata McGraw-Hill.

BA2107   INFERENTIAL STATISTICS   [2 0 2 3]

Course Objective:

This course involves using statistical methods and techniques to analyze and interpret data, and to make inferences about a larger population based on the information obtained from a smaller sample of that population. It further aims to provide insights and information that can be used to make informed decisions in a variety of fields, including business, healthcare, social sciences, and many others.

Course Content:

Statistics for Business Decisions: Introduction to Probability: Permutation & Combination, Types of Events; Basics of Probability: Random Variables, Probability Distributions, Expected Value; Descriptive Methods: Measures of Central Tendency, Dispersion, and Shape. Basics of Probability: Random Variables, Probability Distributions, Expected Value. Probability Distributions: Discrete Probability Distributions: Probability Without Experiment, CDF, Binomial Distribution, Continuous Probability Distributions: PDF, Normal Distribution and Std. Normal. Central Limit Theorem and Sampling Methods: Sample and Population, Sampling Distributions, Properties, Central Limit Theorem, Types of Sampling Methods, Uses of Sampling in Various Domains, Additional Resources. ABC Bank Project: As a consultant for ABC Bank, you need to help them understand how well their call centres are performing and how they can improve customer satisfaction.

Reference Books:

- Dunlop, Tamhane, Statistics and Data Analysis: From Elementary to Intermediate, Pearson, 2000. ASIN: B000MBV06A (Hard Copy), ISBN: 9780137444267 (Paperback)

DS2005   INTRODUCTION TO R-LANGUAGE   [3 0 2 4]

Course Objectives:

This course is an introduction to R-Language, an open-source programming language used for statistical analysis and data visualization. Students will learn how to write basic R code, manipulate data, create visualizations, and conduct basic statistical analysis. By the end of the course, students will have a foundation in R that they can use for further statistical analysis.

Course Contents:

Introduction to R: What is R-Language?, Advantages of R-Language, History and Development of R-Language, Installing R and RStudio. Introduction to functions: Vectors, Character Strings, Matrices, Data sheets, Variables and Data Types, Operators and Arrays. Data Manipulation with R: Data Frames, Importing and Exporting Data, Filtering and Sorting Data, Merging and Joining Data. Basic Data Visualization with R: Base Plotting System, Scatter Plots, Bar Charts, Histograms. Statistical Analysis with R: hypothesis testing, parametric and non-parametric testing. Installing of R and Packages.

Reference books:

- Norman Matloff, Norman S. Matloff, The Art of R Programming, No Starch Press
- Alex Nordeen (2020), Learn R Programming in 24 Hours: Complete Guide for Beginners
- Kun Ren, Learning R Programming, Packt Publishing
- Omar Trejo, Peter C. Figliozzi), R Programming By Example: Practical, Hands-on Projects to Help You Get Started with R, Packt Publishing.
- Jeeva Jose, Beginner's Guide for Data Analysis using R Programming, Khanna Publishing House

SEMESTER IV

BA2201   **EXPLORATORY DATA ANALYSIS**   **[2 0 2 3]**

Course Objective:

The primary objective of this course is to teach students the fundamental principles, methods, and techniques used to explore and analyse data to gain insight and understanding about the underlying patterns and relationships. The course will include Understanding data structure, describing data numerically, identifying relationships, and Communicating findings, to make data-driven decisions in a variety of fields.

Course Content:

Data Manipulation: Data Sourcing: Public and Private Data; Data Cleaning: Fixing Rows and Columns, Missing Values, Standardising Values, Invalid Values, Filtering Data. Univariate Analysis: Data Description, Unordered and Ordered Categorical Variables; Quantitative Variables: Univariate Analysis and Summary Metrics; Segmented Univariate: Basics, Methods, Comparison of Averages and Other Metrics. Bivariate and Multivariate Analysis: Bivariate Analysis on Continuous and Categorical Variables, Business Problems Involving Correlation, Multivariate Analysis; Derived Metrics: Type Driven, Business Driven, Data Driven. Gramener Case Study: Use the concepts of EDA to decipher which types of customers default on a loan.

Reference Books:

Dunlop, Tamhane, Statistics and Data Analysis: From Elementary to Intermediate, ASIN: B000MBV06A (Hard Copy), ISBN: 9780137444267 (Paperback)

BA2202   BUSINESS ETHICS & CORPORATE GOVERNANCE [2 0 0 2]

Course Objectives:

This course helps student to understand about the importance of ethics in the business, practices of good governance to encourage moral imagination and heightening sensitivity towards the ethical dimension of managerial problems.

