SEMESTER-I

PH 13101: Research Methodology (3 Credits)

Objective: To familiarize the students to the principles of scientific methodology in business enquiry, to develop analytical skills of business research, and to develop the skills for scientific communications

Introduction

Meaning, objectives and motivations in research, Characteristics and limitations of research – Components of research work - Criteria of good research, Research process – Types of Research, Fundamental, Pure or Theoretical Research –Applied Research –Descriptive Research – Evaluation Research –Experimental Research – Survey Research – Qualitative Research – Quantitative Research – Historical Research.

Research Design

Research Design – definition – essentials and types of research design – errors and types of errors in research design. Research problem: Selecting and analyzing the research problem – problem statement formulation – formulation of hypothesis. Literature review: purpose, sources, and importance - literature review procedure. Objectives: Learning Objectives; Definitions; Formulation of the research objectives.

Measurement. Scaling and Sampling

Variables in Research – Measurement and scaling – Different scales – Construction of instrument – Validity and Reliability of instrument. Data Collection methods – primary and secondary data – Construction of questionnaire and instrument – validation of instruments. Sample size determination - Sample design and sampling techniques.

Data Analysis and Tools

Processing of Data: Editing of Data – Coding of Data – Classification of Data – Statistical Series. Qualitative vs Quantitative data analyses – Univariate, Bivariate and Multivariate statistical techniques

Measures of Central Tendency, Dispersion, correlation and Regression, Chi-square test: Applications, Steps, characteristics, limitations, Analysis of Variance and Co-variance, Factor analysis – Discriminant analysis – cluster analysis – multiple regression and correlation – multidimensional scaling – Conjoint Analysis - Application of statistical software for data analysis.

Research Report Writing

Research report – Different types – Contents of report –executive summary – chapterization – contents of chapter – report writing – the role of audience – readability – comprehension – tone – final proof – report format – title of the report – Ethical issues in research: Code of Ethics in Research – Ethics and Research Process – Importance of Ethics in Research.

Readings:

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- Cooper, D.R., Schindler, P.S. and Sun, J., 2006. *Business research methods* (Vol. 9). New York: McGraw-Hill Irwin.
- Creswell, J.W. and Creswell, J.D., 2017. *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.
- Kothari, C.R., 2004. *Research methodology: Methods and techniques*. New Age International.
- Krishnaswamy, K.N., 2006. *Management Research Methodlogy: Integration of Principles, Medthods and Techniques*. Pearson Education India.
- Sekaran, U. and Bougie, R., 2016. *Research methods for business: A skill building approach*. John Wiley &Sons.

PH 13102: Quantitative Techniques (3 Credits)

Objective: The objective of this course is to formulate and construct a mathematical model for a linear programming problem in real life situation and enable the students to have strong knowledge of planning, designing and solving the transportation and assignment problems, to understand the concept of queuing models and applies appropriate queuing models, to study the issues related to replacement models, and to acquaint the knowledge and the concepts of inventory control for solving production problems.

Introduction to Linear Programming (LP)

Introduction to applications of operations research in functional areas of Management-Solution and Implementation-Linear Programming-Formulation-Graphical method- Simplex method- Two phase simplex Method.

Transportation and Assignment Models

Transportation model - Initial solutions using Vogel's Approximation Method-Check for optimality- MODI method- Assignment models - Hungarian method - Travelling Salesman problem.

Queuing Theory

Queuing Theory – Single and Multi-channel models – finite and infinite number of customers finite and infinite calling source.

Replacement Models

Replacement Models-Individuals Replacement Models (With and without time value of money) – Group Replacement Models.

Inventory Models and Simulation

Inventory models- EOQ and EBQ Models (With and without shortages), Quantity Discount Models. Monte-Carlo simulation.

