Course Structure

Integrated MBA (5 Year Programme)
B.Tech. In Information Technology
+
MBA

For batch 2023 onward

ABV-Indian Institute of Information Technology & Management, Gwalior

5 year (10 Semester) Integrated MBA Programme (Total credits: 222)

SEMESTER -1

Sl no	Course Code	Subjects	Credits	L-T-P
1	EE101	Fundamentals of Electrical and Electronics	4	3-0-2
2	ES101	Engineering Physics	4	3-0-2
3	ES102	Engineering Mathematics	4	3-1-0
4	EE102	Engineering Design Principles	3	2-0-2
5	IT101	Principles of Computer Programming	4	3-0-2
6	HS101	Freshman Skills	2	2-0-0
7	HS102	Sports and Physical Education	2	0-1-2
		Total	**23 Credits**	

SEMESTER -2

Sl no	Course Code	Subjects	Credits	L-T-P
1	EE103	Digital Electronics	4	3-0-2
2	ES103	Probability and Statistics	4	3-1-0
3	IT102	Data Structures	4	3-0-2
4	EE104	Hardware Workshop	3	1-0-4
5	IT103	Object Oriented Programming	4	3-0-2
6	HS103	Ecology and Environment Sciences	2	2-0-0
7	CS104	Mobile Application Technologies	2	0-1-2
		Total	**23 Credits**	
	MO101	MOOC-1 (Optional in summer)	2/3-0-0	

EXIT AFTER YEAR - 1 → **Certificate in Engineering Sciences (46 credits)**

SEMESTER -3

Sl no	Course Code	Subjects	Credits	L-T-P
1	HS201	Indian Culture, Ethics and Moral Values	2	2-0-0
2	IT201	Discrete Structures	4	3-1-0
3	IT202	Computer Organization and Architecture	4	3-0-2
4	IT203	Design and Analysis of Algorithms	4	3-0-2
5	IT204	Data Communications	4	3-0-2
6	IT205	Database Systems	4	3-0-2
		Total	**22 credits**	

SEMESTER -4

Sl no	Course Code	Subjects	Credits	L-T-P
1	MS619	Entrepreneurship and Innovation	2	2-0-0
2	IT206	Theory of Computation	3	3-0-0
3	IT207	Operating Systems	4	3-0-2
4	IT208	Computer Networks	4	3-0-2
5	EE201	Signals and Systems	4	3-1-0
6	IT209	Graph Theory	4	3-0-2
		Total	**21 credits**	
	MO201	MOOC-2 (Optional in summer)	2/3-0-0	

EXIT AFTER YEAR - 2 → **Diploma in Information Technology (89 credits)**

SEMESTER -5

Sl no	Course Code	Subjects	Credits	L-T-P
1	MS603	Business Economics	3	3-0-0
2		Multidisciplinary/Open Elective- 1	3	3-0-0
3	EE303	Microprocessor and Interfacing	4	3-0-2
4	IT302	Compiler Design	4	3-0-2
5	IT303	Computer Graphics	4	3-0-2
6	IT304	Trustworthy Artificial Intelligence	4	3-0-2
		Total	**22 credits**	

SEMESTER -6

Sl no	Course Code	Subjects	Credits	L-T-P
1	ENXXX	Art of Engineering Research	2	2-0-0
2		Multidisciplinary/Open Elective- 2/MOOC 1[$]	3	3-0-0
3	IT0XX	Department Elective-1	3	3-0-0
4	IT305	Optimization Techniques	4	3-1-0
5	IT306	Machine Learning	4	3-0-2
6	IT307	Wireless Communication Technologies	4	3-0-2
		Total	**20 credits**	

BTech Project allocation to be done during 6th Semester

[$] MOOC 1 can also be taken in summer after 2nd semester if the student wishes to finish it earlier.

EXIT AFTER YEAR - 3 → **B.Sc. in Information Technology (131 credits)**

[$] MOOC 2 can also be taken in summer after 4th semester if the student wishes to finish it earlier

Colloquium of 3 credits in summer semester (MOOC, NPTEL etc. in place of colloquium)

For the list of Electives upto Semester-6 please see refer to the Elective subjects in 5 year Integrated M.Tech. program.

Focus of the IMG Programme (4th and 5th Year)

Focus of IMG-I to III Year: The students shall be learning the foundation and specialization of technological impetus from in-house class teaching-learning, industrial exposure, live projects, interaction, laboratory experiments and other as deemed fit time to time by blowing through the undergraduate curriculum of B.Tech (IT) upto 3rd year that to be integrated with another two years (4th and 5th Year) of Management Programme to award the IMG Degree.

Focus of IMG IV Year: The program's first year aims to impart knowledge about general management principles, practices, and the analytical ability required to address contemporary business challenges.

Focus of IMG-V Year: The program's second year will provide an integrative management perspective and specialized knowledge in chosen focus areas. Students can customize their specialization by selecting from six diverse elective categories. Additionally, to align with their chosen career trajectory, students can benefit from four high-quality Massive Open Online Courses (MOOCs) that perfectly complement their chosen electives.

Credit Requirement: 1st Year: 23+23=46
2nd Year: 21+22=43
3rd Year: 22+20=42
4th Year: 24+24+4=52
5th Year: 24+15=39

Total Credits: 46+43+42+52+39=222

SEMESTER - 7

Sl	Code	Title of the Course	Credits	L-T-P
1	MS601	Principles and Practices of Management	3	3-0-0
2	MS604	Business and Legal Environment	3	3/4-0-0
3	MS605	Financial Reporting and Control	3	3/4-0-0
4	MS606	Organizational Behavior	3	3-0-0
5	MS607	IoT and Big Data Management	3	3-0-0
6	MS608	Strategic Management	3	3-0-0
7	MS617	Business Data Mining	3	3-0-0
8	MS0XX	**Department Elective-I**	**3**	**3-0-0**
9		Computational laboratory (based on semester courses)	Part of course credit	
		Total Credits	**24**	

SEMESTER - 8

Sl	Code	Title of the Course	Credits	L-T-P
1	MS610	Operations Management	3	3-0-0
2	MS611	Marketing Management	3	3-0-0
3	MS612	Financial Engineering and Management	3	3-0-0
4	MS613	Business Research Methods	3	3-0-0
5	MS622	Could Computing	3	3-0-0
6	MS0XX	**Department Elective-II**	**3**	**3-0-0**
7		Multidisciplinary/Open elective/ MOOC-1	3	3-0-0
8	MS596	Mini project (industry project/case study, self-study, term paper etc.)	3	0-0-6
9		Computational laboratory (based on semester courses)	Part of course credit	
		Total Credits		**24**

Summer Term

1	**MS597**	Summer term of 6-8 weeks (Industry project. R&D Project etc.)	4	0-0-8

Summer Term Evaluation: To be evaluated during 9th semester of the IMG programme

Abrupt EXIT after 4 years (183 credits) leads to B.Sc. in Information Technology (IT) + One year Diploma in Management

SEMESTER - 9

Sl	Code	Title of the Course	Credits	L-T-P
1	MS618	International Business	3	3-0-0
2	MS620	Business Process Management	3	3-0-0
3	MS621	Business Ethics and Sustainability	3	3-0-0
4	MS0XX	**Department Elective-III**	3	3-0-0
5	MS0XX	**Department Elective-IV**	3	3-0-0
6		Multidisciplinary/Open elective/ MOOC-2	3	3-0-0
7	MS598	Major Thesis Part- 1	6	0-0-12
		Total Credits		**24**

SEMESTER - 10	Sl	Code	Title of the Course	Credits	L-T-P
	1		Multidisciplinary/Open elective/ MOOC-3	3	3-0-0
	2	MS599	Major Thesis Part- 2	12	0-0-24
			Total Credits		**15**

EXIT after 5 years (222 credits) leads to B.Tech. in Informstion Technology + MBA

Composition of Electives: A student has to choose 07 electives from the basket of 04 MOOC courses and 05 Departmental Electives. The composition of electives shall be as minimum 03 from the departmental electives, minimum 02 from MOOC electives and remaining two electives may be flexible chosen either from the department or from MOOC electives.

List of suggested courses for MOOC: MOOC courses should be relevant to the area of management programs catering the need of specialization and relevant to the frontier areas of technology, information technology or management fulfilling the modern business needs and are not being offered as in-house courses of ABV-IIITM Gwalior.

Specialization in the MBA degree: A student will be able to earn specialization in a particular area(s) by earning a minimum of ***09 credits (ordinarily equal to 03 courses) through in-house elective courses***. Details of specialization will be part of the transcript issued to a student.

Exit Option from IMG Program: A student can exercise the exit option from the IMG after completing the 3rd year as per the 'exit provision' of IMG program ordinance. However, in case a student makes an abrupt exit at the end of 4th year, he/she will be awarded **B.Sc. in Information Technology (IT) + One year Diploma in Management** upon completion of the required credits.

List of indicative electives proposed to be offered in Odd and Even Semesters

Specialization Basket 01: Information Technology and Systems

Sl	lCode	Title of the Course	L-T-P	Credits	Semester
1	MS001	Digital Production System	3-0-0	3	Odd
2	MS002	IT Products and Intellectual Property Rights	3-0-0	3	Even
3	MS003	Management of Digital Technologies	3-0-0	3	Odd
4	MS004	Knowledge Management	3-0-0	3	Even
5	MS005	Service-Oriented Computing	3-0-0	3	Odd
6	MS006	Social Networks Analytics	3-0-0	3	Even
7	MS007	Software Project Management	3-0-0	3	Odd
8	MS008	Software Quality Management	3-0-0	3	Even
9	MS009	Programming for Business Intelligence	3-0-0	3	Odd
10	MS010	Strategic Planning of Information Systems	3-0-0	3	Even

Specialization Basket 02: Technology and Operations Management

Sl	lCode	Title of the Course	L-T-P	Credits	Semester
1	MS011	Business Systems Simulation	3-0-0	3	Odd
2	MS012	Service Operations Management	3-0-0	3	Even
3	MS013	Sustainable Supply Chain Management	3-0-0	3	Odd
4	MS014	Technology Management	3-0-0	3	Even
5	MS015	Technology and Operations Strategy	3-0-0	3	Odd
6	MS016	Total Quality Management	3-0-0	3	Even
7	MS017	World Class Production Systems	3-0-0	3	Odd

8	MS018	Emerging Areas in Technology and Operations Management	3-0-0	3	Even
9	MS019	New Products and Services Development	3-0-0	3	Odd
10	MS020	Project Management			

Specialization Basket 03: Human Resource Management

Sl	Code	Title of the Course	L-T-P	Credits	Semester
1	MS021	Compensation Management	3-0-0	3	Odd
2	MS022	Change Management	3-0-0	3	Even
3	MS023	Corporate Social Responsibility	3-0-0	3	Odd
4	MS024	Competency Management	3-0-0	3	Even
5	MS025	Human Resource Information System	3-0-0	3	Odd
6	MS026	Emerging Areas in Human Resource	3-0-0	3	Even
7	MS027	Organization Theory and Development	3-0-0	3	Odd
8	MS028	Leadership and Talent Management	3-0-0	3	Even
9	MS029	Training and Development	3-0-0	3	Odd
10	MS030	Management of Employee Relations	3-0-0	3	Even

Specialization Basket 04: Finance

Sl	Code	Title of the Course	L-T-P	Credits	Semester
1	MS031	Corporate Restructuring	3-0-0	3	Odd
2	MS032	Corporate Tax Planning	3-0-0	3	Even
3	MS033	Economic and Financial Modeling	3-0-0	3	Odd
4	MS034	Entrepreneurial Finance	3-0-0	3	Even
5	MS035	Management of Financial Services	3-0-0	3	Odd
6	MS036	Financial Risk management	3-0-0	3	Even
7	MS037	Personal Wealth Management	3-0-0	3	Odd
8	MS038	International Finance	3-0-0	3	Even
9	MS039	Project Appraisal and Finance	3-0-0	3	Odd
10	MS040	Security Analysis and Portfolio Management	3-0-0	3	Even

Specialization Basket 05: Marketing Management

S	Code	Title of the Course	L-T-P	Credits	Semester
1	MS041	Consumer Behavior	3-0-0	3	Odd
2	MS042	Advertisement and Sales Promotion Management	3-0-0	3	Even
3	MS043	Product and Brand Management	3-0-0	3	Odd
4	MS044	E-marketing	3-0-0	3	Even
5	MS045	Retail Management	3-0-0	3	Odd
6	MS046	International Marketing	3-0-0	3	Even
7	MS047	Sales and Distribution	3-0-0	3	Odd
8	MS048	Marketing Research	3-0-0	3	Even
9	MS049	Service Marketing	3-0-0	3	Odd
10	MS050	Strategic Marketing	3-0-0	3	Even

Specialization Basket 06: Management of Social Sector

Sl	Code	Title of the Course	L-T-P	Credits	Semester
1	MS051	Public Policy and Processes	3-0-0	3	Odd

2	MS052	Public Private Partnerships	3-0-0	3	Even
3	MS053	Sustainable Development	3-0-0	3	Odd
4	MS054	Management of Rural and Social Sector	3-0-0	3	Even
5	MS055	Information Technology Enabled Services	3-0-0	3	Odd
6	MS056	Management of Non-Formal Organization	3-0-0	3	Even
7	MS057	Healthcare System Management	3-0-0	3	Odd
8	MS058	Emerging Areas in Management of Social Sector	3-0-0	3	Even
9	MS059	Infrastructure Management	3-0-0	3	Even

Minor in Management (21 credits)

A student from B.Tech/IMT needs to earn a total of minimum 21 credits from the below list of courses (composition of the courses is 50% from the list of core courses and 50% is from the list of elective courses) for a Minor in Management from the list of the offered courses. This is over and above the credit requirement for the respective BTech/IMT degree.

List of Core courses for Minor in Management (50%)

Sl	Code	Title of the Course	L-T-P	Credits	Semester
1	MS601	Principles and Practices of Management	3-0-0	3	Odd
2	MS605	Financial Reporting and Control	3-0-0	3	Odd
3	MS606	Organizational Behavior	3-0-0	3	Odd
4	MS607	IoT and Big Data Management	3-0-0	3	Odd
5	MS617	Business Data Mining	3-0-0	3	Odd
6	MS610	Operations Management	3-0-0	3	Even
7	MS611	Marketing Management	3-0-0	3	Even
8	MS612	Financial Engineering and Management	3-0-0	3	Even
9	MS613	Business Research Methods	3-0-0	3	Even
10	MS622	Could Computing	3-0-0	3	Even

List of Elective courses for Minor in Management (50%)

S. No	Course Code	Title of the Course	L-T-P	Credits	Semester
1	MS001	Digital Production System	3-0-0	3	Odd
2	MS006	Social Networks Analytics	3-0-0	3	Even
3	MS013	Sustainable Supply Chain Management	3-0-0	3	Odd
4	MS012	Service Operations Management	3-0-0	3	Even
5	MS028	Leadership and Talent Management	3-0-0	3	Odd
6	MS022	Change Management	3-0-0	3	Even
7	MS035	Management of Financial Services	3-0-0	3	Odd
8	MS040	Security Analysis and Portfolio Mgt.	3-0-0	3	Even
9	MS049	Service Marketing	3-0-0	3	Odd
10	MS048	Marketing Research	3-0-0	3	Even

NOTE: A Minor in Management is open to student(s) from other discipline subject to successful completion of the minimum total of 21 credits in Management minor with a minimum of 6 CGPA. A student can opt for the courses depending on the convenience. For example: MS601 and MS605 are offered in 7th semester. A student can opt for these courses along with his regular courses in 7th semester OR he can take one of the two courses in 7th semester and the other in his 9th semester. This reduces the credit load in a particular semester. In addition, if a given course is floated in summer semester, the student can also opt for the same in summer semester.

SYLLABUS
SEMESTER - I

1	**Code of the subject**	EE101
2	**Title of the subject**	Fundamentals of Electrical and Electronics
3	**Prerequisite**	NA
4	**L-T-P**	3-0-2
5	**Learning Objectives of the subject**	After the completion of the course, the students will be able to: • Demonstrate the use of semiconductor diodes in various applications. • Discuss and explain the working of transistors, their configurations and applications. • Apply networks laws and theorems to solve electric circuits. • Analyze transient and steady state response of DC circuits. • Explain and analyse the behaviour of transformer. • Elucidate the principle and characteristics of DC motor and DC generator.
6	**Brief Contents**	Fundamental laws of electrical engineering circuit parameters, Classification of devices of an electrical circuit; Basic devices: resistors, controlled sources, diodes, capacitors and inductors, ideal transformers, Methods of Analysis, DC Network Theorems, Basic circuit analysis methods: nodal, mesh and modified nodal-analysis; Transient analysis of RL, RC, and RLC circuits, Three Phase Circuits and Power Measurements, Single Phase Transformers, Three Phase Induction Machines, DC Machines Semiconductor Materials: Ge, Si, and GaAs; n-Type and p-Type Materials; Semiconductor Diode and types; Construction and application of Bipolar Junction Transistors; Common-Base Configuration, Common-Emitter Configuration, Common-Collector Configuration; Clipper and Clamper, Rectifiers, Basics of MOSFET.
7	**Contents for lab**	Familiarization with CRO, DSO and Electronic Components, Diodes characteristics - Input-Output and Switching, BJT and MOSFET Characteristics, Zener diode as voltage regulator, Rectifiers, Clippers and Clampers, Network laws and theorems, Measurement of R,L,C parameters, A.C. series and parallel circuits, Measurement of power in 3 phase circuits, Reactance calculation of variable reactance choke coil, open circuit and short circuit tests on single phase transformer, Starting of rotating machines.
8	**Text /references**	• Electronic Devices and Circuit Theory by R.L. Boylestad and L. Nasheisky, Pearson. • Basic Electrical Engineering by J. Nagrath and D. P. Kothari, TATA Mc Graw Hill. • Electric Circuits by D. A. Bell, Oxford Higher Education. • Modern Semiconductor Device Physics by S.M. Sze, Wiley.

		• Electrical Technology by E. Hughes,Pearson Education. • Electrical Engg Fundamentals by V. Del Toro, PHI Learning. • Electronic Devices and Circuits by Milliman, J. and Halkias, C.C., Tata McGraw Hill. • Introduction to Electrical Engineering by Naidu, M.S. and Kamashaiah, S., Tata McGraw Hill.

1	**Code of the subject**	ES101
2	**Title of the subject**	Engineering Physics
3	**Prerequisite**	Basic knowledge of fundamentals of physics
4	**L-T-P**	3-0-2
5	**Learning Objectives**	Engineering Physics offers a multidisciplinary undergraduate program spanning engineering and physics in which fundamental physical principles are used to address research problems of technological importance at the frontiers of engineering and science. It promotes the understanding of the physical environment while discovering how physics is applied to problem-solving in our changing high-tech world. The engineering physics curriculum is designed to fulfill the educational requirements for professional work in various fields of applied science which are based upon a thorough knowledge of physics and foundation of basic scientific principles as well as the theoretical knowledge and skills required for specific engineering applications. Engineering physicists perform research and development in various industries pertaining to fields of telecommunications, microelectronics, lasers, fiber optics, nanotechnology and quantum computers.
6	**Brief Contents**	**Quantum Physics**: Black body radiation, Planck's hypothesis, wave particle duality, de-Broglie Hypothesis, Heisenberg uncertainty principle, photoelectric effect, Compton effect, phase and group velocity, wave function & its physical significance, Schrodinger's wave equation, Applications of Schrodinger equation. **Electrodynamics**: Maxwell's equations: differential and integral forms, significance of Maxwell's equations, displacement current and correction in Ampere's law, electromagnetic wave propagation, transverse nature of EM waves, applications, pointing vector & Poynting theorem. **Physics of Materials**: Types of Solids, Miller indices, Crystal structure, crystal systems, energy bands in solids, classification of solids, conductivity in metals and concepts of Fermi level, effective mass and holes, phonons, bulk and nanomaterials. Synthesis and characterization techniques, Graphene and 2D materials and its applications. **Laser and Fiber Optics**: Principles of lasers, Einstein Coefficients and their relations, Types of Lasers and their applications. Concept of optical fibers and types of optical fibers, modes of propagation, fiber optic communication, optical fiber sensors, connector and couplers.
8	**Contents for lab**	Practical experiments based on theory contents.
9	**Text /references**	• Engg. Physics- Kakani & Kakani, CBS Publications. • David J Griffith, *Introduction to Quantum Mechanics,2*nd ed. , PHI, 2013. (Text Book). • Avadhanulu, M. N, & Kshirsagar, S. G., *A Textbook of Engineering Physics*, S. Chand, 2014. (Text Book) • Neeraj Mehta, *Applied Physics for Engineers*, PHI Learning Pvt. Ltd., 2011. (Text Book) • Fiber optic communication- J Keiser (McGraw Hill) (Text Book) • David J Griffith, *Introduction to Electrodynamics*, 4th ed. , PHI, 2014. (Ref.).

		• Paul Dirac, *Principles of Quantum Mechanics*, 4th ed., Oxford Uni. Press, 2004. (Ref.) • Kittel, C., *Introduction to Solid State Physics*, 8th ed., Wiley, 2014. (Ref.) • Malik and Singh, Engg Physics, TMH

1	**Code of the subject**	ES102
2	**Title of the subject**	Engineering Mathematics
3	**Any prerequisite**	None
4	**L-T-P**	3-1-0
5	**Learning Objectives**	• To explore the connections of mathematical foundation courses (Algebra, Calculus and Differential Equations) to the mathematics in the later engineering subjects. • To provide platform for the exchange of ideas, practices and pedagogy in the mathematics education in engineering and technical institutions.
6	**Brief Contents**	Vector spaces over arbitrary field, subspaces, linear combination, spanning set, linear dependence and independence of vectors, basis and dimension of vector spaces. Linear Transformation, The Null Space and the Range Space of a **Linear Transformation,** Rank, Nullity, Rank-Nullity Theorem, Algebra of linear transformations, Isomorphism, Matrix representation, Linear functionals, Annihilator, Transpose of a linear transformation. Matrix representation, matrix representation of a linear transformation, Rank of a matrix - echelon form, normal form, types of matrices-symmetric, skew-symmetric, Hermitian, skew-Hermitian, orthogonal, unitary matrices, consistency of system of linear equations (Homogeneous and Non-Homogeneous). Eigen values and Eigen vectors and their properties (Hermitian, Skew-Hermitian, Unitary matrices), Characteristic equations, Cayley-Hamilton theorem (without proof), Diagonalisation, Inner product, Norms of vectors, orthogonal vectors, Cauchy Schwarz Inequality, Triangle inequality. Introduction of function of two variables, Limit, Continuity, Partial differentiation, Differentiations, Maxima and minima for a function of several variables, Method of Lagrange multipliers with one subsidiary condition, Applications of maxima and minima with illustrative examples, Jacobians- Simple problems.
7	**Contents for lab**	Not applicable
8	**Text /references**	1. Linear Algebra and its Applications, Gilbert Strang. 2. Fundamentals of Linear Algebra, James B. Carrell 3. Functions of Several Variables, Wendell Fleming

1	**Code of the subject**	EE102
2	**Title of the subject**	Engineering Design Principles
3	**Any prerequisite**	None
4	**L-T-P**	2-0-2
5	**Learning Objectives**	The course should enable the students to: • Widen students' knowledge on design process. • Enable Students to attain knowledge on tools used in Design Methods. • Create an understanding on the process of material selection and design. • Develop in depth knowledge on Engineering statistics and reliability. • Create awareness on legal and ethical issues in Design an Quality Engineering.
6	**Brief Contents**	Design process, Morphology of Design, Design Drawings, Computer Aided Engineering, Designing of, Product life cycle, Human Factors in Design, Industrial Design. Design Methods, Creativity and Problem Solving, Product Design Specifications, Conceptual design, Embodiment Design, Finite Element Modeling, Optimization, Search Methods, Material Selection Processing and Design, Engineering Statistics and Reliability, Legal and Ethical Issues in Design and Quality Engineering
7	**Contents for lab**	Create geometric constructions; drawing parallel and perpendicular lines, and to construct circles, arcs, tangencies, and irregular curves, Apply orthographic projection method to obtain: Multiview , auxiliary view and section view of an object, Create 2-D computer drawing, Create 3-D computer drawing : using Computer Aided Design (CAD) software
8	**Text /references**	• Fundamentals of Engineering Drawing by W.J. Luzadder and J.M. Duff, PHI. • Engineering Design - "A Materials and Processing Approach" by Dieter, George E., McGraw Hill. • Product Design and Development by Karl T. Ulrich and Steven D. Eppinger, McGraw Hill. • Engineering Design by Pahl, G, and Beitz, W., Springer – Verlag, NY. • Elements of Engg. Design by Ray, M.S., Prentice Hall Inc. • The principles of Design by Suh, N. P., Oxford University Press, NY. • Visualization, Modeling, and Graphics for Engineering Design by D.K. Lieu and S.A. Sor, Cengage Learning. • Fundamentals of Computer Graphics by Shirley, Peter, Michael Ashikhmin, Steve Marschner, CRC Press.