Course Contents:

Business Ethics: Meaning, nature, scope, and purpose of ethics. Types of business ethic issues, why ethical problems occur in business, Ethical dilemmas in business, Ethical principles in business. Ethical decision making-personal and professional moral development and moral reasoning, Computer ethics and business: Computer crime, Computers and Corporate Responsibility Property: information and software, Computer and Privacy Professional ethics, Ethics in international business. Corporate Governance: Concept, need to improve corporate governance standards, features of good governance, Potential consequence of poor corporate governance, corporate governance abuses, Role played by regulators to improve corporate governance. Different Approaches to Corporate Governance, Leadership and Corporate Governance, Different models of Corporate Governance, Landmarks of Corporate Governance, Rights and Privileges of shareholders, Investor's Problem and protection, Corporate Governance and Other Stakeholders, Board of Directors; Role, Duties and Responsibilities of Auditors, Bank and Corporate Governance, Business Ethics and Corporate Governance. Moral issues in business: Importance of moral issues and reasoning, Principles of moral reasoning, Morality in international context, Quality of work life, implications of moral issues in different functional areas of business-like finance, HR, and marketing. Whistle blowing: Kinds of whistle blowing, blowing as morally prohibited, Whistle blowing as morally permitted, Whistle blowing as morally required, precluding the need for whistle blowing. Environmental protection: Safety and acceptable risk, Environmental harm, Pollution and it's control, Product safety and corporate liability.

Reference Books:

- Sadri S & Sadri, J Business Excellence Through Ethics & Governance,
- Mathur, U C Corporate Governance and business ethics, MacMillan India Ltd, Latest Edition
- Baxi, C V: Corporate Governance, Excel Books, Latest Edition
- Sadri S, Sinha A K and Bonnerjee, P: Business Ethics: concepts and cases, TMH, Latest Edition

BA2203   **BIG DATA ANALYTICS**   **[3 0 2 4]**

Course Objective:

To make better and faster decisions using data that was previously inaccessible or unusable.

Course Contents:

Introduction to Big Data Fundamental Terminologies and Concepts, A Brief History of Big Data, Business Drivers that have led to Big Data Innovations, Characteristics of Big Data, Benefits of adopting Big Data, Challenges and Limitations of Big Data. Fundamentals of Big Data Analytics Basic Big Data Analytics, "Big Data" in the Enterprise, Big Data and Traditional Business Intelligence and Data Warehouses, Big Data Visualization, Common Adoption Issues, Planning for Big Data Initiatives, New Roles Introduced by Big Data Projects, Emerging Trends. Big Data Storage and Processing Big Data Storage (Query Workload, Sharding, Replication, CAP, ACID, BASE), Big Data Processing (Parallel Data Processing, Distributed Data Processing, Shared-Everything/Nothing Architecture, SCV). Application Architectures for Big Data and Analytics, Data Modeling Approaches for Big Data and Analytics Solutions, Big Data Analytics Methodology, Extracting Value from Big Data: In-Memory Solutions, Real Time Analytics and Recommendation Systems. The Big Data Analysis Lifecycle (From Dataset Identification to Integration, Analysis and Visualization) Common Analysis and Analytics Techniques, A/B testing, Regression, Correlation, Text Analytics, Sentiment Analysis, Time Series Analysis, Network Analysis, Spatial Analysis, Automated Recommendation, Classification, Clustering, Foundational Big Data Technology Mechanisms, Big Data & Cloud Computing.

Reference Books:

- Foster Provost and Tom Fawcett, Data Science for Business, Shroff Publisher,
- Seema Acharya & Subhashini Chellappan: Big Data and Analytics, Wiley Publications, New Delhi,

BA2204   **OPERATION RESEARCH**   **[3 0 0 3]**

Course Objectives:

The objective of studying operations research is to become a skilled problem solver who can use mathematical and computational tools to make informed decisions and improve the efficiency and effectiveness of complex systems.

Course Contents:

Introduction: Definition, Phases, Applications, Advantages and Limitations of Operations Research. Linear Programming problems: Assumptions, Formulation of LPP for business and non-business applications. Graphical solutions, Special cases – Degeneracy, Infeasible Solution, Unbalanced and Multiple optimal solutions. Minimization and Maximization cases. Simplex algorithm, Concept of dual, Sensitivity analysis with respect to objective function coefficients and R.H.S. values. Transportation problem: Formulation, North-West Corner (NWC) Method, Least Cost (LC) Method, Vogel's Approximation Method (VAM). Assignment problem: Solution algorithm for Assignment Problems. Unbalanced, multiple optimal solutions, Maximization and Application problems. Game theory: Introduction to game theory, two person- zero sum games, Pure and Mixed Strategies, Solution methods for 2 x 2 games, Graphical method (2 x n games; m x 2 games), Critical Path Method (CPM): General framework, Introduction to elements of the network, conventions adopted in drawing network, analyzing the network. Calculation of event and Activity times, Total Float, Free Float, Independent float, Critical path, Determination of project duration, and Project Crashing. Applications and Limitations of CPM. Project Evaluation and Review Technique (PERT): Calculation of Probabilistic/Expected event and Activity times, Variance of activity duration, Determination of critical path, probability/expectation of project completion.

References Books:

- Taha H. A., Operations Research, Pearson Education (7e), Latest edition.
- W.L. Winston, Operations Research, Thomson Asia, Latest edition.
- Vohra N. D., Quantitative Techniques in Management, Latest edition.
- Sharma S. D., Operations Research (14e), Kedar Nath Ramnath Publications, Latest edition.

