MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WEST BENGAL
(FORMERLY KNOWN AS WEST BENGAL UNIVERSITY OF TECHNOLOGY)
Main Campus : Haringhata, Nadia, Pin-741249
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Ref.No. COE/Notice/CBCS Syllabus/62/2020-21 Updated on: 25th November,2020

Updated GE Baskets for Odd Semester 2020-21 for CBCS structure programs
(Updated on 21st January 2021)

Basket No	GE Basket	Course Code	Course Name
Basket 1	HUMANITIES & HUMAN SKILLS	GE1B-01	Mind and Measurement
		GE1B-02	Introduction to Hospitality Industry and major Departments
		GE1B-03	Health Education & Communication
		GE1B-04	Sustainability & Fashion
		GE1B-05	The Yoga Professional
		GE1B-06	Indian History & Culture
Basket 2	CREATIVE & PERFORMING ARTS	GE2B-01	Cinema and Other Arts
		GE2B-02	Surface & Soft Furnishings Design Development Techniques
Basket 3	GENERAL SCIENCE & **MATHEMATICS**	GE3B-01	Study of Textiles
		GE3B-02	IT Literacy
		GE3B-03	Basic Mathematics & Statistics
		GE3B-04	Mathematics for Computer Science Part- 1
		GE3B-05	Business Research Methods: Tool & Techniques
		GE3B-06	Business Mathematics
		GE3B-07	Business Statistics
		GE3B-08	Mathematics for Machine Learning
		GE3B-09	Mathematics for Computing
		GE3B-10	Probability & Statistics
		GE3B-11	Bayesian Statistics
		GE3B-12	Operations Research
		GE3B-13	Data Analytics
		GE3B-14	Applied Cryptography
		GE3B-15	Inferential Statistics
Basket 4	EMERGING TECH, INNOVATION & ENTREPRENEURSHIP	GE4B-01	Operating Systems with Linux
		GE4B-02	Entrepreneurship Theory & Practice
		GE4B-03	Basics of Computing
Basket 5	OTHER COURSES	GE5B-01	Principles of Management
		GE5B-02	Economics
		GE5B-03	Accounting
		GE5B-04	Principles of Management & Organizational

			Behaviour
		GE5B-05	Basics of Accounting & Finance in Healthcare Management
		GE5B-06	Health Economics
		GE5B-07	Medical Microbiology
		GE5B-08	Biochemistry & Nutrition
		GE5B-09	Micro Economics in Business
		GE5B-10	Marco Economics in Business
		GE5B-11	Business Regulatory Framework

(S Datta)
Controller of Examinations

Detail Syllabus of GE Courses available in Offline/Blended mode:

Course Name: Mind and Measurement
Course Code: GE1B-01

Mode- Offline/ Blended **Credits: 6**

Course Objectives: The course has been designed to explore the emotional and motivational states of mind along with knowledge and application of higher cognitive functions. The learner will be able to apply the knowledge of cognition, conation and effect on the human psyche in the context of personal and professional domains and make a relation between brain and body through the understanding of Human Physiology, various psychological processes and changes throughout the lifespan of humans.

Sl	Course Outcome	Mapped modules
CO1	Explaining the concept and the physiological correlates of emotion.	(M1) BL2
CO2	Understanding the different theoretical aspects of emotion.	(M2) BL2
CO3	Explaining the concept and the physiological correlates of motivation.	(M3) BL2
CO4	Understanding the different theoretical aspects of motivation.	(M4) BL2
CO5	Labelling different span of attention.	(M5) BL2
CO6	Assessment of memorization capacity	(M6) BL1, BL2

Module	Content	Total Hours	%ageof questions	Blooms Level (if applicable)	Remarks (If any)
Module 1	Define Emotion and Physiological correlates of emotion: Electrical, Circulatory changes, Respiration and Peripheral measures. The role of Cortex in Emotions. Concept of Homeostasis.	5	15	2	
Module 2	Theories of Emotion : James-Lange; Cannon-Bard, Lindsay, Schachter-Singer, and Lazarus	8	20	2	
Module 3	Understanding the concept of Motivation in connection to its role in education and physiological basis of hunger, thirst.	8	20	2	
Module 4	Theories of Motivation – Maslow, McClelland, Murray. Application, Nature of thinking; Inductive and Deductive reasoning; Problem solving approaches	10	15	2	
Module 5	Assessment of the different span of attention- sustained attention (digit vigilance test) test of divided attention (triad) test of focused attention (trail making)	12	15	2	
Module 6	Interpretation and practical application of memory, learning and forgetting using - whole vs	15	15	1,2	

	part learning, spaced vs un-spaced learning, retroactive inhibition, pro-active inhibition. Learning curve,				
		58	100		

Detailed Syllabus

Module 1- Define Emotion, Nature, Impact & Expression. Physiological correlates of emotion: Electrical, Circulatory changes, Respiration and Peripheral measures. The role of Cortex, Hypothalamus & Limbic System in Emotions. Concept of Homeostasis. Kluver-Bucy Syndrome. **Total Hours: 5**
Module 2- Theories of Emotion: James-Lange Theory of Emotion; Cannon-Bard Thalamic Theory of Emotion, Activation Theory of Emotion by Lindsley, Two Factor Theory by Schachter-Singer, and Cognitive Appraisal Theory of Lazarus: Concept, Research Evidence, Implication, Critical Appraisal for each theory Total Hours: 8
Module 3- Understanding the concept of Motivation, Drive, Need, Impulse in connection to its role in education, physiological basis of hunger, thirst: mechanisms within the system with neurobiological underpinning & special emphasis on research evidence. **Total Hours: 8**
Module 4- Theories of Motivation – Need Hierarchical Theory by Maslow, Achievement Motivation Theory by McClelland, Theory of Psychogenic Needs by Murray: Concept, Research Evidence, Implication, Critical Appraisal for each theory, Application, Nature of thinking; Inductive and Deductive reasoning; Problem solving approaches **Total Hours: 10**
Module 5- Practicum Assessment of the different span of attention- sustained attention (digit vigilance test) Test of divided attention (triad) Test of focused attention (trail making) **Total Hours: 12**
Module 6-Practicum Interpretation and practical application of memory, learning and forgetting using - whole vs part learning, spaced vs un-spaced learning, retroactive inhibition, pro-active inhibition. Learning curve **Total Hours: 15**

Suggested Readings

- Morgan, C. T., King, R. A., Weisz, J. R., &Schopler, J. (2006). Introduction to Psychology, 7th eds.
- Fredrickson, B., Loftus, G. R., Lutz, C., & Nolen-Hoeksema, S. (2014). *Atkinson and Hilgard's introduction to psychology*. Cengage Learning EMEA.
- Schultz, D. P., & Schultz, S. E. (2020). *Psychology and work today*. Routledge.
- Woodsworth, R. S., & Schlosberg, H. (1954). Experimental psychology (Rev. ed.). *New York: Holt*

Course Name: Introduction to Hospitality Industry and Major departments
Course Code: GE1B-02

Mode- Blended

Course Objective: The course is designed to provide overall concept of a hotel operation, the major operating departments, hierarchy, job profiling, functions and relation amongst the departments

Sl	Course Outcome	Mapped modules
1	Understand hospitality industry and relationship with tourism.	M1, M2
2	Understand basic front office operation.	M2, M1
3	Understand basic Housekeeping operation	M2, M3
4	Understand the importance of safety and hygiene.	M2.M3.M4
5	Understand the basic F &B service operation.	M1 ,M5
6	Understand & demonstrate menu and types of service	M5 ,M6

Module Number	Content	Total Hours	%age of questions	Blooms Level (if applicable)	Remarks (If any)
M 1	Introduction to hospitality	6	10	1,2	
M 2	Basic Front office operation	12	15	2,3	
M 3	Basic Housekeeping operation	12	15	2,3	
M 4	Safety and hygiene	06	20	2,3	
M 5	Basic F&B service operations	12	20	3,4	
M 6	Menu and types of service	12	20	3,4	
		60	100		

