



Re- accredited with A ++ Grade (CGPA 3.65) by NAAC
Category- I University Status awarded by UGC

No.AAMS_UGS/ICC/2025-26/46

Date: 18th June, 2025

CIRCULAR :-

Attention of all the Principals of the Affiliated Colleges, Directors of the Recognized Institutions and the Heads, University Departments is invited to this office Circular No. AAMS/(UG)/36 of 2022 dated 18th June, 2022 relating to the syllabus of **BMS (Management & Sports Administration)**.

They are hereby informed that the recommendations made by the **Ad-hoc Board of Studies in Sports Science & Management** at its meeting held on 16th May, 2025 and subsequently passed by the Board of Deans at its meeting held on 19th May, 2025 vide item No. 8.17 (N) have been accepted by the Academic Council at its meeting held on 20th May, 2025 vide item No.8.38 (N) that the accordance therewith syllabus for **B.M.S. (Management and Sports Administration) (Sem III, IV, V and VI) (CBCS)** is introduced as per appendix with effect from the academic year 2024-25 progressively.

(The Circular is available on the University's website www.mu.ac.in).

MUMBAI – 400 032
18th June, 2025


(Dr. Prasad Karande)
REGISTRAR

To

All the Principals of the Affiliated Colleges, Directors of the Recognized Institutions and the Heads, University Departments.

A.C./8.38(N)/20/05/2025

Copy forwarded with Compliments for information to:-

- 1) The Chairman, Board of Deans,
- 2) The Dean, Faculty of Interdisciplinary Studies,
- 3) The Chairman, **Ad-hoc Board of Studies in Sports Science & Management**,
- 4) The Director, Board of Examinations and Evaluation,
- 5) The Director, Board of Students Development,
- 6) The Director, Department of Information & Communication Technology,
- 7) The Director, Centre for Distance and Online Education (CDOE), Vidyanagari.
- 8) The Deputy Registrar, Admissions, Enrolment, Eligibility & Migration Department (AEM).

Copy forwarded for information and necessary action to :-	
1	The Deputy Registrar, (Admissions, Enrolment, Eligibility and Migration Dept)(AEM), dr@eligi.mu.ac.in
2	The Deputy Registrar, Result unit, Vidyanagari drresults@exam.mu.ac.in
3	The Deputy Registrar, Marks and Certificate Unit,. Vidyanagari dr.verification@mu.ac.in
4	The Deputy Registrar, Appointment Unit, Vidyanagari dr.appointment@exam.mu.ac.in
5	The Deputy Registrar, CAP Unit, Vidyanagari cap.exam@mu.ac.in
6	The Deputy Registrar, College Affiliations & Development Department (CAD), deputyregistrar.uni@gmail.com
7	The Deputy Registrar, PRO, Fort, (Publication Section), Pro@mu.ac.in
8	The Deputy Registrar, Executive Authorities Section (EA) eau120@fort.mu.ac.in He is requested to treat this as action taken report on the concerned resolution adopted by the Academic Council referred to the above circular.
9	The Deputy Registrar, Research Administration & Promotion Cell (RAPC), rapc@mu.ac.in
10	The Deputy Registrar, Academic Appointments & Quality Assurance (AAQA) dy.registrar.tau.fort.mu.ac.in ar.tau@fort.mu.ac.in
11	The Deputy Registrar, College Teachers Approval Unit (CTA), concolsection@gmail.com
12	The Deputy Registrars, Finance & Accounts Section, fort draccounts@fort.mu.ac.in
13	The Deputy Registrar, Election Section, Fort drelection@election.mu.ac.in
14	The Assistant Registrar, Administrative Sub-Campus Thane, thanesubcampus@mu.ac.in
15	The Assistant Registrar, School of Engg. & Applied Sciences, Kalyan, ar.seask@mu.ac.in
16	The Assistant Registrar, Ratnagiri Sub-centre, Ratnagiri, ratnagirisubcentar@gmail.com
17	The Director, Centre for Distance and Online Education (CDOE), Vidyanagari, director@idol.mu.ac.in
18	Director, Innovation, Incubation and Linkages, Dr. Sachin Laddha pinkumanno@gmail.com
19	Director, Department of Lifelong Learning and Extension (DLLE), dlleuniversityofmumbai@gmail.com

Copy for information :-	
1	P.A to Hon'ble Vice-Chancellor, vice-chancellor@mu.ac.in
2	P.A to Pro-Vice-Chancellor pvc@fort.mu.ac.in
3	P.A to Registrar, registrar@fort.mu.ac.in
4	P.A to all Deans of all Faculties
5	P.A to Finance & Account Officers, (F & A.O), camu@accounts.mu.ac.in

To,

1	The Chairman, Board of Deans pvc@fort.mu.ac.in
2	Faculty of Humanities, Offg. Dean 1. Prof.Anil Singh Dranilsingh129@gmail.com Offg. Associate Dean 2. Prof.Manisha Karne mkarne@economics.mu.ac.in 3. Dr.Suchitra Naik Naiksuchitra27@gmail.com
	Faculty of Commerce & Management, Offg. Dean, 1 Prin.Ravindra Bambardekar principal@model-college.edu.in Offg. Associate Dean 2. Dr.Kavita Laghate kavitalaghate@jbims.mu.ac.in 3. Dr.Ravikant Balkrishna Sangurde Ravikant.s.@somaiya.edu 4. Prin.Kishori Bhagat kishoribhagat@rediffmail.com

	Faculty of Science & Technology Offg. Dean 1. Prof. Shivram Garje ssgarje@chem.mu.ac.in Offg. Associate Dean 2. Dr. Madhav R. Rajwade Madhavr64@gmail.com 3. Prin. Deven Shah sir.deven@gmail.com
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3	Chairman, Board of Studies,
4	The Director, Board of Examinations and Evaluation, dboee@exam.mu.ac.in
5	The Director, Board of Students Development, dsd@mu.ac.in DSW directr@dsd.mu.ac.in
6	The Director, Department of Information & Communication Technology, director.dict@mu.ac.in

UNIVERSITY OF MUMBAI



**Program: BMS (Management &
Sports Administration)**

SEM III, IV, V, VI

(Choice Based and Credit System)

From: A.Y. 2024-2025 Progressively

UNIVERSITY OF MUMBAI



Syllabus for Approval

Sr. No.	Heading	Particulars
1	Title of the Course <u>O:6761</u>	BMS (Management & Sports Administration)
2	Eligibility for Admission O: 6762	XIIth Pass under 10+2 scheme of any recognized State/Central/International Board
3	Passing Marks	45% Passing Marks
4	Ordinances / Regulations (if any)	
5	No. of Years / Semesters	3 Years / 6 Semesters
6	Level	UG
7	Pattern	Semester
8	Status	New
9	To be implemented from Academic Year	From Academic Year: : 2024-25 Prograssive

Sd/-

**Sign of the BOS
Chairman
Dr. Manoj N. Reddy
Ad-hoc Board of
Studies in
Sports Science and
Management**

Sd/-

**Sign of the
Offg. Associate
Dean
Dr. C.A.Chakradeo
Faculty of
Interdisciplinary
Studies**

Sd/-

**Sign of the
Offg. Associate Dean
Dr. Kunal Ingle
Faculty of
Interdisciplinary
Studies**

Sd/-

**Sign of the
Offg. Dean
Prof. A. K. Singh
Faculty of
Interdisciplinary
Studies**

Title of the course - BMS (Management & Sports Administration)

Eligibility: 10+2 with 45% Marks scheme of any recognized State/Central/International Board

Scheme of Examination

The Semester End Examination will be conducted for 60 Marks each subject

Internal Assessments will be conducted for 40 Marks each subject

The allocation of 40 marks shall be on the following basis: -

- a) Periodical class tests/presentations held in the given semester (30 Marks)
- b) Attendance and Active participation in routine class instructional deliveries(05 Marks)
- c) Overall Conduct as a responsible student, mannerism and articulation and Exhibition of leadership qualities in organizing related academic activities. (05Marks)

Question Paper Pattern for Semester End Examination (60 Marks)

There will be Seven Questions in all.

Q1 would be compulsory and would carry-----20 Marks

In addition to Q1, there would be six questions.

Each question would carry 10 Marks. Q7 will have three sub – questions and each sub – question would carry 05 Marks

Students have to attempt any four out of the remaining six Questions and within Q7; students have to attempt any two out of three sub – questions.

In all, students have to attempt five questions i.e. (Q1+Any Four of the remaining)

Q1 = 20 Marks (Compulsory)

Attempt Any Four out of the Remaining Six

Q2 – Q6 = 10 Marks

Q7 Any two from (a) or (b) or (c) ----- (5x2) = 10 Marks

Standard of Passing: A Student has to separately secure minimum 50% marks (i.e. 20 out of 40) in The internal assessments and secure minimum 50% marks (i.e. 30 out of 60) in the Semester End Examination in every subject to be declared as Pass.

Intake Capacity: The maximum intake capacity of BMS (Hospitality Management & Sports Administration) course as per University of Mumbai is 60 per academic year

Syllabus for BMS Management & Sports Administration – SEM III & IV

SEMESTER - III	CREDITS
COURSE	
CORE	
Operations Management	3
Principles of Marketing	3
Business Environment	3
Cost Accounting	3
SCHOOL ELECTIVES 2/3	
Financial Markets	3
International Economics	3
Introduction to Philosophy	3
SPECIAL ELECTIVES 1/3	
Sports Facility and Event Management	3
Python Programming for Data Science	3
Machine Learning	3

Semester – III			
Course Code: MSC301	Course Title: Operations Management	Credits: 3	Lectures/Week:
Learning Objectives: Understand the different elements of operations and how to analyse an operational environment in terms of these elements. Appreciate the tools and techniques applicable in the context of operations in global dynamic organizations. Understand the challenges facing the operations manager to exploit innovative practices.			
Course Description: The Operations Management course aims to provide students with a critical understanding of the scope and strategic importance of operations management and the role of operations managers; and an appreciation of the interaction of operations with the organisation, employees and customers. You will gain a critical understanding of the nature and importance of operations management, not only in your own but in other organisations competing in the global environment.			
Unit I	Understanding operations management and strategy The concept of operations management • The input-process-output model • Operations strategy and contribution • The five performance objectives • The 4Vs and their influence on process management Process design, type, layout and mapping Process design • Processes and volume/variety dimensions • Manufacturing and service process types • Process layouts • Job design • Process mapping	Hours 10	
Unit II	Product and service innovation • Definitions and types of innovation • Innovation as a process • Beyond product and service innovation • The significance of product and process innovation and service innovation Capacity and demand management The objectives of capacity management • Medium- and long-term capacity management • Reconciling capacity and demand • Short- and long-term outlooks affecting volume Inventory management Inventory control • Understanding the impact of order quantity on inventory turns • The periodic review approach • Cycle safety stocks	15	
Unit III	Quality methodologies The importance of quality • The gap model and expectation-perception gaps • Total Quality Management (TQM) and quality costs • Six Sigma •	15	

	Lean • Causes of waste • Involvement of everyone for successful improvement • Lean tools • Lean improvements across different sectors Sustainable operations The triple bottom line (TBL) • The 3Ps in operations management • Process design for environmental sustainability.	
Unit IV	Technology in operations management Technology in operations management • ERP systems • Industry 4.0 in operations • Challenges in technology adoption.	5

References:

- Slack, N., Brandon-Jones, A. (2018) Essentials of Operations Management, 2nd Edition, London, Pearson.
- Quantitative Techniques in Management : N.D.Vohra, Tata McGraw Hill
- Operations Research : H.Taha, Prentice Hall
- Quantitative Methods for Management Decisions : William P.Cooke, McGraw Hill
- Principle of Operations Research : with Applications to Management Decisions – H.M.Wagner, Prentice-Hall.