BA2205   DATA VISUALISATION AND BUSINESS INTELLIGENCE   [3 0 2 4]

Course Objective:

The fundamental aim of leveraging Data Analysis and Business Intelligence skills is to help understand trends and derive actionable insights from data, thus allowing to make data-driven, strategic, and tactical business decisions.

Course Content:

Overview of Tableau, Why Tableau, Tableau vs Excel vs Power BI, Exploratory vs Explanatory Analysis, Getting Started. Bar Chart, Line Chart, Filters, Area Chart, Pie Chart, Box Plot, Pivoting, Dashboards, Maps and Hierarchies, Tree maps and Grouping. points and Splits, Histograms, Scatter Plots, Dual axis Charts, Stacked Bar Charts. Functions: Numeric, String, Logical, Date; Top N Parameters and Calculated Fields, Storytelling. Getting Started with Power BI, Data Acquisition and Transformation in Power BI, Visualising and Analyzing Data using Power BI, Publishing Reports and Scheduling Data Refresh. IPL Visualization Project: Build a Tableau dashboard of IPL statistics over the years to create an infographic for a newsletter.

Reference Books:

- Tableau For Dummies Paperback –by Molly Monsey (Author), Paul Sochan (Author)
- Microsoft Power BI Dashboards Step by Step| First Edition| By pearson Paperback –by Errin O'Connor (Author)
- Business Intelligence: A Managerial Approach (2011) Turban, Sharda, Delen, King, Publisher: Prentice Hall, Edition: 2nd, ISBN: 13-978-0-136-
- Business Intelligence Roadmap: The Complete Project Lifecycle for Decision-Support Applications by Larissa T. Moss References

BA2206   HUMAN RESOURCE MANAGEMENT-II   [3 0 0 3]

Course Objective:

The objective of this course is to familiarize the students with the conceptual as well as a practical understanding of the current practices of Human Resource management in a modern organization. They will be able to learn the tools & techniques as essential HR practice. This course will also be helpful to guide for the leadership in the management of employees as a key source of organizational effectiveness.

Course Contents:

Strategic HRM: Concept and Importance of Strategic HRM in the Modern Business World, Changing Environment of HRM in Globalization, cultural environment, work force diversity. HR as a strategic partner, emerging challenges in cross cultural HRM. Performance Management Concept; Objectives and Characteristics of Performance Management; Performance Appraisal and Performance Management; Methods of Performance Management; Monitoring performance and reporting, Performance analysis and Behavioral aspects, Performance measurement and control, Criteria for measuring PM; Performance Management Practices of Different Companies. Career & Ccompetency development - Meaning & Concept of career development, contributing factors of career growth, difference between short term and long-term career competency development, Career Development Perspectives - Individual vs. Organizational Needs, career development models, career mapping, challenges in career advancement. Employee Coaching & Counseling: Need for Coaching, Role of HR in coaching, Coaching and Performance – Skills for Effective Coaching, Coaching Effectiveness, Need for Counseling, Role of HR in Counseling, Components of Counseling Programs, Counseling Effectiveness, Employee Health and Welfare Programs, Work Stress Consequences.

Reference Books:

- Aswathappa, K., Human resources and Personnel Management, Tata McGraw Hill, New Delhi.
- Dessler. G. and Varkkey, B., Human Resource Management, Pearson Education, Delhi.
- Chhabra, T.N., Human Resource Management, Dhanpat Rai & Co., Delhi.
- Decenzo, D.A. and Robbins, S.P., Fundamentals of Human Resource Management, Wiley, India.
- Rao, V.S.P., Human Resource Management: Text and Cases, Excel Books.

BA0025   **UNIVERSAL HUMAN VALUES   [2 0 0 2]**

Course Objectives:

This course helps the student to appreciate the essential complementarily between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings. To facilitate the development of a Holistic perspective among students towards life and profession as well as towards happiness and prosperity based on a correct understanding of the Human reality and the rest of existence. Such a holistic perspective forms the basis of Universal Human Values and movement towards value-based living in a natural way.

Course Contents:

Introduction to Value Education: Understanding Value Education, Self-exploration as the Process for Value Education, Continuous Happiness and Prosperity – the Basic Human Aspirations, Right Understanding, Relationship and Physical Facility, Happiness and Prosperity – Current Scenario, Method to Fulfill the Basic Human Aspirations. Harmony in the Human Being: Understanding Human being as the Co-existence of the Self and the Body, distinguishing between the Needs of the Self and the Body, The Body as an Instrument of the Self, Understanding Harmony in the Self, Harmony of the Self with the Body, Programme to ensure self-regulation and Health. Harmony in the Family and Society: Harmony in the Family – the Basic Unit of Human Interaction, Values in Human-to-Human Relationship, 'Trust' – the Foundational Value in Relationship, 'Respect' – as the Right Evaluation, Understanding Harmony in the Society, Vision for the Universal Human Order. Harmony in the Nature/Existence: Understanding Harmony in the Nature, Interconnectedness, self-regulation and Mutual Fulfilment among the Four Orders of Nature, Realizing Existence as Co-existence at All Levels, The Holistic Perception of Harmony in Existence. Implications of the Holistic Understanding – a Look at Professional Ethics: Natural Acceptance of Human Values, Definitiveness of (Ethical) Human Conduct, A Basis for Humanistic Education, Humanistic Constitution and Universal Human Order, Competence in Professional Ethics, Holistic Technologies, Production Systems and Management Models-Typical Case Studies, Strategies for Transition towards Value-based Life and Profession