1	**Code of the subject**	IT101
2	**Title of the subject**	Principles of Computer Programming
3	**Prerequisite**	No
4	**L-T-P**	3-0-2
5	**Learning Objectives**	To understand the basic principles of programming languages. To provide design & development of C and Python programming skills. To introduce problem solving methods and program development.
6	**Brief Contents**	Basics of Computer Languages C, Compilers, Interpreter, Programming Environments and Debugging: types of errors and debugging techniques. Programming features: Data types, Expressions and Operators, Control statements, Iterations. Functions: Scope of variables, call by value, call by reference, Recursion, Pointers. Array, String, Structures and Unions. File handling, File redirection, File pointers. Applications of C programming concepts in different data structures. Python: Introduction, Program Organization, Functions, Modules and Libraries.
7	**Contents for lab**	Experiments are based on the theoretical contents and their applications
8	**Text/references**	1. Kernighan, B.W. and D. M. Ritchie (1998): The C programming language, 2nd ed. Prentice Hall of India. 2. Kanetkar, Y (2016): Let us C, 15thed .BPB Publications. 3. King K.N (2008): C Programming: A Modern Approach. 2nd ed. W. W. Norton & Company.

1	**Code of the subject**	HS 101
2	**Title of the subject**	Freshman Skills
3	**Any prerequisite**	No
4	**L-T-P**	2-0-0
5	**Learning Objectives**	To improve their Personal Skills and Attributes, Study Skills and academic preparation, and learn Community Service.
6	**Brief Contents**	Personal Skills and Attributes Focus: Self-Awareness, Self-Management, and Character Development, Institute personnel and available services, the rotating schedule, acceptable use of social media, opportunities for involvement in extracurricular clubs and sports, effective time-management skills, positive character traits, building self-awareness. Study Skills and Academic Preparation Focus: The Principles of Learning, Establishing Strong Study Skills, Developing an Academic , Pathways, Personal Goals, identify personal post-secondary goals, inherent aptitudes,

		exploring post-secondary options, academic requirements for future goals, financial requirements for future goals, local and global economics, societal trends, cultural trends, Possible linguistic needs, transferable skills, resume foundations
7	**Text /references**	

1	**Code of the subject**	• HS102
2	**Title of the subject**	• Sports and Physical Education
3	**Prerequisite**	• No
4	**L-T-P**	• 0-1-2
5	**Learning Objectives**	• Students will get knowledge and understanding of the facts, concepts and practice relating to a range of sports-both indoor and outdoor. • To teach the students how to keep them fit, to increase his/her concentration, team coordination ability, which will help them as a professional.
6	**Brief Contents**	• he course will be taught in two components • Theory, Sport History, Human Anatomy, Stress Management/ Meditation/Yoga, Important tournaments and its players, Rules and Field Requirements, Sport Equipment, Sports Psychology, Role of IT in sports
7	**Contents for Field Sessions**	• Indoor/ Outdoor: Cricket/ Football/ Volleyball/ Basketball/Badminton/ Table-Tennis/ Lawn-Tennis/ Athletics/ Yoga
8	**Text/references**	• Nation at Play: Ronojoy Sen • The Art of Captaincy: What Sports teaches us about Leadership by Mike Brearley • The Anatomy of Exercise and Movement for the Study of Dance, Pilates, Sports, and Yoga by Jo Ann Staugaard-Jones • Stress and Its Management by Yoga, by K.N. Udupa, R.C. Prasad • THE WINNING WAY: Learning from Sport for Managers by Anita Bhogle, Harsha Bhogle • Think Like a Champion by Webster, Rudi V. • Attitude is Everything, by Jeff Keller

SEMESTER – II

1	**Code of the subject**	EE103
2	**Title of the subject**	Digital Electronics
3	**Any prerequisite**	NA
4	**L-T-P**	3-0-2
5	**Learning Objectives of the subject**	After the completion of the course, the students will be able to: • Recognize and apply the number systems and Boolean algebra. • Reduce Boolean expressions and implement them with Logic Gates. • Analyze, design and implement combinational and sequential circuits
6	**Brief Contents**	Boolean algebra, K-maps, logic gates, Number Systems, Design of combinational circuits, Design of sequential circuits, Introduction to digital logic families, Data processing and conversion: Sample and hold circuits, ADCs and DACs; Basic memory circuits ROM, RAM and PLA.
7	**Contents for lab**	Implementation of digital logic using switching circuits, Study of universal gates, Design of a 1-bit Full Adder/Subtractor using logic gates, Design and implementation of a 4-bit binary ripple, adder using logic gates, 4 X 3 bit binary multiplier using logic gates, Study of code converters (BCD to excess-3, binary to gray and gray to binary), Study of combinational MSI circuits – 1-bit half/full, adder, 1-bit half/full subtractor and 1-bit magnitude, comparator, Study of sequential circuits – Implementation of Flip-Flops, Design of a synchronous decade counter, Design of 4-bit parallel input serial output (PISO), shift-register.
8	**List of text books/references**	**Text/ Reference Books:** • Digital Circuits and Logic Design by S. Lee, Prentice Hall India. • Digital Principles and Applications by D. P. Leach, A. P. Malvino and G. Saha, McGraw Hill Education. • Digital Design by M. M. Mano and M.D. Ciletti, Pearson, Prentice Hall. • Digital Principles and Design by Donald D Givone, McGraw-Hill. • Digital Design: Principles and Practices by John F Wakerly, Pearson. • Digital Electronics: Principles Design and Applications by AK Maini. • Digital Integrated Electronics by H. Taub and D. Schilling, McGraw Hill.

1	**Code of the subject**	ES103
2	**Title of the subject**	Probability and Statistics
3	**Any prerequisite**	No
4	**L-T-P**	3-1-0
6	**Learning Objectives of the subject (in about 50 words)**	To introduce students about basics of probability theory and statistics.
7	**Brief Contents (module wise)**	Introduction: Measures of Central Tendency, Measures of Dispersion, Measures of Skewness, and Measures of Kurtosis, Moments about mean and about any point. Probability: Basic terminology, Types of Probability, Probability rules, Bayes Theorem, Probability distribution, Binomial, Poisson, Negative-Binomial, Geometric, Hyper-geometric, Uniform, Exponential, Normal distribution, log-normal, beta and gamma distributions. Sampling: Types and Sampling Distribution, Random sampling, Relationship between sample size and standard error, Central limit theorem, Weak law of large numbers, estimation theory (MLE). Testing Hypotheses-1: One Sample Tests, Basics to hypotheses, Inference of single mean/proportion, Measuring the power of hypotheses test (z-test and t-test), P-values, interval estimation. Testing Hypotheses-2: Two Sample Tests, Testing for differences between means/proportions. Testing Hypotheses-3: Chi–Square distribution, Chi–Square as a test of independence, Testing the appropriateness of a distribution, Analysis of variance (ANOVA), Inference about a population variance (Chi-square test, F-test). Nonparametric tests (Self Study): The sign-test, Rank-sum, test of randomness, Kolmogorov-Smirnov, Anderson-Darling test. Simple Regression and Correlation: Estimation using the regression line, Correlation analysis, making inferences about population parameters. Multiple Regression: Multiple regression and correlation analysis, Finding multiple regression equation, Inferences about population parameters.
8	**Contents for lab**	NA
10	**List of text books/references**	1. Johnson, R. A., Miller & Freund's Probability and statistics for engineers, Pearson Education, 2000. 2. Ross S. M., Introduction to Probability and Statistics for Engineers and Scientists 5th Edition, Elsevier. 3. Hogg R. V., Craig A., Probability and Statistical Inference, 6th edition, Pearson Education.

1	**Code of the subject**	IT102
2	**Title of the subject**	Data Structures
3	**Any prerequisite**	Basic Computer Programming
4	**L-T-P**	3-0-2
5	**Learning Objectives of the subject (in about 50 words)**	*To enable* students to learn how to store data while maintaining the data's correctness and efficiency in a computer program.
6	**Brief Contents**	Objected oriented programming, List, Sequence, Stack Queue, Program correctness and analysis, Dictionaries, Searching, Trees, traversals, binary search trees, optimal and average BSTs. Balanced BST: AVL Trees, 2-4 trees, red-black trees, B-trees. Sorting, Graphs and Traversal, Graphs algorithms, Geometric data structures, etc.
7	**Contents for lab (If applicable)**	Experiments will be conducted based on the topics covered.
8	**List of text books/references**	1. Data Structures and Algorithm Analysis in C++, by Mark Allen Weiss (Pearson 2007). 2. Goodrich, M. and Tamassia, R. *Data Structures and Algorithms in Java* , John Wiley and Sons, Inc. 3. Fundamentals of Data Structures in C -- by Horowitz, Sahni and Anderson-Freed (Silicon Press 2007). 4. Data Structure Using C and C++ -- by Y. Langsam, M. J. Augenstein and A. N. Tanenbaum (Pearson Education, 2nd Edition, 2015).

1	**Code of the subject**	EE104
2	**Title of the subject**	Hardware Workshop
3	**Any prerequisite**	NA
4	**L-T-P**	1-0-4
5	**Learning Objectives of the subject**	• To familiarize students with various electronic devices and their specifications. • Develop skill for Design and testing of different types of electronic subsystems using Analog and Digital IC's • Familiarize students with PCB layout tool to prepare PCB print for assigned projects. • Develop skills of writing a structured technical document for project and its presentation. • Develop the ability to diagnose faults and their rectification.

6	**Brief Contents**	Familiarization /Identification of electronic components with specification and Functionality, type, size, colour coding, package, symbol, cost etc. Active, Passive, Electrical, Electronic, Electro-mechanical, Wires, Cables, Connectors, Fuses, Switches, Relays, Crystals, Displays, Fasteners, Heat sink, Arduino Uno, Rasberry Pi, ESP8266 Module, HC 05 Bluetooth Module. Drawing of electronic circuit diagrams using EDA tools, Interpret data sheets of discrete components and IC's, Estimation and costing, Familiarization/Application of testing instruments and commonly used tools like Multimeter, Function generator, Power supply, CRO etc. Soldering iron, De-soldering pump, Cutters, Wire strippers, Screw drivers, Hot air soldering and desoldering station etc., Testing of electronic components Resistor, Capacitor, Diode, Transistor etc. using multimeter and different IC's using IC tester, Design and fabrication of a single sided PCB for a simple circuit with manual etching, Assembling electronic circuit/system on general purpose PCB, testing and show the functioning
7	**Contents for lab**	Hardware Based Projects for smart city applications, industries, healthcare, education, agriculture, transportation, power, including social development sector etc.
8	**List of text books/references**	**Text/ Reference Books:** • https://electronicsforu.com/ • https://electronicsforu.com/tag/mini-projects. • Electronics Lab Manual by K. A. Navas, PHI. • Electronic Projects in Workshop by R.A Penfold, Newnes Technical Books. • Electronic Designer's Handbook by T.K. Hamingway, Business Books Limited. • Digital Circuits and Logic Design by S. Lee, Prentice Hall India. • Digital Principles and Applications by D. P. Leach, A. P. Malvino and G. Saha, McGraw Hill Education. • Digital Design by M. M. Mano and M.D. Ciletti, Pearson, Prentice Hall.

1	**Code of the subject**	IT103
2	**Title of the subject**	Object Oriented Programming
3	**Prerequisite**	Programming concepts
4	**L-T-P**	3-0-2
5	**Learning Objectives**	To develop programming skill and to solve engineering related problems using Object Oriented Programming Concepts.
6	**Brief Contents**	Object oriented thinking: Need for OOP Paradigm, Procedural programming vs object oriented programming, object oriented concepts. Class and object concepts: Difference between C structure and class, specifying a class, Defining members inside and outside class, etc.

		Constructor and destructor concepts, Operator overloading and Type Conversion, Inheritance and polymorphism concepts Working with files: Classes for file stream operations, opening and closing files, File opening modes, file Pointers, Error handling during file operations, command line arguments. Templates: Class template, class template with parameter, function template, function template with parameter and Exception handling
7	**Contents for lab**	Experiments are based on the theoretical contents and their applications
8	**List of text books/references**	1. HM Deitel and PJ Deitel ―C++ How to Program, Seventh Edition, 2010, Prentice Hall. 2. Brian W. Kernighan and Dennis M. Ritchie, ―The C programming Language, 2006, Prentice-Hall. 3. E Balagurusamy, ―Object oriented Programming with C++, Third edition, 2006, Tata McGraw Hill. 4. Bjarne Stroustrup, ―The C++ Programming language, Third edition, Pearson Education. 5. Horstmann ―Computing Concepts with C++ Essentials,Third Edition,2003, John Wiley. 6. Robert Lafore, ―Object Oriented Programming in C++, 2002, Pearson education.

1	**Code of the subject**	HS103
2	**Title of the subject**	**Ecology and Environment Sciences**
3	**Prerequisite**	No
4	**L-T-P**	2-0-0
5	**Learning Objectives**	Upon course completion, students will be able to: 1. Understand the basic principles of ecology and ecosystem function. 2. Describe the interrelationships between land, sea, the atmosphere, and the living things that occupy these environments. 3. Determine the role that humans play in affecting the characteristics of the environment. 4. Evaluate current environmental issues and problems including the solutions and management practices that have been used or offered to address these issues and problems.
6	**Brief Contents**	**Environment and Human Intervention** Environment: Definition, environment and ecology, importance of environment, need of public awareness, sustainable ecosystem, human activities, and environment- agriculture, transport, mining, Environmental Impact Assessment (EIA) **Environmental Pollution** Water pollution, waste-water treatment- case studies, land pollution, air pollution, noise pollution, Pollution and public health issues, pollution and environment, greenhouse effect **Environment Protection Policies** Environment policies, forests, biosphere reserves, flora and wildlife, environment laws/acts, environmental movements, environment ethics and awareness, role of government and non-

		government organizations, introduction to GST-CGST and SGST, Swachh Bharat Abhiyan- initiatives, responsibilities and future aspects, Cash-less economy-modes of payment-money transfer (advantages and disadvantages), Making in India concept. **Applied issues in Ecology** Sustainability, habitant degradation, degradation of urban and industrial landscape, conservation, threats to biodiversity, evolutional ecology
7	**Contents for lab**	NA
8	**Text /references**	1. Townsend, C.R., Begon, M. and Harper, J.L., 2003. *Essentials of ecology* (Ed. 2). Blackwell Science. 2. R. Rajagopalan, 2011.*Environmental Studies*, Oxford IBH Pub. 3. Martell, L., 2013. *Ecology and Society: An introduction.* John Wiley & Sons.

1	**Code of the subject**	CS104
2	**Title of the subject**	Mobile Application Technologies
3	**Any prerequisite**	
4	**L-T-P**	0-1-2
5	**Learning Objectives**	To develop the basic skills of using Android IDE and Android SDK for implementing Android applications
6	**Brief Contents**	Introduction, UX development, Testing and debugging of front end and back end application components and their interaction. .
7	**Contents for lab**	Experiments are based on the theoretical contents and their applications
8	**List of text books/references**	1. Android Programming: The Big Nerd Ranch Guide 4th Edition, Bill Phillips, Brian Hardy 2. The Busy Coder's Guide to Android Development, Mark Murphy.

SEMESTER – III

1	**Code of the subject**	HS201
2	**Title of the subject**	**Indian culture, Ethics and Morale**
3	**Prerequisite**	No
4	**L-T-P**	2-0-0
5	**Learning Objectives**	Upon course completion, students will be able to: 1. Identify and analyze an ethical issue in the subject matter under investigation or in a relevant field. 2. Articulate what makes a particular course of action ethically defensible. 3. Assess their own ethical values and the social context of problems. 4. Evaluate the concept of karma that helps to maintain work life balance. 5. Demonstrate contemporary approaches to leadership who inspires human being to reach their goals
6	**Brief Contents**	**Human Values and Ethics** Morals, values and ethics-integrity, work ethics, service learning, civic virtue, respect for others, living peacefully, caring, sharing, honesty, courage, cooperation, commitment, empathy, self-confidence, character, spirituality. **Work Ethos and Values** Meaning of work ethos, levels, dimensions, steps, factors responsible for poor work ethos. Meaning of values, features, values for Indian managers, relevance of value-based management in global change, impact of values on stakeholders: employees, customers, government, competitors and society, values for managers, trans-cultural human values in management and management education, secular v/s spiritual values in management, importance of value system in work culture **Indian Ethos-An Overview** Meaning, features, need, history, relevance, principles practised by Indian companies, requisites, elements, role of Indian ethos in managerial practices, management lessons from Vedas, Mahabharata, Bible and Quran. **Contemporary Approaches to Indian Ethos** Contemporary approaches to leadership, joint Hindu family business, leadership qualities of karta, Indian systems of learning - gurukul system of learning, advantages- disadvantages of karma, importance of karma to managers, nish kama karma, laws of karma, law of creation, law of humility, law of growth, law of responsibility, law of connection, corporate karma leadership.
7	**Contents for lab**	NA

8	**Text /references**	1. Khandelwal, N. M., 2011. *Indian Ethos and Value for Management.* Himalaya Publishing House, 1st Edition. 2. Govindarajan, M., Natarajananad, S., SenthilKumar V.S., 2009. *Engineering Ethics includes Human Values.* PHI Learning Pvt. Ltd. 3. Nandagopal R., Ajith Rn., 2010. *Indian Ethos and Values in Management*. Tata McGraw Hill Education, 1st Edition. 4. Murthy, P.S.R., 2013. *Indian Culture, Values and Professional Ethics*. BS Publication

1	**Code of the subject**	IT201
2	**Title of the subject**	Discrete Structures
3	**Prerequisite**	Engineering Mathematics
4	**L-T-P**	3-1-0
5	**Learning Objectives**	To prepare for a background in abstraction, notation, and critical thinking for the mathematics most directly related to computer science. To foster rigorous thinking skills that can enhance the quality of work of computing professionals. To relate and apply these concepts to practical applications of computer science.
6	**Brief Contents**	Fundamentals of Logicand their use in program proving, resolution principle. Set Theory and Functions, Graph Theory, Group Theory, Elementary Combinatorics etc.
7	**Text/references**	1.Bernanrd Kolman, Robert C Busby, S.Ross, Discrete Mathematical Structures, PHI Learning 2. Kenneth H. Rosen, Discrete Mathematics and Its Appications, Tata McGraw-Hill Edition 3. I.N. Herstein, Topics in Algebra, John Wiley Publications 4. Ralph P. Grimaldi, B.V. Ramana, Discrete and Combinatorial Mathematics, Pearson Education

1	**Code of the subject**	IT202
2	**Title of the subject**	Computer Organisation and Architecture
3	**Any prerequisite**	Digital Electronics, Principles of computer programming
4	**L-T-P**	3-0-2
5	**Learning Objectives**	To understand the Organization and architecture aspects of computer followed by the Application Binary Interfaces.

6	**Brief Contents**	Basic functional blocks of a computer, introduction to Instruction set architecture of a CPU and instruction sets of some common CPUs. Data representation, Computer arithmetic, Control unit design, Memory system, Peripheral devices and their characteristics, Performance enhancement techniques Pipelining, Memory organization.
7	**Contents for lab**	Experiments are based on the theoretical contents and their applications
8	**Text/references**	1. Computer Organization and Design: The Hardware/Software Interface, David A Patterson, John L. Hennessy, 4th Edition, Morgan Kaufmann. 2. Computer Architecture and Organization by William Stallings, PHI Pvt. Ltd., Eastern Economy Edition.

1	**Code of the subject**	IT203
2	**Title of the subject**	Design and Analysis of Algorithms
3	**Prerequisite**	Data Structures, Principles of Computer Programming, Engineering Mathematics
4	**L-T-P**	3-0-2
5	**Learning Objectives**	To understand the performance aspects of algorithms in programming the computing systems
6	**Brief Contents**	Introduction, Asymptotic complexity, Searching in list, Concepts of graphs and shortest path estimation algorithms, Divide and conquer approaches, Search Trees, Greedy : Interval scheduling, Greedy :Proof strategies,Greedy : Human coding, Dynamic Programming: weighted interval scheduling Dynamic Programming, Intractability: NP completeness, Intractability :reductions and examples
7	**Contents for lab**	Experiments are based on the theoretical contents and their applications
8	**Text/references**	1. Introduction to Algorithms (Eastern Economy Edition) by Thomas H Cormen and Charles E Leiserson. 2. Design and Analysis of Algorithms by S Sridhar. 3. Design and Analysis of Computer Algorithms by AHO.

1	**Code of the subject**	IT205
2	**Title of the subject**	Database Systems
3	**Prerequisite**	No
4	**L-T-P**	3-0-2
5	**Learning Objectives**	To understand a Database application, the design and performance aspects from the perspective of Database systems of the past, present and future.
6	**Brief Contents**	Introduction to Databases, Relational Data Model, Relational Algebra, SQL and NoSQL concepts, Database Normalization, Indexing, Database Transactions, Recovery Systems, Transaction Schedules, Concurrency Control, Query Processing and Query Optimization.
7	**Contents for lab**	Experiments are based on the theoretical contents and their applications
8	**Text /references**	1. Abraham Silberschatz, Henry Korth, and S. Sudarshan. Database Systems Concepts (5ed.). McGraw-Hill, New York, USA. 2. Ramez A. Elmasri, Shankrant B. Navathe. Fundamentals of Database Systems Addison-Wesley Longman Publishing Co. 3. Paul DuBois. Mysql. New Riders Publishing 4. C. J. Date. Database in Depth: Relational Theory for Practitioners. O'Reilly Media, Inc. 5. Bipin C. Desai. An Introduction to Database Systems. West Publishing Co.