Semester – III			
Course Code: MSC302	Course Title: Principles of Marketing	Credits: 3	Lectures/Week:
Learning Objectives: This course provides students with an overview of the marketing function with an emphasis on creating value through marketing, market research, consumer behavior, pricing strategies, marketing channels, and various methods of promotion.			
Course Description: To understand the role of marketing within society and within an economic system. – To learn the vital role of marketing within a firm and the necessary relationships between marketing and the other functional areas of business. – To consider the various decision areas within marketing and the tools and methods used by marketing managers for making decisions.			
Unit I	Introduction to marketing- Definition, Scope, Functions and Evolution of Marketing. Marketing environment, Macro and micro environment, SWOT analysis, Marketing mix.	Hours 5	
Unit II	Consumer Behaviour- Meaning, Determinants- Cultural, Social, Personal, Psychological Industrial Buying Behaviour- Meaning, characteristics; differences between consumer buying and industrial buying behaviour Marketing research process - Defining research problem, research objective research techniques, sampling, data collection and analysis, report writing Market Segmentation Targeting & Positioning (STP) - meaning, benefits of market segmentation, basis of segmentation; Target Market; Branding- definition, importance, branding strategy; Packaging	15	
Unit III	Concepts of products, Product Mix, Product Line, Product width, depth; Product Life Cycle meaning and stages, New Product Development- steps Pricing- meaning, objectives and methods of pricing Distribution Channel- meaning, Types of Distribution channel- Direct & Indirect. Role of intermediaries and distribution channel management	15	
Unit IV	Promotion – elements of promotion mix Sales management- selling process, functions of sales manager Service Marketing- meaning, Service Marketing Mix, Characteristics of Service. Reasons for growth of service sector, Service Quality Model	10	
References: • Marketing Management – P Kotler – Prentice Hall • Marketing Management – Stanton, Etzel and Walker – McGraw Hill			
Marketing Management – R Saxena – Tata McGraw Hill			

Semester – III			
Course Code: MSC303	Course Title: Business Environment	Credits: 3	Lectures/Week:
Learning Objectives: To provide knowledge of the environment in which businesses operate, the economic operational and financial framework. To give students an understanding of the various constituents of the local and global business environments. To have a critical study of liberalization, privatization and globalization. To study the procedural aspects of various forms of Business Organizations in India			
Course Description: Identify and evaluate the complexities of business environment and their impact on the business. Analyze the relationships between Government and business and understand the political, economic, legal and social policies of the country. Analyze current economic conditions in developing emerging markets, and evaluate present and future opportunities. Gain knowledge about the operation of different institutions in international business environment.			
Unit I	Environment –. Meaning, concept & scope of environment Business & its environment for effective performance, Indian performance, Indian economy-its main feature, macro environment- Economic consideration, political & government setup, socio cultural factors, social responsibility of business towards employee, community shareholders consumers, business & economy;- meaning of business economy, Types of Economies-free, capitalization, socialistic, socialistic & mixed economy, salient features of USA & Japan Economy, Role of Government Economic, Regulatory, Interpersonal, Promotional & Planning. Constitutional Environment in Expansion state interception.	Hours 15	
Unit II	Economic Growth & Development – Meaning of economic growth, factors affecting economic growth, impact of circular flow of money on business, large scale & small scale business. Role of foreign Investments, private foreign investment limitations & degree of foreign investments, Govt. policy, event changes, Business & Law _ Business cycle, Inflation - Meaning, causes& Measures to check inflation and price spiral.	15	
Unit III	Multinational – Definition, Investment motives, Benefits, Demerits, Recent trends, Multinational in India- Introduction, public, Private joint & co-operative sectors, village, small & ancillary industry. Business & Society:- Business & social responsibility, pollution threat, Ecology balance, environmentalist movement, values & ethics in management, Brief intro of stock exchange & its control, MRTP, FERA, Monetary & fiscal policy, Company law, Money & Capital market. Financial Institutions - an overview.	15	
References: • Economic Environment of Business by M. Ashikary. • Business Environment by Francis Cherrinulam			

Semester – III			
Course Code: MSC304	Course Title: Cost Accounting	Credits: 3	Lectures/Week:
Learning Objectives: 1. Distinguish between financial accounting and cost management 2. Describe a cost management information system 3. Identify and calculate various types of costs such as direct, indirect, total, variable, mixed and fixed costs 4. Determine the costs of producing a product or providing a service using job costing, activity-based costing and process costing 5. Allocate support department costs to operating departments and allocate costs to joint products and byproducts 6. Recognize and solve ethical issues in accounting and business 7. Prepare financial statements for a manufacturing entity			
Course Description: This course introduces students to cost accounting concepts and procedures. An effective cost accounting system provides information that can impact operational and financial performances of an entity. Students will learn how cost accounting information is developed and used for various purposes in different types of business entities. We will examine the role that cost accounting plays in measuring, analyzing and reporting information that relates to the cost of obtaining and using an entity's resources. Students will learn ways of assigning various costs such as direct costs, indirect costs, fixed costs, variable costs, inventorial cost and period costs.			
Unit I	Basic Cost concepts – Different classification of cost, Cost Center, Cost unit, Cost object. Introduction to Materials – levels of Stock & EOQ, Methods of pricing issues (concept), Material Control (Just-in time purchasing, ABC analysis, Perpetual Inventory) (Ind AS 2 – Inventories)	Hours 15	
Unit II	Employee Cost (i) Attendance and payroll procedures, overview of statutory requirements (ii) Determination of employee cost, overtime, idle-time, incentives (iii) Labour turnover Overheads –Concept, Classification. Production Overheads – Collection, apportionment, absorption and its treatment in cost a/c, absorption rates, under and over absorption Adm. & Selling & Overhead –Features, treatment in cost a/c, absorption & control. Activity based costing	15	
Unit III	Preparation of Cost Sheet Methods of Costing – (i) Job Batch & Contract Costing (ii) Process Costing –Double entry bookkeeping, process loss, abnormal gains and losses, joint products and by products (iii) Service or operating costing	15	

References:

- Hanif – Modern Cost and Management Accounting, TATA McGraw-Hill Education Pvt. Ltd, 2013
- Drury – Management & Cost Accounting
- Dr. B Banerjee – Cost Accounting
- Horngren, Foster & Datar – Cost Accounting: A managerial emphasis
- Saxena & Vashist – Cost and Management Accounting, Sultan Chand and Sons.

Semester – III			
Course Code: MSE3011	Course Title: Financial Markets	Credits: 3	Lectures/Week:
Learning Objectives: Understand the role and importance of the Indian financial market. Apply and analyse the Concepts relevant to Indian financial markets and financial institutions. Understand and analyse the mechanics and regulation of financial instruments and determine how the value of stocks, bonds, and securities are calculated. Evaluate empirical evidence of the market performance and accordingly the role of regulatory authorities to develop the financial market. Research and analyze specific problems or issues related to financial markets and institutions.			
Course Description: This course aims to provide students with an introduction to various financial markets, which the student may use as an individual or as part of an organization. It introduces the students to the utility and functioning of these markets as well as understanding the principles behind each.			
Unit I	Financial Markets – Concept, Structure and Regulatory Bodies 2. Money Market – Concept, Functions, Intermediaries and Instruments	Hours 10	
Unit II	3. Capital Market (i) Primary Market – Functions, Methods of Capital Issues, Role of Intermediaries, Regulation (ii) Secondary Market – a) Listing of Securities b) Securities Trading Mechanism c) Depositories and Depositing Participants d) Stock Exchanges - Leading Stock Exchanges in India, Functions, Role of Intermediaries, Stock Indices -Computation Methodology, Major Indices e) SEBI: Role, Functions(Relevant regulations) 4. Debt Market (i) Corporate debt market (ii) Public Sector Undertakings debt market (iii) Government Securities Market.	20	
Unit III	5. Derivative Market: Traders, Types-Forward, Future, Option and Swap 6. Financial Services a) Credit Rating b) Banking Services c) Merchant Banking d) Mutual Funds: Concept, Types, NAV, Loads e) Financial intermediation.	15	
References: 1. "Financial Markets and Institutions" by Frederic S. Mishkin and Stanley Eakins 2. "Options, Futures, and Other Derivatives" by John C. Hull 3. "Investments" by Zvi Bodie, Alex Kane, and Alan J. Marcus 4. "The Theory of Financial Markets" by Robert E. Eisinger 5. "A Random Walk Down Wall Street" by Burton G. Malkiel			

Semester – III			
Course Code: MSE3012	Course Title: International Economics	Credits: 3	Lectures/Week:
Learning Objectives: Defines the types of international economic integration by understanding the purpose and significance of international organizations. Explains the international organizations with economic and social objectives in the United Nations and this system. Explains organizations operating in the area of international monetary, trade and development at the global level and evaluates the activities of these organizations. Explains regional economic integration organizations and compares them. Explains the aims and activities of regional development banks			
Course Description: Students are able to critically explore issues and policies in International Economics are equipped to apply theoretical principles of international trade to the prevailing global economic environment. Students are imbued with skill sets to comprehend the critical issues involved in framing and implementation of international trade policies.			
Unit I	Introduction to the global environment – Environment for foreign trade and investment • Effects of globalization on firms • External influences on India's business environment	Hours 5	
Unit II	International trade theories, Barriers to trade and their impact on the economy. • Costs and benefits of trade • Theory of comparative advantage, H-O Theory • International product cycle • New trade theory • Porter's theory of national competitive advantage • Governmental influence on trade, Tariff	15	
Unit III	International institutions and trade blocs Global market entry strategies Foreign investment	10	
Unit IV	The foreign exchange market International taxation and transfer pricing Foreign trade in India Direction and composition of India's trade.	15	

References:

- **International Business, Environments and Operations, 12th edition, by John Daniels, Lee Radebaugh (Pearson)**
- **International Business, 6th edition by Charles Hill, Arun Jain (Tata McGraw Hill)**
- **International Finance by Prakash Apte, Mc**
- **International Economics, 2nd edition, by Robert Feenstra, Alan Taylor (Palgrave Macmillan)**
- **International Economics by Paul Krugman, Maurice Ostfeld, 8th edition (Pearson)**

Semester – III			
Course Code: MSE3013	Course Title: Introduction to Philosophy	Credits: 3	Lectures/Week:
Learning Objectives: Ability to identify and critically evaluate philosophical arguments made by others. 2. Ability to construct one's own philosophical arguments and defend them from criticism, both orally and in writing. 3. Ability to explain and analyze the key philosophical concepts of determinism, free will, the existence of God, personality identity, skepticism, and ethics.			
Course Description: In-class discussion, in which students learn to evaluate and offer philosophical arguments. 2. Papers to measure the ability to evaluate, construct, and defend philosophical arguments. 3. Quizzes (announced and unannounced) to measure recall of key philosophical concepts. 4. Tests to evaluate comprehensive knowledge of philosophical ideas and the ability to reason effectively about them.			
Unit I	Introduction: RHETORIC vs LOGIC ● Truth & Rhetoric ● Plato's theory of the forms ● Logic: Pre & Post scientific revolution ● Identifying arguments: Deductive vs. Inductive Readings ● Bertrand Russell (1949): Philosophy for laymen ● Armstrong: "What is Philosophy?" ● George Hole "How to read Philosophy"	Hours 5	
Unit II	Formal Argument ● Core questions in Philosophy ● Does God exist? ● Meaning & morality of God's existence: Humanism vs being God like Readings ● Dennett (2005): "Atheism & Evolution" ● Pascals' wager: Blaise Pascal. "The Wage" from Pensées	10	
Unit III	Epistemology ● What is epistemology ● Descartes & the scientific revolution ● Arguments Readings ● Descartes in Cottingham, pp 21-25 ● Locke in Cottingham, pp 25-31	10	

Unit IV	Metaphysics ● Mind body problem ● Dualism ● Functionalism ● Metaphysics of identity	10
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	Readings ● Theseus' ship ● Descartes Meditation IV & VI ● What does Mary Learn? (Exercise) ● Frank Jackson, (1982:130) ● Raymond Smullyan, "An unfortunate dualist"	
Unit V	Applications ● Ethics & Decision making ● Free will Case studies Michael J. Sandel, "The Case Against Perfection", The Atlantic, April 2004 https://www.theatlantic.com/magazine/archive/2004/04/the-case-against-perfection/302927/ Alastair Norcross, "Puppies, Pigs & People", Rice University, 2004 (PDF) https://spot.colorado.edu/~heathwoo/readings/norcross.pdf	10
References: ● Western Philosophy: An Anthology, 3rd edition, John Cottingham, Wiley-Blackwell. ● On Bullshit, Harry G. Frankfurt, Princeton University Press ● The Philosophy Book: Big Ideas Simply Explained, Will Buckingham, DK ● Modern Philosophy: An Introduction and Survey, Roger Scruton, Penguin Books		