Text / Reference Books:

- A Foundation Course in Human Values and Professional Ethics, R R Gaur, R Asthana, G P Bagaria, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-47-1
- Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi.
- Sadri S & Sadri, J Business Excellence Through Ethics & Governance, 2nd edition

CY1003   **ENVIRONMENTAL SCIENCE**   **[3 0 0 3]**

Course Objective:

The objectives of environmental studies are to develop a world in which persons are aware of and concerned about environment and the problems associated with it and committed to work individually as well as collectively towards solutions of current problems and prevention of future problems.

Course Content:

Introduction: Multidisciplinary nature, scope and importance, sustainability, and sustainable development. Ecosystems: Concept, structure and function, energy flow, food chain, food webs and ecological succession, examples. Natural Resources (Renewable and Non-renewable Resources): Land resources and land use change, Land degradation, soil erosion and desertification, deforestation. Water: Use and over-exploitation, floods, droughts, conflicts. Energy resources: Renewable and non- renewable energy sources, alternate energy sources, growing energy needs, case studies. Biodiversity and Conservation: Levels, biogeographic zones, biodiversity patterns and hot spots, India as a mega-biodiversity nation; Endangered and endemic species, threats, conservation, biodiversity services. Environmental Pollution: Type, causes, effects, and controls of Air, Water, Soil and Noise pollution, nuclear hazards and human health risks, fireworks, solid waste management, case studies. Environmental Policies and Practices: Climate change, global warming, ozone layer depletion, acid rain, environment laws, environmental protection acts, international agreements, nature reserves, tribal populations and rights, human wildlife conflicts in Indian context. Human Communities and the Environment: Human population growth, human health and welfare, resettlement and rehabilitation, case studies, disaster management, environmental ethics, environmental communication and public awareness, case studies. Field Work and visit.

References Books:

- R. Rajagopalan, Environmental Studies: From Crisis to Cure, Oxford University Press,
- A. K. De, Environmental Studies, New Age International Publishers, New Delhi,
- E. Bharucha, Text book of Environmental Studies for undergraduate courses, Universities Press, Hyderabad,
- R. Carson, Silent Spring, Houghton Mifflin Harcourt, Latest Edition
- M. Gadgil & R. Guha, This Fissured Land: An Ecological History of India, University of California Press,

SEMESTER V

BA3101   **DBMS with SQL**   **[3 0 2 4]**

Course Objective:

To understand and create conceptual database models utilizing entity-relationship. Design data structures that will limit redundancy and enforce data integrity while conforming to organizational requirements utilizing normalization methodology.

Course Content:

Understanding Database, Advantages, History, Data Models, Three Schema Architecture, Database Languages, Data Independence, Entities and Attributes, Relationships, ER Diagram, Specialisation and Generalisation, Data Warehouse, ERD, Star and Snowflake Schemas, OLAP, OLTP, Constraints, Basic SQL Querying: DDL and DML Statements, Functions, Expressions, Views, Joins and Set Operations. Window Functions, Case Statements, Stored Routines and Cursors, Query Optimisation and Best Practices. Problem Solving using SQL: Profitability Analysis, Profitable Customers, Orders Placed, Fraud Detection. RSVP Movies Project: Use SQL to analyse the data of movies released from 2017-2019 and give recommendations based on the insights.

Reference Books:

- A Silberschatz, H Korth, S Sudarshan, "Database System and Concepts", fifth Edition McGraw-Hill ,
- Rob, Coronel, "Database Systems", Seventh Edition, Cengage Learning.

BA3102   **MULTIVARIATE TECHNIQUE**   **[2 0 2 3]**

Course Objective:

Multivariate Analysis will help students to understand the process involving multiple dependent variables resulting in one outcome. This explains that most of the problems in the real world are Multivariate.