Detailed Syllabus:

Module 1 – Introduction to Hospitality Industry: Characteristics of Hospitality Industry and relation with Tourism, Types and Classification of Hotels, Departments in Hotels like Front Office, House Keeping, F&B Service and non-revenue earning departments and their co-ordination. (06 hours)

Module 2 – Basic Front Office Operations: Organizational chart of Front Office department with duties and responsibilities of staff, Types of guest room, basis of charging tariff, meal plans, type of guests, responsibility of Front Office department, Procedures in Front Office, Pre-registration, registration procedures, Bell-desk, Concierge, Cahier, Night Audit. Registration procedure, Role-play for check-in checkout procedures. Sanitization procedures. (12 Hours)

Module 3 –Basic Housekeeping Operations: Organizational chart of House Keeping department with duties and responsibilities of staff, responsibility of House Keeping department, Layout of Guest room, Guest supplies and amenities, Floor and Pantry, Room cleaning procedures, key control, lost and found procedures, forms formats and registers in Housekeeping, functions of House Keeping control desk. Role-play for complain handling and various services. (12 Hours)

Module 4 – Safety and Hygiene: Importance of Safety and Hygiene, Sanitization techniques for guest, hotel personnel, offices, Guest rooms and Public areas, Liaison with Public health department, Accidents, Fire, and security. Concept of First aid and artificial respiration (06 Hours)

Module 5 – Basic F&B Service Operations: Organizational chart of F&B Service department with duties and responsibilities of staff, responsibility of F&B Service department, Attributes of personnel, Equipment

and Service ware uses care and maintenance, Types and Layout of F&B Service areas, basic menu knowledge and types of service. (12 Hours)

Module 6 –Menu and types of Service: Basic concept of Menu, restaurant and Coffee Shop Layout, the concept of stations, numbering the tables and covers at a table, reservation systems in restaurants, records & registers maintained by a Restaurant, rules to be observed while laying and waiting at the table, Dos & don'ts of waiting staff in F&B service operations, organizing the staff for service. (12 Hours)

Suggested Readings:

- Hotel Housekeeping, Sudhir Andrews, Tata McGraw Hill
- The Professional Housekeeper, Tucker Schneider, VNR
- Professional Management of Housekeeping Operations, Martin Jones, Wiley
- House Keeping Management for Hotels, Rosemary Hurst, Heinemann
- Front office operations by Colin Dix &Chirs Baird
- Hotel Front office management by James Bardi
- Managing front office operations by Kasavana& Brooks
- Food & Beverage Service -Lillicrap& Cousins
- Modern Restaurant Service -John Fuller
- Food & Beverage Service Management-Brian Varghese
- Introduction F& B Service-Brown, Heppner & Deegan
- Professional Food & Beverage Service Management -Brian Varghese

Course: Health Education and Communication

Course Code: GE1B-03

Mode- Offline/ Blended

Course Objective The course is designed to provide basic knowledge about the health and health communication. The students will be able to use information, communication and education across media for the public towards ensuring equitable access to health for both prevention and cure.

Sl	Course Outcome	Mapped modules
1	Explain the concept of health and the knowledge of health education in society.	M1
2	Apply the modern technology in health care sectors.	M2
3	Describe the different model of communication.	M3
4	Develop the communications to the different field of society.	M4
5	Able to use the computer as a tool in health care.	M5
6	Understand how to aware the people about the health.	M6

Module Number	Content	Total Hours	%age of questions	Blooms Level(if applicable)	Remarks (If any)
M 1	Concept Of Health And Health Education	16	20	L1, L2	
M 2	Health Education & Artificial Intelligence	8	10	L1, L2	
M 3	Heath Communication	10	10	L1, L2	
M 4	Mass communication and role of media	8	10	L1, L2	
M 5	Tools used for communication	8	30	L1, L2	LAB
M 6	Presentation on concept of health and health education	10	20	L1, L2	LAB
		60	100		

Detailed Syllabus:

Module 1- Concept of Health and Health Education: 16h

Definition of physical health, mental health, social health, spiritual health determinants of health, indicatory of health, concept of disease, natural history of diseases, the disease agents, concept of prevention of diseases.

Health Education: Principles & Objectives, Levels of Health Education, Educational Methods, Evaluation & practice of Health Education in India.

Family planning: Demography and family planning: Demography cycle, fertility, family planning, contraceptive methods, behavioral methods, natural family planning methods, chemical methods, mechanical methods, hormonal contraceptives, population problem of India.

Module 2-Health Education & Artificial Intelligence: 8h

Changes in the workforce, Robots, assisting the human experts or completely robotic diagnosis, Medical training: to train paramedical students, AI can play a big role, Virtual health assistants, advanced health research, Clinical and administrative task handling.

Module 3-Heath Communication: 10h

Basic Concept & Principles of Communication, Definition, Purpose, Types of Communication, Communication Process, Directions of Communication: Upward, Downward, Lateral, Factors influencing Communication, Barriers of Effective communication, How to overcome the Barriers Models of communication: Aristotle Model, Shannon and Weaver model, Schramm Model, Laegans Model, Fano Model, Literer's Model, Westly Maclean's Model.

Module 4- Mass Communication and Role of Media: 8h

Mass communication & Role of Media in health education, Information Communication Technologies (ICT) in health care and awareness. (Telemedicine & e-health, community radio) Future trends in information and communications systems:

Module 5: Tools Used for Communication 8h

Introduction to PC Operating System and MS office package - Windows 10/Ubuntu, MS Office 2016 / Office360 (MS Word, MS Excel, MS PowerPoint, MS Outlook, Internet and Email)

Module 6: Presentation on Concept of Health and Health Education 10h

Reference Books:

1.Health Education – A new approach – L. Ramachandran & T. Dharmalingan

2.Health Communication in the 21st Century, By Kevin B. Wright, Lisa Sparks, H. Dan O'Hair, Blackwell publishing limited, 2013,

3.Health Communication: From Theory to Practice, By Renata Schiavo, Published by Jossey Bash.

4.Health Communication, R.D. Karma Published by Mohit Publications 2008.

5.Counseling Skills for Health Care Professionals, 1st Edition, Rajinikanth AM, Jaypee Brothers, 20

Course Name-Sustainability & Fashion

Course Code-GE1B-04

Mode- Offline/ Blended

Course Objectives:

The course is designed to provide working knowledge of Environmental, Sustainable, and Ethical issues prevailing in the world. Students will be able to understand the relation between sustainable development goals and fashion industry.

Course Outcomes (CO):

Sl	Course Outcome	Mapped modules
1	Remember & Understand Environmental, Sustainable & Ethical issues being faced today and their causes	M1
2	Remember & Understand the Role of sustainable, ethical and environmental organizations	M2
3	Remember & Understand the innovation in sustainable thinking for the future	M3
4	Remember & Understand the roles and impact designers have on the natural resources and the environment	M4
5	Remember & Understand the renewable & non-renewable energy	M5
6	Remember & Understand the possibilities in sustainable and ethical fashion	M6

Module Number	Content	Total Hours	%age of questions	Blooms Level (if applicable)	Remarks (If any)
M1	Environmental & Sustainability Issues	10	20	1,2	
M2	Sustainable & Ethical focused Organizations	8	14	1,2	
M3	Innovations in sustainable thinking for the future	8	14	1,2	
M4	Resource consumption and depletion	8	16	1,2	
M5	Renewable Energy Vs. Non-Renewable Energy	10	16	1,2	
M6	Fashion Design & Sustainability	10	20	1,2	
		60	**100**		

Detailed Syllabus:

ModuleI (10 Hours)

Environmental & Sustainability Issues: Climate Change & Global Warming, Pollution, Resource depletion, Consumerism and the throw-away society,

ModuleII (8 Hours)

Sustainable & Ethical focused Organizations, bodies and Agencies: Greenpeace, Earth day Network, Ethical Fashion Forum, United Nations, Fair Trade, World Wildlife Fund (WWF)