Readings:

- Duckworth, W.E., 2012. *A guide to operational research*. Springer Science & Business Media.
- Gass, S.I. and Harris, C.M., 1997. Encyclopedia of operations research and management science. *Journal of the Operational Research Society*, *48*(7), pp.759-760.
- Novikov, A.M. and Novikov, D.A., 2013. *Research methodology: From philosophy of science to research design*. CRC Press.
- Taha, H.A., 2011. *Operations research: an introduction* (Vol. 790). Pearson/Prentice Hall.
- Tomlinson, R. and Kiss, I. eds., 2013. *Rethinking the process of operational research & systems analysis*. Elsevier.
- Wilkes, M., 1989. *Operational research: Analysis and applications*. London.: McGraw-Hill.

PH 13103: Qualitative Research Methods (2 Credits)

Objective: This course introduces the fundamental elements of a qualitative approach to research. It will help the participants to understand and become proficient in the qualitative methods to be applied to research.

Introduction to Qualitative Research, Comparing Qualitative and Quantitative Research qualitative research methods- Participant observations, In-depth interviews, Focus group, qualitative data- field notes, audio and video recordings, and transcripts.

Sampling in Qualitative Research, purposive sampling, quota sampling, difference between purposive and quota sampling, snowball sampling, Recruitment in Qualitative Research- project-specific plan for identifying and enrolling people to participate in a research study.

Ethical Guidelines in Qualitative Research, research ethics, informed consent, Principles of informed consent, informed consent for qualitative research, confidentiality

Readings:

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- Bernard, H.R., 2017. *Research methods in anthropology: Qualitative and quantitative approaches*. Rowman & Littlefield.
- Denzin, N.K. and Lincoln, Y.S. eds., 2011. *The Sage handbook of qualitative research*. Sage.
- Flick, U., 2018. *An introduction to qualitative research*. Sage Publications Limited.
- Marshall, P.A., 2003. Human subject's protections, institutional review boards, and cultural anthropological research. *Anthropological Quarterly*, 76(2), pp.269-285.

PH 33201: Applied Econometrics (3 Credits)

Objective: Econometric Theory provides a thorough foundation for understanding the subject. However, in practice, several problems in econometric estimation are encountered by the researchers. Thus, this course is directed towards thorough practice of empirical estimation of numerous multiple egression equations, the analysis and possible policy implications.

Econometric Estimation

Different types of software for estimation of multiple regression equations. Cross section data and Panel data; Heteroscedasticity; Identifying the problem and remedial measures; Nature of qualitative response models; Linear probability model; Logit model; Probit model; Tobit model; Estimation of panel data regression model.

Specification Bias

Specification of the model; Specification bias; Proxy variable; Superfluous variable; Irrelevant variable.

Time Series Analysis

Time series analysis; Pooling of time series and cross section data; Economic forecasting; Stationary time series and transforming non-stationary time series; Estimation and forecasting with vector auto regression (VAR); Problems of autocorrelation and multicollinearity; Identification and remedial measures.

Lag Models

Usefulness of lagged variable as an independent variable; Estimation of distributed-lag models; Koyck approach to distributed-lag model; Almon or Polynomial distributed-lag; Granger Causality Test.

Readings:

- Greene,William H., Econometric Analysis, Pearson Education, 2014.

- Gujarathi, Damodar, Basic Econometrics, McGraw Hill, 2014.

- Peijewang, Financial Econometrics, Routledge, 2015.

- Rao, Potluri and Roger Miller, Applied Econometrics, Prentice Hall of India, 1972.

PH 33202: Business Analytics (3 Credits)

Objective:

The objective of this course is to gain new insights and understand business performance based on statistical & machine learning techniques and to provide in-depth knowledge of data analytics techniques and their applications in improving business processes and decision-making.

Foundation of Analytics

Introduction to data science – data science process, Introduction to R: Basics of R - Basic Math, Variables, Basic data types, Vectors, Advanced Data Structure – Matrices, Factors, List, Data Frames; Loading data into R - Data input, Importing data from Excel, Importing data from Web, Graphics in R
- Bar graph, Scatter plots, Corrograms.