Course Content:

Modelling and inference using the multivariate normal distribution, Multivariate data and models, Multivariate Normal distribution, Traditional inference: Multivariate Regression, MANOVA, etc, Links with mixed linear models and hierarchical modelling. Exploratory techniques-based eigenvalue and singular decomposition, SVD of a data matrix; special decomposition • Principle Component Analysis, Factor Analysis, Canonical Correlation, Classification and Clustering, Linear Discrimination, Classification Trees, Hierarchical Clustering, K-means Clustering, Multidimensional Scaling, Functional data analysis: Functional PCA, Functional Classification, Functional Clustering

References Books:

- Anderson, T.W. An Introduction to Multivariate Statistical Analysis, 3rd ed. Wiley.
- Hastie, T., Tibshirani, R. and Freedman, J. The Elements of Statistical Learning: Data Mining, Inference, and Perdition. Springer.
- Hardle, W. and Simar, L. Applied Multivariate Statistical Analysis. Springer.
- Mardia, K.V., Kent, J.T. and Bibby, J.M. . Multivariate Analysis. Academic Press.

BA3103   DIGITAL TRANSFORMATION OF BUSINESS [3 0 0 3]

Course Objective:

To know and argue how digital strategies can be designed, executed, and communicated in a real-life organizational context.

Course Content:

Digital Strategy, Understand the characteristics of digital innovation, Introduction of Technology Management and Innovation, Distinguish the nature of digital innovation vs. traditional/conventional innovation, Introduction of Digital Transformation, What has changed in the last decade? Managing IT Trends & Emerging Technologies, Future of Technology evolution, advantage of Cloud, Big Data, IOT, AI, AR & VR and the new technological developments, anticipating, assessing, introducing and leveraging these technologies effectively and efficiently, Applying these concepts on business situation. Digital disruption and strategies for a digital transformation. Understand the underlying patterns of successful digital disruptors, industry 4.0 technologies, disruptive tech. transforming the business landscape, successful digital disruptors. Future of Technology Innovation and Best Practices for Digital Transformation Factors influencing future of tech. innovation, prevailing challenges business are facing while embracing tech. innovation, inventions that will change the world within five or ten years from now; changes brought by digital transformation in the business and social world, proven best practices for digital transformation, deploying new technologies, transforming organizational design, digital leader.

Reference Books:

- Galliers, R.D., Leidner, D.E. (Eds): Strategic Information Management: Challenges and Strategies in Managing Information Systems. Fourth Edition. Routledge, New York,
- Parker, G.P.; Alstyne, Van, M.W; Choudary, S.P. : Platform Revolution. Norton & Company, New York London.

BA3104   **E-COMMERCE**   **[3 0 0 3]**

Course Objective:

To familiarize the student with the basic concept of e-commerce along with the knowledge of planning, scheduling, and controlling a successful e- business.

Course Contents:

Evolution of E-Commerce and its transition to m-commerce, Phases of e-commerce, Dot-Com bubble burst in 2001, Advantages and Disadvantages of E-Commerce, Concept of Business Models in E Commerce, Types of Business Models, Components of E-Commerce Business Models, Selling on Internet, Types of sales transactions done on Internet, Evolution of e-tailing in India, B2B and B2C models of selling, Security and Privacy issues of E-Commerce, Major threats to E-Commerce transactions, Types and Components of M-Commerce in India and abroad, Growth and future directions of M-Commerce and its integration with traditional ways of doing business, Emerging trends in E-Commerce, Funding E-Commerce ventures

Reference Books:

- Laudon & Traver: E-Commerce, Business and Society Pearson
- P T Joseph: E-Commerce, an Indian Perspective, PHI
- David Chaffey: E - Business and E - Commerce Management: Strategy, Implementation and Practice, Pearson
- Skeldon Paul: M-Commerce, Pentagon Press

Course Objectives:

To acquire advanced Data Analysis skill and Create AI/ML solutions for various business problems. To Build and deploy production grade AI/ML applications and Apply AI/ML methods, techniques, and tools.

Course Contents:

Vectors and Vector Spaces, Linear Transformations and Matrices, Eigen Values and Eigen Vectors Multivariable Calculus: Functions, Derivatives, Critical Points, Jacobian, Hessian, Taylor Series. Introduction to Linear Regression: Equation, Applications, Limitation Simple Linear Regression: OLS, Assumptions, Goodness of Fit, Model Building & Evaluation, Residual Analysis, Prediction Multivariate Linear Regression: Adjusted R-squared, Multicollinearity, Feature Selection, Model Building & Evaluation. Introduction to Time Series, Smoothing Techniques, Autoregressive Models, Building AR Models.

Geely Auto Assignment: Build a model to understand the factors car prices vary on and help a Chinese company enter the US car market.

Reference Books:

- Marc Peter Deisenroth, A. Aldo Faisal, Cheng Soon Ong, Mathematics for Machine Learning, Cambridge University Press (23 April 2020)
- Tom M. Mitchell- Machine Learning - McGraw Hill Education, International Edition.
- 1.Ian Goodfellow, Yoshoua Bengio, and Aaron Courville Deep Learning MIT Press Ltd, Illustrated edition
- Christopher M. Bishop Pattern Recognition and Machine Learning - Springer, 2nd edition
- Trevor Hastie, Robert Tibshirani, and Jerome Friedman - The Elements of Statistical Learning: Data Mining, Inference, and Prediction - Springer, 2nd edition.