ModuleIII (8 Hours)

Innovations in sustainable thinking for the future: UN Sustainable Development Goals, The Paris Climate Agreement, Ocean Clean-Up

Module IV (8 Hours)
Resource consumption and depletion: Deforestation, Fossil Fuels, Sand, Minerals, Precious Stones & Metals

ModuleV (10 Hours)
Renewable Energy Vs. Non-Renewable Energy: Impact of non-renewable i.e. traditional fossil fuel based energies, Renewable energy systems and technology innovations, Sustainable energy schemes and initiatives in India

ModuleVI (10 Hours)
Fashion Design & Sustainability: Sustainable Fashion design concepts, Sustainable materials for fashion and an understanding of the impacts of our materials choices, Future trends within sustainable fashion, an overview of the key issues the fashion and textiles industry faces, Discussion on the impact of new emerging technologies

Suggested readings:
1. Introduction to Sustainability Paperback – 2016 by Robert Brinkmann
2. Sustainability in Interior Design Book by Sian Moxon
3. References:
1. Centre for Sustainable Fashion- www.sustainable-2. MISTRA Future Fashion- www.mistrafuturefashiofans.choiomn .com
3. Sustainable Clothing Action Plan: Clothing Knowledge Hub- www.wrap.org.uk/node/19930
4. Textiles Environment Design- www.tedresearch.net
5. Textile Futures Research Centre -www.tfrc.org.uk
6. Sandy Black | The Sustainable Fashion Handbook 2012
Tamsin Blanchard | Green is the New Black: How to Change The World with Style 2008
7. Michael Braungart and William McDonough | Cradle to Cradle: Remaking the Way We Make Things 2009
8. Sass Brown | ReFashioned: Cutting Edge clothing from Recycled Materials 2013
9. Elisabeth Cline | Overdressed: The Shockingly High Cost of Cheap Fashion 2012
10. Kate Fletcher and Lynda Grose | Fashion and Sustainability: Design for Change 2012

COURSE: THE YOGA PROFESSIONAL

COURSE CODE:GE1B-05

MODE: OFFLINE/ BLENDED

COURSE OBJECTIVE:

The course is designed to provide understanding about the textual and grammatical aspects of sanskrit language to enable the students to better imbibe the essence of the yogic concepts. The students will be able to interpret the new dimensions of yoga and education and be able to apply principles of yoga for personality development through objectivity.

Sl	Course Outcome	Mapped modules
1	Read and understand the colloquial words of Sanskrit.	M1, M2
2	Write in Sanskrit and have some idea about grammar.	M1, M2
3	Communicate and comprehend Sanskrit to the best of their ability.	M1, M2, M3
4	Understand the Interface between Culture & Psychology.	M4
5	Apply the principles of Culture & Basic Psychological Processes	M5
6	Assess the importance of Culture & Gender interrelation	M6

Module Number	Content	Total Hours	%age of questions	Covered CO	Blooms Level	Remarks (If any)
Module 1	Introduction to reading, writing & speaking of Sanskrit language	10	15	1,2,3	2,3	
Module 2	Grammatical aspects of Sanskrit language	10	15	1,2,3	2,3	
Module 3	Transliteration according to authentic dictionary method	10	10	3	2,3	
Module 4	Interface between Culture & Psychology	10	10	4	2,3	
Module 5	Culture & Basic Psychological Processes	10	30	5	2,3,4,5	
Module 6	Culture & Gender	10	20	6	2,3,5	
		60	100			

Detailed Syllabus:

MODULE 01 **8L + 2T**

Vowels and Consonants, pronunciation, articulation of each letter and the technical names of the letters according to their articulation, similar and dissimilar letters and how to write them.

Consonants combined with vowels, pronunciation and writing, special letters which do not follow the general method.

MODULE 02 **8L + 2T**

Conjunct letters, rules to combine consonants, special consonants, how Sanskrit articulation can be applied to languages like English, special attention to Anusvara, when it can be written in the form of a nasal, two consonant combinations and three consonant combinations, their writing practice, special conjunct letters and their writing.

MODULE 03 **8L + 2T**

Transliteration according to authentic dictionary method.

MODULE 04 **8L + 2T**

Interface between Culture & Psychology Methods of Understanding Culture, Scope of Cultural Psychology, Mechanisms of Cultural Transmission

MODULE 05 **8L + 2T**

Culture & Basic Psychological Processes Interrelation between Culture, Perception, Cognition Emotional expressions and Culture

MODULE 06 **8L + 2T**

Culture & Gender, Culture and Gender stereotype

REFERENCE BOOKS:

1. Dr. Sarasvati Mohan, Sanskrit Level-1 Sharadh Enterprises, Bangalore, 2007.
2. Dr. Sarasvati Mohan, DVD and CD.(Publication of Akshram and Hindu SevaPrathisthana)

Paper Code: BBA (TTM)-103/GE1B-06

Paper Name- Indian History & Culture

Total Credit: 6
Total hours of lectures: 60 hours

Sl.	Topic/Module	Hour
1.	**Unit-I** The pre-historic period, Indus Valley Civilization - Source of Information, Characteristics of Indian culture & society in the pre-historic ages and Indus valley civilization. Vedic Period – Early and Later Vedic period. . Jainism, Teaching & Principles of Jainism, Contribution of Jainism to Indian Culture. Buddhism- Rise and Growth, Doctrines of Buddhism.	10
2.	**Unit-II** Mauryan Period – origin, growth and contribution, Sunga Dynasty, Kusana Dynasty, Gupta Period – political, religious, socio-cultural and economic development during Maurya to Gupta period. Art & Architecture during Mauryan and Gupta period Political condition of North India, South India and Eastern India after Guptas.	10
3.	**Unit-III** History of Medieval India 1206 - 1526 A.D. Rise of Turks, causes of Success of Arab invasion and its impact, Slave Dynasty, Khaliji Dynasty, Tughlaq Dynasty, Sayyid Dynasty, Lodhi Dynasty. Moghul dynasty. Indo Islamic & Mughal Architecture.	10
4.	**Unit- IV** Political Condition of India after Moghul- Decline of Mughal emperor and its impact. Shivaji & the rise of the Marathas. Advent of Europeans in India – Establishment of East India company and other European companies. Establishment of British Rule in India.	10
5.	**Unit-V** Social and religious reforms movement in India, Brahma Samaj, Arya Samaj, Rama Krishna Mission, Social Traditions, Economic, political, religious and social development post-Independence.	10
6.	**Unit-VI** Concept of Cultural Tourism. Performing Arts- Classical Music, Classical Dance- various formation, Theatre, Visual Arts- Paintings, Sculpture, Different fairs & festivals in India. Various handicrafts items in India, folk culture in India,	10

Suggested reading

1) Themes of Indian History – Part 1, 2, 3 – NCERT (2013)
2) Mitter. Partha (2001), Indian Art, Oxford Publications, London
3) R. S. Sharma – India's ancient Past, Oxford University Press
4) 2. Romila Thapar- Penguin History of India
5) R.C.Mazumdar, H.C.Roychowdhury & K. K. Dutta Advance History of India
6) Singhania. Nitin (2015), Indian Art and Culture, Tata McGraw Hill Education,

Course Name: Cinema and Other Arts

Course Code: GE2B-01

Mode: Offline/ Blended

Course Objective: The course is designed to provide a general understanding and appreciation of the history of world cinema, acclaimed international films, artists, and movements. The students will be able to gain a multiple cultural perspective based on the underlying theories and principles of cinema and media.