Data Understanding & Preparation

Data Pre-processing: Data cleaning, handling missing values and outliers, measures of centre& spread, Data Transformation: Need for transformations, min-max transformations, Z-scores, transforming categorical variables into numeric variables, binning numerical variables, Data Exploration: Data Exploration exploring numeric variables, exploring categorical variables, deriving new variables

Predictive Analytics

Understanding supervised learning algorithms: Linear Regression: Introduction to simple and multiple linear regression, Regression diagnostic–R-squared, identifying multi-collinearity and handling, model selection strategy, Common task framework for model evaluation – training cross-validation and test set.

Understanding supervised learning algorithms

Logistic Regression: Introduction to logistic regression, Logistic regression diagnostic: Wald statistics, Hosmer Lemeshow test, Classification Matrix, Sensitivity, Specificity, ROC Curve, Strategy to find the optimal cut-off, Case study using logistic regression techniques and hands-on using R code for regression.

Supply chain Analytics

Analytical Hierarchical Process – A multi-criteria decision-making approach
Software tools, like Advanced MS-Excel & R-studio, Python for analyzing complex data

Readings:

- Evans, J.R., 2016. *Business analytics*. Pearson Higher Ed.
- Lander, J.P., 2014. *R for everyone: advanced analytics and graphics*. Pearson Education.
- Larose, D.T., 2015. *Data mining and predictive analytics*. John Wiley & Sons.
- Mathirajan, M., 2019. Business Analytics: The Science of Data-Driven Decision Making,

- Shmueli, G., Patel, N.R. and Bruce, P.C., 2011. *Data mining for business intelligence: Concepts, techniques, and applications in Microsoft Office Excel with XLMiner*. John Wiley and Sons.
- Taylor, B.W., Bector, C.R., Bhatt, S.K. and Rosenbloom, E.S., 1996. *Introduction to management science*. New Jersey: Prentice Hall.
- U. Dinesh Kumar, Wiley (2017), 736 pp, INR 729.
- Whigham, D., 2007. *Business data analysis using Excel*. Oxford University Press.

Objective: The main objective of this course is to familiarize the students with the different types of IPRs, concept of novelty, prior art search, obtaining and maintaining the IPR, international protection of IP, technology negotiation, licensing agreement, National policy on IPRs and international conventions and treaties.

Innovation, R&D and IPRs

Technological innovation systems and processes; Pre-requisites for successful innovation; Management issues in the process of R&D, prototyping, successful production trial, consumer acceptance of the product, marketing and scaling up; Product life cycle; Technology life cycle; IP and IPRs.

TRIPS Agreement and Nature of Intellectual Property and IPRs

Background of TRIPS agreement; Basic introduction to different types of IPRs; Industrial property rights and copyright; Patent, Industrial Design, Trademark, Geographical Indication and appellation of origin;

Obtaining and Maintaining IPRs

Filing IPR application; Novelty and prior art search for patents and designs; Application filing and IPR maintaining fees; Lapse in timely payment of fee; Restoration of IPRs; Non-working of patents; Compulsory licensing; Protection of plant varieties; Patenting computer software; Protection of traditional knowledge (TK); TKDL.

Management Issues related to R&D, IPRs, Licensing Agreement and IPR Policy

Non-discloser agreement; Inward and outward transfer of technology; Technology transfer models: Licensing agreement and licensing fee negotiation; Patent pools; International patenting patterns; India's National Policy on IPRs (2016); Emerging scenario.

Valuation of Intellectual Property

Basic Valuation Methods: Cost-based, Market-based and Income-based; Specific IP-Valuation Methodologies; The Twenty Five Per Cent Rule; Industry Standards; Rating & Ranking; Surrogate Measures; Monte Carlo Analysis; Real Options

International Conventions and Treaties on IPRs

International Conventions and Treaties on IP protection, global protection and IP classification; Paris Convention (1883), Berne Convention (1886), Madrid Agreement (1891), Nairobi Treaty (1981), Phonograms Convention (1971), Rome Convention (1961), WIPO Performances & Phonograms Treaty (1996), Budapest Treaty (1977), Hague Agreement (1967), Lisbon Agreement (1958), PCT (1970), Nice Agreement (1967), Locarno Agreement (1968), Strasbourg Agreement (1971), Vienna Agreement (1973).