SEMESTER VI

BA3201   **PROJECT MANAGEMENT**   **[3 0 0 3]**

Course Objective:

The course provides an overview of project management focusing upon project initiation, planning, execution, and control. The feasibility study of project is important for preparing detailed project report. A discussion of different budgeting techniques including risk analysis, cost and time control are included.

Course Contents:

Project: Meaning, Definition, Characteristics, Project Identification: Project Ideas, Screening of Ideas, Environmental Scanning and Opportunity Analysis, Project Life Cycle, Project Feasibility Analysis, Formulation of Detailed Project Report. PMBOK. Social Cost Benefit Analysis, Project Organization Structure, Setting Up of Organization Structure, Project Manager: Qualifications, Selections and Training; Role & Responsibility of a Project Manager. Marginal Costing Technique for Project Management, Project Evaluation Under Risk & Uncertainty: Risk Adjusted Rate Method, Certainty Equivalent Method, Probability Method, Sensitivity Analysis, Project Control: - Time Control- Scheduling and Control by Network Techniques like PERT & CPM, Cost Control- Budgetary Controls. Project Budgeting Techniques: Pay-Back, Average Rate of Return, Net Present Value & Internal Rate of Return.

Reference Books:

- Project Management: Prof. N.P. Agarwal, Dr. B.K. Sharma
- Project Management: Dennis Lock (Gower Publishing)
- Project Management: Harvey Maylor (Pearson Publication)
- Project Management: Prasanna Chandra (TMH)
- Project Management: R. Pannerselvam, P. Senthilkumar (PHI)
- Project Management: Gray, Larson & Desai (TMH

BA3202   **STRATEGIC MANAGEMENT**   **[3 0 0 3]**

Course Objective:

To equip students with the necessary inside into designing strategies for an organization and linking the organizations strategies with the changing environment.

Course Content:

Introduction to Strategic Management: Evolution of Strategic Management, Concept of Strategy, Levels at which strategy operates, Strategic Decision Making, Introduction to strategic management level, Elements in strategic management process, Model of Strategic Management Process. Objectives of Strategic Management: Understanding Strategic Intent, Developing Vision statement, Mission statement, Goals and objectives. Strategy Formulation: Concept of environment, External and Internal environment, Appraising the environment. Organisational Appraisal, Factors affecting organizational appraisal, Approaches to organizational appraisal, Methods for organizational appraisal (VRIO framework and Value chain analysis). Corporate-level strategies: Stability strategies, Expansion strategies (Concentration strategies, Integration strategies, Diversification strategies), Retrenchment strategies (Turnaround strategies, Divestment strategies, Liquidation strategies), Combination strategies. Business Level strategies: Cost leadership, Differentiation, focus, Integrating cost leadership and differentiation. Method of pursuing strategies: Alliances, Joint Venture, Mergers and Acquisitions. Strategic Analysis: Process of strategic choice, Corporate Portfolio Analysis: Boston Consulting Group (BCG), General Electric Nine-Cell matrix, SWOT Analysis, Industry Analysis: Porter's Five force model. Strategy Implementation: Nature of strategy implementation, Barriers to strategy implementation, Model of strategy implementation Strategy Evaluation: Overview, Importance, Barriers to evaluation, Strategic Control, Techniques of strategic evaluation and control.

Reference Books:

- Pearce, J Robinson R, Amita Mital A , Strategic Management: Formulation, Implementation and Control, McGraw Hill Education (India) Pvt. Ltd
- Saloner G, Shephard A and Podonly J Strategic Management, John Wiley and Sons
- Pearce J A and Robinson E B Strategic Management, Irwin / McGraw Hill
- David N D Strategic Management: a competitive advantage approach, concepts and cases, Prentice Hall

CAP****   **MACHINE LEARNING-II**   **[3 0 2 4]**

Course Objective:

To provide understanding of advanced (ensemble) prediction methods and able to built up a comprehensive ML toolkit to tackle various learning problems.

Course Content:

Maximal margin classifier, Soft margin classifier, Slack variables, Cost of Misclassification, Kernels, Introduction, Splitting and Homogeneity, Impurity Measures, Gini Index, Hyperparameter Tuning, Ensembles and Random Forests. Introduction to Clustering, K-Means and Hierarchical Clustering, Execution in Python, Clustering Interview Questions.Help NGO Assignment: As a data analyst, categorise the countries using some factors that determine the overall development of the country and then suggest the countries that needs focus the most.

Reference Books:

- Marc Peter Deisenroth, A. Aldo Faisal, Cheng Soon Ong, Mathematics for Machine Learning, Cambridge University Press
- Tom M. Mitchell- Machine Learning - McGraw Hill Education, International Edition
- Aurélien Géron Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow, O'Reilly Media, Inc.
- 1.Ian Goodfellow, Yoshoua Bengio, and Aaron Courville Deep Learning MIT Press Ltd, Illustrated edition
- Christopher M. Bishop Pattern Recognition and Machine Learning - Springer,
- Trevor Hastie, Robert Tibshirani, and Jerome Friedman - The Elements of Statistical Learning: Data Mining, Inference, and Prediction - Springer,

ELECTIVES GROUP I (SEMESTER V)

BA3140   **FINANCIAL ANALYTICS**   **[2 0 2 3]**

Course Objectives:

To provide a strong foundation in financial analytics to handle complex financial data, build advanced analytical models and deliver effective visualization product and comprehensive reports.