Sl	Course Outcome	Mapped modules
1	Understand the fundamental components of a Cinema and other arts	M1, M2, M3, M4, M5, M6
2	Remember the readings and understand the perspective	M1, M2
3	Understand the nuances of modern painting	M2, M3
4	Understand the nuances of Indian painting	M2, M3, M4
5	Understand and examine the Indian and Western music	M1, M2, M5
6	Analyze the music of parallel and commercial Indian cinema	M1, M2, M5, M6

Module Number	Content	Total Hours	%age of questions	Blooms Level (if applicable)	Remarks (If any)
Module 1	Pre-Renaissance	10	15	L1, L2	
Module 2	Renaissance and Perspective	10	15	LI, L2	
Module 3	Modern Painting	08	15	L1, L2	Workshop
Module 4	Indian Painting	08	15	L1, L2	Workshop
Module 5	Fundamentals of music	12	15	L2, L3	Workshop
Module 6	Music and cinema	12	25	L2, L3	Workshop
		60	100		

Detailed Syllabus:

M1	**Pre-Renaissance**: Visual representations in cave paintings, in folk cultures and early civilizations like Egypt Visual representations in Greece: A breakaway from earlier practices Visual representations in ancient and medieval India: Ajanta cave paintings,Mughal miniature, Kangra, Ragmalaetc
M2	**Renaissance and Perspective** The Renaissance at a Glancefrom The Enquiring Eye – European Renaissance Art, Development of the idea of perspective; Use of camera obscura and camera lucida Selected Readings from John Berger's Ways of Seeing, Dutch painting; Baroque, Rococo and Mannerism.
M3	**Modern Painting:** Impressionism, Expressionism, Surrealism, Cubism

M4	**Indian Painting** Raja Ravi Verma, Bengal School Contemporary Masters
M5	**Fundamentals of music:** Tone, note, key, octave, musical scales – diatonic and tempered scales, chords, melody, harmony, swar and shruti Folk music, forms and structures of Indian classical music, forms and structures of western classical music; Evolution of musical forms; Music industry and popular music; Urban folk music, Blues, Jazz, Rock
M6	**Music and cinema;** Music for Cinema Comparison of the two art forms – music and cinema; Ray and Ghatak's ideas on structural similarities of music and cinema Analysis of structures of films to compare with musical forms Musical accompaniment of films – from live musical accompaniment of silent era to present day. Diagetic and extra-diagetic music Analysis of music tracks of selected films Electronic Vs acoustic musical accompaniment (Has to be done as a workshop by a music composer) Item numbers of Bollywood films

Suggested Readings:

1. Andrei Tarkovsky, Sculpting in Time
2. Satyajit Ray, Our Films Their Films
3. RitwikGhatak, Rows and Rows of Fences
4. Penguin Dictionary of Music
5. S.C Deva, Music of India
6. E.H Gombirch, The Story of Art, Phaidon Publications
7. Hendrik Willen Van Loon, The Arts of Mankind
8. Hugh Honour and John F. Fleming, The Visual Arts: A History. Prentice Hall, 2005. Sylvan Barnet, A Short Guide to Writing About Art. Prentice Hall, 2007.
9. The Enquiring Eye – European Renaissance Art (National Gallery of Art, Washington)
10. Herbert Read The Meaning of Art 11. Walter Pater The Renaissance
12. John Berger, Ways of Seeing
13. Art Through the Ages by Helen Gardner
14. Nothing If Not Critical: Selected Essays on Art and Artists
15. The Story of Painting by Wendy Beckett
16. Minor: Art Historys History _p2 by Vernon Hyde Minor
17. Isms: Understanding Art by Stephen Little
18. The Visual Arts: A History by Hugh Honour
19. What Are You Looking At: 150 Years of Modern Art in a Nutshell by Will Gompertz
20. Art and Illusion: A Study in the Psychology of Pictorial Representation by E.H. Gombrich

Course Name: Surface & Soft Furnishings Design Development Techniques

Course Code-GE2B-02

Mode-Offline/ Blended

Course Objective:**The course is designed to provide a conceptual understanding of interior design of spaces with surface and soft furnishings. The students will be able to visually express with colour, texture, pattern and material effects for surface design appropriate to project specifications.**

Sl	Course Outcome	Mapped modules
1	Understand the fundamental interior design aspects of surface and soft furnishings	M1, M2, M6
2	Understand the fundamentals of textiles and types	M1, M2
3	Understand and demonstrate printing techniques	M2, M3
4	Understand the apply embroideries	M2, M3, M4
5	Understand and examine materials, techniques, and technology	M1, M2, M5
6	Apply the surface designs	M5, M6

Module Number	Content	Total Hours	%age of questions	Blooms Level (if applicable)	Remarks (If any)
Module 1	Textiles and Its Types	08	15	L1, L2	
Module 2	Research soft furnishings and textiles/fabrics used in the design	08	15	L1, L2	
Module 3	Printing and its techniques	10	15	L1, L2	
Module 4	Embroideries and its types	10	15	L1, L2	
Module 5	Exploration of materials, techniques and technologies for the development of surface design	12	15	L2, L3	
Module 6	Final surface designs and presentation	12	25	L3	
		60	100		

Detailed Syllabus:

Module -1: Textiles and Its Types

- Introduction to textiles – Indian (kalamkari, matanipachedi, ikkat) and international textiles.
- Special embellishment techniques: Batik, Tie and dye - lehariya, bandhini ,shibori, sunray and marbling.

Module – 2: Research soft furnishings and textiles/fabrics used in the design

- Table Linens
- Rugs & Carpets
- Window dressings (Curtains & Blinds)
- Towels
- Bedding & Bedspreads
- Cushions & Throws

- Lampshades
- Wallpaper
- Tiles
- Flooring

Module -3: Printing and its techniques

- Print application through block printing, Lino printing, Wood cut printing, Lithograph printing
- Print application through screen & block printing (vegetable block and wooden blocks, Appliqué, quilting, Smocking, honey comb, Fabric painting, Stencil- dabbing and spraying).
- Natural dyeing techniques and explorations.

Module -4: Embroideries and its types

•Basic Hand Embroidery, their technique, variations and applications. Basic running stitch, backstitch, stem stitch, chain stitch, lazy daisy stitch, buttonhole stitch, featherstitch, herringbone stitch, knot stitch, satin stitch and cross-stitch.

•Traditional Embroidery- Origin, application &colours. Kantha, Chikan, Kasuti, Zardosi, Kutch and Mirror work.

Module -5: Exploration of materials, techniques and technologies for the development of surface design

- Print – Screen, Block, Mono etc.
- Stenciling
- Fabric Dye (Natural and Azo free)
- Fabric paints
- Fabric and textiles Embellishment

Module -6: Final surface designs and presentation

- Develop surface designs for a range of applications.

Reference Books:

• The Complete Technology Book on Dyes & Dye Intermediates Paperback – 1 Jan 2003 by NIIR Board of Consultants & Engineers (Author)

• Biodegradation of Azo Dyes by HaticeAtacagErkurt (Editor) – Publisher: Springer (9 August 2010), ISBN-10: 3642118917

• Second Skin: Choosing and Caring for Textiles and Clothing by India Flint Murdoch Books, 2011 ISBN 978-1-74196-720

• Indigo:The Color that Changed the World by Catherine Legrand Thames & Hudson, 2013 ISBN 978-0500516607

• Warp and Weft:
Woven Textiles in Fashion, Art and Interiors by Jessica HemmingsBloomsbury, 2012 – ISBN 978-1-4081-3444-3

• Quilt National 2013:The Best of Contemporary Quilts by The Dairy Barn Cultural Arts Center

• DragonThreads Extraordinary Textile Arts Books, 2013 - ISBN 978-0-9818860-4-6

• Surface Design for Fabric: Studio Access Card Printed Access Code – February 15, 2015 by Kimberly Irwin Publisher: Fairchild Books (February 15, 2015) ISBN-10: 1501395033

Websites

- https://www.houseology.com/masterclass/design-school/chapter-eight-soft-furnishings
https://www.twosistersecotextiles.com/pages/azo-dyes

Course Name- Study of Textiles
Course Code- GE3B-01

Mode-Offline/ Blended

Course Objectives:

The course is designed to provide working knowledge of textile, the best utilization of available fabric resources, the awareness of its property, suitability for a particular use. The students will be able to understand and apply the acquired knowledge in their designs., and enhance aesthetic and functional value of textile material for fashion industry.