Readings:

- WIPO Background Reading Material, WIPO, 2012

- India's Acts on different IPRs: The Patents Act, 1970; The Designs Act, 2000; Trademarks Act 1999; Indian Copyright Act 1957; The Designs Act, 2000; The Geographical Indications of Goods (Registration and Protection) Act, 1999; The Protection of Plant Varieties and Farmers 'Rights Act, 2001 The Semiconductor Integrated Circuits Layout-Design Act, 2000.

PH33204: Indian Business Ethos (3 Credits)

Objective: This course attempts to make participants learn about Indian ethos and its relevance today and to assist and guide the participant in understanding value systems and its impact on business. This course will help participants to understand the fundamental tenet of Indian philosophy i.e., to know oneself. It will also enable the participants to understand the management functions with Indian perspective and to know management concepts from ancient texts.

Indian Ethos and Values

Indian Ethos - Indian work ethos and principles of Indian Management - Economics of giving - Developing and implementing gross national happiness. Formation of values - Application of values - Business leadership and value attributes – Cases

Indian Philosophical System

Indian Philosophical system - Nature of mind - Personality attributes based on Gunas - Human values and five sheaths - Indian Ethos and corporate governance - Indian constitution and Unity in diversity – Cases

Indian Management Thoughts

Bagavad Gita and Management - Chanakya Neethi on leadership - Thirukural and Management – Cases

Indian Economic System

Indian economy after Independence - Features of Indian Economic Systems – Family system, High Savings, Non-corporate sector as the base, Higher entrepreneurial activities, Social Capital, Value systems – Differences with the Western Economic Models – Capitalism – Communism – Features - Western Models are not universal –Impact of Culture, History and other factors on Economy

Indian Business Models

Business Models: Western, Eastern and Indian Models – Features of Western Models – Weak Foundations- Universality of Models - Indian Business Models since Ancient times – Business During British Domination- Business in Independent India – Corporate Sector - MSMEs – Industrial and Business Clusters

Readings:

- Agarwala, P.N., 2001. *A comprehensive history of business in India from 3000 BC to 2000 AD*. Tata McGraw-Hill Publishing Company.
- Dutt, R.C., 2013. *The economic history of India under early British rule: from the rise of the British power in 1757 to the accession of Queen Victoria in 1837*. Routledge.
- Dutt, R.C., 2013. *The economic history of India under early British rule: from the rise of the British power in 1757 to the accession of Queen Victoria in 1837*. Routledge.
- Kanagasabapathi, P., 2013. *Indian models of economy, business and management*. PHI Learning Pvt. Ltd.
- Nandagopal, R., 2010. *Indian Ethos & Values in Management*. Tata McGraw Hill Education Private Limited.

PH 33205: Time Series Analysis and Business Forecasting (3 Credits)

Objective: The objective of this course is to provide students with an overview and in-depth knowledge of quantitative techniques used for forecasting and their application. This includes techniques that range from simple ones like moving averages and smoothing techniques to more sophisticated ones like regression models, ARIMA (and related) models, VAR and VECM models, Causality testing and ARCH and GARCH models to test volatility.

Forecasting Theory and Methods

Overview and Types of Forecasts, Forecasting with a Single-Equation Regression Model - Unconditional Forecasting, Forecasting with Serially Correlated Errors, Conditional Forecasting.

Smoothing and Extrapolation of Time Series

Simple Extrapolation Models, Smoothing and Seasonal Adjustment, Properties of Stochastic Time Series- Characterizing Time Series: The Autocorrelation Function, Stationarity, Random Walk, Testing for Random Walks, Co-integrated Time Series.