SEMESTER - IV

1	**Code of the subject**	MS619
2	**Title of the subject**	Entrepreneurship and Innovation
3	**Prerequisite**	No
4	**L-T-P**	2-0-0
5	**Learning Objectives**	Course is designed for preparing students to take of Entrepreneurial journey on the basis of innovative ideas. The content is highly focused to start venture to making business mature up-to international level.
6	**Brief Contents**	Entrepreneurship, Creativity and innovation, Business planning process, Institutions supporting entrepreneurs, Family businesses, International entrepreneurship opportunities, Informal risk capital and venture capital, Managing growth.
7	**Contents for lab**	No

1	**Code of the subject**	IT206
2	**Title of the subject**	Theory of Computation
3	**Prerequisite**	No
4	**L-T-P**	3-0-0
5	**Learning Objectives**	To introduce the mathematical foundations of computation, develop the ability to understand and conduct mathematical proofs for computation and algorithms.
6	**Brief Contents**	Finite Automata, Finite State system concepts, Regular Languages, Equivalence of NFA and DFA, Minimization of DFA- – Pumping Lemma for Regular. Grammars, Pushdown Automata, Turing Machines, Unsolvable Problems and Computable functions, Measuring and classifying complexity: Tractable and Intractable problems- Tractable and possibly intractable problems – P and NP completeness – Polynomial time reductions.
7	**Text /references**	1. Hopcroft J.E., Motwani R. and Ullman J.D, ―Introduction to Automata Theory, Languages and Computations, Pearson Education. 2. John C Martin, ―Introduction to Languages and the Theory of Computation, TMH, New Delhi. REFERENCES 1.Mishra K L P and Chandrasekaran N, ―Theory of Computer Science – Automata, Languages and Computation, Third Edition, Prentice Hall of India 2.Harry R Lewis and Christos H Papadimitriou, ―Elements of the Theory of Computation, Second Edition, Prentice Hall of India, Pearson Education, New Delhi. 3.Peter Linz, ―An Introduction to Formal Language and Automata, Third Edition, Narosa Publishers. 4.KamalaKrithivasan and Rama. R, ―Introduction to Formal Languages, Automata Theory and Computation, Pearson Education.

1	**Code of the subject**	IT207
2	**Title of the subject**	Operating Systems
3	**Prerequisite**	Computer Organization; Data Structures and Computer Programming
4	**L-T-P**	3-0-2
5	**Learning Objectives**	To study the importance of the operating system and its function, techniques of the operating system to achieve its goals as resource manager. Application interaction with

		the operating system and the operating systems interaction with the machine.
6	**Brief Contents**	Introduction and history of Operating systems, Process concepts and scheduling, Storage management, Processor management, Interprocess communication, CPU scheduling, Process Synchronization, Memory Management, Virtual memory concepts, Deadlocks, Device management, File management, File Systems, Free space Management: Bit vector, Linked list. Some case Studies of traditinal and modern operating systems.
7	**Contents for lab**	Experiments are based on the theoretical contents and their applications
8	**Text /references**	1. A. Silberschatz & P.B. Galvin, Operating System concepts and principles, Wiley India. 2. A. Tanenbaum, Modern Operating Systems', Prentice Hall India 3. W. Stallings, _Operating Systems: Internals and design Principles, Pearson Ed. 4. M.J. Bach, Design of Unix Operating system', Prentice Hall. Additional Reading: 1. D.M. Dhamdere, Operating Systems: a concept based approach', Tata McGraw-Hill Pubs. 2. G. Glass, Unix for programmers and users-a complete guide, Pearson Ed.

	Code of the subject	IT208
2	**Title of the subject**	Computer Networks
3	**Prerequisite**	User applications and some aspects of process and their interaction
4	**L-T-P**	3-0-2
5	**Learning Objectives**	The understand the purpose and overview of the Internetworking technology, issues, and approaches using top-down philosophy.
6	**Brief Contents**	Computer Networks and the Internet, Network Application Architectures, Processes Communication, Transport Services, Application-Layer Protocols, The Web and HTTP, Case Study: P2P Internet Telephony with Skype, Socket Programming with TCP and UDP; Transport Layer: Relationship Between Transport and

		Network Layers, Overview of the Transport Layer in the Internet, Principles of Reliable Data Transfer Services, Multiple Access protocols, Link-Layer concepts; Wireless and Mobile Networks, Cellular Internet Access, Mobile IP.
7	**Contents for lab**	Experiments are based on the theoretical contents and their applications
8	**Text /references**	Computer Networking: A top-down approach featuring the Internet / James F. Kurose , Keith W. Ross., 7th edition, Pearson.

1	**Code of the subject**	EE201
2	**Title of the subject**	Signals & Systems
3	**Any prerequisite**	Engineering Mathematics
4	**L-T-P**	3-1-0
5	**Learning Objectives of the subject**	This course trains students for an intermediate level of fluency with signals and systems in both continuous time and discrete time, in preparation for more advanced subjects in digital signal processing (including audio, image and video processing), communication theory, and system theory, control and robotics
6	**Brief Contents**	Classification of signals, Continuous-time and discrete-time signals, Basic system properties, Discrete-time LTI systems: convolution sum, Continuous-time LTI systems, Properties of LTI systems, Causal LTI systems described by difference equations (Natural, Forced, and Complete Response), Representation of Periodic (Continuous Time & Discrete-Time) Signals Using Fourier Series, Continuous-time Fourier transform, the discrete-time Fourier transform (DTFT), discrete Fourier transform (DFT) Sampling theorem, Laplace transform, z-transform.
7	**Contents for lab**	NA
8	**List of text books/references**	• Signals and systems by A.V. Oppenheim, A.S. Willsky and S. H. Nawab, Prentice Hall India. • Linear Systems and Signals by B. P. Lathi, Oxford University Press. • Signals & Systems by Simon & Haykins, John Wiley & Sons. • Digital Signal Processing: Principles, Algorithms and Applications by Proakis, PHI.

1	**Code of the subject**	IT209
2	**Title of the subject**	Graph Theory
3	**Any prerequisite**	N/A
4	**L-T-P**	3-0-2
5	**Learning Objectives of the subject (in about 50 words)**	To develop ability to solve real life problems, translating them one form to another, using appropriate mathematical and computational techniques. To prepare abstract and critical mathematical thinking, most directly related to computer science
6	**Brief Contents**	Introduction to graphs, connected graphs and shortest paths, trees, independent set coverings and matchings, vertex colorings, planar graphs, directed graphs, tournaments, spanning tree, cut-set, vector space of a graph, Applications of graph theory.
7	**Contents for lab (If applicable)**	N/A
8	**List of text books/references**	1. J.A. Bondy and U.S.R. Murty: Graph Theory and Applications. 2. West, Douglas B., Introduction to Graph Theory, Pearson Education, 2002. 3. Mott J.L., Kandel, A. and Baker T.P., Discrete Mathematics for Computer Scientists and Mathematicians, Prentice Hall of India, 2001. 4. Reinhard Diestel, Graph Theory, Springer International Edition, 2004. 5. D.B. West: Introduction to Graph Theory, Prentice-Hall of India/Pearson, 2009 6. Deo Narsingh, Graph Theory With Applications To Engineering And Computer Science, Prentice Hall of India, 1992.

SEMESTER – V

1	**Code of the subject**	MS603
2	**Title of the subject**	**Business Economics**
3	**Any prerequisite**	No
4	**L-T-P**	3-0-0
5	**Learning Objectives**	To equip students with the necessary theory and techniques and the ability to apply them in order to inform and enhance managerial decision making.
6	**Brief Contents**	Introduction to Economics; Nature and Scope of Management Economics, Significance in decision-making and fundamental concepts, Consumer behaviour and typical characteristics of Indian consumer, Consumer decision making process, Indian market: characteristics, Objectives of a firm, Demand Analysis, Law of Demand, Exceptions to the law of Demand, Determinants of Demand. Elasticity of Demand- Price, Income, Cross and

		Advertising Elasticity, Uses of Elasticity of Demand for managerial decision making, Measurement of Elasticity of Demand, Demand forecasting meaning, significance and methods, Supply Analysis, Law of Supply, Supply Elasticity, Analysis and its uses for managerial decision making, Production concepts & analysis, Production function, single variable-law of variable proportion, two variable-Law of returns to scale, Cost concept and analysis, short-run and long-run cost curves and its managerial use, Market Equilibrium and Average Revenue Concept, Market Structure: Perfect Competition, features, determination of price under perfect competition, Monopoly: Feature, pricing under monopoly, Price discrimination, Monopolistic: Features, pricing under monopolistic competition, product differentiation, Oligopoly: Features, kinked demand curve, cartels, price leadership, Pricing strategies Price determination, Full cost pricing, Product line pricing, Price skimming, Penetration pricing, National Income; Concepts and various methods of its measurement, Inflation, types and causes, Business cycle, Profit concept and major theories of profits; Dynamic Surplus theory, Risk & Uncertainty bearing theory and Innovation theory
7	**Contents for lab**	No

1	**Code of the subject**	EE206
2	**Title of the subject**	Microprocessor and Interfacing
3	**Any prerequisite**	EE103
4	**L-T-P**	3-0-2
5	**Learning Objectives of the subject**	Upon completion of this course, the student will be able to: • To develop background knowledge and core expertise in microprocessor. • To study the concepts and basic architecture of 8085, and 8086 processor. • To know the importance of different peripheral devices and their interfacing to 8086. • To know the design aspects of basic microprocessor. • To write assembly language programs in microprocessor for various application
6	**Brief Contents**	Microprocessors-Evolution and Introduction, Microprocessor based system, Origin of Microprocessor, Classification of Microprocessors, Types of Memory, I/O Devices, Technology Improvements Adapted to Microprocessors and Computers, Introduction to 8085 processor, Architecture of 8085, Microprocessor instructions, classification of instructions, Instruction set of 8085, Basic 80x86 Architecture, Role of Microprocessor in Micro Computer, Features of 8086, Internal Block Diagram of 8086, Execution Unit, Bus Interface Unit, Programming of x86 processor, Interrupt mechanism of x86 & Interfacing of chips, Advanced Processor Technologies

		Interfacing of Data Converters (D-To-A and A-To-D), Programmable Interfacing Devices Like 8255A PPI, 8253/8254 Timer, 8259A PIT, Serial I/O Concepts, SID And SOD, 8251A USART. Interfacing of above chips with 8085.
7	**Contents for lab**	Assembly language programs for 8085 and 8086, Programs involving Arithmetic & logical operations, Programs involving data transfer instructions, programs involving bit manipulation instructions, programs involving branch/ loop instructions, Interfacing Experiments.
8	**List of text books/references**	**Text/ Reference Books:** • Microprocessors and Interfacing by Douglas V. Hall • The 8051 Microcontroller and Embedded Systems by M.A. Mazidi and J. G. Mazidi, PHI. • The Intel Microprocessors by Barry B. Brey, Prentice Hall. • The 8088 and 8086 Microprocessors by Walter A. Triebel, Avtar Singh, Prentice Hall Inc. • 8086/8088 family: Design, Programming and Interfacing by John Uffenbeck, Prentice Hall. • Advanced Microprocessor and Peripherals, Architecture Programming and Interfacing by A. K. Ray and K. M. Burchandi, Tata McGraw Hill. • Microcontroller and Embedded Systems by M. A. Mazidi, Pearson Education. • 8051 Microcontroller and Embedded Systems by R. Kapadia, Jaico Publishing House. • Fundamentals of Microprocessors and Microcomputers by B. Ram, Dhanpat Rai Publications.

1	**Code of the subject**	IT302
2	**Title of the subject**	Compiler Design
3	**Prerequisite**	Theory of Computation
4	**L-T-P**	3-0-2
5	**Learning Objectives**	To design the front end of the compiler, scanner, parser, intermediate code generator, objectcode generator, and the parallel compilation strategies. To gain the ability to implement a parser etc.
6	**Brief Contents**	The structure of Compiler – Lexical analysis, Syntax analysis, LR parsers; Intermediate code generation concepts, Object code generation, Code optimization, Parallelizing compiler etc.

7	**Contents for lab**	Experiments are based on the theoretical contents and their applications
8	**Text /references**	1. Alfred V. Aho, Monica S.Lam, Ravi Sethi, Jeffrey D.Ullman, Compilers : Principles, Techniques and Tools, Second Edition, Pearson Education. 2. Randy Allen, Ken Kennedy, Optimizing Compilers for Modern Architectures: A Dependence-based Approach, Morgan Kaufmann Publishers. 3. Steven S. Muchnick, Advanced Compiler Design and Implementation‖, Morgan Kaufmann Publishers - Elsevier Science, India, Indian Reprint. 4. Keith D Cooper and Linda Torczon, Engineering a Compiler, Morgan Kaufmann Publishers Elsevier Science. 5. V. Raghavan, Principles of Compiler Design, Tata McGrawHill Education Publishers.

1	**Code of the subject**	IT303
2	**Title of the subject**	Computer Graphics
3	**Prerequisite**	
4	**L-T-P**	3-0-2
5	**Learning Objectives**	To expose onto the primary tools by which the flood of information from Computational Science is analyzed.
6	**Brief Contents**	Introduction of computer graphics, Graphic Displays and the algorithms; Three Dimensional aspects of graphics; Transformations; Windowing and Clipping concepts; Hidden Lines and Surfaces etc.
7	**Contents for lab**	Experiments are based on the theoretical contents and their applications
8	**List of text books/references**	1.Computer Graphics, C Version Donald D Hearn, M. Pauline Baker 2. Computer Graphics: Principles and Practiceby James D. Foley, Andries van Dam , Steven K. Feiner

1	**Code of the subject**	IT304
2	**Title of the subject**	Trustworthy Artificial Intelligence
3	**Prerequisite**	Algorithms and Data Structures

4	**L-T-P**	3-0-2
5	**Learning Objectives**	To understand the techniques and concepts related to machine based reasoning systems through various applications of AI
6	**Brief Contents**	Introduction to AI and intelligent agents. Problem solving methods in AI, Informed and uninformed search strategies, knowledge representation, Uncertain Knowledge and Reasoning, Probabilities, Bayesian Networks. Overview of different forms of learning, Learning Decision Trees, Artificial Neural Networks and Fuzzy Approaches; Logic in AI, Prolog, Modern AI language and tools etc.
7	**Contents for lab**	Experiments are based on the theoretical contents and their applications
8	**Text /references**	1. S. Russell and P. Norvig, Artificial Intelligence: A Modern Approach, 2nd Ed, Prentice Hall, 2003 2. Elaine Rich and Kevin Knight. Artificial Intelligence, Tata McGraw Hill Reference Books: 1. Patrick Henary Winston, Artificial Intelligence, Pearson publication 2. Deepak Khemani. A First Course in Artificial Intelligence, McGraw Hill Education (India) 3. Eugene Charnaik and Drew McDermott, Introduction to Artificial Intelligence, Pearson publication 4. Nils John Nilsson, The Quest for Artificial Intelligence: A History of Ideas and Achievements, Morgan Kaufman 5. Dennis Rothman, Artificial Intelligence by Example

SEMESTER – VI

1	**Code of the subject**	ENxxx
2	**Title of the subject**	Art of Engineering Research
3	**Prerequisite**	Engineering mathematics, programming
4	**L-T-P**	2-0-0
5	**Learning Objectives**	**Knowledge and understanding** to recognize the ethical principles of conducting applied research, to identify various sources of information, to identify and formulate research problem. **Intellectual skills** to carry out literature searches and ability to critically evaluate literature, to design/conduct

		experiments, devise appropriate measurements, analyse data and form conclusions. **Professional and practical skills** to undertake and manage a research projects, to document all aspects of the development of an engineering project. **General and transferrable skills** to apply project management skills to research activities, to communicate effectively in written and oral ways.
6	**Brief Contents**	**Introduction and Overview:** Introduction to Research Methodology, Research types and applications, Research management, Research phases, Research problem formulation, Academic honesty. **Literature Review:** How to read journal papers, Literature review process, Information sources, Synthesizing information, Writing the literature review, Referencing. **Thesis Proposals:** Thesis Proposal main sections, How to write Thesis Proposals. **Modeling and Simulation:** MATLAB Tool Boxes overview, Building math models in MATLAB or any other tool, Simulation and results analysis. **Engineering Experiments:** Experiment set-up (Lab Work), Running experiments (Lab Work), Data collection and analysis. **Writing Research Papers:** How to write research paper, Technical writing, Where to submit, How to submit. Writing and submit research paper.
7	**Text /references**	1. Engineering Research Methodology: A Computer Science and Engineering and Information and Communication Technologies Perspective by Krishnan Nallaperumal 1st edition PHI Learning Privtae Limited, New Delhi, India 2014 2. Research Methodology: Methods and Techniques by Kothari 2nd edition 2004 3. Research Guide for Post-Graduate Students by Andre Buys. University of Pretoria 2007 4. Emerging Methodologies in Engineering Education Research by Case and Light, Journal of Engineering Education 2011 5. Designing Requirements Engineering by Wieringa and Heerkens 6. Development Research Methods: Creating Knowledge from Instructional Design and Development Practice by Richey and Klein. Journal of Computing in Higher Education 2005 7. Scientific Research Methodologies and Techniques by Luis Camarinha-Matos 8. How to Read an Engineering Research Paper by William Griswold, UC at San Diago

		10. How to Write an Effective Literature Review by Sonia Martinez, University of California 11. Models of Dissertation Research in Design by Poggenpohl and Sato, Illinois Institute of Technology 12. On the ability to design engineering experiments by Du, Furman, and Mourtos. 8th UICEE Annual Conference on Engineering Education 13. How to write a research journal article in engineering and science by Socolofsky

1	**Code of the subject**	IT305
2	**Title of the subject**	Optimization Techniques
3	**Any prerequisite**	Exposure to relevant concepts at the undergraduate level and instructor consent
4	**L-T-P**	3-1-0
5	**Learning Objectives of the subject (in about 50 words)**	The aim of this course is to have some basic understanding of provably convergent computational schemes for constrained optimization problems.
6	**Brief Contents**	Solving Linear constraint optimization problem, Non-linear programming: First and second order conditions. Iterative methods and associated issues. Line search methods: Stationarity of limit points of steepest decent, successive step-size reduction algorithms, etc. Hessian-based algorithms: Newton, Conjugate directions and Quasi-Newton methods. Constrained optimization problems: Lagrange variables, Karush-Kuhn-Tucker conditions, Regular points, Sensitivity analysis. Quadratic programming, Convex problems. Mixed integer models; Interior point methods; Iterative schemes for constrained problems; Sequential quadratic programming methods; Barrier methods; Trust-region methods, etc.
7	**Contents for lab (If applicable)**	Experiments will be based on the theory covered as above.
8	**List of textbooks/references**	1. Boyd, Stephen, Stephen P. Boyd, and Lieven Vandenberghe. Convex optimization. Cambridge university press, 2004. 2. D. Bertsekas Nonlinear programming, 2nd Edition, Athena Scientific, 1999, Nashua. 3. V. Chvatal Linear programming, W. H. Freeman, 1983, New York. 4. E. K. P. Chong and S. Zak, An introduction to optimization, 2nd Edition, 2004, John Wiley and Sons (Asia) Pvt. Ltd., Singapore 5. R. Fletcher, Practical methods of optimization, 2nd Edition, Wiley, 2000, New York 6. D. Luenberger, Linear and nonlinear programming, 2nd Edition, 1984, Kluwer Academic Publisher, New York

		7. O. L. Mangasarian, Nonlinear programming, SIAM, 1987, Philadelphia

1	**Code of the subject**	IT306
2	**Title of the subject**	Machine Learning
3	**Any prerequisite**	Introductory courses on probability theory and linear algebra. Knowledge of basic programming languages such as Python and MATLAB.
4	**L-T-P**	3-0-2
5	**Learning Objectives of the subject (in about 50 words)**	After successful completion of this course, students will able to relate/understand/solve several day-to-day real-time with machine learning algorithms. The objective of this course is to familiarize the students with different machine learning algorithms ranging basic linear classifier/regression modeling problems to non-linear classification problems using deep neural network.
6	**Brief Contents**	Introduction to the course of machine learning (ML), Classification, regression, sequence modeling. Linear classifier and classification problem, Gradient descent algorithm, Underfitting vs Over-fitting problem, Training, Testing, and Validation Process, Supervised vs unsupervised classification, Bayesian classifier: decision boundaries; nearest neighbour methods, and support vector machine (SVM); Unsupervised learning: k-means and hierarchical clustering, Feature extraction and feature selection; dimensionality reduction techniques: PCA, LDA and ICA, Introduction to Neural Networks: Modelling and applications to logic gates. Backpropagation learning algorithm: training and testing. Introduction to Convolution neural network (CNN): AlexNet, VGG architectures. Introduction to auto-encoder and generative adversarial networks (GAN).
7	**Contents for lab (If applicable)**	Experiments will be based on the theory covered as above.
8	**List of textbooks/references**	1. Christopher Bishop. Pattern Recognition and Machine Learning, 2nd Edition 2. Ethem Alpaydin, Introduction to Machine Learning, 2nd Edition. 3. T. Hastie, R. Tibshirani, J. Friedman. The Elements of Statistical Learning, 2nd Edition, 2008.

1	**Code of the subject**	IT307
2	**Title of the subject**	Wireless Communication Technologies
3	**Any prerequisite**	Student should have basic knowledge of communication/data communication.
4	**L-T-P**	3-0-2
5	**Learning Objectives of the subject (in about 50 words)**	This course introduces the concepts of wireless/mobile communication using cellular technologies. It helps students to know about the various modulation techniques, propagation methods, and multi-access techniques used in mobile communication. It provides detailed ideas about path loss and shadow fading and how to solve such problems as also various types of diversity and their outage probability.
6	**Brief Contents**	Fundamentals of Communication: Fundamentals of Wireless Communication, Advantages, Limitations, and Applications, Multiple access technique: TDMA, CDMA, FDMA, CSMA, OFDMA, Frequency spectrum. Wireless Technology: The cellular concepts: Frequency Reuse, Channel assignment strategies, Handoff strategies Interference and System Capacity, Evolution of cellular networks, Path Loss and Shadowing Concepts, Diversity Techniques, Wireless local area networks, etc.
7	**Contents for lab (If applicable)**	Experiments will be based on the theory covered as above.
8	**List of textbooks/references**	1. Andrea Goldsmith, Wireless communication, Cambridge University Press, 2005. 2. Roy Blake, Wireless communication technologies, Leo Chartland, Delmar Cengage Learning, 1st edition, 2000. 3. Modern Wireless Communications by Simon O. Haykin and Michael Moher, Pearson, 1st edition (March 4, 2004) 4. Rappaport, Theodore S. Wireless communications: Principles and practice, 2nd Edition. Pearson Education India, 2010.