Course Outcomes (CO):

Sl	Course Outcome	Mapped modules
1	Remember & Understand different types of Textile materials available in the market and their uses.	M1, M2
2	Understand various kinds of fabrics, their structure, properties and the utility.	M2,
3	Understand Textile dyeing, printing and finishing techniques and	M3, M4.
4	Apply dyeing & Printing techniques on fabric samples to add aesthetic value to it	M4, M6
5	Remember & Understand various traditional hand embroidery techniques of India, and Apply this techniques for surface ornamentation of fabric samples	M5
6	Apply different embellishment techniques on different samples for value addition to it	M6

Module	Content	Total Hours	%age of questions	Covered CO	Blooms Level	Remarks (If any)
Module 1	Fiber Classification	4	12	1	1,2	
Module 2	Yarn & Fabric Formation	10	20	1	1,2	
Module 3	Fabric Finishing	6	20	2,3	1,2	
Module 4	Dyeing & Printing	8	20	3,4	2,3	
Module 5	Embroidery (Practical)	16	16	5	2,3	
Module 6	Surface Embellishment (Practical)	16	12	4, 6	2,3	
		60	100			

Detailed Syllabus:

ModuleI (4 Hours)
Introduction to Textiles and classification off ibres
According to source– Natural and Manmade.
Identification and proper ties of Textile fibres- Cotton, Silk, Wool ,Linen, Rayon(regenerated),Acetate ,Polyester, Nylonand Acrylic.

ModuleII (10 Hours)
Process of yarn for mation– handspinning, mechanical–ring spinning and modern-open end spinning.
Yarn classification–simple and novel tyyarns, characteristics, properties and uses of different yarn.
Method of fabric construction: Weaving-. Basic weaves-plain, satin, twill and their variations. Fancy weaves-pile, dobby, jacquard, extrawarp and weftfigure, leno, crepe and double cloth.
Other method of fabric construction- knitting, braiding, lace and felt. Non-woven fabrics and their applications.

ModuleIII (6Hours)
Finishes given to fabrics- definition, importance to the consumer, classification according to durability and function. singeing, scouring, bleaching, mercerization calendaring, sizing, de-sizing, brushing, carbonizing, crabbing, fulling, heat setting, shearing, weighting, stentering, napping.

Special Finishes and Treatments- water repellent and waterproof finishes, antistatic finish, anti-slip finish, flame retardant finishes, crease resistant finishes, durable press and shrink resistant finishes.

Module IV (8 Hours)

Dyeing-Stages of dyeing- fibrestage, yarn dyeing, fabric, cross, union dyeing and product stage. Method of dyeing- batch dyeing, reeldyeing, jig dyeing and package dyeing.

Printing- Direct roller printing, block printing, duplex printing, discharge printing, screenprinting-flat androtary, resist, batikandtie-dye.

ModuleV (Practical) (16 Hours)

Embroidery

Embroidery tools and techniques, embroidery threads and their classification, selection of threads, needle and cloth, tracing techniques, ironing and finishing of embroidered articles.

Basic Hand Embroidery. Basic and two variations of running stitch, backstitch, stemstitch, chainstitch, lazy daisy stitch, button hole stitch, feather stitch, herring bone stitch, knot stitch, satin stitch and cross stitch.

Traditional Embroidery- Origin, application & colours. Kantha, Chikan, Kasuti, Zardosi(Fourvariations), Kutchand Mirrorwork (Twovariations).

ModuleVI (Practical) (16Hours)

Surface Embellishment

Printing & Painting techniques:–originand applications –Block printing, Kalamkari and Patachitra.

Dyeingand weaving techniques:- Ikats, Patola, Bhandini, Laharia, Shibori, Brocade weave and Carpet weaving.

Special embellishment techniques: Batik-splash, t-janting, crackled, Tie and dye-lehariya, bandini, shibori, sunray and marbling, Block printing- vegetable block and wooden blocks, Applique(2methods), quilting(2 methods), Smocking-Chinese smocking(2 methods), honey comb, gathered with embroidery, Fabric painting(4methods), hand, Stencil- dabbing and spraying.

Suggested readings:

1. Fibertofabric.,B.T.Corbman,Mc.GrawHill
2.Fromfiberto fabrics,E.gale,Allman&SonsLtd.
3.FiberScienceandtheirselection.,Wingate,Prenticehall
4.Encyclopediaoftextiles.,EditorsofAmericanfabricmagazine.
5.Textiles.,Hollen.N.,Macmillanpublishingcompany.
6.Murphy.W.S.,TextileFinishing,AbhishekPublications,Chandigarh.
7.IndianTie-DyedFabrics,VolumeIVofHistoricTextilesofIndia.Merchant: CelunionShop
8.Traditional Indian Textiles., John Gillow /NocholasBarnard, Thames & Hudson.
9.Surfacedesignforfabric,RichardMProctor/JenniferFLew,Universityof Washington Press.
10.Artof Embroidery: Historyofstyleandtechnique, LantoSynge,Woodridge
11.TheTimelessEmbroidery,HelenM,David&Charles.
12.Readers Digest, CompleteguidetoSewing,1993, Pleasantville-Nu GailL,SearchPressLtd.
13.Barbara. S,CreativeArt ofEmbroidery,Lundon,NumblyPub.groupLtd.
14.ShailajaN,TraditionalEmbroideriesof India.,MumbaiAPHPublishing.

Course Name: IT Literacy

Course Code: GE3B-02

Mode-Blended

Course Objective: This course is designed impart a foundational level appreciation for the implementation of IT in business and management. Students will be utilizing digital tools for communication, researching and interpreting digital information, developing advanced spreadsheets, understanding operating systems and word processing functions, supporting the evaluation, selection and application of office productivity software appropriate to a sports management context.

Sl	Course Outcome	Mapped modules
1	Identify the principal components of a relevant computer system and describe computer technology for communication in management.	M1, M3
2	Interpret fundamental hardware components that make up a computer's hardware and the role of each of these components relevant to Management.	M1,M2
3	Relate the usage of Digital innovations in Sports Threats and Opportunities of Digital Application in Sports, SWOT analysis.	M2, M4
4	Explain the role of information technology in presentation supporting the functions of large sport events and their stakeholders, as well as the needs of sports federations.	M1, M2, M3
5	To understand the emerging technological trends, as well as solutions and applications that will impact broadcasting and media industries and spectators' experience.	M1, M4, M5, M6
6	Demonstrate developing technology solutions and understanding the limits of data capture (what, how, and why) in sport.	M4, M6

Module	Content	Total Hours	%age of questions	Blooms Level	Remarks (If any)
M 1	Data and Information Storage	12	20	1,2	
M2	Digital Transformation and innovation in Sports Management	10	15	1, 2	
M3	Presentation Software	08	15	1, 2	
M4	Management Information System	06	15	1, 2	
M5	DOS System commands and editors	10	15	2,3	
M6	Programs involving the use of arrays with subscripts and pointers	12	20	2, 3	
		58	100		

Detailed Syllabus:

Module 1 – Data and Information Storage – Data and Information, definition and meaning, Data Storage device: Primary storage – RAM, ROM, EEROM, PROM, EPROM; Secondary storage – direct access devices, serial access devices: hard disks, CD-ROM, DVD Central Processing Unit – Control Unit. Computer languages, machine language, assembly language and high level language, role of assembler and compiler. Storage devices, floppy disc, hard disc, CD ROM and DVD. Importance of Computer as data storage for Businessand Management. **Fundamental Hardware Applications in Sports Management** – RFID Chips, Sensors, Timing System, andtheir applications in Sports Management. **Operating System and Application Software**– Meaning of software; broad classification of software; system. Software and application software; utilities. Systems software – Operating systems: Brief introduction to different types of operating systems like DOS, Windows, Unix, Linux etc.,Importance and application of Cloud, Mobile, Artificial Intelligence in Sports Management. Use.