Semester – III			
Course Code: MSE3021	Course Title: Sports Facility and Event Management	Credits: 3	Lectures/Week: 3
Learning Objectives: • Explain the basic issues related to planning facilities, including site selection, design and construction process • Explain the different forms of public and private funding of sport facilities and ethical issues involved in utilising public funds • Describe the process involved in event planning and management • Explain the event and facility issues pertinent to participants, spectators and sponsors • Describe the operation of venues and events including staffing, box office management, security, concessions and maintenance • Explain the legal issues facing event and facility management including the risk management process • Analyse the process of event bidding and venue selection			
Course Description: This course module will enable a sports manager to understand a core component of planning and operating sports and recreational facilities and events.			
Unit I	Understanding the Sports Industry – Players and Opportunities Sports Infrastructure – the cradle of the sporting ecosystem Overview and Facility Planning Facility Construction and Event Planning	Hours 5	
Unit II	Designing, Planning and Controlling Event Logistics Providing Hospitality and Sports Events Sports Sponsorships Bid Assignment Evaluating Events and Managing Staff	5	
Unit III	Negotiations and Contracts Risk Management – Protecting your Investment Event Marketing Merchandising, Sales, Ticketing Law, Ethics, Marketing and Finance Quiz Economics of Sports Facilities Officials, Athletes, Match Day – Planning and Process	8	

	Alcohol + F&B Management	
Unit IV	Opportunities and challenges towards building an Olympics Event Bidding Assignment Evaluating Events and Managing Staff Field Trip – Fire, Health and Safety Drill, Quality Control Crowd Engagement Facility Design Project – Presentation – Event Objective Financial Plan Supply List Promotion Plan Staffing Plan Registration Plan Evaluation Plan Cancellation plan Critical Dates Event Evaluation SAI Centre – Case Study Odisha Government – Case Study (Adoption of Hockey)	12

Unit V	Practical Presentation - In groups, students to study and present on a Design, Build, Operate and Maintain basis – the following TransStadia sport facilities viz: Football ground, swimming pool, Indoor sports hall & tennis courts. Students will present on the facility design, the sport surface used (natural / synthetic), the costs of building such a surface, pros and cons, the Lighting systems used, maintenance processes, Field visit - Visit to the DY Patil stadium, to understand all facilities Event proposal - Present a Sport event plan proposal for the Hosting of a NON-TELEVISED event within the TS Indoor Arena Event organization - Organise a multi-sport school event / organize a non-mainstream sport FIELD event focused around fitness (American Ninja Warrior / Devils Circuit Obstacle Course Race)	15
References: Marketing Management – P Kotler – Prentice Hall Marketing Management – Stanton, Etzel and Walker – McGraw Hill Marketing Management – R Saxena – Tata McGraw Hill		

Semester – III			
Course Code: MSE3022	Course Title: Python Programming for Data Science	Credits: 3	Lectures/Week:3
Learning Objectives: • Apply various Python data structures types of data. • Explore various steps of data science pipeline with role of Python. • Design applications applying various operations for data cleansing and transformation. • Use various data visualization tools for effective interpretations and insights of data.			
Course Description: This course covers basic and advanced features of Python programming including data structures, python libraries like matplotlib, numpy, pandas.			
Unit I	Overview of Python and Data Structures: Basics of Python including data types, variables, expressions, objects and functions. Python data structures including String, Array, List, Tuple, Set, Dictionary and operations them.	Hours 2	
Unit II	Discovering the match between data science and python: Defining the Sexiest Job of the 21st Century, Considering the emergence of data science, Outlining the core competencies of a data scientist, Linking data science, big data, and AI , Understanding the role of programming, Creating the Data Science Pipeline, Preparing the data, Performing exploratory data analysis, Learning from data, Visualizing, Obtaining insights and data products, Understanding Python's Role in Data Science, Considering the shifting profile of data scientists, Working with a multipurpose, simple, and efficient language, Learning to Use Python Fast ,Loading data, Training a model, Viewing a result.	4	
Unit III	Introducing Python's Capabilities and Wonders: Why Python?, Grasping Python's Core Philosophy, Contributing to data science, Discovering present and future development goals, Working with Python, Getting a taste of the language, Understanding the need for indentation, Working at the command line or in the IDE, Performing Rapid Prototyping and Experimentation, Considering Speed of Execution, Visualizing Power, Using the Python Ecosystem for Data Science, Accessing scientific tools using SciPy, Performing fundamental scientific computing using NumPy, Performing data analysis using pandas, Implementing machine learning using Scikit-learn, Going for deep learning with Keras and TensorFlow, Plotting the data using matplotlib, Creating graphs with NetworkX, Parsing HTML documents using Beautiful Soup.	4	
Unit IV	Using the Jupyter Console, Interacting with screen text, Changing the window appearance, Getting Python help, Getting IPython help, Using magic functions, Discovering objects, Using Jupyter Notebook, Working with styles, Restarting the kernel, Restoring a checkpoint, Performing Multimedia and Graphic Integration, Embedding plots and other images,		

	Loading examples from online sites, Obtaining online graphics and multimedia. Working with Real Data: Uploading, Streaming, and Sampling Data, Uploading small amounts of data into memory, Streaming large amounts of data into memory, Generating variations on image data, Sampling data in different ways, Accessing Data in Structured Flat-File Form ,Reading from a text file Reading CSV delimited format, Reading Excel and other Microsoft Office files, Sending Data in Unstructured File Form, Managing Data from Relational Databases, Interacting with Data from NoSQL Databases, Accessing Data from the Web. Conditioning Your Data: Juggling between NumPy and pandas, Knowing when to use NumPy, Knowing when to use pandas, Validating Your Data, Figuring out what's in your data, Removing duplicates, Creating a data map and data plan, Manipulating Categorical Variables, Creating categorical variables, Renaming levels, Combining levels, Dealing with Dates in Your Data, Formatting date and time values, Using the right time transformation, Dealing with Missing Data, Finding the missing data, Encoding missingness, Imputing missing data, Slicing and Dicing: Filtering and Selecting Data, Slicing rows, Slicing columns, Dicing, Concatenating and Transforming, Adding new cases and variables, Removing data, Sorting and shuffling, Aggregating Data at Any Level.	4
Unit V	Data Visualization: Visualizing Information: Starting with a Graph, Defining the plot, Drawing multiple lines and plots, Saving your work to disk, Setting the Axis, Ticks, Grids, Getting the axes, Formatting the axes, Adding grids, Defining the Line Appearance, Working with line style, Using colors, Adding markers, Using Labels, Annotations, and Legends, Adding labels, Annotating the chart, Creating a legend.	4
Unit VI	Visualizing the Data: Choosing the Right Graph, Showing parts of a whole with pie charts, Creating comparisons with bar charts, Showing distributions using histograms, Depicting groups using boxplots, Seeing data patterns using scatterplots, Creating Advanced Scatterplots, Depicting groups, Showing correlations, Plotting Time Series, Representing time on axes, Plotting trends over time, Plotting Geographical Data, Using an environment in Notebook, Getting the Basemap toolkit, Dealing with deprecated library issues, Using Basemap to plot geographic data, Visualizing Graphs, Developing undirected graphs, Developing directed graphs.	4
Unit VII	Wrangling Data: Playing with Scikit-learn, Understanding classes in Scikit-learn, Defining applications for data science, Performing the Hashing Trick, Using hash functions, Demonstrating the hashing trick, Working with deterministic selection, Considering Timing and Performance, Benchmarkin, with,timeit, Working with the memory profiler, Running in Parallel on Multiple Cores, Performing multicore parallelism, Demonstrating multiprocessing. Exploring Data Analysis: The EDA	6

	Approach, Defining Descriptive Statistics for Numeric Data, Measuring central tendency, Measuring variance and range, Working with percentiles, Defining measures of normality, Counting for Categorical Data, Understanding frequencies, Creating contingency tables, Creating Applied Visualization for EDA, Inspecting boxplots, Performing t-tests after boxplots, Observing parallel coordinates, Graphing distributions, Plotting scatterplots, Understanding Correlation, Using covariance and correlation, Using nonparametric correlation, Considering the chi-square test for tables, Modifying Data Distributions, Using different statistical distributions, Creating a Z-score standardization, Transforming other notable distributions.	
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References:

1. Python for data science for dummies 2nd Edition, John Paul Mueller, Luca Massaron, Wiley
2. Programming through Python, M. T. Savaliya, R. K. Maurya, G. M. Magar, STAREDU Solutions
3. Pandas for everyone : Python Data Analysis, Daniel Y. Chen, Pearson
4. Introducing Data Science: Big Data, Machine Learning, and More, Using Python Tools, Davy Cielen, Arno D.B. Meysman, et al., Minning
5. Applied Data Science with Python and Jupyter: Use powerful industry-standard tools to unlock new, actionable insights from your data, , Packt
6. Data Analytics, Anil Maheshwari, McGrawHill
7. Data Science From Scratch: First Principles with Python, Joel Grus, SPD
8. Star Data Science Specialist, STAR CERTIFICATION

Course Name:: Python Programming for Data Science Lab	No of Labs : 13 (each lab duration 1 hour)
List of Programs	Practical should be performed by students based on – • Use of Python Data Structures • Using NumPy and Panda for Data Analysis Matplotlib for Visualization

Semester – III			
CourseCode: MSE3023	Course Title: Machine Learning	Credits: 3	Lectures/Week:3
Learning Objectives: - To learn the concept of how to learn patterns and concepts from data without being explicitly programmed - To design and analyse various machine learning algorithms and techniques with a modern outlook focusing on recent advances. - Explore supervised and unsupervised learning paradigms of machine learning.			
Course Description: This Course covers the basic concepts of Machine Learning techniques including Supervised and un supervised learning.			
Unit I	Introduction: Machine Learning Foundations – Overview – Design of a Learning System – Types of Machine Learning – Supervised Learning and Unsupervised Learning – Mathematical Foundations of Machine Learning – Applications of Machine Learning.	Hours 9	
Unit II	Supervised Learning-I: Simple Linear Regression – Multiple Linear Regression – Polynomial Regression – Ridge Regression – Lasso Regression – Evaluating Regression Models – Model Selection – Bagging – Ensemble Methods.	9	
Unit III	Supervised Learning - II : Classification – Logistic Regression – Decision Tree Regression and Classification – Random Forest Regression and Classification – Support Vector Machine Regression and Classification - Evaluating Classification Models.	9	
Unit IV	Unsupervised Learning: Clustering – K-Means Clustering – Density-Based Clustering – Dimensionality Reduction – Collaborative Filtering.	9	
Unit V	Association Rule: Learning and Reinforcement Learning Association Rule Learning – Apriori – Eclat – Reinforcement Learning – Upper Confidence Bound – Thompson Sampling – Q-Learning.	9	
References: 1. Christopher Bishop, “Pattern Recognition and Machine Learning” Springer, 2007. 2. Kevin P. Murphy, “Machine Learning: A Probabilistic Perspective”, MIT Press, 2012. 3. Ethem Alpaydin, “Introduction to Machine Learning”, MIT Press, Third Edition, 2014. 4. Tom Mitchell, "Machine Learning", McGraw-Hill, 1997. 5. Stanford Lectures of Prof. Andrew Ng.			