1	**Programme**	MBA/IMG
2	**Semester**	I/VII
3	**Type of course**	Core
4	**Code of the subject**	MS601
5	**Title of the subject**	Principles and Practices of Management
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	Element of Management is concerned with the way in which organizations manage their resources. The aim is to explore the concepts of management, managers, and organizations in today's dynamic environment. This course outline illustrates the varied backgrounds, skills, and characteristics required for successful managers. It continues with an examination of the functions of management, managerial roles and diverse nature of modern business organizations, and rewards and challenges offered by a career in management.
9	**Brief Contents**	Explain what is meant by the term management, Classify the three levels of managers and identify the primary responsibility of each group, Describe the difference between managers and operative employees, Explain the skills and roles manager, Describe the value of studying management, Identify the relevance of popular humanities and social science courses to management practices, Define planning. Explain the potential benefits of planning, Distinguish between strategic and tactical plans, Define management by objectives and identify its common elements, Outline the steps in the strategic management process, Explain SWOT analysis, Describe the steps in the decision-making process, Identify the assumptions of the rational decision-making model, Define certainty, risk, and uncertainty as they relate to decision making, Identify the two types of decision problems and the two types of decisions that are used to solve them, Describe the advantages and disadvantages of group decisions, Identify and define the six elements of organization structure, Contrast mechanistic and organic organizations, Summarize the effect of strategy, size, technology, and environment on organization structures, Contrast the divisional and functional structures, Define leader and explain the difference between managers and leaders, Describe the skills that visionary leader exhibit, Explain the styles and theories of leadership, Define Motivation at work, Techniques of motivation, Theories of motivation, Explain what is meant by the term learning organization, Define control, Describe three approaches to control,

		Explain why control is important, Describe the control process, Distinguish among the three types of control, Describe the qualities of an effective control system, Explain how controls can become dysfunctional
10	**Contents for lab**	No

1	**Programme**	MBA
2	**Semester**	I
3	**Type of course**	Core
4	**Code of the subject**	MS602
5	**Title of the subject**	Business Statistics
6	**Any prerequisite**	Basic knowledge of mathematics and statistics
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	To understand the role of statistics in the field of business management. To understand the process associated with statistical decisions, defining and formulating problems, analysing the data, and using the results in decision making.
9	**Brief Contents**	Introduction to Statistics, Charts and Graphs, Measures of central tendency, Measures of dispersion, Probability, Discrete probability distribution, Continuous probability distribution Sampling and sampling distributions, Statistical inference: Estimation for single populations, Statistical inference: Hypothesis testing for single population, Statistical inference: Hypothesis testing for two populations, Analysis of variance and Experimental designs, Hypothesis testing for categorical data (chi-square test), Simple linear regression analysis , Multiple regression analysis, Time series and Index numbers, Statistical quality control, Non-parametric statistics, Statistical decision theory
10	**Contents for lab**	Application of appropriate statistical software

1	**Programme**	MBA
2	**Semester**	I
3	**Type of course**	Core
4	**Code of the subject**	MS603
5	**Title of the subject**	Business Economics
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	Managerial Economics is the use of economic theory and mathematical and statistical techniques in order to examine how a firm can make optimal managerial decisions given the constraints it faces. The main objective of this course is to equip students with the necessary theory and techniques and the ability to apply them in order to inform and enhance managerial decision making. Topics covered include: goals of the firm, optimization techniques, demand theory and estimation,

		forecasting and measurement, theory of production and estimation, cost theory and estimation, pricing and output determination under different market structures, game theory, and pricing in practice.
9	**Brief Contents**	Introduction to Economics; Nature and Scope of Management Economics, Significance in decision-making and fundamental concepts, Consumer behaviour and typical characteristics of Indian consumer, Consumer decision making process, Indian market: characteristics, Objectives of a firm, Demand Analysis, Law of Demand, Exceptions to the law of Demand, Determinants of Demand. Elasticity of Demand- Price, Income, Cross and Advertising Elasticity, Uses of Elasticity of Demand for managerial decision making, Measurement of Elasticity of Demand, Demand forecasting meaning, significance and methods, Supply Analysis, Law of Supply, Supply Elasticity, Analysis and its uses for managerial decision making, Production concepts & analysis, Production function, single variable-law of variable proportion, two variable-Law of returns to scale, Cost concept and analysis, short-run and long-run cost curves and its managerial use, Market Equilibrium and Average Revenue Concept, Market Structure: Perfect Competition, features, determination of price under perfect competition, Monopoly: Feature, pricing under monopoly, Price discrimination, Monopolistic: Features, pricing under monopolistic competition, product differentiation, Oligopoly: Features, kinked demand curve, cartels, price leadership, Pricing strategies Price determination, Full cost pricing, Product line pricing, Price skimming, Penetration pricing, National Income; Concepts and various methods of its measurement, Inflation, types and causes, Business cycle, Profit concept and major theories of profits; Dynamic Surplus theory, Risk & Uncertainty bearing theory and Innovation theory
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	I/VII
3	**Type of course**	Core
4	**Code of the subject**	MS604
5	**Title of the subject**	Business and Legal Environment
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	This course will give orientation to the students about different forms of organizations, functions in organizations, business environment and strategies, along with an exposure to basic elements of company laws, economics laws, industrial and labour laws, foreign exchange management act in business perspective.
9	**Brief Contents**	Concepts of Vision and Mission statements, Types of Environments, Business Environment with reference to

		Global integration, Forms of business organisation: Scales of business; Emerging trends in business, Company Laws: The Companies Act 2013, Limited Liability Partnership Act, 2008, The insolvency and bankruptcy code 2016, Economic Laws: FDI Policy-Foreign Direct Investment in India and abroad, External Commercial Borrowing (ECB), Formalities-Establishment of Branch Office of a foreign entity in India, Foreign Trade Policy- Opportunities of commerce/finance professional in foreign trade-Procedure of import and export-Export promotion schemes and initiatives, Competition Commission of India- Compliance of competition law, Industrial and Labour laws: Overview of Industrial Policy of Govt. of India, Regulatory Mechanism under IDRA, MSME Development Act, Advantages of MSMEs and their role and significance in economic development, Central and State Schemes for MSME Promotion-Udyog Aadhar, Foreign Exchange Management Act: Features and Application-Opportunities for Indian Business Challenges, Foreign Contribution (Regulation) Act 2010
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	I/VII
3	**Type of course**	Core
4	**Code of the subject**	MS605
5	**Title of the subject**	Financial Reporting and Control
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	After the completion of this course, students will be able to understand the role and relevance of financial accounting in management and its implications for a business entity, and utility of cost and management accounting information as a vital input for management and decision-making process.
9	**Brief Contents**	Introduction, nature and scope of financial and management accounting, GAAP and accounting environment, Principles, concepts and conventions of accounting, Accounting process, Construction of profit and loss statement, Balance sheet and cash flow statement, Concept of financial statements analysis, Horizontal and vertical Analysis, Trend analysis, Ratio analysis, Cash flow statement analysis, Cost accounting and information, Types of cost, Preparation of cost sheet, Activity-based costing, Concepts of budget and budgetary control, Static and flexible budgets, Preparation of sales budget, Production budget, Material budget, Cash budget, Master budget, Concept of standard costing and variance analysis, Setting of standards, Analysis of material

		variances, Labour variances and overhead variances, Marginal costing and absorption costing, Marginal costing, and its applications, Cost-volume-profit analysis, Concept of contribution and break-even analysis and its uses, Margin of safety and angle of incidence.
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	I/VII
3	**Type of course**	Core
4	**Code of the subject**	MS606
5	**Title of the subject**	Organizational Behavior
6	**Any prerequisite**	General Understanding of Management Functioning
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	To provide a comprehensive analysis of individual and group behaviour in the organizations. To provide an understanding of how organizations can be managed more effectively and at the same time enhancing the quality of employees work life.
9	**Brief Contents**	What is organizational behaviour?, OB as an interdisciplinary subject ,The Individual: Diversity in the organizations, attitudes and job satisfaction, emotions and moods, personality and values, perception and individual decision making, motivation concepts, motivation: from concepts to applications The Group: Foundations of group behaviour, understanding work teams, communication, leadership, power and politics, conflict and negotiations, foundations of organization structure, The Organization system Organizational culture, human resource policies and practices, organizational change and stress management
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	I/VII
3	**Type of course**	Core
4	**Code of the subject**	MS607
5	**Title of the subject**	IoT and Big Data Management
6	**Any prerequisite**	Fundamentals of Computer/ Computer organization and any programming language
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	Upon course completion, students will be able to: Understand deploying smart applications on different IoT platforms. Develop Interface of various sensors, I/O devices and I/O peripherals with N/W Protocols.

		Understand the impact of big data for business decisions and strategy. Gain hands-on experience on large-scale analytics tools to solve some open big data problems. Understand the concept and challenge of big data and why existing technology is inadequate to analyze the big data
9	**Brief Contents**	Design principles and needed capabilities, AI applications in IoT Applications, Sensing, Actuation, Basics of networking, M2M and IoT technology fundamentals- devices and gateways, Data management, Business processes in IoT, Everything as a Service (XaaS), Role of Cloud in IoT, Security aspects in IoT, Components selection criterion for implementing IoT application, Hardware components computing (Node MCU, Raspberry Pi), Communication, Sensing, Actuation, I/O interfaces, Software components-programming API's (using Python/Node.js/Arduino), Sensors interfacing: Interfacing of temperature, Humidity, Light, Accelerometer, Ultrasonic, IR/PIR, Camera etc, Communication and I/O components, Interfacing: bluetooth, WiFi, GSM, Displays and touch sensor etc., Types of Digital Data, Introduction to Big Data, Big Data Analytics, Relational Databases & SQL, Data Cleansing and Preparation, History of Hadoop, Apache Hadoop, Analysing Data with Unix tools, analyzing data with Hadoop, Hadoop Streaming, IBM Big Data Strategy, Infosphere Big Insights and Big Sheets, HDFS (Hadoop Distributed File System): The Design of HDFS, HDFS concepts, Command Line Interface, Hadoop file system interfaces, Data flow, Data ingest with Flume and Scoop and Hadoop archives, NoSQL, Types of NoSQL database, Advantages, New SQL, Comparison of SQL, NoSQL and NewSQL., Supervised learning with regression and classification techniques, Bias-Variance trade-off, Model validation approaches, Logistic regression, Linear discriminant analysis, Quadratic discriminant analysis, Ensemble methods: random forest neural networks, Deep learning unsupervised learning and challenges for big data analytics, Clustering, associative rule mining, Challenges for big data analytics prescriptive analytics, Creating data for analytics through designed experiments, Creating data for analytics through active learning, Creating data for analytics through reinforcement learning.
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	III/IX
3	**Type of course**	Core
4	**Code of the subject**	MS608
5	**Title of the subject**	International Business
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	The goal of this course is to introduce participants to the field of international business. This course will make participants familiar with three basic areas: underlying theories of international business, environmental factors affecting international activities, and the management of business functional operations in an international context. In addition, participants will learn how to analyse international situations and evaluate contemporary issues in international business.
9	**Brief Contents**	Background for International Business: Globalization and International Business, Comparative Environmental Frameworks: The Cultural environments facing business, The Political and Legal environments facing business, The Economic environments facing business, Globalization and Society, Theories and Institutions: Trade and Investment: International trade and Factor mobility theory, Governmental Influence on trade, Cross-National cooperation and agreements World Financial Environment Global Foreign: Exchange markets, The Determination of Exchange rates, Global capital markets, Global Strategy, Structure, and Implementation: The Strategy of international business, Country evaluation and selection, Export and Import, Direct investment and Collaborative strategies, The Organization of international business, Managing International Operations: Marketing globally, Global operations and supply-chain management, International accounting and finance issues, International human resource management
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	II/VIII
3	**Type of course**	Core
4	**Code of the subject**	MS609
5	**Title of the subject**	Human Resource Management
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	Human Resource Management (HRM) is concerned with the way in which organizations manage their people. The aim is to chart some of the broad terrain of a rapidly developing field of study in order to prepare the students for the more finely grained treatment of specific HRM topics. This course outline examines the recent rise of HRM, the effects of the changing context of work on HRM, what it involves, and the strategic nature of HRM practice, its impact on organizational performance and the changing role of HRM function.
9	**Brief Contents**	Define HRM, Describe the Nature, Feature and Scope of HRM, Describe the major activities of HRM, Explain the skills and roles of Human Resource manager, Why HRM is important to all managers, List the challenges and opportunities of HR manager, Define Job Analysis, Explain types of Job analysis, Understand Job Analysis Process, Describe the basic methods of collecting the Job analysis information, Define HR planning, Describe the need and objectives of HR planning, Understand the HR planning model, Explain the factors affecting HR planning, Define Recruitment, Explain essential steps for Recruitment Planning, Understand Recruitment model, Describe sources of Recruitment, Explain the Pros and Cons of recruitment, Define selection , Steps / process of selection, Define Employee training, Explain need and objectives of training, Differentiate between training and development, Describe the principles, areas and benefits of training, Understand the Training Methods, Describe Training system model, Understand levels of training evaluation, Define Career and its related terms, Understand stages of growth and career, Describe Career-planning process and its responsibility, Understand the benefits of Career development system, Know the career program for special target groups, Explain the Model or Designing organizational career development, Define Performance appraisal, Explain why it is important to effectively appraise performance, Understand features, purposes and objectives of performance appraisal. Describe the methods of performance appraisal. List the criticism of performance appraisal.
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	II/VIII
3	**Type of course**	Core
4	**Code of the subject**	MS610
5	**Title of the subject**	Operations Management
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	Upon successful completion of the course, student should be able to: Understand the role of operations in both manufacturing and service organizations. Describe the importance of facilities location decision in the end-to-end supply chain. Develop understanding of a range of inventory models available their contextual suitability. Employ different quality prescriptive and the tools of statistical process control.
9	**Brief Contents**	Operations and strategy: nature, evolution and scope of production and operations management, Emerging trends in operations management, Operations strategy: linkage with competitive strategy and formulation of operations strategy, Facility Planning: facilities location: globalization of operations, Factors affecting location decisions, Location planning methods, Linkage with supply chain network design decisions, Process Management: Design of production process and facility layout, Process design and analysis, Design of products and services: process of product and service design, Tools, Critical chain, Just-in-time, Lean operations and Toyota production system, Inventory Management: deterministic models, Probabilistic models: multi-period and single period (news vendor) models, Selective inventory models, Aggregate production planning (APP), Master production schedule (MPS), Materials requirements planning (MRP), Quality management, Statistical process control (SPC), Process capability and Six Sigma.
10	**Contents for lab**	Simulation exercises on Arena

1	**Programme**	MBA/IMG
2	**Semester**	II/VIII
3	**Type of course**	Core
4	**Code of the subject**	MS611
5	**Title of the subject**	Marketing Management
6	**Any prerequisite**	Basic understanding of microeconomics
7	**L-T-P**	3-0-1

8	**Learning Objectives of the subject**	To understand the fundamental marketing concepts and the processes that influences the market orientation of a firm. To understand the role of marketing within the organization. To recognize the importance of marketing in the competitive world. To analyze critically the marketing process and its relationship with the environment within which it operates. To broadly look at the role of Marketing as a key element within an organization's strategy.
9	**Brief Contents**	Introduction to Marketing- Definition of marketing, Marketing environment, Business models and value chain, Segmentation and targeting- Concept of segmentation, Bases of segmentation (B2C & B2B), Targeting, Application in real life scenario, Positioning and differentiation- Differentiation parameters, POP& POD, Competition, Consumer Behavior- Consumer decision making process, factors influencing consumer behavior, B2B Marketing- Organizational decision making process, buying roles, Marketing strategy (product, service and pricing decisions)- Product strategy, branding, service, pricing strategy, Marketing strategy (place decisions)- Channels of distribution, Distribution strategy, Marketing strategy (promotion decisions)- Integrated marketing communication, Advance topics in marketing- Predictive, contextual, augmented and agile marketing.
10	**Contents for lab**	Simulation on marketing environment Case study exercises Class projects and exercises Field projects and company visits

1	**Programme**	MBA/IMG
2	**Semester**	II/VIII
3	**Type of course**	Core
4	**Code of the subject**	MS612
5	**Title of the subject**	Financial Engineering and Management
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	The course aims at providing an understanding of financial engineering and management concepts. This will enable to understand how corporations make investment & financing decisions with dynamic risk exposures. It will help develop the financial engineering fundamentals for proper risk mitigation.

9	**Brief Contents**	Changing Financial arena and associated risks, Financial engineering as a response to increased risks, Types of Risks and Risk management, Financial markets, Financial institutions, Financial services, Financial instruments,. Financial Management: Nature, Scope, and Objectives of financial management, Time value of money, Risk and return, Capital Structure and Cost of Capital: Capital structure theories and leverage, Optimum capital structure, Measurement of specific costs, Computation of overall cost of capital. Financing Decision: Long-term financing, Short-term financing, Term financing, Venture capital. Capital Budgeting: Principles, Techniques, Measurement, evaluation, and involved risk analysis, Working Capital Management: Planning of working capital, Working capital financing, Cash management, Receivable management and Inventory management. Dividend Policy Decision: Dividend and valuation, Determinants of dividend policy, The Futures Markets, Static and dynamic hedging, Devising a Hedging Strategy Using Futures, Stock Index Futures, Value at Risk (VaR), Short Term and Long Term Interest Rate Futures, Foreign Currency Futures and Commodity Futures, Options Markets; Properties of Stock Option Prices; Option Pricing Models – Binomial Model, Black-Scholes; Model, Single Period Options –Calls and Puts, Option Strategies, Multi-Period Options – Caps, Floors, Collars, Captions, Swaptions and Compound options, Cross-currency Futures and Options, Structure of a Swap, Interest Rate Swaps, Currency of Swaps, Commodity Swaps, Other Swaps, Credit Risk and Credit Derivatives, Credit default swaps, Role of a Swap Dealer. Basics of FRAs, Emerging Innovations and recent trends
10	**Contents for lab**	No

1	**Programme**	MBA
2	**Semester**	II
3	**Type of course**	Core
4	**Code of the subject**	MS613
5	**Title of the subject**	Business Research Methods
6	**Any prerequisite**	Basic knowledge of business statistics
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	To design and execute a basic survey research project. To understand the research tools and techniques for executing a business project and decision making.

9	**Brief Contents**	Introduction to business research: Business research methods: An introduction, business research process design, Research design formulation: Measurement and scaling, questionnaire design, sampling and sampling distributions, Sources and collection of data: Secondary data sources, data collection: survey and observations, experimentation, fieldwork and data preparation, Data analysis and presentation: Statistical inference: hypothesis testing for single population, hypothesis testing for two populations, analysis of variance and experimental designs, hypothesis testing for categorical data (chi-square test), non-parametric statistics, Correlation and simple linear regression analysis, Multivariate analyses (Multiple regression analysis, discriminant analysis, conjoint analysis, factor analysis, cluster analysis, multidimensional scaling, correspondence analysis), Result presentation: Presentation of results, report writing
10	**Contents for lab**	Data analysis and presentation: Statistical inference: hypothesis testing for single population, hypothesis testing for two populations, analysis of variance and experimental designs, hypothesis testing for categorical data (chi-square test), non-parametric statistics, Correlation and simple linear regression analysis, Multivariate analyses (Multiple regression analysis, discriminant analysis, conjoint analysis, factor analysis, cluster analysis, multidimensional scaling, correspondence analysis)

1	**Programme**	MBA
2	**Semester**	II
3	**Type of course**	Core
4	**Code of the subject**	MS614
5	**Title of the subject**	Decision Modelling and Optimization
6	**Any prerequisite**	Basic Knowledge of Mathematics, Probability distributions and Statistics.
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	The objectives of the course is to acquaint the student with the applications of Operations Research to business and industry and help them to grasp the significance of analytical techniques in decision making
9	**Brief Contents**	Introduction to Operation Research, Overview of how Operations Research and Analytics professionals analyse problems, Introduction to Linear Programming

		Solving Linear Programming problems: The Simplex method, The Theory of the Simplex Method, Duality theory, Linear Programming under Uncertainty, Other Algorithms for Linear Programming, The Transportation and Assignment problems Network Optimization models Dynamic Programming, Integer Programming, Nonlinear Programming, Metaheuristics, Game Theory, Decision Analysis, Queueing Theory, Inventory Theory, Markov Decision Processes, Simulation
10	**Contents for lab**	No

1	**Programme**	MBA
2	**Semester**	II
3	**Type of course**	Core
4	**Code of the subject**	MS615
5	**Title of the subject**	Artificial Intelligence and Machine Learning
6	**Any prerequisite**	Statistics, linear algebra, matrix, probability, programming languages and data modelling.
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	Upon course completion, students will be able to: Identify problems that are amenable to solution by AI methods, and which AI methods may be suited to solving a given problem. Formalize a given problem in the language/framework of different AI methods. Implement basic algorithms using basic machine learning libraries mostly in python. Gain hands-on experience in applying ML to problems encountered in various domains. Obtain exposure to high-level ML libraries or frameworks such as TensorFlow, PyTorch.
9	**Brief Contents**	Introduction to AI: Definitions, Historical foundations, Basic elements of AI, Characteristics of intelligent algorithm, AI application areas, Neural network representation, Neural networks as a paradigm for parallel processing, Linear discrimination, Gradient descent, Logistic discrimination, Perceptron, Training a perceptron, Multilayer perceptron, Back propagation algorithm, Recurrent networks, Dynamically modifying network structure, Basic concepts, Hypothesis space search, Genetic programming, Models of evolution and learning, Parallelizing genetic algorithms, State space search, Production systems, Search space control: depth-first, breadth-first search, Heuristic search - hill climbing, Best-first search, Branch and Bound, Problem reduction, Constraint satisfaction end, Means-end analysis, Need of machine learning, Types of machine learning, Supervised

		learning: k-nearest neighbours, Linear regression, Logistic regression, Classification, Support vector machines, Neural networks, Unsupervised learning: clustering (k-means, hierarchical, EM), Auto-encoders, Dimensionality reduction, Learning by agents, Intelligent agent, Online learning, Batch learning, Markov Decision Processes, Temporal difference learning, Dynamic programming, Hyperparameters, Deep learning, Optimization techniques.
10	**Contents for lab**	Use Python/Jupyter notebooks/ google Colab for programming and hand out assignments Machine learning platforms: TensorFlow, Scikit-Learn etc. It may be good to have both theory and programming components in the assignment/homework component, to allow students to appreciate and learn both aspects of AI and machine learning

1	**Programme**	MBA/IMG
2	**Semester**	II/VIII
3	**Type of course**	Core
4	**Code of the subject**	MS616
5	**Title of the subject**	Project Management
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	Students will be able to understand to manage the scope, cost, timing, and quality of the project, as defined by project stakeholders. Align the project to the organization's strategic plans and business justification throughout its lifecycle. Identify project goals, constraints, deliverables, performance criteria, control needs, and resource requirements in consultation with stakeholders. Implement project management knowledge, processes, lifecycle and the embodied concepts, tools and techniques in order to achieve project success. Apply project management practices to the launch of new programs, products, and services
9	**Brief Contents**	Introduction to Project Management: Concept of a project; categories of project, project development cycle, tools & techniques of project management, forms of project organizations, project management theory, various stages of planning, designing and managing projects, Development of Project Matrices, Critical Success factors and key performance indicators, Project Organization, Scheduling & Planning: Project Elements, Work Breakdown Structure (WBS), Types of WBS, Functions, Activities and Tasks, Project Life Cycle and Product Life Cycle, Project schedule, Scheduling Objectives, Building the project schedule, Scheduling terminology and

		techniques, Network Diagrams: PERT, CPM; Bar Charts, Milestone Charts, Gantt Charts, Estimating Project Costs and Project Selection: Estimation of activity and project costs, means of financing, financial projections, Qualitative and Quantitative Methods of Project identification and selection, Developing the Project Schedule: Activity Sequencing, Precedence Network Diagram, Project Resource levelling and allocation in projects, network techniques and timelines, crashing of projects: time vs. cost trade-off, Program Evaluation and Review Technique, Critical Path Method, Project Scheduling, Basics of Scheduling, project management tools, Project Execution and Control: Assessing and managing costs and gains, crashing of projects: time vs. cost trade-off, earned value method, Managing Project Risks: Probabilistic aspects of projects; risk management; Principles & Concepts of project Risks Management, Risk Assessment, Risk control; critical chain project management.
10	**Contents for lab**	No