Course Content:

Introduction to Financial Analytics: Definition, relevance and scope financial Analytics; recent trends in financial analytics, Financial Time Series and Their Characteristics: Asset Returns, Review of Statistical Distributions and properties of financial time series, Asset Portfolio Models: Basics of portfolio construction; Markowitz Theorem, Capital Asset Pricing Model; Diversification and Portfolio Optimization, Modeling Volatility and Risk: Characteristics of volatility; Modeling volatility using ARCH/GARCH models; Measuring and modeling risk; Application of Value at Risk (VaR), High-Frequency Data Analysis: Empirical Characteristics of Trading Data; Models for Price Changes; Modeling Credit Risk: Corporate Liabilities as contingent claims; Intensity Modeling; Credit risk and interest-rate Swaps; Modeling dependent defaults, Derivative Pricing: Issues regarding derivative markets; Brownian motion; Black - Sholes model; Modeling derivative prices.

References Books:

- Ruey S. Tsay (2012), "An Introduction to Analysis of Financial Data with R", Wiley, ISBN: 978-0-470-89081-3
- Argimiro Arratia (2014), "Computational Finance an Introductory Course with R", Atlantis Press, ISBN 978-94-6239-069-0
- Bernhard Pfaff (2013), "Financial risk modelling and portfolio optimization with R", Wiley, ISBN 978-0-470-97870-2
- Cairns, A.J. G (2004), "Interest Rate Models: An Introduction", Princeton University Press, ISBN: 9780691118949
- Christian Gourieroux & Joann Jasiak (2002), "Financial Econometrics: Problems, Models, and Methods", Princeton University Press, ISBN: 9780691088723
- David Ruppert (2011), "Statistics and Data Analysis for Financial Engineering", Springer, ISBN 978-1-4419-7786-1
- Duffie, D. and Singleton, K.J (2003), "Credit Risk: Pricing, Measurement, and Management", Princeton University Press, ISBN: 9780691090467

BA3141   **MARKETING AND RETAIL ANALYTICS**   **[2 0 2 3]**

Course Objective:

To provide a strong foundation in marketing and retail analytics to handle diversified marketing data, build advanced analytical models and deliver effective visualization product and comprehensive reports.

Course Contents:

Introduction, basic marketing models, Analytical framework for marketing models, Product Analytics, Price and Promotion, Price recommendation (own and cross price elasticity). Modelling segmentation and Pricing, Marketing-Mix Analytics Measuring ROI, MROI, advertisement elasticity, search engine marketing and mobile marketing, Analysing customer lifetime value. Predicting customer retention and profit, Choice modelling, Retail Marketplace Overview & Intro; Merchandising Planning & Assortment: Market Basket Analysis, Digital Analytics Planning, Resource Allocation Planning, and modelling, resource allocation in the organization. Overview of retailing, Retailers' entry decision, Promotion strategy, Different type of retail channels, Omni & Supply Chain: Operations Analytics, Customer Analytics Survival Analysis. What is Machine Learning & AI? Understanding modern retailing marketplace & technological aspects. Specialty and the Future of Retail

References Books:

- Brea Cesar, "Marketing and Sales Analytics: Proven Techniques and Powerful Applications from Industry Leaders", FT Press, ISBN-0133761711
- Chapman Christopher N, Feit Elea McDonnell, "R for Marketing Research and Analytics", Springer, ISBN-3319144367
- Emmett Cox, "Retail Analytics: The Secret Weapon" Wiley, ISBN- 978-1-118-09984-1
- Fok Dennis "Advanced Econometric Marketing Models"ERIM, ISBN 90–5892–049-6
- Grigsby Mike (2015), "Marketing Analytics: A Practical Guide to Real Marketing Science", Kogan Page Publishers, ISBN- 0749474181
- Lilien Gary L, Kotler Philip, Moorthy K. Sridhar, "Marketing Models", Prentice-Hall, ISBN0135446449
- Mireles Carlos Hern´andez, "Marketing Modelling for New Products", ERIM, ISBN 978-90- 5892-237-3
- Rackley Jerry, "Marketing Analytics Roadmap: Methods, Metrics, and Tools", Press, ISBN-1484202597

Course Objectives:

This course introduces the student to the theory, concepts, and business application of human resources research, data, metrics, systems, analyses, and reporting. The student will develop an understanding of the role and importance of HR analytics, and the ability to track, store, retrieve, analyse, and interpret HR data to support decision making.