Linear Time Series

Moving Average Models, Autoregressive Models, Mixed Autoregressive and Moving Average Models, Homogeneous Non-Stationary Processes: ARIMA Models, Box-Jenkins Methodology, Specification of ARIMA Models, SARIMA, ARMAX Models.

Forecasting with Time Series Models

Computing a Forecast, The Forecast Error, Properties of ARIMA Forecasts, Causality, Exogeneity, VAR, Impulse Response Functions, Volatility Measurement, Modeling and Forecasting: The ARCH Process, The GARCH Process.

Readings

- Box, G.E., Jenkins, G.M., Reinsel, G.C. and Ljung, G.M., 2015. *Time series analysis: forecasting and control*. John Wiley & Sons.
- Durlauf, S. and Blume, L. eds., 2016. *Macroeconometrics and time series analysis*. Springer.
- Enders, W., 2008. *Applied econometric time series*. John Wiley & Sons.
- Evans, M.K., 2003. *Practical business forecasting*. Blackwell (Malden).
- Hanke, J.E., Reitsch, A.G. and Wichern, D.W., 2001. *Business forecasting* (Vol. 9). Upper Saddle River, NJ: Prentice Hall.
- Makridakis, S., Wheelwright, S.C. and Hyndman, R.J., 2008. *Forecasting methods and applications*. Hoshmand, A.R., 2009. *Business forecasting: a practical approach*. Routledge.

PH 33206: Advanced Managerial Economics (3 Credits)

Objective: The main objective of this course is to orient the doctoral students specializing in economics related fields towards research thinking through providing them research-based readings and curriculum. Each doctoral student should be able to write one research paper adequately worthy of publication in a journal or any reputed international conference.

Topics for Study

Emerging theories of firms; Open economy model for demand analysis, costing and pricing.

Empirical estimation of elasticity of demand w.r.t. product's price, income and other related products' prices etc.

Recent research studies on demand forecasting and forecasting of other economic indicators. Emerging techniques and developments in existing demand forecasting methods.

Empirical studies in joint-product pricing and emerging techniques of pricing having interface with artificial intelligence, machine learning etc.

Empirical studies in social cost-benefit analysis.

Readings:

Research articles in different journals.
Internet based new authentic studies.
Practices and empirical research conducted in the industry.

PH 33207: Advance Financial Management (3 Credits)

Objective: To help the students in developing skills related to basic principles, tools and techniques of financial management.

Concept of Finance: Scope and Objectives of Finance, Functions of Financial Management, Role of Finance Manager, Financial Planning and Strategies, Shareholders Value and its Calculation, EVA/VAR, Financial Reengineering, Derivatives.

Concept and Principles of Capital Structure: Leverage Analysis – Operating, Financial and Combined Leverage and its Implications, Long-term Sources of Fund: Equity Share, Preference Shares, Debentures, Bonds, Warrants, Venture Capital and Ploughing Back of Profits. Short-term Sources of Funds: Commercial Paper, Certificate of Deposit, Treasury Bills.

Financial Markets: Nature and Significance of Primary and Secondary Markets, Objectives and Functions., Indices of BSE, NSE and OTCEI and its Calculation.

Financial Institutions: Nature, Types and Functions, Investment Bank, Investment Companies, Commercial Banks.

Time Value of Money: Risk and Return Analysis, Concept and Significance of Cost of Capital and its Computation, Concept and Significance of Capital Budgeting, Appraisal Techniques for Risk Free Projects.

Working Capital Management: Meaning, Significance and Factors Influencing the Level of working Capital Management, Management of Cash, Receivables and Inventory, Credit Management, Working Capital Financing.

Readings:

- E. F. Brigham and J. F. Houston., 2014. *Fundamentals of Financial Management,* Thomson.
- E. F. Brigham., 2017. *Financial Management: Theory and Practice*, Cengage Publication.
- I. M. Pandey., 2016. *Financial Management*, Vikas Publishing House, New Delhi.
- P. Chandra., 2016. *Financial Management*, Mc-Graw Hill Publishing Company Pvt. Ltd.
- V. Horne., 2015. *Fundamentals of Financial Management*, Pearson Education, New Delhi.
- V. K. Bhalla., 2016. *Financial Management,* Anmol Publications, New Delhi.