1	**Programme**	IMG
2	**Semester**	VII
3	**Type of course**	Core
4	**Code of the subject**	MS617
5	**Title of the subject**	Business Data Mining
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	Extract knowledge using data mining techniques. Explore recent trends in data mining such as web mining, spatial-temporal mining. Be acquainted with the tools and techniques used for Knowledge Discovery in Databases.
9	**Brief Contents**	Data Mining Concepts, Knowledge Representation, Supervised Learning framework, Concepts & hypothesis, Training & Learning, Types of Data, Data mining functionalities, Classification of data mining systems, Data mining task primitives, Data cleaning, Data integration & transformation, Data reduction, Mining Business data patterns, Associations and Correlations, Mining methods, Mining various kinds of association rules, Correlation analysis, Constraint based association mining, Classification and prediction, Basic concepts, Decision Tree induction, Bayesian classification, Rule based classification, Classification by back propagation, Support vector machines, Associative classification, Lazy learners, Other classification methods, Cluster analysis, Types of data, Categorization of major clustering

		Methods, K-means partitioning methods, Hierarchical methods, Density-based methods, Grid based methods, Model-based clustering methods, Clustering high dimensional data, Constraint based cluster analysis, Outlier analysis, Mining trends and business application of data
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	I/VII
3	**Type of course**	Core
4	**Code of the subject**	MS618
5	**Title of the subject**	Strategic Management
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	After the completion of this course students will be able to understand the organization and the environment in which it functions and competes. The student should be able to integrate acquired knowledge of other functional areas with the body of the knowledge of strategic management and be able to deploy all as a unified tool to analyse and formulate the actions that shall deliver the intended results.
9	**Brief Contents**	Concept of strategy and strategic management, Difference between corporate planning and strategic planning, Strategic management model, Different levels of strategies, Relevance of strategic management in 21st century, Strategic intent-vision and mission statement, Organisational objectives, Setting objectives, Organisational values and its impact, External and internal Environment and analytical tools- evaluating the company's strategic environment, SWOT analysis, PESTEL analysis, Competitive analysis, Porter's five force model, Internal Assessment- strategic capability: fit and stretch concept, Porter's value chain analysis, Core competencies, Organisational capabilities, Resource analysis and synergy, Strategies in action- Functional level- Achieving superior efficiency- Economics of scale, Experience curve, Just-in-Time, Six-sigma, Business level-cost leadership, Differentiation & focus strategies, Growth strategies, Corporate level- integration, Diversification, Acquisition, Mergers & joint venture, Short term corporate strategies-stability, Retrenchment, and turnaround, Portfolio and other analytical models- BCG matrix, GE/McKinsy matrix, Corporate parenting, Evaluation of strategy- suitability, Acceptability, and feasibility, Implementing strategies-resource allocation, Structure and strategy, Organisation culture, Balance score card.
10	**Contents for lab**	No

1	**Programme**	MBA
2	**Semester**	III
3	**Type of course**	Core
4	**Code of the subject**	MS619

5	**Title of the subject**	Entrepreneurship and Innovation
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	Course is designed for preparing students to take of Entrepreneurial journey on the basis of innovative ideas. The content is highly focused to start venture to making business mature up-to international level.
9	**Brief Contents**	Entrepreneurship, Creativity and innovation, Business planning process, Institutions supporting entrepreneurs, Family businesses, International entrepreneurship opportunities, Informal risk capital and venture capital, Managing growth.
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	III/IX
3	**Type of course**	Core
4	**Code of the subject**	MS620
5	**Title of the subject**	Business Process Management
6	**Any prerequisite**	Courses on functional areas of management
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	Upon successful completion of the course, student should be able to: Describe and evaluate the development of process management and tasks of process holders in organizations. Assess the importance of the strategic perspective of business process management. Analyse and model strategic and operational business processes. Employ process performance indicators and measures.
9	**Brief Contents**	Orientation: Process perspective, Components of processes, Evolution of processes, Process life-cycle, Process identification, Process architecture, Process selection, Process modeling: Introduction to BPMN, Business objects, Process decomposition, Process Discovery: Process discovery, Methods, Process modeling, Process model quality assurance, Process Analysis: qualitative process analysis, Value-added analysis, Waste analysis, Stakeholder analysis, Root-cause analysis, Quantitative process analysis: flow analysis, Queues, Simulation, Process redesign, Transactional methods, Transformational methods, Process aware information systems: Types of process aware information systems, Process implementation with executable models, Process monitoring, Process as enterprise capability
10	**Contents for lab**	BPMN modeling software (open source) for modeling of processes

1	**Program**	MBA/ IMG/
2	**Semester**	III/IX
3	**Type of course**	Core
4	**Code of the subject**	MS621
5	**Title of the subject**	Business Ethics and Sustainability
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	Upon course completion, students will be able to: Develop skills in recognizing and analysing ethical issues. Define cross cultural variations and similarities in organizational practices in corporate social responsibility and business ethics. Understand sources of organizational ethical culture and to design ethical programs designed to accomplish specific objectives in organizations. Develop ethical leadership skills and practices
9	**Brief Contents**	Business ethics- an overview, Concepts and theories of business ethics, Emerging business ethics issues, Ethical decision making in business, Creating an ethical organization globalization and business ethics, Stakeholders and business ethics, Social responsibility and ethics, Issues in social responsibility, Implementing stakeholders' perspective, Stakeholder and issue management approaches, Managing corporate responsibility with external stakeholders, Corporate governance and ethical leadership, Kohlberg's six stages of moral development, Levels of ethical analysis, Concept of corporate integrity, Issues in corporate governance, good corporate governance - obligations towards society and stake holders, Ethics in consumer protection, Role of government agencies, SEBI, judiciary in ensuring ethical practices, Ethics and Indian business, Marketing ethics, Ethics in human resource management, financial management, banking and insurance.
10	**Contents for lab**	No

1	**Program**	MBA/ IMG/
2	**Semester**	III/IX
3	**Type of course**	Core
1	**Code of the subject**	MS621
2	**Title of the subject**	Cloud Computing and Services
3	**Any prerequisite**	Basic understanding of computer system
6	**Will this course require visiting faculty**	No
4	**L-T-P**	3-0-0

7	**Learning Objectives of the subject (in about 50 words)**	Upon course completion, students will be able to: 6. Understand cloud computing and memorize the different cloud service and deployment models. 7. Describe the concerns of storage, processing, parallelism, distribution, consensus, and scalability as they relate to the cloud 8. Learn about the different levels of clouds services, which include IaaS (Infrastructure as a Service), PaaS (Platform as a Service), SaaS (Software as a Service), FaaS (Function as a Service (server-less architecture)), MBaaS (Mobile Backend as a Service (server-less architecture)), and Amazon Lambda. 9. Learn about many types of cloud-based storage services, including object storage, block-level storage, archival storage, and Big Data file systems. 10. Become familiar with the key concepts underlying Big Data and data streaming applications on the Cloud.
8	**Brief Contents (module wise)**	**Module-I: Introduction** Introduction, Foundations of cloud computing, Big Clouds (such as the AWS Cloud, Google Cloud, Microsoft Azure Cloud, or IBM Cloud) via portals, APIs, and SDKs, Cloud Computing characteristics (e.g., elasticity, multi-tenancy, on-demand access, ubiquitous access, usage metering, self-service capability, SLA-monitoring), Cloud Computing and Service Oriented Architecture (SOA), Cloud Service Models/Types (i.e., Public, Private, Hybrid, and Community), Cloud deployment models (i.e., IaaS, PaaS, SaaS, and BPaaS), Cloud Return on Investment (ROI) models, Cloud Reference Architectures, Cloud Standards (e.g., OSDIAPIs), Technology Providers vs. Cloud providers vs. Cloud vendors, Planning Cloud transformations **Module-II: Cloud Storage Services** Storage models and storage as a service, Using Amazon Cloud Storage Services via Portal and APIs, Using Microsoft Azure Cloud Storage Services via Portal and APIs, Using Google Cloud Storage Services via Portal and APIs, Using IBM Cloud Storage Services via Portal and APIs, Using OpenStack Cloud Storage Services via Portal and APIs **Module-III: Cloud Networking Services and Service Platform Design** Virtual Private Cloud Networking, High-Performance, Scalable Load Balancing, Cloud API Gateways, Global Content Delivery Networks, Cloud-Managed High-Performance Network Address Translation, Network Edge Connectivity, Reliable, Resilient, Low-Latency DNS Serving on the Cloud, Network Performance and Availability Optimization on the Cloud, Big Cloud Service Platforms Convergence and Service Offerings (Amazon AWS, Google GCP, Microsoft Azure, IBM Cloud, Force.com Cloud, Clouds at SGI, NASA, and CERN)

		Module-IV: Cloud Platforms in Industry Cloud platforms in industry, amazon web services, compute services, storage services, communication services, additional services, google AppEngine, architecture and core concepts, application life-cycle, cost model, observations, Microsoft Azure, Azure core concepts, SQL Azure, Windows Azure platform appliance, scientific applications, healthcare: ECG analysis in the cloud, cancer diagnosis, cloud machine learning services, business and consumer applications, CRM and ERP, productivity, social networking, media applications, multiplayer online gaming.
9	**Contents for lab (If applicable)**	• Learn how to access the Cloud via Big Cloud vendors' websites, and their APIs/SDKs; install Python, Anaconda, and Jupyter to run lab notebooks as applicable. • Create a virtual machine on the various Big Clouds using both the Portals and the applicable python libraries. • It may be good to have both theory and programming components in the assignment/Lab component, to allow students to appreciate and learn various aspects of cloud computing

List of electives

for

Master of Business Administration

&

Integrated Management Programme

(Basket wise)

List of electives from the specialization basket of Information Technology and Systems

S. No	Course Code	Title of the Course	L-T-P	Credits	Semester
1	MS001	Digital Production System	3-0-0	3	Odd
2	MS002	IT Products and Intellectual Property Rights	3-0-0	3	Even
3	MS003	Management of Digital Technologies	3-0-0	3	Odd
4	MS004	Knowledge Management	3-0-0	3	Even
5	MS005	Service-Oriented Computing	3-0-0	3	Odd
6	MS006	Social Networks Analytics	3-0-0	3	Even
7	MS007	Software Project Management	3-0-0	3	Odd
8	MS008	Software Quality Management	3-0-0	3	Even
9	MS009	Programming for Business Intelligence	3-0-0	3	Odd
10	MS010	Strategic Planning of Information Systems	3-0-0	3	Even

1	**Programme**	MBA/IMG
2	**Semester**	Odd
3	**Type of course**	Elective
4	**Code of the subject**	MS001
5	**Title of the subject**	Digital Production System
6	**Any prerequisite**	Operations Management
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	Upon successful completion of the course, student should be able to: Appreciate role of digital manufacturing. Analyse various computing models. Employ information and communication technologies for design of digital production systems.
9	**Brief Contents**	Science of digital manufacturing: operation mode and architecture of digital manufacturing system, Modeling theory and method of digital manufacturing science, Theory system of digital manufacturing science, Computing manufacturing in digital manufacturing science: computing manufacturing methodology, Manufacturing computational model, Theoretical units in manufacturing computing, Manufacturing informatics in digital manufacturing science: Principal properties of manufacturing information, Measurement, Synthesis and materialization of manufacturing information, Integration, sharing and security of manufacturing information, Intelligent manufacturing in digital manufacturing science: Intelligent multi-information sensing and fusion in the manufacturing process, Knowledge engineering in the whole life cycle of manufacturing product, Autonomy, Self-learning, Adapting of manufacturing system, Intelligent manufacturing system
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	Even
3	**Type of course**	Elective
4	**Code of the subject**	MS002
5	**Title of the subject**	IT Products and Intellectual Property Rights
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	The course is designed to impart the value driven IT products development including software, and firmware/hardware of different industrial requirements. Through understanding of the Intellectual property rights, the learner acquaint with the protection of new IT product from business threat.

9	**Brief Contents**	Industry Need analysis for IT product development, The Design thinking for new IT product development, Tools and Techniques of IT product development, Software design analysis, Firmware design, Product prototyping, Value analysis, Intellectual property rights for Software and Firmware, Industry-Market fit performance, Evaluation of product
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	Odd
3	**Type of course**	Elective
4	**Code of the subject**	MS003
5	**Title of the subject**	Management of Digital Technologies
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	The course has been designed to provide comprehensive and in-depth coverage of all important aspects of modern digital technologies on the principle of industrial applications to maximize the efficiency, effectiveness and business performance. It is primarily intended for students who wish to pursue a career in mapping industrial design on the digital system.
9	**Brief Contents**	Introduction of Industry 4.0. Business System engineering and Management through Digital Technologies, Digital Transformation and Business Transition to industrial revolution 5.0. Concepts of Industry 5.0-sustainability, human centricity and system resilience through digital technologies, Understanding Blockchain principles, technology and its applications, Introduction of sensory inputs, data acquisition and applications, Introduction of Business data cloud and management, Human-system interface concept, principles, and design, Introduction of Cyber Physical System and understanding design cases
10	**Contents for lab**	No

1	**Program**	MBA/IPG MBA
2	**Semester**	Even
3	**Type of course**	Elective
4	**Code of the subject**	MS004
5	**Title of the subject**	Knowledge Management
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	Develop an integrated and comprehensive perspective of knowledge management as a strategic function. Identify the strategic contexts of knowledge management and the role of organisational structure and processes. Discuss the frameworks, techniques, and the nature of IT support for managing knowledge. Delineate the role of innovations in knowledge creation. Raise and resolve issues in knowledge protection for sustaining competitive advantage. Provide a platform for sharing experiences in knowledge management.
9	**Brief Contents**	The Nature of knowledge: Introduction to knowledge management, The nature of knowing, Leveraging knowledge, Intellectual capital, Strategic management perspectives, Creating knowledge, Organisational learning, The learning organisation, Knowledge management tools and systems, Knowledge management tools: component technologies, Knowledge management systems, Mobilising knowledge, Enabling knowledge contexts and networks, Implementing knowledge management.
10	**Contents for lab**	Case study exercises

1	**Programme**	MBA/IMG
2	**Semester**	Odd
3	**Type of course**	Elective
4	**Code of the subject**	MS005
5	**Title of the subject**	Service-Oriented Computing
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	Service delivery lifecycle and associated phases. Analysis and conceptualization of services and micro-services. Service design through web. Modern service APIs and contract versioning techniques for web services
9	**Brief Contents**	Introduction of Service Oriented Architecture design and development , Case examples and case descriptions, Understanding Service-Orientation- Business Automation, Design paradigm, Design principles, Silo-based application architecture, Effects of service-orientation on the enterprise, Service-orientation and the concept of

		application and integration, The Service composition, Goals and benefits of Service-Oriented computing, Four pillars of Service-orientation, Understanding SOA- The Four characteristics of SOA: Business-driven, Vendor-neutral, Enterprise-centric, Composition-centric, Design priorities; The Four common types of SOA, The End result of Service-orientation and SOA, SOA Project delivery strategies, SOA project stages, SOA adoption planning, Service inventory analysis, SOA modelling, Contract, Logic design, Service development, Testing, Deployment and maintenance, Usage and monitoring, Understanding layers with services and micro services, Analysis and modelling with Web services and Micro services, Analysis and modelling with REST services and Micro services
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	Even
3	**Type of course**	Elective
4	**Code of the subject**	MS006
5	**Title of the subject**	Social Networks Analytics
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	The main learning objective with this course is to enable students to put Social Network Analysis projects into action in a planned, informed and efficient manner. This overarching goal involves the following subtasks: Formalize different types of entities and relationships as nodes and edges and represent this information as relational data .Plan and execute network analytical computations. Use advanced network analysis software to generate visualizations and perform empirical investigations of network data. Interpret and synthesize the meaning of the results with respect to a question, goal, or task. Collect network data in different ways and from different sources while adhering to legal standards and ethics standards.
9	**Brief Contents**	Overview on network analysis, The Network analysis process and methodology, Network visualization, When images do not suffice: Network analytical measures, Models and simulation of network evolution, Models and simulation of diffusion in networks, Subgroups and cliques clustering, Block models, Ego networks, Reciprocity, Social capital, structural holes, equivalence; Network Data: Ethics, Privacy, Legality, Introduction:

		Using text data for network analysis, natural Language Processing and Relation Extraction from Texts Construct: A model of meta-network dynamics, Usage of network analysis for investigating crime, Relational methods for analysing covert networks
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	Odd
3	**Type of course**	Elective
4	**Code of the subject**	MS007
5	**Title of the subject**	Software Project Management
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	The students will be able to understand the principles of project management. Comprehend the fundamental principles of project management, including project planning, scheduling, resource allocation, and risk management. Develop a project plan that includes a work breakdown structure, critical path analysis, resource allocation, budgeting and time management.
9	**Brief Contents**	Introduction and Software Project Planning: Fundamentals of software project management (SPM), Need identification, Vision and scope document, project management cycle, SPM objectives, Management spectrum, SPM framework, Software project planning, Planning objectives, Project plan, Types of project plan, Structure of a software project management plan, Software project estimation, Estimation methods, Estimation models, Decision process, Project Organization and Scheduling: Project Elements, Work Breakdown Structure (WBS), Types of WBS, Functions, Activities and Tasks, Project Life Cycle and Product Life Cycle, Ways to Organize Personnel, Project schedule, Scheduling objectives; Building the project schedule, Scheduling terminology and techniques, Network Diagrams: PERT, CPM, Bar Charts: Milestone Charts, Gantt Charts, Project Monitoring and Control: Dimensions of Project Monitoring & Control, Earned Value Analysis, Earned Value indicators: Budgeted Cost for Work Scheduled (BCWS); Cost Variance (CV), Schedule Variance (SV), Cost Performance Index (CPI), Schedule Performance Index (SPI), Interpretation of Earned Value Indicators, Error Tracking; Software Reviews, Types of Review: Inspections, Deskchecks,

		Walkthroughs, Code Reviews, Pair Programming, Software Quality Assurance and Testing: Testing Objectives, Testing Principles, Test Plans, Test Cases, Types of Testing, Levels of Testing, Test strategies, Program correctness, Program verification & validation, Testing automation & Testing tools, Concept of Software quality; Software quality attributes; Software Quality Metrics and indicators; The SEI Capability Maturity Model CMM), SQA activities, Formal SQA Approaches: Proof of correctness, Statistical quality assurance, Cleanroom process, Project Management and Project Management Tools: Software Configuration Management: Software Configuration items and tasks; Baselines; Plan for Change, Change control, Change Requests management, Version Control; Risk management: Risks and risk types, Risk Breakdown Structure (RBS); Risk Management process: Risk identification, Risk analysis, Risk planning, Risk monitoring; Cost Benefit analysis; Software Project management tools: CASE tools, Planning and Scheduling tools, MS-Project.
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	Even
3	**Type of course**	Elective
4	**Code of the subject**	MS008
5	**Title of the subject**	Software Quality Management
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	Students will be able to develop a comprehensive understanding of the concepts and practices related to software quality management. Gaining knowledge of software quality standards, testing techniques, and software metrics. Evaluate the effectiveness of quality management strategies, such as continuous improvement, risk management, and quality assurance.
9	**Brief Contents**	Introduction to Software Quality: Defining Software Quality, Software quality, Attributes and specification, Cost of quality defects, faults, failures, Defect rate and reliability, Defect prevention, Reduction and containment, Overview of different types of software review, Introduction to measurement and inspection process, Documents and metrics, Software Quality Metrics: Product

		Quality Metrics: Defect density, Customer problems metric, Customer satisfaction metrics, Function points, In-process quality metrics: Defect arrival pattern, Phase-based defect removal pattern, Defect removal effectiveness, Metrics for software maintenance: Backlog management index, Fix response time, Fix quality, Software quality indicators, Software Quality Management and Models: Modeling process, Software reliability models: The Rayleigh model, Exponential distribution and Software reliability growth models, Software reliability allocation models, Criteria for model evaluation, Software quality assessment models: Hierarchical model of software quality assessment. Software Quality Assurance: Quality Planning and Control, Quality improvement process, Evolution of software quality assurance SQA, Major SQA activities, Major SQA issues, Zero defect software, SQA techniques, Statistical quality assurance, Total quality management, Quality standards and processes, Software Verification, Validation & Testing: Verification and validation, Evolutionary nature of verification and validation, Impracticality of testing all data and paths, Proof of correctness, Software testing, Functional, structural and Error-oriented analysis & testing, Static and dynamic testing tools, Characteristics of modern testing tools.
10	**Contents for lab**	No

1	**Program**	MBA/IMG
2	**Semester**	Even
3	**Type of course**	Elective
4	**Code of the subject**	MS009
5	**Title of the subject**	Programming for Business Intelligence
6	**Any prerequisite**	None
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	Upon course completion, students will be able to: Derive actionable insights from data, thus allowing to make data-driven, strategic and tactical business decisions. Design and implement an algorithm to conduct technical calculations, manipulate data and create graphical user interfaces. Identify the technological architecture that makes up Business Intelligence systems
9	**Brief Contents**	Business Intelligence (BI): Effective and timely decisions, Data, Information and knowledge, Role of mathematical models, BI architectures, Ethics and BI, Decision support systems: definition of system, Representation of the decision-making process, Definition of decision support system, Development of a decision support system,

		Customer Relationship Management (CRM), ERP, and BI, Importance of data and relevance in industry, Statistical learning vs. machine learning, Types and phases of analytics, Data pre-processing and cleaning: data manipulation steps, Normalizing data, Sampling, Missing value treatment, Outliers, Exploratory data analysis: data visualization using matplotlib, Seaborn libraries, Creating graphs, Summarizing data, Descriptive statistics, Univariate analysis, Bivariate analysis, Querying and reporting, Building Ad-Hoc queries, Building on-demand self-service reports, Enhancing and modifying data access, Pull-oriented data access, Push-oriented data access dashboards, Executive Information System (EIS) engine, Metric system and KPIs, business intelligence dashboards, Learning SQL query structure with examples, Data management and query system OLTP and OLAP and their data models, Data warehousing, ETL and data integration dashboard creation using Tableau, Power BI, The relevance of BI in application to analytics industry and different domains such as marketing models: relational marketing, Sales force management, Logistic and production models: supply chain optimization, Optimization models for logistics planning, Revenue management systems.
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	Even
3	**Type of course**	Elective
4	**Code of the subject**	MS010
5	**Title of the subject**	Strategic Planning of Information Systems
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	The strategic use of information systems as a means for acquiring competitive advantage. Integration of concepts and methodologies with skills acquired in the field of information systems and technology in the development of a comprehensive information systems prototype. Measurable benefits in the alignment of business processes with information systems solutions. The course provides students with the opportunity to apply systems concepts and techniques in the design of an information system.
9	**Brief Contents**	Introduction to strategic information systems , Business environment issues, The process of strategic information systems , Current business situation analysis , Identify an opportunity , The role of business information systems , Information systems strategies , Strategic information systems management, Organization of the information systems technologies , Software , Hardware, Database ,