BMS Management and Sports Administration

Semester –IV

SEMESTER - IV	CREDITS
COURSE	
CORE	
Financial Management	3
Organizational Behavior	3
Marketing Management	3
Business Statistics II	3
SCHOOL ELECTIVES 2/3	
Math I	3
Financial Services	3
Ethics and Governance	3
SPECIAL ELECTIVES 1/3	
Doping Control in Sport	3
Deep Learning	3
Cloud Computing	3

Semester – IV			
Course Code: MSC401	Course Title: Financial Management	Credits: 3	Lectures/Week:
Learning Objectives: • Understand basic concepts of financial management and their application in investment, financing and dividend decisions. • Understand concepts of cost of capital, leverage analysis, capital structure and dividend theories and identify courses of action in financial environment that would result in maximization of wealth of an organization. • Understand management of working capital and estimate the same for an organization.			
Course Description: This course is designed to survey the field of finance and provide the foundation for more advanced finance coursework. Topics include sources of business and financial information, financial statement, analysis, risk and return, asset valuation, capital budgeting, capital structure, business financial planning and working capital management.			
Unit I	Introduction of Business Finance Financial Manager's role Financial Goal and Firms Objectives Limitations of various type of sources of fund	Hours 15	
Unit II	Capital structure and Leverage Meaning of Financial Leverage, Measures of financial Leverage, Financial leverage and shareholders Return Combining financial and Operating leverage Venture capital financing Development of Venture capital in India Future Prospects of Venture Financing.	15	
Unit III	Cost of Capital The cost of capital and opportunity cost concept Determining component, cost of capital Capital and Investment Analysis	15	

Semester – IV			
Course Code: MSC402	Course Title: Organizational Behavior	Credits: 3	Lectures/Week:
Learning Objectives: Organizational behavior studies the mechanisms governing these interactions, seeking to identify and foster behaviors conducive to the survival and effectiveness of the organization. ▶ iedunote.com/objectives-of-organizational-behavior .			
Course Description: This course aims to lay the foundation of understanding of human behavior in organizations through an exposure to organizational behavior theories, case studies and live examples. This course has a large applied component to it in order to facilitate hands-on learning of contemporary organizational challenges.			
Unit I	Introduction to Organizational behavior – nature and structure Contemporary Approaches to organizational behavior Social learning framework Individual differences – personality, diversity	Hours 5	
Unit II	Perception Attitudes and satisfaction Job stress Group dynamics Informal organization structure Informal communication Information processing	10	
Unit III	Conflict resolution Negotiations Decision making and control Control process and its elements Organizational culture Change management	15	
Unit IV	Cases, Simulation games, blogs and audio visual material, psychometric tests	15	
References: ● Mullins, L. J. (2007). <i>Management and organisational behaviour</i>. Pearson education. ● Business Organization and Management by Bhushan Y.K. ● Business Organization by Gupta C.B ● Organizational Behaviour by L.M. Prasad ● Wood, J. M., Zeffane, R. M., Fromholtz, M., Wiesner, R., Morrison, R., Factor, A., ... & Osborn, R. N. (2016). <i>Organisational behaviour: Core concepts and applications</i>. John Wiley & Sons Australia, Ltd..			

Semester – IV			
Course Code: MSC403	Course Title: Marketing Management	Credits: 3	Lectures/Week:
Learning Objectives: To understand the role of marketing within society and within an economic system. – To learn the vital role of marketing within a firm and the necessary relationships between marketing and the other functional areas of business. – To consider the various decision areas within marketing and the tools and methods used by marketing managers for making decisions. – To learn key marketing principles and terminology. Because this is a survey course, there is an emphasis on basic terminology and concepts. – To appreciate how a marketing perspective is important in your own personal and professional development.			
Course Description: This course provides students with an overview of the marketing function with an emphasis on creating value through marketing, market research, consumer behavior, pricing strategies, marketing channels, and various methods of promotion.			
Unit I	Analyzing markets and identifying opportunities Introduction and company analysis Competitive analysis Customer analysis	Hours 10	
Unit II	Marketing strategy development Segmentation, Targeting and Positioning Social Responsibility and marketing Branding Innovation in marketing strategy	15	
Unit III	Formulating marketing programs Marketing products for multi-sided demand markets Price and Promotion Distribution	15	
Unit IV	Class Project, Case study evaluation	5	
References: ● Kotler, Philip, and Kevin Keller. <i>Marketing Management</i>. 13th ed. Prentice Hall, 2008 ● Best, Roger J. <i>Market-Based Management – Strategies for Growing Customer Value and Profitability</i>. 5th ed. Prentice Hall, 2009.			

Semester – IV			
Course Code: MSC404	Course Title: Business Statistics II	Credits: 3	Lectures/Week:
Learning Objectives: To inculcate analytical and computational ability			
Course Description: This course is designed as an extension to the introductory statistics course. This courses deal with advanced statistical concepts, intending to enable students to analyse data usingthe appropriate methodology with the right tools.			
Unit I	Linear and Nonlinear Regression Correlation Vs. Regression Line of Regression of X on Y Using Regression Lines for Prediction.	Hours 5	
Unit II	Introduction and uses of Index numbers Problems and Methods of Constructing Index Numbers Simple and Weighted Index Number (Laspeyre - Paasche, Marshall – Edge worth) Tests of Consistency of Index Number	10	
Unit III	Introduction and Components of time series Methods of time series analysis Deseasonalisation of Data Uses and Limitations of Time Series	10	
Unit IV	Probability Experiment – Event - Mutually Exclusive Events - Collectively Exhaustive Events - Independent Events - Simple and Compound Events – Basics of Set Theory – Permutations and Combinations Approaches to Probability: Classical, Empirical, Subjective, Axiomatic Theorems of Probability: Addition – Multiplication - Baye's Theorem.	10	
Unit V	Binomial Distribution Poisson Distribution Normal Distribution Central Limit Theorem Fitting a Normal Distribution	10	
References: ● Statistics for Management: Levin & Rubin, Pearson, ● Fundamentals of Statistics: Gupta S.C, Himalaya ● Business Statistics: Theory & Application, P. N. Jani, PHI Learning			

Semester – IV			
Course Code: MSE4011	Course Title: Math I	Credits: 3	Lectures/Week:
Learning Objectives: The course is aimed to develop the basic Mathematical skills of engineering students that are imperative for effective understanding of engineering subjects. The topics introduced will serve as basic tools for specialized studies in many fields of engineering and technology.			
Course Description: This course is designed to introduce students to preliminary mathematical theory. This theory forms the basis of most advanced analytical tools			
Unit I	Introduction to Calculus Differential and Integral Calculus Applications	Hours 15	
Unit II	Introduction to Geometry Analytical geometry of two dimensions Analytical geometry of three dimensions Quadrics	15	
Unit III	Introduction to Algebra Matrix theory Matrix Algebra Linear Algebra Theory of Equations	15	
References: A text book of Applied Mathematics, P.N.Wartikar and J.N.Wartikar, Vol – I and –II by Pune VidyarthiGraha. 1. Higher Engineering Mathematics, Dr.B.S.Grewal, Khanna Publication 2. Advanced Engineering Mathematics, Erwin Kreyszig, Wiley Eastern Limited, 9thEd. 3. Matrices, Shanti Narayan.S. Chand publication 4. Numerical Methods, Dr. P. Kandasamy , S. Chand Publication			

Semester – IV			
Course Code: MSE4012	Course Title: Financial Services	Credits: 3	Lectures/Week:
Learning Objectives: Learn about the services offered by such companies • Analyze the ways these companies earn profits. • Introduces students to the main concepts behind investing • Discriminates among different ways to invest money. • Examine contemporary issues including the level of personal saving in the United States, ethics in the financial services industry, and the industry's effect on communities and families.			
Course Description: This course gives students an overview of banks and other financial services companies. Financial Services provides students with an overview of banks and other financial services companies. The course begins by introducing students to the origins of money and banking, and then examines the early history of banking in the United States. Students move into an in-depth study of the financial services industry and explore the types of companies that make up this industry.			
Unit I	Introduction to financial services Difference between product and services marketing Characteristics and Classification of services Paradigms in services marketing Role of Services in Economy	Hours 10	
Unit II	Services marketing mix Augmented marketing mix Developing the service product Services product planning, pricing strategy and promotions Role of communication in service marketing People and internal communication Process of operations and delivery of services Role of technology in services marketing.	10	
Unit III	Personal Selling & Marketing Strategy: Sales Management Personal Selling and salesmanship Organizing the Sales Effort Sales Organization Distribution of financial services	10	
Unit IV	Sales Force Management in financial services Recruiting and Selecting Sales Personnel Planning Executing and Evaluating Sales Training Programme Motivating and Compensating Sales Personnel Controlling the Sales Effort Sales control and cost analysis	10	
Unit V	Live sales project, case analysis, group projects	5	

References:

- Baron S and Harris K- *Services Marketing: Text and Cases* (Palgrave, 2003)
- Lovelock- *Services Marketing: People, Technology and Strategy* (Pearson Education, 5th edition).
- Zeithaml, V. A and Bitner, M. J. - *Services Marketing* (Tata McGraw-Hill).
- S. L. Gupta *Marketing of Services* (Sultan Chand).

Semester – IV			
Course Code: MSE4012	Course Title: Ethics and Governance	Credits: 3	Lectures/Week: 2
Learning Objectives: 1. To understand the Business Ethics and to provide best practices of business ethics. 2) To learn the values and implement in their careers to become a good managers. 3)			
Course Description: To develop various corporate social Responsibilities and practice in their professional life To Imbibe the ethical issues in corporate governance and to adhere to the ethical codes.			
Unit I	Introduction to Sport Governance Key Governance Principles Managerial activities related to governance Strategic management and sport policy development Ethics in sport policy and governance Olympic ideals in international sport policy and governance Issues and challenges in International Sport Governance Legal and Regulatory Issues in Sport	Hours	10
Unit II	Defines Ethics, Morals and Morality with respect to different professions in sport. Examine ethical decision – making in sport. Issues in Sports Marketing Ethical Theory, Sports and Integrity Sports Governance Organizations		15
Unit III	Anti- doping: Ethics, Policy and Practice Sports Integrity, Corruption and Gambling/ Betting Ability, Disability and Athlete Integrity Child Protection and Safeguarding Gender, Transgender and Homophobic Issues Olympism and the Olympic Movement Governance, Law and Sports Integrity Financial Fair play		15
Unit IV	Identify various sports governing bodies. Evaluate conflicting sides of ethical issues to form logical arguments Dutee Chand Case		5
References: Velasquez Manuel G: Business ethics- concepts and cases, PHI. (Chapter 1, 2) Fernando A.C.: Business Ethics – An Indian Perspective, Pearson. (Chapter 1, 2, 3, 4) Crane Andrew & Matten Dirk: Business Ethics, Oxford. (Chapter 1, 7, 8) Ghosh B N: Business Ethics & Corporate Governance, Mc Graw Hill. (Chapter 9, 11)			

Semester – IV

Course Code: MSE4021	Course Title: Doping Control in Sport	Credits: 3	Lectures/Week: 3
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Learning Objectives:

After completing the course

- You will have knowledge about the role and responsibility of medical support personnel related to the administration of drugs to athletes and to the role of pharmacists in the prevention of doping
- You will have knowledge about the anti-doping rules (World Anti-Doping Code, International standards, national rules) and national and international anti-doping work
- You will have knowledge about WADAs prohibited list, therapeutic use exemption and the Norwegian drug search database, and how to use this knowledge to advice athletes in correct use of drugs
- You will have knowledge about common diagnoses amongst athletes and treatment of these, included pain management, anti-inflammatory drugs, asthma treatment, hormonal treatment and the use of stimulating drugs including drugs of abuse
- You will have knowledge about doping analysis, including procedures, methods and result management, and dosing of drugs considering the prohibited list and doping analysis
- You will have knowledge about the use of dietary supplements, and the use of this knowledge to do risk assessments, and prevention of doping both in sport and the society.

Course Description: The course offers an introduction to the use of medicines for athletes and its relation to the anti-doping rules. It will focus on the role of pharmacists to avoid doping violations, as a result of either intended or inadvertent doping. This course outline the roles and responsibilities and to strengthen their understanding on doping in sports, this course covers the testing procedures, education, Anti-Doping Rule Violations (ADRV) and many more.