PH 33208: Advanced Marketing Management (3 Credits)

Objective: The objective of this course is to enable students acquire the knowledge and skills required to develop, implement, and control successful marketing strategies.

People

Overview of Marketing, Marketing Ethics, Consumer Behavior, Segmentation, Targeting and Positioning

Planning

Developing Marketing Strategies and a Marketing Plan, Marketing Environment, Market Research

Price

Advanced Marketing Pricing Concepts for Establishing Value, Strategic Pricing Methods

Product

Product Branding and Packaging Decisions, Developing New Product

Promotion

Advertising, Public Relations and Sales Promotions, Personal Selling and Sales Management

Place

Supply Chain and Channel Management, Retailing and Multichannel Marketing

Readings:

- Kotler, P., 2009. *Marketing management: A south Asian perspective*. Pearson Education India.
- Ramaswamy, V.S. and Namakumari, S., 2009. *Marketing management: Global perspective, Indian context*. Macmillan.
- Saxena, R., 2005. *Marketing management*. Tata McGraw-Hill Education.
- Neelamegham, S., 2000. *Marketing in India: Cases and Readings*. Vikas Publishing House Pvt Ltd.
- Keillor, B.D., 2007. *Marketing in the 21st Century*. Greenwood Publishing Group.

PH 33209: Advanced Human Resource Management (3 Credits)

Objective: To make the participants understand the issues involved in ensuring the availability of required type and quantity of employees at required time to extract the best and maximum from the employees to achieve the organizational goals effectively.

Introduction: Meaning of HRM, Difference between HRM and Personnel Management (PM); Evolution and Development of the Field of HRM; Role of Human Resource Management in a Competitive Business Environment; Strategic Human Resource Management.

Acquisition: Human Resource Planning; Job Analysis and Design; Recruitment, Selection, and Induction.

Development: Career Planning and Development; Employee Training, Executive Development; Internal Mobility and Separation.

Maintenance: Job Evaluation, Wage and Salary Administration; Incentives; Motivation; Workers' Participation in Management; Employee Discipline and Grievance; Industrial Disputes; Industrial Relations; Trade Unions; Collective Bargaining; Performance and Potential Appraisal.

Control: Personnel Research and Audit; Human Resource Accounting; Human Resource Information System; Managing Generation – Y Employees; International Human Resource Management.

Readings:

- Budhwar, P.S. and Debrah, Y.A. eds., 2013. *Human resource management in developing countries*. Routledge.
- Dessler, G. and Varrkey, B., 2005. *Human Resource Management, 15e*. Pearson Education India.
- Ivancevich, J.M., 2014. *Human resource management: Foundations of personnel*. McGraw- Hill.
- John M. Ivancevich: *Human Resource Management*, Tata McGraw-Hill Publishing Company Limited, New Delhi, 2014.
- Noe, R.A., Hollenbeck, J.R., Gerhart, B. and Wright, P.M., 2017. *Human resource management: Gaining a competitive advantage*. New York, NY: McGraw-Hill Education.

PH 33210: Emerging Issues in Information Technology Management (3 Credits)

Objective: This course will cover emerging concepts in Information technology, like Soft Computing, Fuzzy logic, Artificial Neural Networks (ANNs) and optimization techniques using genetic Algorithm (GA) etc.

Introduction to Soft Computing

Concept of computing systems, "Soft" computing versus "Hard" computing, Characteristics of Soft computing, some applications of Soft computing techniques.