		Communications ,Networking , Evaluation of possible IS solutions, Project Management, Cost Benefit Analysis, Functional requirement, System specifications , Information systems benefits , Strategic information management , Managing the information resource
10	**Contents for lab**	No

List of electives from the specialization basket of Technology and Operations Management

S. No	Course Code	Title of the Course	L-T-P	Credits	Semester
1	MS011	Business Systems Simulation	3-0-0	3	Odd
2	MS012	Service Operations Management	3-0-0	3	Even
3	MS013	Sustainable Supply Chain Management	3-0-0	3	Odd
4	MS014	Technology Management	3-0-0	3	Even
5	MS015	Technology and Operations Strategy	3-0-0	3	Odd
6	MS016	Total Quality Management	3-0-0	3	Even
7	MS017	World Class Production Systems	3-0-0	3	Odd
8	MS018	Emerging Areas in Technology and Operations Management	3-0-0	3	Even
9	MS019	New Products and Services Development	3-0-0	3	Odd
10	MS020	Operational Intelligence	3-0-0	3	Even

1	**Programme**	MBA/IMG
2	**Semester**	Odd
3	**Type of course**	Elective
4	**Code of the subject**	MS011
5	**Title of the subject**	Business Systems Simulation
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	Understanding the principles and techniques of simulation modeling for business systems. Understanding the key components of a business system and how they interact with each other. Learning how to analyse and interpret simulation results to make informed decisions. Understanding the limitations of simulation modeling and the assumptions that need to be made. Learning how to optimize simulation models to achieve business objectives. Understanding the ethical implications of simulation modeling and the importance of data privacy and security. Learning how to apply simulation modeling in different industries and applications, such as manufacturing, logistics, healthcare, finance, and customer service.
9	**Brief Contents**	Introduction to Business System Simulation: Overview of the benefits of simulation modeling, The various types of

		simulation models, and the different tools and software used for simulation modelling, System Dynamics: Modeling approach on the feedback loops and dynamic relationships between different variables in a system, Topics covered include stock and flow diagrams, feedback loops, and system dynamics models, Discrete-Event Simulation: Modeling the discrete events and processes that occur in a system, such as customer arrivals, order processing, and inventory movements, Topics covered include event scheduling, process modeling, and queuing theory, Agent-Based Simulation: Modeling individual agents or entities within a system, such as customers, employees, or machines. Topics covered include agent behaviour modeling, agent interactions, and emergent behaviour, Optimization and Analysis: Various techniques used to optimize a simulation model and analyse the results, including sensitivity analysis, scenario analysis, and statistical analysis. Applications of Business System Simulation: Case studies and examples of how simulation modeling is used in different industries and applications, such as manufacturing, logistics, healthcare, finance, and customer service.
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	Even
3	**Type of course**	Elective
4	**Code of the subject**	MS012
5	**Title of the subject**	Service Operations Management
6	**Any prerequisite**	Operations Management
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	Upon successful completion of the course, student should be able to: Define services along with their nature and classification. Assess factors related to location and capacity planning. Employ design principles in development of service delivery systems. Analyse requirements to ensure maintainability and reliability in services.
9	**Brief Contents**	Matrix of service characteristics, Taxonomy of services, Challenges in operations management of services, Aggregate capacity planning for services, Facility location, Subjective and objective factors, Service design and delivery systems, layouts in services, Job and work design in services-safety and physical environment, Effect of managing queues, Automation, Operations standards and work measurement, Determinants of quality in services,

		Measurement, control and improvement of quality of services, Concept of a total quality service, Dynamics of service delivery system, Scheduling for service operations, Personnel and vehicles, Supply chain and distribution of services, Maintainability and reliability in services, Total productive maintenance (TPM) in services, Case studies of exemplary professionally managed services.
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	Odd
3	**Type of course**	Elective
4	**Code of the subject**	MS013
5	**Title of the subject**	Sustainable Supply Chain Management
6	**Any prerequisite**	Operations Management
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	Upon successful completion of the course, student should be able to: Develop an understanding of the role of supply chain in an overall value creation. Analyse different modes of transportation, different design options of transportation network in a supply chain, their applicability under different contexts and the trade-offs in transportation design. Describe the importance of reverse logistics in market places as well as market spaces. Design sustainable supply chains.
9	**Brief Contents**	Evolution of SCM, Issues of SCM, Competitive strategy vis-à-vis supply chain strategy, Achieving strategic fit, Managing inventory in a supply chain, Deterministic models, Probabilistic models (multi-period and single period). Managing risk and uncertainty in a supply chain: quick response strategy, Postponement strategy, Tailored sourcing strategy, Transportation in a supply chain: role of transportation in a supply chain, Modes of transportation and their performance characteristics, Design options for a transportation network, Trade-offs in transportation design, Supply chain coordination: Bullwhip effect - causes and consequences, Bullwhip effect quantification, Impact of centralized information on bullwhip effect, Mitigating strategies, Information sharing and incentives, Strategic sourcing in SCM: Role of sourcing in a supply chain, Framework for make/buy decisions, Supplier scoring and assessment, Supply contracts and supply chain performance, Big data analytics in SCM: Significance of big data in supply chain, Relevant tools, Reverse logistics:

		Reverse logistics in manufacturing organizations and ecommerce firms.
10	**Contents for lab**	SCM software like SAP SCM, Logility, Perfect Commerce, Oracle SCM etc.

1	**Programme**	MBA/IMG
2	**Semester**	Even
3	**Type of course**	Elective
4	**Code of the subject**	MS014
5	**Title of the subject**	Technology Management
6	**Any prerequisite**	Operations Management
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	Upon successful completion of the course, student should be able to: Define types of innovation, innovators and innovation environment. Describe the nature and extent of technological change and potential roles of incremental and disruptive innovation in creating and sustaining firm competitiveness. Perform feasibility and viability of new product development proposal from various perspectives.
9	**Brief Contents**	Introduction, Understanding innovation, Levels and types of innovation, Key drivers of innovation, Sources of innovation, and the relationship between innovation and research and technology development. understanding creativity as a building block to innovation, Innovation management, Framework for the management of innovation, Public sector services innovation, Diffusion of innovation creating organizational innovative effectiveness, Strategic aspects of technology, Critical factors in managing technology innovations, Critical issues/factors in choice of technology and processes; Indian context, Technology portfolio, Open innovation, New technology transfer-channels, Modes, Levels and issues, Absorption, adaption and adoption of technology, Technology considerations in lean environment, Strategic role of R&D, New R&D approaches, Strategic evaluation of technology investments, New product development and life cycle management, Understanding product platform strategy, Commercialization of core competencies, Marketing new products and technologies, Role, rationale and requisites of a national technology policy, IPR and licensing issues, Role of WTO.
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	Odd

3	**Type of course**	Elective
4	**Code of the subject**	MS015
5	**Title of the subject**	Technology and Operations Strategy
6	**Any prerequisite**	Operations Management
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	Upon successful completion of the course, student should be able to: Appreciate the nature, need and scope of operations strategy. Describe the strategic role of transformation processes and associated flows. Develop and analyse innovation, new product and process development strategies. Employ process of operations strategy in terms of sustainable alignment.
9	**Brief Contents**	Need for Operations Strategy, Impact of globalization on Operations Management, The Marketing link in the Operations Strategy -Role in competitive advantage, Time-based competitiveness and other criteria of success, The Sandcone model, Process of designing, analysing and implementing operations' strategies, Strategic management of transformation processes and flow strategies, Strategic choices in layout and capacity planning, Managing innovations and new product and process development strategies, Strategic purchasing and supply management, Outsourcing decisions, Strategic Purchasing Portfolio analysis, Operations improvement strategies, Breakthrough vs. continuous, The direct, Develop and deploy strategies, The market strategy, Bohn's stages of process matrix, Measures of performance, Process of Operations strategy, Sustainable alignment, Methodology of operations strategy formulation, Process of operations strategy formulation, Integrated management systems
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	Even
3	**Type of course**	Elective
4	**Code of the subject**	MS016
5	**Title of the subject**	Total Quality Management
6	**Any prerequisite**	Basic Knowledge of Probability and Statistics
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	This course provides learners with an understanding of quality control and improvement systems. This course will help participants to: Understand the principles of total quality management. Choose appropriate statistical techniques for improving processes. Develop the

		organizational, competitive and economic potential of quality. Integrate fundamental principles with the practice of total quality management.
9	**Brief Contents**	Evolution and Importance of Total Quality Management: Introduction, Importance of Quality, Evolution of Quality, What is Total Quality Management, Quality Pioneers, Active Living and Health Environment for TQM: Quality Leadership and Management Commitment, Employee Empowerment, Organizational Culture and Change, Team Building, TQM Infrastructure: Supplier relation and partnership, Continuous Improvement process lesson, Developing TQM action plan, TQM and Other Continuous Improvement Systems: Quality Standards, Six Sigma, Benchmarking, Just in Time, Stabilizing and Improving a Process: Defining and Documenting a Process, Diagnosing and Improving a Process, Statistical Process Control, Variables and Attributes Charts, The Fork Model For Quality Management- Management's Commitment to Transformation Lesson, Education and Daily Management, Cross-Functional Management, Quality Policy Management
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	Odd
3	**Type of course**	Elective
4	**Code of the subject**	MS017
5	**Title of the subject**	World Class Production Systems
6	**Any prerequisite**	Operations Management
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	Upon successful completion of the course, student should be able to: Appreciate the concept and need of world class manufacturing. Employ frameworks of various product and process design structures and systems in modern manufacturing. Analyse the implementation of TQM, JIT and Theory of Constraints. Appreciate philosophy and principles of Japanese manufacturing especially Toyota Production System (TPS).
9	**Brief Contents**	World Class Manufacturing (WCM): Concepts and Evolution, Understanding the linkage between Operations Strategy and WCM, Agile Manufacturing: Distinction between flexibility and agility, Model for implementing flexible and agile manufacturing, Flexible Manufacturing System (FMS), Concepts and components, Modern product and process design concepts and considerations,

		Assembly lines and batch manufacturing; group technology (GT), Total Quality Management (TQM): Roadmap to Implementation of TQM in manufacturing, Six Sigma approach, Just-in-Time (JIT) and Lean Operations, Theory of constraints (ToC), Japanese manufacturing techniques particularly Toyota Production System, Japanese vs American manufacturing focus, Critical elements of JIT, Operational Framework for concurrent implementation of TQM and JIT, Total Productive Maintenance (TPM): Concepts and Evolution, Metrics of TPM, Overall Equipment Effectiveness (OEE), Roadmap to TPM implementation in modern manufacturing, Computer Integrated Manufacturing System (CIMS): A framework for computer integrated enterprise issues involved in CIMS, Benchmarks for excellence in operational performance with global examples, Significance of implementation of concurrent operations management initiatives, Metrics of operational excellence in global context.
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	Even
3	**Type of course**	Elective
4	**Code of the subject**	MS018
5	**Title of the subject**	Emerging areas in Operations and Technology Management
6	**Any prerequisite**	Operations management
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	Upon successful completion of the course, student should be able to: Describe role of sustainable operations management. Design operations management along globally dispersed distributed networks. Develop nimble factories for supporting a lot size of one.
9	**Brief Contents**	Digital supply chains, Computer aided design and integrated manufacturing, A Focus on the employee experience, Flexible, blended workplace environments, Mobile communications and collaboration, Scaling production according to demand, Building the customer relationship.
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	Even
3	**Type of course**	Elective
4	**Code of the subject**	MS019
5	**Title of the subject**	New Products and Services Development
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	On completion of the course, students will be able to: Describe the nature and techniques of innovation and new product development. Discuss and reflect on the role of marketing in different phases of new product development. Explain the phases and intermediate results in new product development process. Apply theories of innovation to demonstrate the best level of practice in each problem situation within the context of new product development. Develop and implement a new product strategy for an enterprise.
9	**Brief Contents**	Product Conception: Product Basics Consumer problems and unmet need Empathy, Personas, User Stories Identifying New Product Opportunities using Data Market Research for New Product Development Idea Generation & Need Analysis Concept testing using Surveys-Customer Discovery Product potentiality and Conjoint analysis Design Thinking for B2C, B2B Products and Services, Product Design: Product Design Process - 7 Stages Product specifications and features Visual Design Elements Tools for Design of Digital Products User experience (UX) design Introduction to Software Tools used to design Engineering Products Quality Function Deployment, Value engineering methodology, Iterative design optimisation, Design for manufacturing, Prototyping: What is Minimum Viable Products (MVP)? Types of MVP Hypothesis Testing, A/B Prototype development for Digital Products, Wireframing 3D Printing and 3D Cutting Material Selection for Engineering Product, Prototyping Prototype, Functionalisation using Electronics and Instrumentation, Role of Robotics and Automation in Prototyping, Usability and Beta Testing, Product Deployment: Production planning and control Material handling In-house Budgeting and Outsourcing Quality Assurance Protocols Principles of Lean: Lean Manufacturing and Management Regulations and Standards: ISO Intellectual Property and Trademarks Building Markets and Creating Demand for New products services, Simulated test marketing, and Launching of new products, Product Lifecycle Management: Organisation for

		Product Management Marketing Manager-Product Manager-Brand Manager Concept Approaches and Organisational role Product Manager-Functions and Tasks-Tools and Techniques The Product in Corporate Life, Corporate and Product Objective Product Strategy and Policy Optimum Product Pattern/Line Range Challenge Of Change-Opportunity and Risk-Product Innovation, Modification, Addition and Elimination Product Proposals-Sources, Generation, Processing and Selection Contemporary Challenges and opportunities in product Management, Product Sales and Marketing: Brand Awareness, Consumer Brand Knowledge Product-line Decisions (extension, reduction), Product Category expansion Pricing Model and Strategy Product Costing Segmentation | Target | Positioning Sales Forecasting Distribution Channels Lead Generation-Role of Contacts and social media Customer Acquisition Customer retention, Commercialisation and Start-up: Introduction to Business Model Canvas Funding Requirement and Avenues Bootstrapping Team Building and Collaborations Customers and End Users Market Competition and Creating Barriers to Entry Deployment and Distribution Strategy Launching of Start-up: Rules and Steps Social media, Websites, and Digital Marketing Scale-up model and Sustainable growth plan
10	**Contents for lab**	No

1	**Program**	MBA/IMG
2	**Semester**	Even
3	**Type of course**	Elective
4	**Code of the subject**	MS020
5	**Title of the subject**	Operational Intelligence
6	**Any prerequisite**	None
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	Upon successful completion of the course, student should be able to: Describe the importance of data-driven operations along supply chains. Assess unbiased estimates of demand forecasting as well as optimization using various statistical methods. Employ mathematical models to capture and analyze data on supply chain carbon footprint.
9	**Brief Contents**	Problem-driven to Data-driven operations along supply chains, Big data in supply chain, Analytics in demand planning: Capturing demand data from different sources, Demand prediction models, Price optimization, Analytics in sourcing and procurement: In-house or outsource, Logistics and transportation, Supply chain contracts, Analytics in sales

		and operations planning: Differentiated service level to different products and customers, Location of plants, Product line mix at plants, Production planning and scheduling, Analytics in distribution: Location of distribution centre, Transportation and distribution planning, Inventory policies/order fulfilment at locations, Vehicle routing for deliveries, Analytics in reverse logistics in traditional and e-commerce firms: Location of return centres, Reverse distribution plan, Vehicle routing for returns collection, Analytics in supply chain carbon footprint
10	**Contents for lab**	Proficiency in using various software like SAS Business Analytics (SAS BA), Excel, Tableau, Microsoft Power BI etc.

List of electives from the specialization basket of Human Resource Management

S. No	Course Code	Title of the Course	L-T-P	Credits	Semester
1	MS021	Compensation Management	3-0-0	3	Odd
2	MS022	Change Management	3-0-0	3	Even
3	MS023	Corporate Social Responsibility	3-0-0	3	Odd
4	MS024	Competency Management	3-0-0	3	Even
5	MS025	Human Resource Information System	3-0-0	3	Odd
6	MS026	Emerging Areas in Human Resource	3-0-0	3	Even
7	MS027	Organization Theory and Development	3-0-0	3	Odd
8	MS028	Leadership and Talent Management	3-0-0	3	Even
9	MS029	Training and Development	3-0-0	3	Odd
10	MS030	Management of Employee Relations	3-0-0	3	Even

1	**Programme**	MBA/IMG
2	**Semester**	Odd
3	**Type of course**	Elective
4	**Code of the subject**	MS021
5	**Title of the subject**	Compensation Management
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	The aim of this subject is to develop students' understanding of the concepts of compensation and rewards in the organization. In particular the subject is designed to develop the underpinning knowledge and skills required to understand the one of the complex management functions i.e. compensating employees and its importance. This subject introduces the student to the basics compensation structure and differentials. It familiarizes the students with the practice of various management techniques and its expected results like job evaluation etc. The learner is apprised about the latest issues in management related to compensation in order to make the students abreast about the recent trends in the area.

9	**Brief Contents**	Introduction to compensation and rewards, Objective of compensation and rewards, Introduction to framework of compensation policy, Labor market characteristics and pay relatives, Wage determination: Introduction to compensation, rewards, wage levels and wage structures, Introduction to wage determination process and wage administration rules; Introduction to factors influencing wage and salary structure and principles of wage and salaries administration, Introduction to the theory of wages: Introduction to minimum, fair and living wage, Introduction to nature and objectives of job evaluation; Introduction to principles and procedure of job evaluation programs, Introduction to basic job evaluation methods; Introduction to Implementation of evaluated job, Introduction to determinants of incentives, Introduction to classification of Rewards, Incentive payments and its objectives, Introduction to wage incentives in India; Introduction to types of wage incentive plans, Introduction to prevalent systems & guidelines for effectives incentive plans; Introduction to non- monetary incentives, Introduction to cafeteria style of compensation, Introduction to problems of equity and bonus, Profit sharing & stock options, Introduction to features of fringe benefits, Introduction to history and growth factors, Coverage of benefits, Introduction to employee services & fringe benefits in India
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	Even
3	**Type of course**	Elective
4	**Code of the subject**	MS022
5	**Title of the subject**	Change Management
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	Effective management within organizations requires an understanding of various behaviour and processes. Managers need to know why people behave as they do in relation to their jobs, their work groups and their organizations. This knowledge of individuals' perceptions, motivational attitudes and behaviour will enable managers to not only understand themselves better, but also to adopt appropriate managerial policies and leadership styles to increase their effectiveness.

		The major objective of this course is to provide students with a better understanding of behavioural processes and thereby enable them to function more effectively in their present or future roles as managers of human resources.
9	**Brief Contents**	Definition of Organization Development (OD), OD and planned change from other forms of organization change, Describe the historical development of OD, Describe and compare three major perspectives on changing organizations, Introduce a General model of planned change, Describe how planned change can be adopted to fit different kinds of conditions, Understand the essential character of OD practitioners, Understand the necessary competencies required of an effective OD practitioner, Understand the roles and ethical conflicts that face OD practitioners, Reinforce the definition of an OD practitioner as anyone who is helping a system to make planned change, Describe the steps associated with starting a planned change process, Equip students with a general framework of diagnostic tools from a systematic perspective, Define diagnosis and to explain how the diagnostic process provides a practical understanding of problems at the organizational level of analysis, Discuss criteria for effective interventions, Discuss issues, considerations, constraints, ingredients, and processes associated with intervention design, Give an overview of the various interventions, Understand the issues associated with evaluating OD interventions, Understand the process of institutionalizing OD interventions and the factors that contribute to it, Understand the importance of data feedback in the OD process, Describe the desired characteristics of feedback content, and Describe the desired characteristics of the feedback process.
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	Odd
3	**Type of course**	Elective
4	**Code of the subject**	MS023
5	**Title of the subject**	Corporate Social Responsibility
6	**Any prerequisite**	None
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	Upon course completion, students will be able to: Develop skills in recognizing and analysing ethical issues. Define cross cultural variations and similarities

		in organizational practices in corporate social responsibility and business ethics. Understand sources of organizational ethical culture and to design ethical programs designed to accomplish specific objectives in organizations. Develop ethical leadership skills and practices
9	**Brief Contents**	Business ethics- an overview, Concepts and theories of business ethics, Emerging business ethics issues, Ethical decision making in business, Creating an ethical organization globalization and business ethics, Stakeholders and business ethics, Social responsibility and ethics, Issues in social responsibility, Implementing stakeholders' perspective, Stakeholder and issue management approaches, Managing corporate responsibility with external stakeholders, Corporate governance and ethical leadership, Kohlberg's six stages of moral development, Levels of ethical analysis, Concept of corporate integrity, Issues in corporate governance, good corporate governance - obligations towards society and stake holders, Ethics in consumer protection, Role of government agencies, SEBI, judiciary in ensuring ethical practices, Ethics and Indian business, Marketing ethics, Ethics in human resource management, financial management, banking and insurance.
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	Even
3	**Type of course**	Elective
4	**Code of the subject**	MS024
5	**Title of the subject**	Competency Management
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	The aim is to give students a better idea of how to work with their employees to make today's competency-based performance reviews more effective and a more positive experience. Begin to think of it differently: as a partnership or a collaborative effort.
9	**Brief Contents**	Introduction to competency**:** definition and history of competency, Basic components of competency (Knowledge(K), Skill(S), Attitude(A)), Performance Vs competency, Difference between competence and competency, Type of competency generic vs key

		competency, Functional and technical competency, Leadership and managerial competency, Need for competency framework, Limitation and learning from competency framework, Myth about competency, Competency development & its models**:** Need and importance of competency development, Stages in developing competency model, Types of competency Model – core/generic, Job specific, Managerial / leadership, Custom, development of personnel competency framework, competency mapping**:** procedures / steps-determining objectives and scope, Clarifying implementation goals and standards, create an action plan, Define competency-based performance effectiveness (key result area (KRA) & key performance indicators (KPI)), Tools for data collection, Data analysis, Validating competency model, Mapping future jobs, and single incumbent jobs, Using competency profile in HR decisions, Mapping competency for recruitment and selection, Training and development, Performance and compensation, Competency driven career and culture**:** Role of competency in career progression, Transactional competency, Tradition competency and transformational competency, Evaluation of career through KSA (Knowledge, Skill, and Attitude) Competency-based succession and career planning, corporate competency driven culture.
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	Odd
3	**Type of course**	Elective
4	**Code of the subject**	MS025
5	**Title of the subject**	Human Resource Information System
6	**Any prerequisite**	Human Resource Management
7	**L-T-P**	3-0-1
8	**Learning Objectives of the subject**	To review and understand the basic concepts and principles of human resource information system and to apply the same to the real world. To explore strategic value of HRIS and its contribution to organizational success. To review the leading HRIS software. To explore the ways of identifying best HRIS based on industry specificity and ROI.
9	**Brief Contents**	Introduction to HRIS, Acquisition and HRIS costs, Needs Assessment; HR metrics, Database concepts and

		applications in HRIS, Change management and data validation, HRIS design and implementation considerations, HR administration and HRIS, Job analysis, Security and privacy issues, Emerging trends in HRIS.
10	**Contents for lab**	Case study exercises Class projects and exercises

1	**Programme**	MBA/IMG
2	**Semester**	Even
3	**Type of course**	Elective
4	**Code of the subject**	MS026
5	**Title of the subject**	Emerging Areas in Human Resource
6	**Any prerequisite**	Human Resource Management
7	**L-T-P**	3-0-1
8	**Learning Objectives of the subject**	To recap the major concepts and theories of HRM. To explore the emerging areas of HRM. To understand practical applications of theory relevant to today's workplace. To explore contemporary topics in Human Resource Management. To build strong foundation and relevant skill set required in today's workplace.
9	**Brief Contents**	Setting the hybrid work model for collaboration, Human leadership, Working in the metaverse, Managing international human resources, Managing human resources in small and medium enterprises, Strategic human resource management, Change management, People analytics, The transition from employee well-being to healthy organization, Diversity, equity and inclusion
10	**Contents for lab**	Case study exercises Class projects and exercises Role playing

1	**Programme**	MBA/IMG
2	**Semester**	Odd
3	**Type of course**	Elective
4	**Code of the subject**	MS027
5	**Title of the subject**	Organization Theory & Development
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	Describe how the need to increase organizational efficiency and effectiveness has guided the evolution of management theory. Explain the principle of job specialization and division of labor, and tell why the study of person-task relationships is central to the pursuit of increased efficiency.