Unit I	What is doping? Why do athletes give in to doping? Organizations and doping: prevention and repression Bioanalytical and forensic approaches to doping	Hours 3
Unit II	WADA – Information/ Education Guidelines to Prevent Doping in Sport Psychological Support for Athletes Sports Genetics and Performance Exercise Immunology	2
Unit III	Athlete Handbook – Information Pocket Guide Coaches Guide Health Advantages and Disadvantages to athletes Testing Guidelines National Anti- Doping Policy	6

	Athlete – Rights and Responsibilities Guide Non – Analytical Investigations Principles Whereabouts Policy Whistleblowing Policy World Anti-Doping Code Testing and Investigations International Standards Protection of Privacy and Personal Information International Standard Laboratories – International Standard Results Management – International Standard Prohibited List – International Standard Therapeutic Exemptions – International Standards Therapeutic Exemptions Policy – International Standards	
Unit IV	Substance Abuse Treatment, Prevention and Policy. Legal, Regulatory and Prevention Practice Provisions	7
Unit V	Movie Review – Icarus Tour de France Sharapova Case Narsingh Yadav Case NADA Review WADA Review UNESCO's Convention Against Doping	9
Unit VI	Practicals Individual assignment - Students will select a sport and explore the motivation for doping in each of these. They will also present the kind of drugs that will largely be “beneficial” to them in this particular sport. Through this, students will learn about why and how athletes are pushed towards doping (ignorance in substance intake, injury recovery, performance enhancement, weight loss etc) Movie Review - Icarus Case Studies - In groups, students to present the case studies of famous athletes who have been found guilty of doping. Students will present the background, the accusation, the journey through the charges being investigated, the reasons why the athlete indulged in doping, the sanctions Skit - one group will engage in Doping, the counter group will have to question and demonstrate the process by which they have been suspected, and the process followed to complete the investigation Guest lecture - WADA / NADA and the processes in place to avoid / detect doping	18
References: Doping In Elite Sports: Voices of French Sportsmedic and Their Doctors Christophe Brissonneau, Jeffery - Doping In Non-Olympic Sports: Challenging the legitimacy Lovely Dasgupta - Fair play in sport: A moral Norm System Sigmund Toland Doping & Anti-doping Policy in Sport Mike Mcnamee, Verner Moller		

Semester – IV

Course Code: MSE4022	Course Title: Deep Learning	Credits: 3	Lectures/ Week:3
• Learning Objectives: Learn about different types of layers and their functionalities in deep learning models, including fully connected layers, convolutional layers, and recurrent layers. • Gain knowledge of different activation functions and their impact on the performance of deep learning models. • Explore optimization algorithms and techniques for training deep neural networks, including stochastic gradient descent (SGD), Adam optimizer, and learning rate schedules.			
Course Description: This course provides a comprehensive introduction to the field of deep learning, which focuses on developing and training neural networks with multiple layers to solve complex problems. Deep learning has revolutionized various domains, including computer vision, natural language processing, and speech recognition. This course covers the fundamental concepts, architectures, and techniques of deep learning, enabling students to understand, implement, and apply deep learning models effectively.			
Unit I	Basics: Biological Neuron, Idea of computational units, McCulloch–Pitts unit and Thresholding logic, Linear Perceptron, Perceptron Learning Algorithm, Linear separability. Convergence theorem for Perceptron Learning Algorithm	Hours	9
Unit II	Feedforward Networks: Multilayer Perceptron, Gradient Descent, Backpropagation, Empirical Risk Minimization, regularization, autoencoders. Deep Neural Networks: Difficulty of training deep neural networks, Greedy layerwise training		9
Unit III	Better Training of Neural Networks: Newer optimization methods for neural networks (Adagrad, adadelta, rmsprop, adam, NAG), second order methods for training, Saddle point problem in neural networks, Regularization methods (dropout, drop connect, batch normalization).		9
Unit IV	Recurrent Neural Networks: Back propagation through time, Long Short Term Memory, Gated Recurrent Units, Bidirectional LSTMs, Bidirectional RNNs Convolutional Neural Networks: LeNet, AlexNet. Generative models: Restrictive Boltzmann Machines (RBMs), Introduction to MCMC and Gibbs Sampling, gradient computations in RBMs, Deep Boltzmann Machines.		9
Unit –V	Recent trends: Variational Autoencoders, Generative Adversarial Networks, Multi-task Deep Learning, Multi-view Deep Learning Applications: Vision, NLP, Speech (just an overview of different applications in 2-3 lectures)		9
References 1. Deep Learning, Ian Goodfellow and Yoshua Bengio and Aaron Courville, MIT Press, 2016. 2. Neural Networks: A Systematic Introduction, Raúl Rojas, 1996 3. Pattern Recognition and Machine Learning, Christopher Bishop, 2007			

Semester – IV			
Course Code: MSE4023	Course Title: Cloud Computing	Credits: 3	Lectures/ Week:3
Learning Objectives: - Identify the technical foundations of cloud systems architectures. - Analyze the problems and solutions to cloud application problems. - Apply principles of best practice in cloud application design and management. - Identify and define technical challenges for cloud applications and assess their importance.			
Course Description: This course gives students an insight into the basics of cloud computing along with virtualization, cloud computing is one of the fastest growing domain from a while now. It will provide the students basic understanding about cloud and virtualization along with it how one can migrate over it.			
Unit I	Introduction Evolution of Cloud Computing –Essential Characteristics of cloud computing – Operational models such as private, dedicated, virtual private, community, hybrid and public cloud – Service models such as IaaS, PaaS and SaaS – Governance and Change Management – Business drivers, metrics and typical use cases. Example cloud vendors – Google cloud platform, Amazon AWS, Microsoft Azure, Pivotal cloud foundry and Open Stack.	Hours 9	
Unit II	Infrastructure Services Basics of Virtual Machines - Taxonomy of Virtual Machines. Virtualization Architectures. Challenges with Dynamic Infrastructure - Principles of Infrastructure as Code - Considerations for Infrastructure Services and Tools - Monitoring: Alerting, Metrics, and Logging - Service Discovery - Server Provisioning via Templates - Patterns and Practices for Continuous Deployment - Organizing Infrastructure and Testing Infrastructure - Change Management Pipelines for Infrastructure.	9	
Unit III	Platform Engineering Cloud Native Design and Microservices– Containerized - Dynamically orchestrated design – Continuous delivery - Support for a variety of client devices – Monolithic vs Microservices Architecture - Characteristics of microservice architecture – 12 factor application design - Considering service granularity – Scalable Services - Sharing dependencies between microservices - Stateless versus Stateful microservices - Service discovery – Service Registry – Performance Considerations	9	
Unit IV	Serverless Architecture and DevOps Function as a Service (FaaS) - Backend as a Service (BaaS) - Advantages of serverless architectures - Taking a hybrid approach to serverless architecture - Function deployment and Function invocation. Introduction to DevOps - The Deployment Pipeline - The Overall Architecture - Building and Testing - Deployment - Crosscutting Concerns such as Monitoring, Scalability, Repeatability, Reliability, Recoverability, Interoperability, Testability, and Modifiability.	9	

Unit V	Cloud Security Security Considerations – STRIDE Threat Model - Cloud Security Challenges – Cloud specific Cryptographic Techniques – CIA Triad – Security by Design – Common Security Risks - Risk Management – Security Monitoring – Security Architecture Design – Data Security – Application Security – Virtual Machine Security.	9
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References:

1. Software Architect's Handbook, by Joseph Ingeno, Published by Packt Publishing, 2018
2. Architecting Cloud Computing Solutions by Scott Goessling, Kevin L. Jackson, Publisher: Packet Publishing, Release Date: May 2018
3. Microservices: Flexible Software Architecture, by Eberhard Wolff, Publisher: Addison-Wesley Professional, Release Date: October 2016

Evaluation Scheme

Continuous Assessment (C.A.) - __Marks

C.A. – I: Test – Rubric to assess __marks

C.A. – II:

Organization and Development of Ideas	Analysis and Evaluation
__Marks	__Marks

Semester End Examination (SEE) - 60 Marks

Passing marks shall be 40% for all subjects compulsorily.

Justification for introducing various new courses in the University of Mumbai

BMS (Management and Sports Administration)

1 Necessity of starting these courses?

With the recent spurt in interest in sports and ancillary industries, it has become imperative that the workforce entering the market should be well-equipped and well trained to take the ecosystem to its full potential. The focus needs to be on ensuring that athletes and their supporting individuals are trained to be good managers and leaders. The proposed course through the School of Management ensures this outcome through the various core and cross-electives proposed.

2- Whether UGC has recommended starting the said course?

Yes

3- Whether all the courses have commenced from the academic year 2019-20?

No. It will commence from 2022

4- The courses started by the University are self-financed, whether adequate number of eligible permanent faculties is available?

Yes

5- To give details regarding the duration of the course and is it possible to compress the course?

The course is 3 years, 6 semesters long. Since this is an undergraduate degree and lays the foundation for academic as well as professional work for a student, it is not possible to compress the course. The time dictated is required to ensure adequate learning and absorption.

6- The intake capacity of each course and no. of admissions given in the current academic year(2019-20) The proposed batch size is 60 students. However, if there is increase in demand, can increase the batch size to up to 120 students

7- Opportunities of Employability/ Employment available after undertaking these courses?

Post the completion of this degree, an individual will be able to handle managerial level jobs within the sporting ecosystem. This includes, but is not limited to, human resource management – team and athlete management, financial management for individuals and organizations, analyzing data to ensure optimization as well as merchandising or marketing managers

Syllabus for BMS Management & Sports Administration – SEM V

SEMESTER - V	CREDITS
COURSE	
CORE	
Managerial Economics	3
Financial Management - II	3
Business Research Methodology - I	3
Consumer Strategy	3
SCHOOL ELECTIVES 2/3	
Consumer Psychology	3
Financial Derivatives	3
Corporate Finance	3
SPECIAL ELECTIVES 1/3	
Fan Engagement	3
Cryptography and Cyber Security	3
Introduction to Robotics	3

Semester – V

Course Code: MSC501	Course Title: Managerial Economics	Credits: 3	Lectures/Week:
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Learning Objectives:

1. To understand the working of economies with respect to demand and supply of goods and services.
2. To know the impact of costs on production function and the later on the profit forecasting.
3. To be able to understand the impact of pricing decisions and the factors responsible for the change
4. To study the risks and uncertainty of the economies and its impact on the capital budgeting of the firms.
5. To analyse the business cycles and evaluate its impact on the economy

Course Description: To understand the application of the economic concepts, theories, tools and methodologies to solve practical problems in a business. This course will enable students to get an insight into the in decision making done by the managers and acts as a link between practice and theory. This subject will help to bridge the gap between economic theory and economics in practice. As a sport enthusiast the students will gain knowledge about the relationship of demand and supply, while enabling them to take decision regarding the profitability of economic decisions.

Unit I	Fundamentals of micro economics	Hours
	Meaning, scope and importance of micro-economics, basic concepts for analysis, tools used for economic analysis.	5
Unit II	Demand analysis and business forecasting	Hours
	Demand schedule, and factors influencing demand, to determine the pricing decisions taken by a firm.	8
Unit III	Supply	Hours
	Market situation based on supply variables and changes in the same	7
Unit IV	Theory of production and cost concepts - Market analysis	Hours
		10
Unit V	Pricing Decisions Profit Management	Hours
		10
Unit VI	Case study, Supply and demand graph projections, caselet solving	Hours
		5

References:

- Managerial economics- R.L.Varshney, K.L.Maheshwari
- Managerial economics- D.N.Dwivedi

Semester –V

Course Code: MSC502	Course Title: Financial Management - II	Credits: 3	Lectures/Week:
Learning Objectives: 1. To develop an understanding of how financial management works 2. Incorporate understanding of financial terms to develop a strong foundation for future financial working 3. Understanding different types of capital and leverage			
Course Description: This course is designed to help students develop a practical understanding of the financial world. The aim is to demystify the working of finances for students through case studies and real-world data. This will instil a sense of confidence to approach finances with maturity.			
Unit I	Fundamentals of Financial Management Definition, scope, objectives of Financial Management, goal of a firm-Profit maximization VS wealth maximization Functions of a finance manager Time value of money.	Hours 5	
Unit II	Working Capital Management Concept of Working Capital Types of Working Capital Meaning of Working Capital Management and its importance Factors to be considered while determining the quantum of Working Capital requirements	10	
Unit III	Cost of capital and Capital Structure Cost of equity, cost of debt and weighted average cost of capital Meaning and importance of Capital Structure Factors influencing Capital Structure Capital Structure theories (Net Income, Net Operating Income and Modigliani-Miller's Approach) Taxation aspect of Capital Structure. Concept of Optimum Capital Structure.	10	

Unit IV	Leverage Concept, types and significance of leverage Derivation of Degree of Operating Leverage Degree of Financial Leverage and Degree of Total Leverage Concept of business risk and financial risk EBIT- EPS analysis and its practical application Concept and application of financial break-even point	10
Unit V	Dividend Decision Meaning and significance; determinant of dividend policies, Critical analysis of dividend policy theories - Walter's Model, Gordon's Model and Modigliani-Miller's Model	10

References:

- Prasanna Chandra — Financial Management —McGraw-Hill Education (India) Ltd
- Khan and Jain — Financial Management—McGraw-Hill Education (India) Ltd.
- I. M. Pandey — Financial Management— Vikas Publications, Delhi
- Damodaran – Applied Corporate Finance – Wiley, India

Semester – V

Course Code: MSC503	Course Title: Business Research Methodology - I	Credits: 3	Lectures/Week:
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Learning Objectives: Apply a range of quantitative and / or qualitative research techniques to business and management problems / issues • Understand and apply research approaches, techniques and strategies in the appropriate manner for managerial decision making • Demonstrate knowledge and understanding of data analysis and interpretation in relation to the research process • Conceptualize the research process • Develop necessary critical thinking skills in order to evaluate different research approaches utilized in the service industries • Students should be able to identify the overall process of designing a research study from its inception to its report.