[Total Hours – 12]
Module 2 - Digital Transformations and Innovations– Digital Transformation and future changes, challenges in Management, factors of success, Impact of Digital media on business, new digitized innovations in modern Management. Impact of Digital media, SWOT analysis.**Role of Data Bases -** Roles, Types, Functions, Current Practice and Future Potentials, Importance of digital technology in Management. **[Total Hours – 10]**
Module 3 - Presentation Software - Power Point – Creating new presentations – Auto content wizard – Using template – Blank presentation – Opening existing presentations – Adding, editing, deleting, copying , hiding slides – Presentations – Applying new design – Adding graphics – Using headers and footers – Animations text – Special effects to create transition slides – Controlling the transition speed – Adding sounds to slides – Using action buttons. **Word processing software:** WORD – Creating a new document with templates & Wizard – Creating own document – Opening/modifying a saved document – converting files to and from other document formats – Using keyboard short-cuts & mouse – Adding symbols & pictures to documents – header and footers – Finding and replacing text – spell check and Grammar check – Formatting text - paragraph formats - adjusting margins, line space – character space – Changing font type, size – Bullets and numbering – Tables – Adding, editing, deleting tables – Working within tables – Adding, deleting, modifying rows and columns – merging & splitting cells. **Spreadsheet software -** EXCEL – Working with worksheets – cells – Entering, editing, moving, copying, cutting, pasting, transforming data – Inserting and deleting of cells, rows & columns – Working with multiple worksheets – switching between worksheets – moving, copying, inserting & deleting worksheets – Using formulas for quick Calculations – Working & entering a Formula – Formatting a worksheet – Creating and editing charts – elements of an Excel Chart – Selecting data to a chart – Types of chart – chart wizard – Formatting chart elements – Editing a chart – Printing charts. **[Total Hours - 08]**
Module 4 - Management Information Management (MIS) - database management, data communications, transaction processing information systems, decision support systems, information reporting systems, office automation, networks, expert systems, and systems analyses and design. **ERP**: Introduction – Need for ERP – Advantages – Major ERP Packages – Applications. **[Total Hours - 06]**
Module 5 - DOS System commands and Editors (Preliminaries) used in Sports Management. **UNIX system** commands and vi (Preliminaries) – Applications in Management. **Programs to demonstrate control structure:** text processing, use of break and continue, etc. **Programs involving functions and recursion,** Use and application in Business and Management. **[Total Hours - 10]**
Module 6 - Programs involving the use of arrays with subscripts and pointers, Programs using structures and files. Applications of C Language. **Microsoft office -** Word, Excel, PowerPoint, Mail merge, Internet – Use and Applications. **[Total Hours – 12]**

Suggested Readings:

1.Mano – Computer System Architecture; Pearson Education

2.Tanenbaum – Structured Computer Organization,Pearson Education

3.Martin & Powell – Information Systems: A Management Perspective; mcgraw-Hill

4.Laudon & Laudon – Management Information Systems: Pearson Education

5.Comer: Computer Networks and the Internet: Pearson Education Graham Curtis – Business Information Systems: Addison Wesley
6Introduction to Computers with MS-Office, Leon, TMH
7.An Introduction to Database Systems - C.J. Date, Pearson Education
8Windows 98 6 in one by Jane Calabria and Dorothy Burke – PHI
9.Using Microsoft Office 2000 by Ed, Bott – PHI
10.Enterprise Resource planning (ERP): Text and case studies by Murthy, C S V, HPH
11.Teach yourself SAP in 24 hours by George Anderson; Danielle Larocca - Pearson Education
12.Teach yourself SAP in 24 hours by George Anderson; Danielle Larocca - Pearson Education
13.Running MS – DOS by Van Wolverton, 20th Anniversary Edition
14.C Programming Language (Prentece Hall Software) by Brian W. Kernighan
15.Let Us C by Yashavant Kanetkar.
16.Data Structure Through C by Yashavant Kanetkar
17.C in depth by Deepali Srivastava and S.K.Srivastava

Paper Code: BBA (BA)- 103/ GE3B-03

Basic Mathematics and Statistics

Total Credit: 6

Total hours of lectures: 60 hours

Course Objective: The course is designed to provide a basic applied knowledge of mathematics. The students will be to apply the number system & basic algebra, set theory, determinants and matrices, limits, continuity, differentiation & Integration, data frequency & distribution and measures of central tendency and measures of dispersion for solving business problems.

statistical problems

Sl	Course Outcome	Mapped modules
1	Remembering	M1,M2,M3,M4,M5,M6
2	Understanding the course	M1,M2,M3,M4,M5,M6
3	Applying the general problem	M1,M2,M3,M4,M5,M6
4	Analyse the problems	
5	Evaluate the problems after analysing	
6	Create using the evaluation process	

Module Number	Content	Total Hours	%age of questions	Blooms Level (if applicable)	Remarks (If any)
M 1	The Number System and Basic Algebra	8	10	1,2	
M 2	Set Theory and Permutation and Combination	10	15	1,2	
M 3	Determinants and Matrices	10	15	1,2	
M 4	Limits, Continuity, Differentiation and Integration	16	35	1,2,3	
M 5	Data, Frequency Distribution	6	10	1,2,3	
M 6	Measures of Central Tendency and Measures of Dispersion	10	15	1,2,3	
		60	**100**		

Sl.	Topic/Module	Hour
1.	**Module 1 : *The Number System*** – Positive and Negative Integers, Fractions, Rational and Irrational Numbers, Real Numbers, Problems Involving the Concept of Real Numbers. ***Basic Algebra*** – Algebraic Identities, Simple Factorizations; Equations: Linear and Quadratic (in Single Variable and Simultaneous Equations). Surds and Indices; Logarithms and Their Properties (Including Change of Base); Problems Based on Logarithms.	8
2.	**Module 2** : ***Set Theory***–Introduction; Representation of sets; Subsets and supersets; Universal and Null sets; Basic operations on sets; Laws of set algebra; Cardinal number of a set; Venn Diagrams; Application of set theory to the solution of problems ***Permutations and Combinations*** – Fundamental principle of counting; Factorial notation. Permutation: Permutation of n different things; of things not all different; restricted permutations; circular permutations. Combination: different formulas on combination;	7

	complementary combination; restricted combination; Division into groups. Mixed problems on permutation and combination	
3.	**Module 3**: ***Determinants***- Determinants of order 2 and 3; minors and cofactors; expansion of determinants; properties of determinants; Cramer's rule for solving simultaneous equations in two or three variables ***Matrices-*** Different types of matrices; Matrix Algebra – addition, subtraction and multiplication of matrices; Singular and non-singular matrices; adjoint and inverse of a matrix; elementary row / column operations; Solution of a system of linear equations using matrix algebra. Concept of Eigen Value, Eigenvector.	7
4	**Module 4:** Differentiation: Meaning & geometrical interpretation of differentiation; standard derivatives (excluding trigonometric functions); rules for calculating derivatives; logarithmic differentiation. Integration: Meaning, Standard formulas, Substitution, Integration by parts (Excluding Trigonometric functions)	4
5.	**Module 5**: ***Data-***Collection, Editing and Presentation of Data: Primary data and secondary data; Methods of collection; Scrutiny of data. Presentation of data: textual and tabular presentations; Construction of a table and the different components of a table. Diagrammatic representation of data: Line diagrams, Bar diagrams, Pie charts and divided-bar diagrams.	7
5.	**Module 5** : ***Frequency Distributions-*** Attribute and variable; Frequency distribution of an attribute; Discrete and continuous variables; Frequency distributions of discrete and continuous variables; Bivariate and Multivariate Frequency Distributions. Diagrammatic representation of a frequency distribution: case of an attribute; case of a discrete variable: column diagram, frequency polygon and step diagram; case of a continuous variable: histogram and ogive.	7
6.	**Module 6** : ***Measures of Central Tendency-*** Definition and utility; Characteristics of a good average; Different measures of average; Arithmetic Mean; Median; Other positional measures – quartiles, deciles, percentiles; Mode; Relation between Mean, Median and Mode; Geometric and Harmonic Mean. Choice of a suitable measure of central tendency.	10
7	**Module 7: *Measures of Dispersion-*** Meaning and objective of dispersion; Characteristics of a good measure of dispersion; Different measures of dispersion – Range, Quartile deviation, Mean deviation, Mean Absolute deviation, Standard deviation; Comparison of the different measures of dispersion. Measures of relative dispersion – Coefficient of Variation. Combined mean and standard deviation, Combined mean and standard deviation. Introduction to Skewness, Kurtosis, Moments.	10