		Identify the principles of administration and organization that underlie effective organizations.
	Brief Contents	Explain what is meant by the term organization, Classify the three levels of managers and identify the primary responsibility of each group, Describe the difference between managers and operative employees. Explain the skills and roles manager, Describe the value of studying organization. Identify the relevance of popular humanities and social science courses to management practices, Trace the change in theories about how managers should behave to motivate and control employees, Explain the contributions of management science to the efficient use of organizational resources, Explain why the study of the external environment and its impact on an organization has become a central issue in management thought, Describe forces that act as stimulants to change, Summarize the sources of individual and organizational resistance to change, Summarize Lewin's three-step change model. Explain the values underlying most OD efforts, Contrast process reengineering and continuous improvement processes, Identify properties of innovative organizations**,** List characteristics of a learning organization, Describe potential sources of stress, Organizational Development Techniques, Explain individual difference variables that moderate the stress–outcome relationship
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	Even
3	**Type of course**	Elective
4	**Code of the subject**	MS028
5	**Title of the subject**	Leadership & Talent Management
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	Leadership and Talent Management primarily focus on managerial leadership as opposed to parliamentary leadership or emergent leadership in informal groups. The objective of this module is to present the theory and research on leadership and talent management in formal group.
9	**Brief Contents**	Define leader and explain the difference between managers and leaders, Summarize the conclusions of trait theories of leadership, Describe the Fiedler contingency model, Summarize the path goal model of leadership, Explain situational leadership, Identify the qualities that characterize charismatic leaders and authentic leaders, Meaning of talent, Talent or human capital of an organization, Why talent/human capital management? Functions of talent management**.**
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	Odd
3	**Type of course**	Elective
4	**Code of the subject**	MS029
5	**Title of the subject**	Training & Development
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	To develop an understanding from the point of view of the individual employee. Improve the individual's level of awareness. Increase an individual's skill in one or more areas of expertise. Increase an individual's motivation to perform their job well.
9	**Brief Contents**	Overview of training, Trends in training, Career opportunities in training important concepts and meanings, Why conduct a training needs analysis, When to conduct a TNA, The TNA model, The framework for conducting a TNA, Output of TNA, Approaches to TNA, Introduction to the design of training organizational constraints developing objectives, Why use training objectives, Overview of the training design ,Matching methods with outcomes , Lectures and demonstrations , Games and simulations, On-the-job & off the job training, Development of training, implementation, transfer of training. Evaluation of training, Rationale for evaluation, Resistance to training evaluation
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	Even
3	**Type of course**	Elective
4	**Code of the subject**	MS030
5	**Title of the subject**	Management of Employee Relations
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	To develop an understanding of the interaction pattern among labour, management and the State. To build awareness of certain important and critical issues in Industrial relations. To impart basic knowledge of the Indian Industrial relations system and its distinctive features.
9	**Brief Contents**	The evolution of Industrial relations, understand the scope and objectives of Industrial relations, Essential of Industrial relations, participants of Industrial relations and dynamics of their participation, perspective and approach, The system of industrial relation in India, the historical perspective of

		Industrial relations, Describe the trends in Industrial relations management, The changing characteristics of Industry and workforce in India, Describe the demand for labour, The challenges to industrial relations, Labour laws pertaining to Industrial relations viz Trade Union act, Industrial dispute act, Factories act, A paradigm shift from Industrial relations to Employee relations, Understand the Employee relations management. Describe the differences in perspective of employee relations and industrial relations.
10	**Contents for lab**	No

List of electives from the specialization basket of Finance

S. No	Course Code	Title of the Course	L-T-P	Credits	Semester
1	MS031	Corporate Restructuring	3-0-0	3	Odd
2	MS032	Corporate Tax Planning	3-0-0	3	Even
3	MS033	Economic and Financial Modeling	3-0-0	3	Odd
4	MS034	Entrepreneurial Finance	3-0-0	3	Even
5	MS035	Management of Financial Services	3-0-0	3	Odd
6	MS036	Financial Risk management	3-0-0	3	Even
7	MS037	Personal Wealth Management	3-0-0	3	Odd
8	MS038	International Finance	3-0-0	3	Even
9	MS039	Project Appraisal and Finance	3-0-0	3	Odd
10	MS040	Security Analysis and Portfolio Management	3-0-0	3	Even

1	**Programme**	MBA/IMG
2	**Semester**	Odd
3	**Type of course**	Elective
4	**Code of the subject**	MS031
5	**Title of the subject**	Corporate Restructuring
6	**Any prerequisite**	Financial Reporting and Control Financial Engineering and Management
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	The objective of this course is to sensitize the students about the need for corporate restructuring for achieving fast growth and maximize shareholders' value in the context of ever-increasing competition thrown up by liberalization and globalization of Indian economy. The focus of this course, however, will be to analyse the decisions in a financial perspective emphasizing valuation.
9	**Brief Contents**	Opening of the economy, Global view, Indian scenario, Economic liberalization, Corporate restructuring- mergers,

		acquisitions, and demergers, Mergers and amalgamations, Search for a merger partner, Negotiations, steps, and formalities, Demergers-divestitures, Spin off, Equity carved out, Split off, Split up, Reconstruction, Modes of demerger, Tax aspects, Advantages, and procedure of reverse merger- Requirements, Takeover by reverse bid, Techniques of and procedure for organizing takeover bids, Search for acquisition of target company, Procedure for takeovers and acquisitions, Valuation and exchange ratio-valuation of listed and unlisted companies, Modes of valuation, Fixing price for acquisition, Determination of share exchange ratio on merger, Feasibility analysis for cash acquisition, Valuation practices in India, Funding of merges and acquisitions-financing alternatives, Management buyouts, Leveraged buyouts, Post-merger management- accomplishment of objectives, Performance after merger, Mergers and accusations overseas by Indian corporates
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	Even
3	**Type of course**	Elective
4	**Code of the subject**	MS032
5	**Title of the subject**	Corporate Tax Planning
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	After the completion of this course, students will be able to understand and apply corporate tax provisions to real life business problems efficiently using appropriate concepts of taxation laws for corporate tax planning.
9	**Brief Contents**	Concept of tax planning, Tax management, Tax evasion, Tax avoidance, Corporate tax in India, Types of companies, Residential status of companies and tax incidences, Tax liability and minimum alternative tax, Tax on distributed profits of companies, Tax planning with reference to setting up a new business, locational aspect, Nature of business, Form of business, Tax planning with reference to financial management decision-capital structure, Dividend including deemed dividend and bonus shares, Tax planning with reference to specific management decisions - Make or buy, Own or lease, Repair or replace, Tax planning with reference to employee remuneration, Tax Planning with reference to business restructuring- Amalgamation, Demerger, Slump sale, Transfer between holding and

		subsidiary companies, Tax deducted at source, Advance Tax, Double taxation relief, Goods and service tax planning, Transfer pricing and taxation.
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	Odd
3	**Type of course**	Elective
4	**Code of the subject**	MS033
5	**Title of the subject**	Economic and Financial Modeling
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	The students will be able to: Learn the skills for framing finance and economy modeling. Develop problem solving abilities in the context of both macroeconomics and microeconomics. Analyze the company / industry performance on relevant financial parameters using historical information on companies
9	**Brief Contents**	Economic Modelling: Classical model of national income; distribution of national income to the households; fiscal policy and the allocation of resources between consumption, investment and government purchases; modelling economic growth, Modelling inflation; net exports; capital flows and exchange rates in the long run; Mundell Fleming model of business cycle; Edgeworth-Bowley box and the production possibility curve, Financial Modelling: Introduction to financial modeling; basic excel for financial modeling (formatting of excel sheets; use of formula functions; data filter and sort; charts and graphs; table formula and scenario building; vlookup; pivot tables), Introduction to financial statement analysis; financial reporting mechanics; income statement; balance sheet; cash flow statement; financial analysis techniques; inventories; long lived assets; non-current liabilities; financial statement application, Financial ratio analysis for financial statement interpretation; time value of money; long term financing; cash flow waterfall & resolve circular reference problem in interest during construction.
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	Even
3	**Type of course**	Elective
4	**Code of the subject**	MS034
5	**Title of the subject**	Entrepreneurial Finance
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	Students will be able to Understand the importance of financial management and managing a new venture. Learn analyzing the various sources of investment and also know the support provided by the state and central government for entrepreneurship. Determine the various financial supp ort schemes provided different institutions to the entrepreneurs.
9	**Brief Contents**	Financing and managing new venture: Importance of financial management as an integral part of entrepreneurship; conducting a feasibility analysis; what lenders and investors look for in a business plan, Sources of Finance: Various sources of investment; basics of venture capital and angel investment; start-up culture; various measures of encouragement and support being provided by the state and central government for strengthening the entrepreneurial culture, Institutional Financial Support: Schemes and functions of rate of Industries; District Industries Centres (DICs); Industrial development corporation (IDC); State financial corporation (SFCs); Small scale industries development corporations (SSIDCs); Khadi and village industries commission (KVIC); Technical consultancy organisation (TCO); Small industries service institute (SISI); National small industries corporation (NSIC); Small industries development bank of India (SIDBI). Evaluating new venture: Project evaluation; Real options and risk assessment, Financial assessment of new venture: Measuring and evaluating financial performance; financial strategy and capital structure
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	Odd
3	**Type of course**	Elective
4	**Code of the subject**	MS035
5	**Title of the subject**	Management of Financial Services
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	Students will be able to Enable participants, understand the financial services industry, regulatory environment, financial analysis, and risk management. Learn investment management, banking operations, financial planning, and financial technology, and ethics and professionalism. Determine the financial markets, financial intermediation and different financial services.
9	**Brief Contents**	Introduction to Financial Services: Financial services; Financial services sector in India: overview of financial services in India; nature scope and types of financial services: fund based and non-fund based financial services; venture capital: concept and types; regulatory framework; private equity; strategic secrets of private equity, investment strategies, hedge funds; new venture financing; risk & return in venture capital, Mutual Funds and Pensions Funds: Mutual funds and pensions funds; insurance services; bank assurances; reinsurances; securitization; Indian banking and financial crisis; asset reconstruction companies; depositaries; credit cards; micro/macro finance; financial inclusion, Plastic Money - Concept and different forms of plastic money - credit and debit cards, pros and cons. Credit process followed by credit card organizations. Factors affecting utilization of plastic money in India, Financial Depository: Depository – introduction, concept, depository participants; functioning of depository systems; process of switching over to depository systems; benefits; depository system in India; dematerialization and rematerialization role; objectives and functions of SEBI and its guidelines relating to depository system, Credit Rating & Merchant Banking: Credit Rating: the concept and objective of credit rating, various credit rating agencies in India, credit rating agencies – importance, issue, difference in credit rating, rating methodology and benchmarks, are Indian credit rating credible? International credit rating agencies – crisis of confidence?, Merchant Banking: origin and development of merchant banking in India scope, organizational aspects and importance of merchant

		bankers. latest guidelines of SEBI w.r.t. merchant bankers. Debt Securitization & Risk Management in Banks: Debt Securitization: meaning, features, scope and process of securitization. factoring: development of factoring types & importance, procedural aspects in factoring, financial aspects, prospects of factoring in India, Risk Management in Banks: credit risk management, operational risk management, market risk management, corporate treasury management, liquidity risk management, governance risk and compliance.
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	Even
3	**Type of course**	Elective
4	**Code of the subject**	MS036
5	**Title of the subject**	Financial Risk Management
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	Understand the concept of financial risk and a comprehensive understanding of the various types of financial risks that organizations face. Developing the skills to identify and measure financial risk using various quantitative and qualitative techniques. Understanding to develop and implement the strategies to manage financial risk. Understanding the regulatory environment surrounding financial risk.
9	**Brief Contents**	Overview of financial risks, Risk, expectations, and asset prices, Volatility behavior and forecasting, Market risk measurement, Value-at-Risk and its implementation, Credit and counterparty risk, Leverage and leverage risk, Liquidity risk, Extreme events and market risk measurement, Assessing the accuracy of Value-at-Risk, Incorporating extreme events into risk measurement, Credit risk measurement, Portfolio credit risk measurement, Structured credit risk, Financial crises, Overview of regulatory policy, Regulatory capital and liquidity standards, Financial stability regulation
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	Odd
3	**Type of course**	Elective
4	**Code of the subject**	MS037
5	**Title of the subject**	Personal Wealth Management
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	After completion of the course, students will be able to understand personal financial planning as an approach for investment, insurance, taxation, and retirement and can identified the best combination of different financial products in view of different time horizons and propositions of risk return trade-off.
9	**Brief Contents**	Introduction and importance of personal wealth management, Concept of personal financial planning, Objective of personal financial planning, Steps involve in personal financial planning process, Emergence of personal financial planning in India, Financial institutions and products, Concept of risk, Types of risk, Measuring risk, Understanding return, Concept of compounding, Real and nominal rate of return, Tax adjusted return, Risk adjusted returns, Asset classes, Portfolio construction, Practical asset allocation and rebalancing strategies, Portfolio monitoring and re-balancing, Need for insurance, Requirement of an insurable risk, Role of insurance in personal finance, Steps involve in insurance planning, Insurance products, Products and functions of life and non-life insurance business, Need of life insurance, Retirement planning process, Estimation of retirement corpus, Determination of retirement corpus, Retirement products, Understand income tax principles, Tax aspects of investment products, Personal tax planning, Estate planning.
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	Even
3	**Type of course**	Elective
4	**Code of the subject**	MS038
5	**Title of the subject**	International Finance
6	**Any prerequisite**	Financial Engineering and Management
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	Students will be able to understand the significance of financial management in the global context particularly for MNCs, importance of foreign exchange market and

		international financial institutions, and applications of financial instruments of the international financial markets for the working capital and financing decisions.
9	**Brief Contents**	Concept and comparison of international trade, International business, International finance, International trade theories, Balance of payments and capital account convertibility, Development of international monetary system, Nominal, real and effective exchange rates, Determination of exchange rates, Factors influencing exchange rates, Theories of exchange rate behaviour; International financial institutions, Major participants in foreign exchange market, Spot market and forward market, Markets for currency futures and options, Foreign exchange rates, Techniques of exchange rate forecasting, Nature and Measurement of Foreign Exchange Exposure, Management of Foreign Exchange Exposure, Theories of Foreign direct investment, International capital budgeting- Evaluation criteria, Computation of cash flows, Cost of capital, Adjusted present value approach, Evaluation and management of political risk, International Portfolio Investment-concept of optimal portfolio, modes of international portfolio investment, An overview of international financial markets, Channels for international flow of funds, Multilateral development banks, International banking, International financial instruments, Financial swaps, Management of interest rate risk, Working capital policy, Management of current assets, Financing current assets, Foreign trade documentation, Modes of payments in international trade, Methods of trade financing.
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	Odd
3	**Type of course**	Elective
4	**Code of the subject**	MS039
5	**Title of the subject**	Project Appraisal and Finance
6	**Any prerequisite**	Elementary Financial Management
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	The course aims at providing an understanding of project identification, feasibility study of the project and project report preparations. It facilitates the knowledge about different sources of financing and financial appraisal technique. It provides an acquaintance about social cost benefit analysis with understanding for different types of project risk and also post assessment of the project.

9	**Brief Contents**	An introduction to project appraisal, Project appraisal and evaluation , Project life cycle, Project cycle management , Cost benefit analysis of Private and public sector projects; Identification of investment opportunities – industry analysis review of project profiles, – feasibility study , Project identification and formulation , Generation of project ideas, Basic principles of project analysis entrepreneurship concept, Theory and perspective, Market feasibility analysis of a project, Need for market analysis, Demand and supply analysis, Collection analysis, primary /secondary data, Forecasting of market growth; Market forecasting techniques, Technical appraisal of a project, Technology tie ups and diffusion; Management of technology and business, Financial feasibility analysis: Estimation of cost of project & means of financing, Arrangement of funds, Traditional sources of financing: Equity shares, preference shares, Debentures / bonds, loan from financial institutions, Alternative sources of financing: FDI & FII, private equity, securitization, venture capital, Different business/project support government schemes, Government funding for projects, Startup schemes of government, Projected cash flows of project, Appraisal criteria, NPV,IRR, PI, PBP, ARR, Economic analysis of a project : Social cost benefit analysis – rationale of SCBA, direct and indirect cost and benefits, shadow price efficiency and equity in project appraisal, UNIDO approach, Little Mirrlees approach, Environment impact assessment of a project and social impact assessment of a project, Risk and sensitivity Analysis, taxonomy of risks, break even analysis, Sensitivity analysis, Risk analysis using simulation models and decision trees, Monitoring and evaluation of a project – PERT / CPM, Monitoring mechanism, valuation and lessons, project audit, Preparation of project report, Case analysis.
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	Even
3	**Type of course**	Elective
4	**Code of the subject**	MS040
5	**Title of the subject**	Security Analysis and Portfolio Management
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	The objective of this course is to help students gain an understanding of the evolving domestic and international investment landscape in general, and the Indian capital market with special emphasis on the availability of

		different financial products and stock exchange operations. It aims to provide a thorough understanding of portfolio management theory and practice. With the goal of assisting the participants in making wise investment choices in the context of portfolio investment, significant theories, techniques, laws, and advancements in investment theory will be covered.
9	**Brief Contents**	Investment Alternatives and Objectives, Organization and Mechanics of Securities Markets, Types of Security Markets and their Functions, Stock Exchanges, Depository, Stock Indices, Role of Regulatory Authorities, and various participants in markets, Market Microstructure, Risk and Return dynamics, Utility Theory, Portfolio Theory, CAPM Capital Asset Pricing Model (CAPM), Arbitrage Pricing Model (APT), Multi-factor Models, Sharpe's Single Index Model, Lagrange Multiplier Theory, Basics of futures and options, Fundamental Analysis: Macroeconomic activities and security markets, The Cyclical indicator approach, Monetary variables, Business cycles and industry sectors, Evaluating Industry life cycle, Analysis of industry competition and industry rate of returns, Company analysis, Analysis of Financial statement and Stock valuation, Technical analysis: Assumption, Advantages, Challenges, Types of Charts, Technical Trading Rules, and Indicators, Introduction to Efficient Market Hypothesis, Random Walk Model, Forms of EMH, Empirical Evidence, Bond Fundaments, Valuation and Bond Yield, Term structure, Bond Theorems, Bond Portfolio Management Strategies, Passive and Active Management, Portfolio Management, Portfolio Objectives, Evaluation of Portfolio Performances, Application of Portfolio performance measures
10	**Contents for lab**	No

List of electives from the specialization basket of Marketing Management

S. No	Course Code	Title of the Course	L-T-P	Credits	Semester
1	MS041	Consumer Behavior	3-0-0	3	Odd
2	MS042	Advertisement and Sales Promotion Management	3-0-0	3	Even
3	MS043	Product and Brand Management	3-0-0	3	Odd
4	MS044	E-marketing	3-0-0	3	Even
5	MS045	Retail Management	3-0-0	3	Odd
6	MS046	International Marketing	3-0-0	3	Even
7	MS047	Sales and Distribution	3-0-0	3	Odd
8	MS048	Marketing Research	3-0-0	3	Even
9	MS049	Service Marketing	3-0-0	3	Odd
10	MS050	Strategic Marketing	3-0-0	3	Even

1	**Program**	MBA/IPG MBA
2	**Semester**	Odd
3	**Type of course**	Elective
4	**Code of the subject**	MS041
5	**Title of the subject**	Consumer Behavior
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	Explaining the basic concepts of Consumer Behavior and its linkages to marketing. Examine how markets are segmented, and brands are positioned. Analyse the phenomenon of consumer learning about a brand and forming perceptions about it. Compare how the theoretical aspects of Consumer Behaviour are practiced in real scenarios by marketers and brands.
9	**Brief Contents**	Consumers, Marketers, and Technology, Consumer Behavior and Technology, Market Segmentation and Real-Time Bidding, The Consumer as an Individual, Consumer Motivation and Personality, Consumer Perception and Positioning, Consumer Learning, Consumer Attitude Formation and Change, Communication and Consumer Behavior, Persuading Consumers, From Print and Broadcast to Social Media and Mobile Advertising, Reference Groups and Communities, Opinion Leaders, and Word-of-Mouth, Social and Cultural Settings, The Family and Its Social Standing, Cultural Values and Consumer Behavior, Cross-Cultural Consumer Behavior: An International Perspective, Consumer Decision-Making, Marketing Ethics, and Consumer Research, Consumer Decision-Making and Diffusion of Innovations, Marketers' Ethics and Social Responsibility, Consumer Research.
10	**Contents for lab**	Case study exercises

1	**Programme**	MBA/IMG
2	**Semester**	Even
3	**Type of course**	Elective
4	**Code of the subject**	MS042
5	**Title of the subject**	Advertisement and Sales Promotion Management
6	**Any prerequisite**	Marketing Management
7	**L-T-P**	3-0-1
8	**Learning Objectives of the subject**	To understand the key concepts of advertising and sales promotion. To explore an organisation’s numerous copy and media decisions. To understand the link between advertising and sales promotion for enhancing brand equity

9	**Brief Contents**	Role of integrated marketing communication, Role of IMC in marketing process, Marketing and promotions process, Organizing for advertising and promotion: the role of Ad agencies and other marketing communication organizations, Perspectives on consumer behavior, The communication process, Source, message and channel factors, Establishing objectives and budgeting for the promotional program, Creative strategy: planning and development, Media planning and strategy, Media decisions, Evaluation of broadcast media, The internet and interactive media, International advertising and promotion, Advertisement effectiveness, Sales promotion, Linkage between advertising and sales promotion, Brand equity, Regulation of advertising and promotion, Evaluating the social, ethical, & economic aspects of advertising & promotion.
10	**Contents for lab**	Case study exercises Class projects and exercises Field projects and company visits