Course Description: 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. It includes discussions on sampling techniques, research designs and techniques of analysis.

Unit I	Introduction to Research Methodology Importance, objectives, types of research and steps for research	Hours 5
Unit II	Formulation of the research problem Defining research problem, literature review, sources of problem for research, developing the research proposal into a research design, use of Statistics Research application in accounting, finance and marketing areas	7
Unit III	Data Collection Primary data collection methods (questionnaire method, online surveys, observation method), sources of secondary data, survey, questionnaire preparation (characteristics a good questionnaire, layout, pre-test, revision, final), organization of fieldwork, training interviewers, respondents' attitude, evaluation of field work	8
Unit IV	Scaling Techniques Introduction to scales of measurements (nominal, ordinal, interval, Likert) Sample Survey: population, sample, sampling techniques (probability sampling, nonprobability sampling, simple random sampling, stratified random sampling, cluster sampling, systematic sampling), random number table, sample size determination.	8
Unit V	Summarization and Analysis of Data: tabulation, validation, errors in data, use of computer, univariate and bivariate data analysis, measures of association for categorical data, correlation, regression, hypothesis testing (parametric), biometric tables Interpretation and Report Writing: meaning, steps, LATEX (official software for paper writing)	8
Unit VI	Introduction to SPSS/Excel	9

References:

• Kothari, C. R.: **Research Methodology, Methods and Techniques**; New Age International Publishers

Semester - V			
Course Code: MSC504	Course Title: Consumer Strategy	Credits: 3	Lectures/Week:
Learning Objectives: Learning objectives include understanding consumer motivations, analyzing market trends, and developing effective strategies to influence consumer choices.			
Course Description: Consumer Strategy course aims to explore the intricacies of consumer behavior, market segmentation, and brand positioning, market research.			
Unit I	Introduction to Marketing Research Marketing Research – Concept, Marketing research & market research – difference, scope and importance of Marketing Research, Marketing information system – concept, research process, Major techniques of Marketing research (quantitative and qualitative), research design.	Hours 5	
Unit II	Methodology in Marketing Research Developing Research Objectives; Collection of Primary Data – Observation, Methods of Observation, Survey: Methods of Survey, Selection of Survey Methods, Questionnaire design, Qualitative research: Depth interviews, Focus groups, Projective Techniques Collection of Secondary Data –Meaning, evaluation, sources; Sampling, Sampling Designs: Census Vs Sample Advantages & Disadvantages of Sampling; Sampling & Non-sampling errors; Types of sample designs Probability Sampling & Non-Probability sampling Random sampling; Systematic Sampling; Cluster sampling; Stratified Random sampling; Multistage sampling; Multi-phase sampling Quota sampling; Judgement Sampling; Convenience Sampling; Snowball sampling.	15	
Unit III	Measurement & Scaling Nominal; Ordinal, Interval, Ratio, Attitude measurement; Compilation; tabulation & classification of data Analytical Techniques Simple Numericals on Correlation; Regression; Testing of Hypothesis for application of Marketing Research Report Preparation – Oral and written reports, report outline, general guidelines for writing reports and evaluation of research report.	10	

Unit IV	Introduction to Advertising –meaning, objectives its role and functions, economic, social and ethical issues, DAGMAR approach Integrated Marketing Communication – strategic integration of marketing functions and promotional functions, relationship between product mix and promotion mix	5
Unit V	Response Process in Advertising – Consumer and mental process in buying, AIDA model, Hierarchy of effects model, Information processing model. Brand and Brand Equity Advertising Budget – Top down and Build up approach, methods of advertising –Affordable method, Arbitrary allocation method, percentage of sales method, competitive parity method, Objective and Task method	10
References: • Marketing Research: Text & Cases by Loudon, Jaico Publication • Marketing Research: S.L. Gupta, Excel Books • Marketing Research: M.V. Kulkarni, EPH • Marketing Research : G.C.Beri, TMH		

Semester - V

Course Code: MSE5011	Course Title: Consumer Psychology	Credits: 3	Lectures/Week:
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Learning Objectives:

- Understand the different frameworks applied to human behaviour
- Importance of consumer analysis in developing successful marketing strategies
- Exposure to relevant theories from across the behavioural sciences
- Apply findings to evaluating marketing strategies

Course Description:

Consumer focus has become an important factor in contemporary business approaches. This makes it even more important for marketing since it is a highly customer-driven function. This course focuses on understanding human behaviour – how do they choose, use or evaluate goods and services. The theories in this course are derived to understand human behaviour through behavioural sciences.

Unit I	Introduction to Consumer Psychology Motivation and needs of the consumer	Hours 3
Unit II	Perception Attention Information Categorization	8
Unit III	Learning and memory Interpersonal influence in marketing and advertising	10
Unit IV	Decision making Consumer decision making Consumption and satisfaction Culture and sub-culture Evaluating marketing strategies and promotions	15
Unit V	Presentations, case studies, live projects	9

References:

- Hoyer, Wayne D., Deborah J. MacInnis, Rick Pieters (2012), Consumer Behavior, 6th Ed. Houghton Mifflin Co: Boston: MA.
- Cialdini, Robert (2006), Influence: The Psychology of Persuasion, Collins Underhill, Paco (2001)
- Why We Buy: The Science of Shopping, Texere Publishing

Semester – V			
Course Code: MSE5012	Course Title: Financial Derivatives	Credits: 3	Lectures/Week:
Learning Objectives: 1) Students will be able to analyze the risks in different financial markets. 2) Acquire ability to selection of various options and then can apply them to specific markets. 3) Student will be able to strategically manage the financial derivatives.			
Course Description: This course aims at providing an in-depth understanding of financial derivatives in terms of concepts, structure, instruments and trading strategies for profit and risk management.			
Unit I	Introduction to derivatives Definitions Futures Options	Hours 7	
Unit II	Pricing of futures and options Cost of carry models Factors affecting options pricing Sensitivity of option premia	15	
Unit III	Trading, clearing and settlement of options and futures Future and options trading system Clearing entities and their roles Margining and settlement mechanism	15	
Unit IV	Interest rate, credit, currency and weather derivatives Interest rate options Currency futures and options trading strategies Weather, energy and insurance derivatives	8	
References: • John Hull, Options, Futures and other Derivatives, Pearson Education • S.L.Gupta, Financial Derivatives, Prentice Hall • Parameshwaran, Financial Derivatives, Mcgraw Hill • D. C. Patwari, Options and Futures- An Indian Perspective, Jaico Publishing House.			

Semester – V

CourseCode: MSE5013	Course Title: Corporate Finance	Credits: 3	Lectures/Week:
Learning Objectives: Acquire, interpret, and analyze accounting, economic, and financial data to facilitate decision making in corporate and investment environments in both personal and professional settings.			
Course Description: This course is designed to critically evaluate corporate finance techniques. It enables the student to be able to take an informed decision in a risky business environment.			
Unit I	Overview of Financial Management Meaning, Objectives, Scope, Role and Functions of Financial Management (Financial Decisions) Financial Goal - Profit Maximization versus Shareholders' Wealth Maximization. Time value of Money: (theory and numerical) Concepts, Compounding, Discounting, Annuities Sources of Long-Term Finance Introduction to Equity Shares, Preference Shares and Debentures, Term loan	Hours 10	
Unit II	Understanding Dividend Decision Dividend and dividend policy Factors affecting dividend pay-out Dividend payment models: (theory and numerical)	10	
Unit III	Cost of Capital: (theory and numerical) Significance, Concept of the Opportunity Cost of Capital Component Costs of Capital - Cost of Debt, Preference Capital and Equity Capital Weighted Average Cost of Capital (WACC) Leverage: (theory and numerical) Types of Leverage - Operating, Financial and Combined Leverage Point of indifference	10	

Unit IV	Working Capital Management Concepts of Working Capital Operating Cycle Determinants of Working Capital Estimating Working Capital Needs. (theory and numerical) Working Capital Finance Policies	10
Unit V	Live case studies, presentations, practical assignments	5

References:

- **Prasanna Chandra Financial Management, theory and Practice McGraw - Hill Latest Edition**
- **I M Pandey Financial Management Vikas Latest Edition**
- **M. Y. Khan and P. K. Jain Financial Management McGraw - Hill Latest Edition**

Semester - V

Course Code: MSE5021	Course Title: Fan Engagement	Credits: 3	Lectures/Week: 2
Learning Objectives: To understand the principles of fan engagement. ☐ To understand the flow of interests in fan engagement and the consequences in the Sport business. ☐ To know the different benefits of fan engagement. ☐ To understand the difference and importance between match day & non – match day Practices.			
Course Description: This course will explain the main concepts and best practices of fan engagement, using current methodologies and dealing with examples of real sports institutions. The environment of the fans and their relationship with sports entities is extremely dynamic and volatile, the creation of new engagement strategies or the implementation of constant innovations rather than just opportunities is nowadays a must. To provide the participant with knowledge in the management of the relationship between fans and sports institutions. This course aims to bring participants closer to the main concepts that are part of fan engagement such as fan identification, fan retention, fan experience, new opportunities for sponsorship or brand image, along with several techniques and best practices to encourage fan engagement both in match day and in non – match day. • To understand the principles of fan engagement. • To understand the flow of interests in fan engagement and the consequences in the sport business. • To know the different benefits of fan engagement. • To understand the difference and importance between match day & non – match day practices.			
Unit 1	Introduction to Fan Engagement. Why fan engagement, principles and rationale Key Concepts of Fan Engagement. Delivering fan engagement Understanding the Fan. What is a fan, understanding the nature of fandom Fan Engagement Strategy. Best practices of Fan Engagement. Leadership: creating and sustaining a culture of engagement • Actual & Future Trends of Fan Engagement.	10	
Unit 2	Sports Marketing Entertainment Marketing Cross Country & Cross Industry Innovation in Sports and Entertainment Marketing	10	

Unit 3	Technology to create fan engagement Seroquel: Reliability Alertness Attention Certainty TeamQual LEGO Experience Wheel Yoshida Science Article Surveys Censydiam Fan Engagement Scorecard	10
Unit 4	Fan Engagement in Football Factors involved in fan engagement Value of fan engagement Difference in women's events	5
Unit 5	Assess the baseline capacity of the event/organisation Identify a desired behaviour change Know your audience Understand barriers and benefits Build a behaviour change campaign Message development and delivery Capture results – measurement + reporting The final buzzer Case studies	10

Semester – V			
Course Code: MSE5022	Course Title: Cryptography and Cyber Security	Credits: 3	Lectures/Week:3
Learning Objectives: 1. explain the fundamentals of cryptography, such as encryption, digital signatures and secure hashes 2. select appropriate techniques and apply them to solve a given problem 3. design and evaluate security protocols appropriate for a given situation 4. demonstrate an understanding of the mathematical underpinning of cryptography 5. demonstrate an understanding of some legal and socio-ethical issues surrounding cryptography			
Course Description: The courses covers the basic terminology, concepts, and standards of cryptography.			
Unit I	Introduction to security attacks - services and mechanism - introduction to cryptography -Conventional Encryption: Conventional encryption model - classical encryption techniques - substitution ciphers and transposition ciphers – cryptanalysis – steganography - stream and blockciphers - Modern Block Ciphers: Block ciphers principals - Shannon’s theory of confusion and diffusion - fiestal structure - data encryption standard(DES) - strength of DES - differential and linear crypt analysis of DES - block cipher modes of operations - triple DES – AES.	Hours 10	
Unit II	Confidentiality using conventional encryption - traffic confidentiality - key distribution - random number generation - Introduction to graph - ring and field - prime and relative prime numbers - modular arithmetic - Fermat’s and Euler’s theorem - primality testing - Euclid’s Algorithm - Chinese Remainder theorem - discrete algorithms.	10	
Unit III	Principles of public key crypto systems - RSA algorithm - security of RSA - key management – Diffie-Hellman key exchange algorithm - introductory idea of Elliptic curve cryptography – Elgamel encryption - Message Authentication and Hash Function: Authentication requirements - authentication functions - message authentication code - hash functions - birthday attacks – security of hash functions and MACS.	5	
Unit IV	MD5 message digest algorithm - Secure hash algorithm (SHA) Digital Signatures: Digital Signatures - authentication protocols - digital signature standards (DSS) - proof of digital signature algorithm - Authentication Applications: Kerberos and X.509 - directory authentication service - electronic mail security-pretty good privacy (PGP) - S/MIME.	10	

Unit V	IP Security: Architecture - Authentication header - Encapsulating security payloads - combining security associations - key management.	5
Unit VI	Web Security: Secure socket layer and transport layer security - secure electronic transaction (SET) - System Security: Intruders - Viruses and related threads - firewall design principals – trusted systems.	5
References: 1. William Stallings, "Cryptography and Network security Principles and Practices", Pearson/PHI. 2. Wade Trappe, Lawrence CWashington, " Introduction to Cryptographywith codingtheory", Pearson.		