Suggested Readings

1. H. S. Hall & S. R. Knight – Higher Algebra; Radha Publishing House.

2. Reena Garg, Engineering Mathematics, Khanna Publishing House.

3. Sancheti& Kapoor – Business Mathematics; Sultan Chand & Company.

4. R. S. Soni – Business Mathematics – Pitambar Publishing House.

5. N G Das, Statistical Methods (Combined edition volume 1 & 2), McGraw Hill Education.

6. J K Sharma: Business Statistics, fifth edition, Vikas Publishing house.

Paper Name: MATHEMATICS FOR COMPUTER SCIENCE PART 1
Code : BSCIT103/GE3B-04
Contact: 5L+1T
Credits: 6
Allotted Hrs: 60

Course Objectives:

CO1. To understand different kind of sets, relation, various algebraic structure and their properties.
CO2. To understand the base and dimension of vector space, characteristics of vector space in different dimension, linear transformation, eigenvalue and eigen vectors..
CO3. To learn the imaginary number and imaginary roots of a equation, number in terms of i, operations of complex number i.e. addition, subtraction, conjugate, multiplication, division.
CO4. . To understand basic property of matrices and determinant, relation between matrices and vector space.
CO5. To understand the formation of series from sequence, different type of series, concept of convergence and divergence.
CO6. To understand different type of data and their distribution , presentation, operation for calculating dispersion of central tendency and dispersion.

Course Outcomes:

Sl. No.	Course Outcome	Mapped Module
1	Ability to understand the properties of various algebraic structure and relationship between them. Ability to define binary operation, group, subgroup, ring, field and their properties.	Module 1
2	Ability to understand dimension of vector space, calculation of rank and nullity, linear transformation and mapping.	Module 2
3	Ability to solve quadratic equations with complex roots, properties of i, Operation of complex number.	Module 3
4	Ability to understand several kind of matrices, properties of determinant, calculation of rank of a matix, interpretation of existance and uniqueness of solution geometrically.	Module 4
5	Ability to check convergent and divergent of different series, type of infinite series.	Module 5
6	Ability to calculate measure of central for different type of series and dispersion.	Module 6

Module I Modern Algebra :

Group, Ring, Field 8

Module II Vector Spaces:

Vector Space, linear dependence of vectors, Basis, Dimension; Linear transformations (maps), Range and Kernel of a linear map, Rank and Nullity, Inverse of a linear transformation, Rank-Nullity theorem, composition of linear maps, Matrix associated with a linear map. 8

Module III Complex Numbers:

Complex Numbers; Conjugate of a complex number; modulus of a complex Number; geometrical representation of complex number; De Moivere's theorem; n-th roots of a complex number.6

Module IV Matrices and Determinants :

Determinants and its properties; Cramer's Rule, Definition of a matrix; Operations on matrices, inverse of a matrix; solution of equations using matrices, rank of a matrix, Basics of Vector analysis 8

Module V Infinite Series:

Convergence and divergence; series of positive terms; binomial series; exponential series; logarithmic series, Taylor's series.6

Module VI Basics Statistics:

Measures of central Tendency – Mean, Median, Mode for frequency and non-frequency distributions, Measures of dispersion – Range, Mean deviation about Mean and Median, Quartile deviation, individual and combined standard deviation; variance, coefficient of variation.4

Module No.	**Content**	**Total Hours**	**%age of questions**	**Covered CO**	**Covered PO**	**Blooms Level (If applicable)**	**Remarks (If any)**
Module 1	Modern Algebra	10	20	1	11		
Module 2	Vector Space	12	25	2	11		
Module 3	Complex numbers	8	10	3	11		
Module 4	Matrices and Determinants	10	20	4	11		
Module 5	Infinite Series	8	10	5	11		
Module 6	Basics Statistics	12	15	6	11		

(GE3B-05) : BUSINESS RESEARCH METHODS: TOOLS & TECHNIQUES

Credit Points– 6
Total Contact Hours - 60

Course Objectives

1. To understand the **basic concept, meaning and types of research** and its applications in various domains of business.
2. To formulate **research problems and hypotheses**, know about different types of hypotheses and write a research proposal. Should be able to identify the overall process of designing a research study from its inception to its report.
3. To understand **research design** as the blue print of the research process, in depth understanding of different types of research design with their implications.
4. To understand the concept and types of data used in research, and also to know about different types of data collection processes.
5. To familiarize students with different types of **scaling techniques**. Students should be able to distinguish between categorical and continuous measures.
6. To understand **questionnaire designing** and its type. Should be able to understand types of questions to be included in a questionnaire. Learn various advantages and disadvantages of the instrument.
7. To gain the concept of **population, sampling, sampling frame, sampling design** etc. Determination of sample size, understanding of sampling and non sampling error.
8. To formulate **research hypotheses**, to understand different ways to conduct a statistical test of a hypothesis, criteria to select an appropriate statistical test to answer a research question or hypothesis.
9. Able to understand the way of writing a **research report**, its type, structures and the guidelines for visual representation.
10. To gain knowledge with **ethical issues** in research, including those issues that arise in using quantitative and qualitative research

Course Outcomes (CO)

SN.	Outcome	Mapped Modules
1.	Apply Research & Development to solve managerial problems.	Module I/Unit 1

2.	Identify research problems and formulate hypotheses for effective outcome. Write an appropriate research proposal to conduct the research.	Module I/Unit 2
3.	Formulate research design by understanding different types of design and its implementation in different problem situation.	Module I/Unit 3
4.	Select appropriate type of data and design relevant data collection process.	Module I/Unit 4
5.	Use suitable scaling techniques for attitude measurement. Classify numerical and categorical variables for data analysis.	Module I/Unit 5
6.	Design fitting questionnaire for data collection purpose.	Module II/ Unit 6
7.	Select appropriate sample units, sample size and types of sampling method. Design proper sampling design.	Module II/ Unit 7
8.	Formulate and test hypotheses using appropriate statistical technique.	Module II / Unit 8
9.	Write a research report maintaining all its structure to present the research output.	Module II / Unit 9
10.	Conduct research ethically maintaining all the integrity for an unbiased outcome.	Module II / Unit 10

MODULE I

Unit 1 - Introduction to Research: Meaning of research; Types of research- Exploratory research, Conclusive research; The process of research; Research applications in social and business sciences; Features of a Good research study. **(4L)**

Unit 2 - Research Problem and Formulation of Research Hypotheses: Defining the Research problem; Management Decision Problem vs Management Research Problem; Problem identification process; Components of the research problem; Formulating the research hypothesis- Types of Research hypothesis; Writing a research proposal- Contents of a research proposal and types of research proposals. **(6L)**

Unit 3 - Research Design: Meaning of Research Designs; Nature and Classification of Research Designs; Exploratory Research Designs: Secondary Resource analysis, Case study Method, Expert opinion survey, Focus group discussions; Descriptive Research Designs: Cross-sectional studies and Longitudinal studies; Experimental Designs, Errors affecting Research Design. **(8L)**

Unit 4 - Primary and Secondary Data: Classification of Data; Secondary Data: Uses, Advantages, Disadvantages, Types and sources; Primary Data Collection: Observation method, Focus Group Discussion, Personal Interview method. **(6L)**