1	**Programme**	MBA/IMG
2	**Semester**	Odd
3	**Type of course**	Elective
4	**Code of the subject**	MS043
5	**Title of the subject**	Product and Brand Management
6	**Any prerequisite**	Marketing Management
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	After completion of this course students will be able to understand the concept of product and brand management, branding as marketing strategy; brand equity and its measurement, and operational aspects of brand management.
9	**Brief Contents**	Introduction and concept of product management, Management of new product development process, Understanding and managing product life cycle, Introduction to brand management, Brand management process, Brand choice decisions and models, Brand identity, Brand communication, Brand positioning, Brand image and personality, Brand valuation, Brand tracking and monitoring, Building brands in Indian market, Launching a new brand, Revitalizing brands, Brand extension strategies, Brand portfolio management, Managing brands across geographical borders, Managing brand experience, Digital branding, Employment branding, Co-branding.
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	Even
3	**Type of course**	Elective
4	**Code of the subject**	MS044
5	**Title of the subject**	E-Marketing
6	**Any prerequisite**	Marketing Management
7	**L-T-P**	3-0-1
8	**Learning Objectives of the subject**	To explore frameworks for the successful planning and execution of e-campaign strategies. To understand ROI enhancement, customer lifetime value and firm profitability aligned with business goals through e-marketing. To plan and implement search engine and social media campaigns in simulated environments. To understand leveraging digital marketing funnel for better customer engagement. To understand reach, engagement and conversions with paid and unpaid e-campaigns. To measure and optimize the e-campaigns through different matrices. Strategic application of digital marketing best practice.
9	**Brief Contents**	Marketing in the digital world, Exploring customer behaviour and customer journey in digital world, Crafting and executing digital strategy, Aligning business strategy, Reaching and engaging the customer, Strategies for paid and unpaid e-campaigns, Display, social media and e-mail campaigns, User experience and transformation, True personalization, Customer service, Content strategy, Matrices for strategy evaluation, Digital analytics, Emerging technologies
10	**Contents for lab**	Case study exercises Class projects and exercises Field projects and company visits

1	**Programme**	MBA/IMG
2	**Semester**	Odd
3	**Type of course**	Elective
4	**Code of the subject**	MS045
5	**Title of the subject**	Retail Management
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	Upon successful completion of the course, students should be able to: Demonstrate an understanding of how retailers develop a retail mix to build a sustainable competitive advantage. Explain how retailers use marketing communications to build a brand image and customer loyalty. Understand the integration of merchandise management and supply chain strategies leading to excellent customer service. Understand the financial implication of strategic retail decisions. Demonstrate an understanding of decisions retailers make to satisfy

		customer needs in a rapidly changing and competitive environment.
9	**Brief Contents**	Introduction to the world of Retailing : A. History of retail, B. Retail overview and present scenario C. Concept and Functions performed by retailers D. Emerging Trends and career opportunities in retailing, Types of Retailers: A. Retailer characteristics B. Retail Formats - Store based, Non-store based, Web based C. Various format within store based retailing e.g. specialty store, hyper market, supermarket, buying decision process : A. The buying process - need recognition, information search, evaluation of alternatives. B. Social factors influencing the buying process family, reference groups and culture retail market strategy: A. Definition of retail and market strategy B. Target market C. Building a sustainable competitive advantage like - customer's loyalty, location, human resource management, distribution and information system, vendor relations. D. Growth strategies - Market penetration, market expansion, retail format development diversification, integration, E. Global retail strategies F. Strategic retail planning process, Choosing retail location: A. Types of locations - Unplanned locations free standing sites B. Evaluation of area for location C. Evaluating specific area for locations, HRM In Retailing : A. Human resource planning, Recruitment and selection, training and development of retail employees. B. Motivation of retail employees, C. team building in retailing D. Employee Rewards and Incentives, Store Planning: Design & Layout, Retail Image Mix, effective retail space management, floor space management, Retail Supply Chain Management: A. Introduction to supply chain management B. The distribution across centres 24 C. Collaboration between retailer and vendor in SCM D. Inventory Management E. Warehousing F. Transportation G. Use of IT in SCM 8. Customer Relationship Management - The CRM process 9. Retail Information System Instructrual Strate, Merchandise Pricing: Concept of Merchandise Pricing, Pricing Objectives, External factors affecting a retail price strategy, Pricing Strategies, Types of Pricing.
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	Even
3	**Type of course**	Elective
4	**Code of the subject**	MS046
5	**Title of the subject**	International Marketing
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	The course aims at providing knowledge to students to the global business activities, marketing in international

		business and global forces transforming the international business today. Participants will learn to plan effectively for the marketing of consumer and business needs and wants on an international level. Special emphasis will be placed on cultural and environmental aspects of international trade, and integration of culture and marketing functions.
9	**Brief Contents**	An Overview of International Marketing: The Scope and Challenge of International Marketing, The Dynamic Environment of International Trade, The Cultural Environment of Global Markets: History and Geography: The Foundations of Culture, Cultural dynamics in assessing Global markets, Culture, Management style, and Business systems, The Political environment: A Critical concern, The International legal environment: Playing by the rules , Assessing Global Market Opportunities: Developing a Global Vision through Marketing Research, Economic Development and the Americas, Europe, Africa, and the Middle East, The Asia Pacific Region, Developing Global Marketing Strategies: Global marketing management: Planning and Organization, Products and services for consumers, Products and services for businesses, International marketing channels, Integrated marketing communications and International advertising, Personal selling and Sales management, Pricing for international markets, Implementing Global Marketing Strategies: Inventive Negotiations with International Customers, Partners, and Regulators
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	Odd
3	**Type of course**	Elective
4	**Code of the subject**	MS047
5	**Title of the subject**	Sales and Distribution
6	**Any prerequisite**	Marketing Management
7	**L-T-P**	3-0-1
8	**Learning Objectives of the subject**	To understand the key concepts of sales and distribution. To explore an organisation's numerous distribution and sales channels. To broadly look at the role of sales and distribution as a key element within marketing strategy. To equip with basic skills required in sales and distribution management.

9	**Brief Contents**	Sales management and the business enterprise, Sales management, personal selling, and salesmanship, Setting personal-selling objectives, Determining sales-related marketing policies, Formulating personal- selling strategy, The effective sales executive, The sales organization, Sales department relations, Sales personnel management, Recruitment and selection, Sales training, motivation and compensation, Evaluation and supervision, Sales budget, Territories, control and cost analysis, Marketing channels, Managing channel partners, Channel information system, Logistics and supply chain management, International sales and channel management
10	**Contents for lab**	Case study exercises Class projects and exercises Field projects and company visits

1	**Programme**	MBA/IMG
2	**Semester**	Even
3	**Type of course**	Elective
4	**Code of the subject**	MS048
5	**Title of the subject**	Marketing Research
6	**Any prerequisite**	Basic knowledge of statistics and research methodology
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	To understand the formulation of marketing problem into a feasible research question. To design and execute a basic survey research project. To understand the research tools and techniques for executing a marketing project and decision making.
9	**Brief Contents**	Introduction to Marketing Research: Marketing research an introduction, marketing research process design, Research design formulation: Measurement and scaling, questionnaire designing, sampling and sampling distributions, Sources and collection of data: Secondary data sources, Data collection: survey and observation, experimentation, fieldwork and data preparation, Descriptive statistics and data analysis: Measures of central tendency, measures of dispersion, hypothesis testing for single population and two populations, ANOVA and Experimental designs, hypothesis testing for categorical data (chi-square test), correlation and simple linear regression analysis, Multivariate analyses (multiple regression analysis, discriminant analysis, conjoint analysis, factor analysis, cluster analysis, multidimensional scaling and correspondence analysis, Result presentation: Presentation of results, report writing, Applications of marketing research: Marketing mix research: Product, price, place and promotion research

10	**Contents for lab**	Descriptive statistics and data analysis: Measures of central tendency, measures of dispersion, hypothesis testing for single population and two populations, ANOVA and Experimental designs, hypothesis testing for categorical data (chi-square test), Correlation and simple linear regression analysis, Multivariate analyses (multiple regression analysis, Discriminant analysis, conjoint analysis, factor analysis, Cluster analysis, Multidimensional scaling and correspondence analysis

1	**Programme**	MBA/IMG
2	**Semester**	Odd
3	**Type of course**	Elective
4	**Code of the subject**	MS049
5	**Title of the subject**	Service Marketing
6	**Any prerequisite**	Basic knowledge of Marketing Management
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	To provide an in-depth appreciation and understanding of the unique challenges inherent in managing and delivering quality services. To develop an understanding of the 'state of the art'of service management thinking. To understand the marketing concepts in the perspectives of services.
9	**Brief Contents**	Service Marketing Introduction : Meaning and nature of services, classifications of services, Introduction to service marketing, Evolution of service marketing, Service marketing mix and Gaps model: 7Ps of service marketing, service gaps framework, perceived service quality, model of service marketing, Service design and service delivery: Introduction to service design and service delivery, service delivery process, service encounters and moments of truth, employee role in service delivery, role of service provider, intermediaries involved in service process and delivery, managing demand and supply of service, STP strategy for Services: Need for segmentation of services, bases of service segmentation, segmentation strategies in service marketing, need for targeting and positioning strategies for services, Consumer behaviour in service marketing: Customer expectations in services, Service costs experienced by consumer, the role of consumer in service delivery, customer responses in services, customer delight, service failure and recovery, Emerging issues in Service marketing: Strategic approach in service marketing, Service marketing in e-commerce and e- marketing, Telemarketing services
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	Even
3	**Type of course**	Elective
4	**Code of the subject**	MS050
5	**Title of the subject**	Strategic Marketing
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	On completion of this course, the student will be able to: Understand and critically discuss the marketing activities that impinge on our daily lives as business managers and citizens. Critically evaluate key marketing theory, concepts, research and current practice. Discuss critically decision-making processes and frameworks for selecting marketing objectives, target markets and marketing mixes. Discuss critically how marketing practice is influenced by contemporary challenges in the operating environment. Apply theoretical frameworks to real-world marketing innovation challenges: identifying their key features and implications, setting appropriate marketing objectives and evaluating alternative marketing strategies.
9	**Brief Contents**	Fundamentals of Marketing Strategies, Marketing management for a turbulent era, The marketing fit with corporate and business strategies, Capturing key Marketing environmental insights, Customer insights and customer connections , Capturing marketing insights for demand measurement, Market segmentation and target marketing, Conducting Marketing audits, Branding and positioning, Marketing strategies for competitive and market scenarios, The integrated marketing mix, Marketing Metrics and Analytics, Organising, planning, delivering and measuring market performance, Innovation and Marketing Strategy, Marketing Channels and Pricing, Marketing Communications, Digital and Social media marketing, Marketing strategy to the bottom of the pyramid, Frugal & Grass root marketing
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	Odd
3	**Type of course**	Elective
4	**Code of the subject**	
5	**Title of the subject**	Customer Relationship Management
6	**Any prerequisite**	Marketing Management
7	**L-T-P**	3-0-1
8	**Learning Objectives of the subject**	To understand the meaning and application of CRM. To explore the benefits of CRM to companies and consumers. To explore CRM best practices implementation in organizations. To understand the importance of bonding and building loyalty with customers. To explore the ways of building long-term customer relationships.

9	**Brief Contents**	Introduction to CRM, Market segments, buyer personas, and voice, Understanding and building customer relationships, Managing the customer journey, Strategic CRM, Operational CRM, Analytical CRM, Economies of CRM, CRM applications, CRM in business markets, Building effective internal structure, and choosing the right CRM solution, CRM Implementation, Streamlining processes, automating where possible, and employing analytics, Futuristic developments
10	**Contents for lab**	Case study exercises Class projects and exercises Field projects and company visits

List of electives from the specialization basket of Management of Social Sector

S. No	Course Code	Title of the Course	L-T-P	Credits	Semester
1	MS051	Public Policy and Processes	3-0-0	3	Odd
2	MS052	Public Private Partnerships	3-0-0	3	Even
3	MS053	Sustainable Development	3-0-0	3	Odd
4	MS054	Management of Rural and Social Sector	3-0-0	3	Even
5	MS055	Information Technology Enabled Services	3-0-0	3	Odd
6	MS056	Management of Non-Formal Organization	3-0-0	3	Even
7	MS057	Healthcare System Management	3-0-0	3	Odd
8	MS058	Emerging Areas in Management of Social Sector	3-0-0	3	Even
9	MS059	Infrastructure Management	3-0-0	3	Even

1	**Programme**	MBA/IMG
2	**Semester**	Odd
3	**Type of course**	Elective
4	**Code of the subject**	MS051
5	**Title of the subject**	Public Policy and Processes
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	Upon successful completion of the course, student should be able to: Describe formulation and implementation of policies. Employ role of various institutions and interest groups in policy formulation and implementation process. Assess role of various stakeholders in influencing policy processes and associated outcomes.
9	**Brief Contents**	Concepts and Theories of Public Policy and Processes: Understanding public policy, Policy types, Approaches to policy making- various models of policy making and their relevance, Institutions and its role in Public Policy: Policy making institutions in India: Judiciary, executive and legislature, How policy making is accomplished in India,

		Constitutional/statutory bodies and its role in policy process, Political institutions, Changing role of institutions: new public management, New governance model, Role of networks in shaping public policy, Policy Process: Formulation of policies: Principal phases of policy process: issue identification/agenda setting, Stakeholder consultation and review, Transparency in policy formulation, Identifying the main actors/stakeholders in the policy process, Idea of political power and influence, Regional versus national interest, Policy Process: implementation of policies: policy implementation, Identifying implementation gaps, Feedback on policies, Policy implementation as a political process: political economy, Service Delivery, Accountability and people's participation: role of decentralization and local governance, Policy Change: Identifying role of domestic and international actors in determining policy choices, Endowments and Constraints on their power to determine policy choices civil Society/pressure groups/networks and its role in influencing policy decisions, Market (private sector/business) as an agent in influencing policy decisions, Media and its role in public policy
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	Even
3	**Type of course**	Elective
4	**Code of the subject**	MS052
5	**Title of the subject**	Public Private Partnerships
6	**Any prerequisite**	
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	Upon successful completion of the course, student should be able to: Understand the role of cooperation between public and private sectors in delivering public services; to develop understanding of PPP models and their contextual suitability; and employ various types of partnerships and assess their consequences.
9	**Brief Contents**	PPP Concept, Benefits and Limitations- Public service delivery and roles of government, recent trend of reforms on public service delivery, basic theories of pubic private partnership (PPP) PPPs Models- Concept and practices of outsourcing, Competition between private and public sectors, such as competitive sourcing and market testing, concept and practices of various types of private finance initiative (PFI), recent issues in PFI practices, theories and practices of deregulation, involvement of citizens, non-profit organization (NPOs) and social enterprises in public service

		delivery, Basic theories and practices of executive agencies and public corporations, theories and practices of privatization, recent practices to bring outsourced public services back in-house Government Role for Creating an Enabling PPP Environment- Conventional and innovative approaches for improving government procurement, practical models of shared services in public sector, advantages and disadvantages of PPP, strategies, steps, monitoring, evaluation of PPP, skills and resources required for managing PPP Risk Identification and Allocation- Risk assessment, value for money (VfM) and commercial feasibility exercises, risk identification, political risks, market risks, challenges for public service delivery and possible (desirable) future directions PPP Structure and Financing- Financing options, profitability assessment, funding cost, project attractiveness.
10	**Contents for lab**	N/A

1	**Programme**	MBA/IMG
2	**Semester**	Odd
3	**Type of course**	Elective
4	**Code of the subject**	MS053
5	**Title of the subject**	Sustainable Development
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	To enhance students understanding of the SDGs to create a better- informed citizenry, which will lead to a more sustainable action by all and for all. To understand the basic concept of Sustainable Development (SD), the environmental, social and economic dimensions. To know the history of the SD idea. To Be able to discuss the conflicts which are involved in the SD concept on the national as well as on the global scale. To be familiar with potential strategic options for SD (efficiency, sufficiency). To be able to discuss the (dis-advantages) of instruments for SD. To understand the SD challenge for companies, their responsibility and their potentials for action.
9	**Brief Contents**	Sustainability, sustainable development, and the sustainable development goals; **SDGs overview, goals, and targets, Instruments for sustainable development,** SDG Goal part-1 : Poverty, Hunger, Good health and Well-being, SDG Goal part-2 : Gender equality, Reduced inequalities, SDG Goal part-3 : Clean water and sanitation, Affordable and clean energy, SDG Goal part-4: Quality education, Decent work and Economic growth, SDG Goal part-5 Industry, Innovation, and Infrastructure; SDG goal part- 6: Sustainable cities and communities, Responsible Consumption and Production, SDG Goal part-7 Climate

		action, Life below water, Life on land; SDG Goal part-8 Peace, Justice, and Strong institutions, #17 Partnerships for goals, Implementing the SDGs, Monitoring, Evaluation, Reporting, Beyond sustainability to radical transformation, Company perspectives
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	Even
3	**Type of course**	Elective
4	**Code of the subject**	MS054
5	**Title of the subject**	Management of Rural and Social Sector
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	Course is designed to inculcate students with realistic understanding of rural segment and society for the application of managerial and technological learning.
9	**Brief Contents**	Indian rural and social sectors, Rural and sector economic development, Different rural and social sector reform programmes of Asia; Local, National and International focuses and policies for economic reforms of rural and social sectors.
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	Odd
3	**Type of course**	Elective
4	**Code of the subject**	MS055
5	**Title of the subject**	Information Technology Enabled Services
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	Understand the business strategy and business implications for strategic IT planning. Equip students to understanding the concepts of IT infrastructure library and services
9	**Brief Contents**	Business Strategy: Challenges- opportunities, Interconnection establish principles before practice, IT strategy, Application strategy, Technology strategy for IT, IT management strategy, Developing IT strategy for competitive advantage, Stages of IT strategy development and implementation, Challenges of IT and business strategy alignment, Inhibitors of business and IT strategy alignment, Three-D framework for Business and IT strategy alignment, Business implications for IT strategy and planning, Strategic IT planning, Motivations, SITP Process: Prevalent planning approaches difficulties, Best practices for achieving good SITP, SITP approaches: Prevalent researches, Defining EITA, Contents of a typical enterprise IT architecture, Standard for enterprise IT architecture, Technology Management strategy framework, Information Technology

		Infrastructure Library (ITIL), ITIL overview- ITIL Service-support processes, Incident management, Problem management, Service delivery, Service level management- Financial management, Capacity management, IT Service continuity management (ITSCM), Availability management, Imperatives for outsourcing, IT management layers- Variants of outsourcing, Business process outsourcing, Insourcing.
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	Even
3	**Type of course**	Elective
4	**Code of the subject**	MS056
5	**Title of the subject**	Management of Non-Formal Organization
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	The Non-Informal sector is the backbone of the Indian Economy. The understanding of the issues related to the informal sector is necessary to have a better understanding of the Indian economy. This course would try to educate the researcher on different issues related to the informal sector in India and across the developing countries. This paper would enable the management student and potential researcher to conduct some in-depth research work in the unorganized sector.
9	**Brief Contents**	Introduction: Why the Informal Economy Matters to Management, Concept, Features and Types of Non formal sector, Difference between formal and informal organisation, Function of Non formal sector ,Formalizing informal sector, Challenges of the informal economy for the field of Management, Theoretical Foundations: A General Equilibrium approach, Communication, Visibility, and the Informal Economy, Technology in Non formal sector – Application and challenges, Management of The ICT in Non informal sector, Small Business in the informal Economy, Informal Financial Services: A Proposed Research Agenda, The hidden enterprise culture: Entrepreneurship in the Non informal sector, Organization and Contract in the Informal Economy, Comparative Economic Organization Revisited: Hybrid Governance in the Informal Economy, Factors Influencing the Registration Decision in the Informal Economy, Informal Firms in India What Do We Know and Where Does the Research Go, Healthcare in the Informal economy, Subsistence Entrepreneurs and Formal Institutions: Semi-formal Governance among Indian Entrepreneurs, Learning From India's Aadhaar Project, Lesson form Akshyapatra',Lesson from 'Arvind Eye care'
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	Odd
3	**Type of course**	Elective
4	**Code of the subject**	MS057
5	**Title of the subject**	Healthcare System Management
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	Upon successful completion of the course, student should be able to: Delve into the components and functions of health care provider organizations and assess the unique challenges involved in managing complex health care organizations. Appraise the motivations and interests of key internal and external stakeholders and managing expectations and communicating with these stakeholders. Weigh common problems and decisions faced by health care managers, and explore the implications of various alternative strategic solutions
9	**Brief Contents**	Issues in health management: leadership, management and motivation, Organizational behavior and management thinking, Strategic planning, Information systems, Complexity and purpose of health care organizations, For profit and non-profit organizations, Management responsibilities and health care operations, Management code of ethics and ethical decision-making, Care and cure processes, Operations management, Impact of the pandemic on providers and caregivers, Physician practice management, The post-pandemic health care system, Strategic planning, Industry consolidation
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	Even
3	**Type of course**	Elective
4	**Code of the subject**	MS058
5	**Title of the subject**	Emerging Areas in Management of Social Sector
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	Upon successful completion of the course, student should be able to: Apply social work skills, values and ethical responsibilities to leadership, management and supervision practices. Describe and critique selected theories, research and practice approaches relevant to effective and socially just leadership and management in human service organizations. Create a plan for strategic change using

		concepts, processes and skills related to leadership, management, and organization development.
9	**Brief Contents**	Corporate governance, Project management, Social entrepreneurship for sustainable development, Strategic planning for social sector organizations, Essentials of managing a social organization, Understanding financial statements, Measuring project results, Systems and tools for impact measurement, Social impact marketing and sales management, Scaling a social enterprise, Attracting & raising capital, Market regulation and compliance.
10	**Contents for lab**	No

1	**Programme**	MBA/IMG
2	**Semester**	Even
3	**Type of course**	Elective
4	**Code of the subject**	MS059
5	**Title of the subject**	Infrastructure Management
6	**Any prerequisite**	No
7	**L-T-P**	3-0-0
8	**Learning Objectives of the subject**	Understanding the importance of infrastructure in supporting economic development, quality of life, and public safety. Understanding the roles and responsibilities of different stakeholders involved in infrastructure management, including government agencies, private sector organizations, and community groups. Developing skills in infrastructure asset management, including maintenance, repair, and replacement of infrastructure assets. Understanding the principles of sustainable infrastructure development and management, including considerations of environmental and social impact. Developing an understanding of risk management, including identifying, assessing, and mitigating risks associated with infrastructure systems. Understanding the legal and regulatory frameworks governing infrastructure development and management. Developing an understanding of the financing and funding mechanisms for infrastructure projects, including public-private partnerships and other innovative financing approaches.
9	**Brief Contents**	Introduction to Infrastructure Management: Definition and scope of infrastructure, Importance of infrastructure management, Historical development of infrastructure management, Types of Infrastructure: Transport, Water and wastewater infrastructure, Energy infrastructure management, Telecommunication management, Asset Management: Asset inventory and condition assessment, life cycle costing, risk management, Funding and Financing of Infrastructure: Public sector funding, private

		sector funding, public -private partnership, Project Management: Project identification and selection, project planning and design, project procurement and contracting, construction management and supervision. Infrastructure Policy and Regulation: Government policy on infrastructure, regulatory framework for infrastructure management, environment regulations and considerations, Emerging trends in Infrastructure management: New technologies for infrastructure management, Sustainability and resilience considerations, Future challenges and opportunities in infrastructure management
10	**Contents for lab**	No