Semester- V

Course Code: MSE5023	Course Title: Introduction to Robotics	Credits: 3	Lectures/Week:3
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Learning Objectives:

- To introduce the functional elements of Robotics
- To impart knowledge on the direct and inverse kinematics
- To introduce the manipulator differential motion and control
- To educate on various path planning techniques
- To introduce the dynamics and control of manipulators

Course Description: This course presents an overview of robotics and research with topics including vision, motion planning, mathematical representation, and kinematics.

Unit I	Brief history-Types of Robot–Technology-Robot classifications and specifications-Design and control issues- Various manipulators – Sensors – work cell – Programming languages.	Hours 15
Unit II	Mathematical representation of Robots – Position and orientation – Homogeneous transformation-Variou joints- Representation using the Denavit Hattenberg parameters -Degrees of freedom-Direct kinematics- Inverse kinematics-PUMA560 & SCARA robots- Solvability – Solution methods-Closed form solution.	15
Unit III	Linear and angular velocities-Manipulator Jacobian-Prismatic and rotary joints Inverse -Wrist and arm singularity – Static analysis – Force and moment Balance.	15

References

2. R.K.Mittal and I.J.Nagrath, Robotics and Control,Tata McGraw Hill,New Delhi,4th Reprint, 2005.
3. JohnJ.Craig ,Introduction to Robotics Mechanics and Control, Third edition, Pearson Education, 2009.
4. M.P.Groover, M.Weiss,R.N. Nageland N. G.Odrej, Industrial Robotics, McGraw-Hill Singapore, 1996.

Evaluation
Scheme

Continuous Assessment (C.A.) -_Marks

C.A. – I: Test Marks

C.A. – II: Rubric to assess__Marks

Organization and Development of Ideas	Analysis and Evaluation
__Marks	__Marks

Semester End Examination (SEE) - ____Marks

Passing marks shall be 50% for all subjects compulsorily.

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BMS Management & Sports Administration

Semester – VI

SEMESTER - VI	CREDITS
COURSE	
CORE	
Psychology for Wellness	3
Market Structure and Behaviour	3
Competitive Strategy	3
Business Research Methodology - II	3
SCHOOL ELECTIVES 2/3	
Digital Media and Marketing	3
Game Theory	3
Development Economics	3
SPECIAL ELECTIVES 1/3	
Sports Entrepreneurship	3
Cyber Security	3
E- Commerce	3

Unit III	Building Resilience The role of Contemplative Practices and its importance - I • Self – Anchoring The role of Contemplative Practices and its importance – II • Self-Anchoring Ikigai – Finding your purpose and flow Living a fulfilling life	10
Unit IV	Practical's: Stress Model: Physical, Emotional/Mental, Spiritual Impact Learning to Ground – to be a tree Write Down Personal Essay • Grounding Exercise • Belief Systems • Movie Review Emotional Awareness • Free Flowing Thoughts • Food Awareness • Cathartic Exercise – Journaling Expressing Emotions Song • Music • Poems • Drawing • Colouring • Painting • Walking • Groundin g Release Emotions • Silence – Being with Self Breathwork Breathwork and Foetal Position and Journaling • Survival Tools (RPT) Parent Stories • Cultural Stories Releasing Stories • Movie Review Bringing it together Old triggers • New Behaviours Self-Anchoring • Finding a Practise – Resistance and how to identify it • Changing Scripts Flowing through Rhythm	15

Semester – VI

Course Code: MSC602	Course Title: Market Structure and Behavior	Credits: 3	Lectures/Week:
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Learning Objectives: The learning objectives of studying market structure and behavior include understanding different types of market structures such as perfect competition, monopolistic competition, oligopoly, and monopoly. This knowledge helps in identifying how firms operate within each structure and how they interact with competitors. Students learn to analyze market outcomes in terms of pricing strategies, output decisions, and efficiency.

Course Description: It covers the characteristics of perfect competition, monopolistic competition, oligopoly, and monopoly, analyzing how these market types influence pricing, output, and overall efficiency. Students will examine the strategies firms use to gain and maintain market power and how these strategies impact consumer choices and market outcomes

Unit I	Review of Perfect Competition, Monopoly and Cost Functions Review of market conditions and basic concepts Mergers, Vertical Relations, Merger Policy	Hours 15
Unit II	Monopoly Price Discrimination, Quality Discrimination Durable Goods Monopoly Homogenous Goods Oligopoly Models Dynamic Models: Entry, Oligopoly Collusion	15
Unit III	Product Differentiation Entry Deterrence, Limit Pricing, and Strategic Investment Imperfect Information, Asymmetric information Decision trees and nodes Auctions	15

References:

- The Theory of Industrial Organization: Jean Tirole
- Industrial Organization, A Strategic Approach, by Church and Ware

Semester –VI

Semester –VI			
Course Code: MSC603	Course Title: Competitive Strategy	Credits: 3	Lectures/Week:
Learning Objectives: - To introduce students to the concept of strategic thinking - Expose the students to an understanding of the corporate functioning - Provide them with tools to conceptualize strategic thinking and ways of functioning			
Course Description: This course is designed to help analyse strategy from different viewpoints. It is designed to answer why some companies are more successful and what are the tools thatthey use to achieve that success.			
Unit I	What is strategy Origin and importance	Hours 5	
Unit II	Industry analysis Industry relevance and attractiveness	7	
Unit III	Value based strategies Value based business strategy Competitive advantage	8	
Unit IV	Sustainability in business practices Sustainability in duopolies/oligopolies Diversification and growth Diversification strategy	10	
Unit V	Strategies for vertical integration Alliances CSR Global industries Governance and strategy Technology and its impact	15	
References: Strategy and the Business Landscape by Pankaj Ghemawat			

Semester – VI

Course Code: MSC604	Course Title: Business Research Methodology - II	Credits: 3	Lectures/Week:
Learning Objectives: Apply a range of quantitative and / or qualitative research techniques to business and management problems / issues • Understand and apply research approaches, techniques and strategies in the appropriate manner for managerial decision making • Demonstrate knowledge and understanding of data analysis and interpretation in relation to the research process • Conceptualize the research process • Develop necessary critical thinking skills in order to evaluate different research approaches utilized in the service industries			
Course Description: 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. It includes discussions on sampling techniques, research designs and techniques of analysis.			
Unit I	Foundations of Research: Meaning, Objectives, Motivation, Utility Concept of theory, empiricism, deductive and inductive theory Characteristics of scientific method – Understanding the language of research – Concept, Construct, Definition, Variable. Research Process	Hours 5	
Unit II	Problem identification and formulation Research question formulation Measurement issues Hypothesis formulation Hypothesis testing	10	
Unit III	Concept and Importance of Research Design– Features of a good research design Exploratory Research Design – concept, types and uses, Descriptive Research Designs – concept, types and uses Experimental Design: Concept of Independent & Dependent variables Qualitative and Quantitative Research: Qualitative research – Quantitative research – Concept of measurement, causality, generalization, replication. Mixed methods in research design and how to use them	10	

Unit IV	Measurement: Concept of measurement Validity and Reliability Sampling: Concepts of Statistical Population, Sample, Sampling Frame, Sampling Error, Sample Size, Non Response. Characteristics of a good sample Probability Sample – Simple Random Sample, Systematic Sample, Stratified Random Sample & Multi-stage sampling. Determining size of the sample Practical considerations in sampling and sample size Data Analysis: Data Preparation – Univariate analysis, Bivariate analysis – Cross tabulations and Chi-square test including testing hypothesis of association	10
Unit V	Interpretation of Data and Paper Writing – Layout of a Research Paper, Journals, Impact factor of Journals, Publishing and Ethical issues related to publishing Plagiarism and Self-Plagiarism Use of tools / techniques for Research: methods to search required information effectively Reference Management Software like Zotero/Mendeley, Software for paper formatting like LaTeX/MS Office, Software for detection of Plagiarism	10
References: • Business Research Methods – Donald Cooper & Pamela Schindler, TMGH, 9th edition • Business Research Methods – Alan Bryman & Emma Bell, Oxford University Press • Research Methodology – C.R.Kothari		

Semester – VI

Course Code: MSE6011	Course Title: Digital Media and Marketing	Credits: 3	Lectures/Week: 2
Learning Objectives: On successful completion of the module, the student should be able to: • Evaluate the theory pertaining to issues in sports promotion and sponsorship and formulate appropriate communication strategies within a sport industry setting, for a team or product. • Explain the fundamental concepts and processes of marketing promotion and communication in sport and evaluate the role of social media in the promotion of sports. • Explain and evaluate different types of sports promotion and communication strategies with emphasis on sport sponsorship and social media and the targets they are relevant for.			
Course Description: Sports promotion, through sports sponsorship and marketing communications, has increased in importance over the last few years due to the need to create revenues and to disconnect from state funded sources. The module concentrates primarily on the objectives of marketing communication of brands (that can refer to products, teams, venues and athletes) that invest in sport promotion and the strategies and tools to achieve these objectives. The approach combines the advancement of new methods of promotion through traditional offline methods and digital methods with emphasis to socialmedia to attract participants (athletes), buyers (fans) and sponsors.			
Unit I	Overview of principles of marketing and communication as they relate to the sports industry - Target audiences (consumers, athletes, businesses) - Sports integrated communication - Sports Sponsorship - Sports web marketing - Social media marketing - Design and implementation of campaigns What is sports marketing? Sports Marketing: differences and similarities with other marketing	Hours 15	

Unit II	Fundamentals of Digital Marketing and Advanced SEO - Pay-per-click (PPC) - Web Analytics - Digital Marketing Capstone Project Social Media Marketing - Facebook - YouTube - Website - Instagram - Snap chat/Tiktok/Takatak - Weibo - LinkedIn Affiliate and Influencer Marketing Email Marketing	
		15
Unit III	Value: sponsorship, partnership and dynamic ticket pricing Sports Communication: Press Releases, Media Relations, Public Relations - SEO Optimization - Introduction to CRM - Competitor and Website Analysis - Market Research and Niche Potential - Content Creation, Management and Promotion - Introduction to Web Analytics - Mobile Marketing - Social Media Marketing - Digital Marketing Budgeting, Planning and Forecast - Digital Marketing Project Management - Product Marketing (Facebook, Instagram, Google Ads) - Website Data Analytics - Paid Ads Optimization Strategies - Neuro-Marketing Fundamentals	15

References: MATERIAL

- Lagae, W. (2005) Sports Sponsorship and Marketing Communications: A European Perspective. Essex, UK: Pearson Education Limited.
- Newman, T., Peck, J. & Harris C. (2013) Social Media in Sport Marketing, Scottsdale, AZ: Holcomb Hathaway Publishers.

RECOMMENDED READING :

A. Books

- Pelsmacker, P., Geuens, M. & van den Bergh, J. (2007) Marketing Communications: A European perspective, 4th Edition, Essex, UK: Pearson Education Limited.
- Shank, M. (2008) Sports Marketing: A Strategic Perspective, 4th Edition, Upper Saddle River, NJ: Pearson.