Fuzzy logic and Genetic Algorithms

Introduction to Fuzzy logic, Fuzzy sets and membership functions, Operations on Fuzzy sets, Fuzzy relations, rules, propositions, implications and inferences, Defuzzification techniques, Fuzzy logic controller design, Some applications of Fuzzy logic, Concept of "Genetics" and "Evolution" and its application to probabilistic search techniques, Basic GA framework and different GA architectures, GA operators: Encoding, Crossover, Selection, Mutation, etc, Solving single-objective optimization problems using GAs.

Multi-objective Optimization Problem Solving

Concept of multi-objective optimization problems (MOOPs) and issues of solving them, Multi- Objective Evolutionary Algorithm (MOEA), Non-Pareto approaches to solve MOOPs, Pareto-based approaches to solve MOOPs, Some applications with MOEAs.

Machine Learning

Overview of machine learning related areas, applications, software tools, Dimensionality reduction- Feature selection, principal component analysis, linear discriminant analysis, factor analysis, independent component analysis, multidimensional scaling, manifold learning.

Artificial Neural Networks

The perceptron algorithm, multilayer perceptrons, backpropagation, nonlinear regression, multiclass discrimination, training procedures, localized network structure, dimensionality reduction interpretation, Biological neurons and its working, Simulation of biological neurons to problem solving, Different ANNs architectures, Training techniques for ANNs, Applications of ANNs to solve some real life problems.

Support vector machines

Functional and geometric margins, optimum margin classifier, constrained optimization, Lagrange multipliers, primal/dual problems, KKT conditions, dual of the optimum margin classifier, soft margins, kernels, quadratic programming, SMO algorithm.

Graphical and sequential models

Bayesian networks, conditional independence, Markov random fields, inference in graphical models, belief propagation, Markov models, hidden Markov models, decoding states from observations, learning HMM parameters.

Readings:

- Alpaydin, E., 2010. Introduction to Machine Learning. [Sl].
- Bishop, C.M., 2006. *Pattern recognition and machine learning*. springer.
- Fogel, D.B., 1997. An introduction to genetic algorithms-Melanie Mitchell. MIT Press, Cambridge MA, 1996. $30.00 (cloth), 270 pp. *Bulletin of Mathematical Biology*, *1*(59), pp.199- 204.
- Goldberg, D.E., 1989. Genetic algorithms in search, optimization, and machine learning. Boston, MA: Addison-Wesley.
- Haykin, S.S., 2009. *Neural networks and learning machines/Simon Haykin*. New York: Prentice Hall.
- Ibrahim, A., 2004. *Fuzzy logic for embedded systems applications*. Newnes.
- Jang, J.S.R., Sun, C.T. and Mizutani, E., 1997. Neuro-fuzzy and soft computing-a computational approach to learning and machine intelligence [Book Review]. *IEEE Transactions on automatic control*, *42*(10), pp.1482-1484.
- Kasabov, N.K., 1996. *Foundations of neural networks, fuzzy systems, and knowledge engineering*. Marcel Alencar.
- McNeill, F.M. and Thro, E., 2014. *Fuzzy logic: a practical approach*. Academic Press.
- Pratihar, D.K., 2007. *Soft computing*. Alpha Science International, Ltd.
- Ross, T.J., 2005. *Fuzzy logic with engineering applications*. John Wiley & Sons.

PH 33211: Emerging Issues in Organization Behavior (3 Credits)

Objective: To make the participants understand the principles followed and functions performed by management in a business organization and also to understand why employees / people behave as they behave at work place.

Management: Meaning and Definition, Scope, Importance, Process, Principles, Functions of Management, Evolution of Management Thought, Social Responsibility of Management.

Organizational Behavior (O.B.): Definition, Nature and Scope of O.B., Contributing Disciplines to O.B., O.B. Process, Models of O.B.

Individual Perspective: Personality; Attitudes, Values and Job Satisfaction; Learning; Motivation

Group Dynamics: Group Behavior; Organizational Conflicts; Job Stress; Communication; Leadership; Power and Politics.

Organizational Perspective: Organizational Structure; Organizational Culture; Organizational Change and Development, Quality of Working Life (QWL); International Organizational Behavior.