Course Content:

Introduction to HR Analytics: Evolution of HR Analytics, HR information systems and data sources, HR Metric and HR Analytics, Evolution of HR Analytics; Intuition versus analytical thinking; HRMS/HRIS and data sources; Diversity Analysis: Equality, diversity and inclusion, measuring diversity and inclusion, Testing the impact of diversity, Workforce segmentation and search for critical job roles, Recruitment and Selection Analytics: Evaluating Reliability and validity of selection models, Finding out selection bias, Predicting the performance and turnover, Performance Analysis: Predicting employee performance, Training requirements, evaluating training and development, Optimizing selection and promotion decisions, Monitoring impact of Interventions: Tracking impact interventions, Evaluating stress levels and value-change; Evaluation mediation process, moderation and interaction analysis.

References Books :

- Edwards Martin R, Edwards Kirsten (2016),"Predictive HR Analytics: Mastering the HR Metric", Kogan Page Publishers, ISBN-0749473924
- Fitz-enz Jac (2010), "The new HR analytics: predicting the economic value of your company's human capital investments", AMACOM, ISBN-13: 978-0-8144-1643-3
- Fitz-enz Jac, Mattox II John (2014), "Predictive Analytics for Human Resources", Wiley, ISBN-1118940709
- Ulrich, D. & Brockbank, W. (2010). The HR Value Proposition. Harvard Business School Press.
- Phillips, J., & Phillips, P.P. (2014). Making Human Capital Analytics Work: Measuring the ROI of Human Capital Processes and Outcomes. McGraw-Hill

ELECTIVE II(GROUP II) SEMESTER VI

BA3243   SUPPLY CHAIN ANALYTICS   [2 0 2 3]

Course Objective:

To provide a strong foundation in supply chain analytics in order to handle complex data bases, build advanced analytical models and deliver effective visualization product and comprehensive reports.

Course Content:

Basics of Supply Chain Management Supply Chain Management – An Overview Supply Chain Analysis Types of Supply Chains Advanced Planning, Concepts of Advanced Planning Systems, Structure of Advanced Planning Systems, Strategic Network Planning, Demand Planning, Master Planning, Demand Fulfilment and ATP Production Planning and Scheduling Purchasing and Material Requirements Planning, Distribution and Transport Planning Coordination and Integration Collaborative Planning, Implementing Advanced Planning Systems, The Definition of a Supply Chain Project, The Implementation Process

Reference Books:

- Stadler Hartmut and Kilger Christoph (2005),"Supply Chain Management and Advanced Planning: Concepts, Models, Software and Case Studies", Third Edition, Springer, ISBN-3- 540-22065-8
- Supply Chain Management: Strategy, Planning, and Operation, 6th Edition, Chopra and Meindl, Prentice Hall,
- Supply Chain and Logistics Management Made Easy: Methods and Applications for Planning, Operations, Integration, Control and Improvement, and Network Design, by Paul A. Myerson (Author), Pearson FT Press; 1 Edition (

BA3244   **NETWORK ANALYTICS**   **[2 0 2 3]**

Course Objective:

To understand concept of network analytics, function of Hadoop, Apache Hive. Also, to make learner aware about data visualization.

Course Content:

Introduction to Data Analytics, Data Analytical Architecture, Big Data and Ecosystem. Hadoop (Call Log Analytics and Network Log Analytics using Hadoop). Apache Hive, Apache Spark, Strom. Introduction to Data Visualization, Visualization using Python, Visualization Charts, Advanced Visualization (3D Bar Plots, 3d Histograms, etc).

Reference Books:

- Web and Network Data Science Modelling Techniques in Predictive Analytics By Thomas W. Miller · Pearson Education, ISBN: 9780133887648, 0133887642.
- Social Media Analytics, Marshall Sponder
- Big Data Analytics: A Social Network Approach 2018, CRC Press, ISBN: 9781351622592, 1351622595

BA3245   **WEB & SOCIAL MEDIA ANALYTICS**   **[2 0 2 3]**

Course Objective:

To understand the role of web analytics within the digital marketing landscape. And, to identify, define and interpret commonly used web metrics and KPIs. To enable the students how to effectively use insights to support website design decisions, campaign optimization, search analytics, etc.

Course Content:

Introduction to the course, the concept of Purchasing funnel in Marketing in Offline and Online world, technical concepts about web medium. Definition and History of Web Analytics, Overview in different mediums of Web analytics. Data collection methods in Web Analytics. Google Analytics, Outcome data analysis and Web survey analysis, Metrics used in Web analysis, Pyramid Model of Web Analytics. Fundamentals of Social Networks, Website Goals, Website Optimization, Email analytics, Facebook analytics, Sentimental analysis on social media data, Attribution modelling, modelling on Twitter data.

Reference Books:

- Web Analytics 2.0: The Art of Online Accountability and Science of Customer Centricity by Avinash Kaushik
- Social Media Analytics: Techniques and Insights for Extracting Business Value Out of social media, Matthew Ganis, Avinash Kohirkar
- Social Media Metrics: How to Measure and Optimize Your Marketing Investment,