Shilbury, D., Westerbeek, H., Quick, S. & Funk, D. (2009) Strategic Sport Marketing, Crows Nest, AU: Allen and Unwin.

B. Articles

- Ferrier, S., Waite, K. & Harrison, T. (2013) "Sports sponsorship perceptions: An exploration", Journal of Financial Services Marketing, 18(2), 78-90.
- Farrelly, F.(2010) "Not Playing the Game: Why Sport Sponsorship Relationships Break Down", Journal of Sport Management, 24(3), 319-337.
- Hutchins, B.& Rowe, D.(2010) "Reconfiguring Media Sport for the Online World: An Inquiry Into "Sports News and Digital Media"", International Journal of Communication, 4, 696-718.
- Moore, A. J. (2011) "Go for the goal: How pro sports teams score with social media", Public Relations Tactics, 18(3), 11.
- Pronschinske, M., Groza, M. & Walker, M. (2012) "Attracting Facebook Fans: The Importance of Authenticity and Engagement as a Social Networking Strategy for Professional Sport Teams", Sport Marketing Quarterly, 21(4), 221-231.
- Price, J., Farrington, N. & Hall, L. (2013) "Changing the game? The impact of Twitter on relationships between football clubs, supporters and the sports media", Soccer & Society, 14(4), 446-461.
- Schultz, B. & Sheffer, M. (2011) "Factors Influencing Sports Consumption in the Era of New Media", Web Journal Of Mass Communication Research, 37. Retrieved from <http://www.scripps.ohiou.edu/wjmcr/vol37/>.

C. Web Resources

- Journal of Sports Management www.nassm.com
- Journal of Sports Management and Marketing www.inderscience.com
- Journal of Sports Marketing and Sponsorship www.imrpublicorshipations.com
- North American Association of Sports Management www.nassm.com
- Sport Marketing Quarterly www.marketingpower.com
- European Association of Sport Management www.easm.net
- Sport Marketing Association www.sportmarketingassociation.net

Semester – VI

Course Code: MSE6012	Course Title: Game Theory	Credits: 3	Lectures/Week:
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Learning Objectives:

- Understanding of game theory concepts in theory and practice
- Be able to apply concepts to real world problems in the market
- Provide a more holistic understanding of strategy and equilibria in the market

Course Description:

This course intends to provide the student with an intensive understanding of non-cooperative (non- collusive) solutions in game theory. Students at this stage will not have had an exposure to the theory but will have an idea of the concept in play. With this course, the aim is to bridge this gap and provide them a rigorous training in understanding equilibrium, foundations and repeated games in the market.

Unit I	Introduction to Game theory Static Games Complete and incomplete information Nash Equilibrium theory Rationalizability, Bayesian Nash Equilibrium	Hours 5
Unit II	Extensive form games Backwards induction, subgame perfection, iterated conditional dominance Bargaining with complete information	6
Unit III	Equilibrium Concepts for Games with Imperfect Information Signalling and Forward Induction Stable equilibrium The intuitive criterion, iterated weak dominance, epistemic foundations Repeated Games	7
Unit IV	Reputation Formation Super modular Games Global Games	6
Unit V	Cooperative Games Nash bargaining solution, core, Shapley value Non-cooperative implantations	7
Unit VI	Nash bargaining solution Repeated games, cooperative games Nash Equilibrium in game form Student games and group activities in class and on field Problem sets for each unit	14

References:

Fudenberg, Drew, and Jean Tirole. *Game Theory*. MIT Press, 1991. ISBN: 9780262061414.

Semester – VI			
Course Code: MSE6013	Course Title: Development Economics	Credits: 3	Lectures/Week:
Learning Objectives: This course introduces students to the basics of development economics, with in-depth discussions of the concepts of development, growth, poverty, inequality, as well as the underlying political institutions.			
Course Description: This is the first part of a two-part course on economic development. The course begins with a discussion of alternative conceptions of development and their justification. It then proceeds to aggregate models of growth and cross-national comparisons of the growth experience that can help evaluate these models. The axiomatic basis for inequality measurement is used to develop measures of inequality and connections between growth and inequality are explored. The course ends by linking political institutions to growth and inequality by discussing the role of the state in economic development and the informational and incentive problems that affect state governance.			
Unit I	Conceptions of Development Measures of development International measures of development Comparing development trajectories amongst nations	Hours 5	
Unit II	Growth models and empirics Harrod-Domar model Solow growth model and its variants Endogenous growth models Determinants of growth	7	
Unit III	Poverty and Inequality Definitions, measures and mechanisms Poverty traps and what creates them Health, disease and Development	7	
Unit IV	Education and Development Education and growth Human rights and Development Women's rights and Development	7	
Unit V	Financial capital Land reforms Institutional reforms Corruption and governance	5	
Unit VI	Case Studies, live examples, mock UN meets	13	

Semester – VI

Course Code: MSE6021	Course Title: Sports Entrepreneurship	Credits: 3	Lectures/Week: 2
Learning Objectives: - Identify the skills and knowledge base needed to foster entrepreneurial activity for individuals based on the experiences of successful sports entrepreneurs as well as assess and discuss the challenges they have faced. - Critically discuss ways in which entrepreneurial-minded individuals can thrive in large sports organisations despite the tendency of such organisations to resist innovation and to favour the status quo or only seek marginal gains. - Demonstrate an understanding of, and identify, new opportunities and translate them into viable business solutions or opportunities.			
Course Description: This module aims to develop, evaluate and critique entrepreneurial skills within the context of launching new products or services in the sport industry. It will also be of benefit for entrepreneurs who are looking to flourish within existing organizations.			
Unit I	Nature and Importance of Entrepreneurship and mind set, intentions of corporate entrepreneurship. Types of Entrepreneurships Sport as a catalyst for Entrepreneurs in Sport Characteristics of individual entrepreneurs in sport Entrepreneurialism within large sporting organisations	Hours	
Unit II	Identifying opportunities for innovation in sport Structuring the sports start-up Funding and resourcing a sports start-up		
Unit III	Managing growth and existing within the sports industry Generating and exploiting new entries, and creativity and the business idea Domestic and International opportunities and legal issues Business Plan, and Marketing plan Organizational Plan, Financial Plan Sources of Capital, and informal risk capital, venture capital and going public Strategies for growth and accessing resources for growth from external sources Succession planning and strategies for harvesting and ending the venture		
Unit IV	Business Plan Online Sports Entrepreneurship Magazine		
Unit V	Practical Guest Lecture - Identifying opportunities for innovation in sport Movie Review		

	- 22 Yards, Million Dollar Arm Preparation of business plan - Prepare a business plan for a new business start up idea in the field of sports. Presentation - Present any one successful business model in the e-sports industry.	
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Semester – VI			
Course Code: MSE6022	Course Title: Cyber Security	Credits: 3	Lectures/Week:
Learning Objectives: • To understand the concept of attacks, encryptions • To understand the concept of threats, threat management • To understand authorization and authentication			
Course Description: The course covers the concept of cyber security including threat, threat management and authentication and authorization.			
Unit I	Introduction: Security threats - Sources of security threats- Motives - Target Assets and vulnerabilities – Consequences of threats- E-mail threats - Web-threats - Intruders and Hackers, Insider threats, Cyber crimes. Network Threats: Active/ Passive – Interference – Interception –Impersonation – Worms –Virus – Spam’s – Ad ware - Spy ware – Trojans and covert channels – Backdoors – Bots – IP, Spoofing - ARP spoofing - Session Hijacking - Sabotage-Internal treats Environmental threats - Threats to Server security.	Hours 10	
Unit II	Security Threat Management: Risk Assessment - Forensic Analysis - Security threat correlation –Threat awareness - Vulnerability sources and assessment- Vulnerability assessment tools – Threatidentification - Threat Analysis - Threat Modeling - Model for Information Security Planning.	15	
Unit III	Security Elements: Authorization and Authentication - types, policies and techniques – Securitycertification - Security monitoring and Auditing - Security Requirements Specifications – Security Policies and Procedures, Firewalls, IDS, Log Files, Honey Pots	15	
	Access control, Trusted Computing and multilevel security - Security models, Trusted Systems,Software security issues, Physical and infrastructure security, Human factors – Security awareness,training , Email and Internet use policies.	5	
References: 1. Swiderski, Frank and Syndex, “Threat Modeling”, Microsoft Press, 2004. 2. William Stallings and Lawrie Brown, “Computer Security: Principles and Practice”,Prentice Hall, 2008. 3. Joseph M Kizza, “Computer Network Security”, Springer Verlag, 2005 4. Thomas Calabres and Tom Calabrese, “Information Security Intelligence: Cryptographic Principles & Application”, Thomson Delmar Learning, 2004.			

Semester – VI			
Course Code: MSE6023	Course Title: E Commerce	Credits: 3	Lectures/Week:3
Learning Objectives: This course provides an introduction to information systems for business and management. It is designed to familiarize students with organizational and managerial foundations of systems, the technical foundation for understanding information systems			
Course Description: After Completion of the subject student should able to • Understand the basic concepts and technologies used in the field of management information systems; • Have the knowledge of the different types of management information systems; • Understand the processes of developing and implementing information systems; • Be aware of the ethical, social, and security issues of information systems.			
Unit I	Overview, Definitions, Advantages & Disadvantages of E – Commerce, Threats of E – Commerce, Managerial Prospective, Rules & Regulations For Controlling E – Commerce, Cyber Laws.	Hours	3
Unit II	Technologies : Relationship Between E – Commerce & Networking, Different Types of Networking Commerce, Internet, Intranet & Extranet, EDI Systems Wireless Application Protocol : Definition, Hand Held Devices, Mobility & Commerce, Mobile Computing, Wireless Web, Web Security, Infrastructure Requirement For E – Commerce.		7
Unit III	Business Models of e – commerce: Model Based On Transaction Type, Model Based On Transaction Party - B2B, B2C, C2B, C2C, E – Governance.		5
Unit IV	E – strategy : Overview, Strategic Methods for developing E – commerce. Four C's : (Convergence, Collaborative Computing, Content Management & Call Center). Convergence : Technological Advances in Convergence – Types, Convergence and its implications, Convergence & Electronic Commerce. Collaborative Computing : Collaborative product development, contract as per CAD, Simultaneous Collaboration, Security. Content Management : Definition of content, Authoring Tools & Content Management, Content – partnership, repositories, convergence, providers, Web Traffic & Traffic Management ; Content Marketing. Call Center : Definition, Need, Tasks Handled, Mode of Operation, Equipment , Strength & Weaknesses of Call Center, Customer Premises Equipment (CPE).		9
Unit V	Supply Chain Management : E – logistics, Supply Chain Portal, Supply Chain Planning Tools (SCP Tools), Supply Chain Execution (SCE), SCE - Framework, Internet's effect on Supply Chain Power.		7
Unit VI	E – Payment Mechanism : Payment through card system, E – Cheque. E – Cash. E – Payment Threats & Protections		7

Unit VII	Electronic Data Interchange (EDI) : Meaning, Benefits, Concepts, Application, EDI Model, Protocols (UN EDI FACT / GTDI, ANSI X – 12), Data Encryption (DES / RSA). [2 L] 11. Risk of E – Commerce : Overview, Security for E – Commerce, Security Standards, Firewall, Cryptography, Key Management, Password Systems, Digital certificates, Digital signatures.	7
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References:

1. E-Commerce, M.M. Oka, EPH
2. Kalakotia, Whinston : Frontiers of Electronic Commerce , Pearson Education.
3. Bhaskar Bharat : Electronic Commerce - Technologies & Applications. TMH
4. Loshin Pete, Murphy P.A. : Electronic Commerce , Jaico Publishing Housing.
5. Murthy : E – Commerce , Himalaya Publishing.
6. E – Commerce : Strategy Technologies & Applications, Tata McGraw Hill.
7. Global E-Commerce, J. Christopher & T.H.K. Clerk, University Press
8. Beginning E-Commerce, Reynolds, SPD
9. Krishnamurthy, E-Commerce Mgmt, Vikas

Evaluation Scheme

Continuous Assessment (C.A.) – Marks –

C.A. – I: Test Marks

C.A. – II: Rubric to assess __Marks

Organization and Development of Ideas	Analysis and Evaluation
__Marks	__Marks

Semester End Examination (SEE) - ____Marks

Passing marks shall be 50% for all subjects compulsorily.

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