Readings:

- DuBrin, A.J., 2013. *Fundamentals of organizational behavior: An applied perspective*. Elsevier.
- Huczynski, A., Buchanan, D.A. and Huczynski, A.A., 2013. *Organizational behaviour* (p. 82). London: Pearson.
- Judge, T.A. and Robbins, S.P., 2017. *Essentials of organizational behavior*. Pearson Education (us).
- Knights, D. and Willmott, H., 2007. *Introducing organizational behaviour and management*. Cengage Learning EMEA.
- Nelson, D. and Cooper, C.L. eds., 2007. *Positive organizational behavior*. Sage.

PH 33212: Financial Market Operations (3 Credits)

Objective: This course is designed to help the students in understanding of Financial Markets.

Concept of Financial System; Economic Development and Financial System; Growth of Indian Financial System – Pre-1951 Scenario, 1951 to Mid-Eighties, Post Mid-Eighties and Present Position.

Emerging Structure of Indian Money Market; Instruments of Money Market; Money Market Mutual Funds – An Overview and RBI's Regulatory Guidelines; Guilt – Edged (Govt.) Securities Market-An Overview; Commercial Banks – Role in Industrial Finance and Working Capital Finance.

Concept; Structure and Functions of Capital Market; Primary Market – Concept, Instruments of Issue and Methods of Floatation; Secondary Market – Concept, Market Players, Trading System and Settlement.

Company Law Regulations – Share Capital and Issue of Shares, Prospectus and its Form; Securities Contract (Regulation) Act-Stipulations Relating to Constitution of Recognised Stock Exchanges and Listing of Securities; Securities and Exchange Board of India (SEBI) – Introduction and an Overview of its Powers and Functions. Credit rating: The concept and objective of credit rating, various credit rating agencies in India, Credit Rating Agencies –Importance, Issue, Difference in credit rating, Rating methodology and benchmarks, Merchant Banking: Origin and development of merchant banking in India scope, organizational aspects and importance of merchant bankers. Latest guidelines of SEBI. Merchant bankers. Venture Capital: Concepts and characteristics of venture capital, venture capital in India, guidelines for venture capital.

Readings:

- Hampton, John., 2016. *Financial Decision Making*, Prentice Hall.
- Khan MY, Jain PK., 2018. *Financial Management*, Tata McGraw Hill.
- S. N. Gupta., 2013. *The Banking Law in Theory and Practice*, Universal Publishing.
- Sahoo S.C. & S.C.Das., 2017. *Bank Management*. HPH.

Objective:

The papers would prepare students about the cooperative and non-cooperative games which firm play as a pricing and output strategy.
Strategic games

Concepts of dominance, pure and mixed strategy Nash equilibrium
Extensive games

Backward induction outcomes in games with perfect information, subgame perfect equilibrium in games with imperfect information; Rubinstein bargaining solution
Repeated games

Nash folk theorems; finitely and infinitely repeated games
Static and dynamic games of incomplete information

Bayesian-Nash equilibrium, perfect Bayesian equilibrium and sequential equilibrium
Cooperative games

Nash bargaining solution, concepts of core, shapely value etc.
Readings:

- Dixit, A.K. and Skeath, S., 2015. *Games of Strategy: Fourth International Student Edition*. WW Norton & Company.
- Dresher, M., 2012. *The mathematics of games of strategy*. Courier Corporation.
- Dresher, M., 1961. *Games of strategy: theory and applications* (No. RAND/CB-149-1). RAND CORP SANTA MONICA CA.
- Gibbons, R.S., 1992. *Game theory for applied economists*. Princeton University Press.
- Kreps, D.M., 1990. *A course in microeconomic theory*. Princeton university press.
- Narahari, Y., 2014. *Game theory and mechanism design* (Vol. 4). World Scientific.
- Williams, J.D., 1986. *The Complete Strategist: Being a primer on the theory of games of strategy*. Courier Corporation.