Unit 5 - Attitude Measurement and Scaling: Types of Measurement Scales; Attitude; Classification of Scales: Single item vs Multiple Item scale, Comparative vs Non- Comparative scales, Measurement Error, Criteria for Good Measurement. **(6L)**

MODULE II

Unit 6 - Questionnaire Design: Questionnaire method; Types of Questionnaires; Process of Questionnaire Designing; Advantages and Disadvantages of Questionnaire Method. **(6L)**

Unit 7 - Sampling: Sampling concepts- Sample vs Census, Sampling vs Non Sampling error; Sampling Design- Probability and Non Probability Sampling design; Determination of Sample size- Sample size for estimating population mean, Determination of sample size for estimating the population proportion. **(8L)**

Unit 8 - Testing of Hypotheses: Concepts in Testing of Hypothesis – Steps in testing of hypothesis, Test Statistic for testing hypothesis about population mean; Tests concerning Means- the case of single population; Tests for Difference between two population means; Tests concerning population proportion- the case of single population; Tests for difference between two population proportions. **(6L)**

Unit 9 - Research Report Writing: Types of research reports – Brief reports and Detailed reports; Report writing: Structure of the research report- Preliminary section, Main report, Interpretations of Results and Suggested Recommendations; Report writing: Formulation rules for writing the report: Guidelines for presenting tabular data, Guidelines for visual Representations. **(6L)**

Unit 10- Ethics in Research: Meaning of Research Ethics; Clients Ethical code; Researchers Ethical code; Ethical Codes related to respondents; Responsibility of ethics in research **(4L)**

Suggested Readings:

1. Business Research Methods – Donald Cooper & Pamela Schindler, TMGH.
2. Business Research Methods – Alan Bryman & Emma Bell, Oxford University Press.
3. Research Methodology – C.R.Kothari, New age International Publishing House
4. Research Methodology—Ranjit Kumar, Sage Publication

Module Number	Contents	Total Hours	%age of questions	Covered CO	Covered PO	Blooms Level (if applicable)	Remarks (if any)
Module I/Unit 1	Introduction to Research	4	6.67	1	10		
Module I/Unit 2	Research Problem and Formulation of Research Hypotheses	6	10	2	10		
Module I/Unit 3	Research Design	8	13.33	3	10		
Module I/Unit 4	Primary and Secondary Data: Classification of Data; Secondary Data	6	10	4	10		
Module I/Unit 5	Attitude Measurement and Scaling	6	10	5	10		
Module II/Unit 6	Questionnaire Design	6	10	6	10		
Module II/Unit 7	Sampling	8	13.33	7	10		
Module II/Unit 8	Testing of Hypotheses	6	10	8	10		
Module II/Unit 9	Research Report Writing	6	10	9	10		
Module II/Unit 10	Ethics in Research	4	6.67	10	10		

(GE3B-06) : BUSINESS MATHAMETICS

Credit Points– 6
Total Contact Hours - 60
Course Objectives

1. Independent solving of Business Problems.
2. To understand the basics of Counting Principles using **Permutation & Combination** with larger data sets as the foundation stone of Mathematics.
3. To understand **Set Theory** and the rules of logic for effective business planning and operations.
4. To understand **Determinant Matrix** with Cramer's rule
5. To solve complicated and long calculations of financial institutions using **Logarithm**
6. To estimate costs in engineering projects etc. using **Binomial Theorem**
7. To understand the concept of **Derivation**
8. Use **Simple and Compound interest** to do business calculations such as value of money, maturity value, promissory notes, present value, and future value and be able to differentiate which mathematical method should be used for different problems.

Course outcomes (CO)

Sl. No.	Outcome	Module / Unit
1.	Apply basic concepts of **Mathematical Techniques** in solving practical problems in the field of business.	Module I/Unit 1
2.	Apply the techniques of **Permutation** in solving probability problems for effective business decision making process under risk.	Module I/Unit 2
3.	Apply the techniques of **Combination** in solving probability problems for effective business decision making process under risk.	Module I/Unit 3
4.	Apply the concept of **Set Theory** for solving complex calculations and optimize business operations of financial institutions.	Module I/Unit 4
5	Apply the concept of **Determinants Matrix** and properties	Module I/Unit 5
6.	Apply the concept of **Logarithm** for solving complex calculations and optimize business operations of financial institutions.	Module II/Unit 6
7.	Identify binomial coefficients given the formula for a combination and expand a binomial using the **Binomial Theorem**.	Module II/ Unit 7
8	Apply the concept of **Differentiation** with its rule and applicability	Module II/ Unit 8

9.	Define the concept of interest and show how it relates to the time value of money, distinguish between simple and compound interest and also between the nominal interest rate and the effective annual yield. Outline the process of calculating a repayment schedule for a loan to be repaid in equal installments, with each payment a blend of interest and principal.	Module II/ Unit 9

MODULE I

Unit 1: Introduction
Definition of Statistics; Importance and scope of Mathematics and Statistics in business decisions; Limitations. **(4L)**

Unit 2: Permutations
Definition, Factorial notation; Theorems on permutation, permutations with repetitions; Restricted permutations. **(8L)**

Unit 3: Combinations
Definition; Theorems on combination; Basic identities;restricted combinations. **(4L)**

Unit 4: Set Theory
Definition of Set ; Presentation of Sets; Different types of Sets- Null Set, Finite and Infinite Sets, Universal Set , Subset , Power Set etc.; Set operations ;Laws of algebra of Sets . **(6L)**

Unit 5: Determinant Matrix
Determinants upto third order, Elementary properties of determinants, Minors and co-factors, Solution of a system of linear equations by Cramer's Rule (up to three variables). **(6L)**

MODULE II

Unit 6: Logarithm
Definition, Base & index of logarithm, general properties of logarithm, Common problems.
(6L)

Unit 7: Binomial Theorem
Statement of the theorem for positive integral index, General term, Middle term, Equidistant terms, Simple properties of binomial coefficient. **(8L)**

Unit 8: Differentiation
Derivative and its meaning; Rules of differentiation; Geometrical interpretation; Significance of derivative as rate measure; Second order derivatives **(8L)**

Unit 9: Compound Interest and Annuities
Different types of interest rates; Concept of Present value and amount of sum; Types of annuities; Present value and amount of an annuity; including the case of continuous

compounding; Valuation of simple loans and debentures; Problems relating to sinking funds.
(10L)

Suggested Readings

1. Business Mathematics and Statistics- N G Das & J K Das, Tata McGraw Hill
2. M. Raghavachari, Mathematics for Management, Tata McGraw-Hill
3. S. Baruah, Basic Mathematics and its Application in Economics, Macmillan
4. R. S. Bhardwaj, Mathematics for Economics and Business, Excel Books
5. P. K. Giri and J. Bannerjee, Introduction to Business Mathematics, Academic Publishers

Module Number	Contents	Total Hours	%age of questions	Covered CO	Covered PO	Blooms Level (if applicable)	Remarks (if any)
Module I/Unit 1	**Introduction**	4	6.67	1	10		
Module I/Unit 2	**Permutations**	8	13.33	2	10		
Module I/Unit 3	**Combinations**	4	6.67	3	10		
Module I/Unit 4	**Set Theory**	6	10	4	10		
Module I/Unit 5	**Determinant Matrix**	6	10	5	10		
Module II/Unit 6	**Logarithm**	6	10	6	10		
Module II/Unit 7	**Binomial Theorem**	8	13.33	7	10		
Module II/Unit 8	**Differentiation**	8	13.33	8	10		
Module II/Unit 9	**Compound Interest and Annuities**	10	16.67	9	10		

(GE3B-07) : BUSINESS STATISTICS

Credit Points– 6
Total Contact Hours - 60

Course Objectives:

1. To have a proper understanding of Descriptive and Inferential Statistics.
2. To understand collection, classification, analysis and interpretation of data.
3. Use basic statistics for central measurements, frequency distributions, graphs, and measure of dispersion and be able to select which statistical method should be usedfor different problems.
4. To define and calculate mean, median, mode, and range. Construct data tables that facilitate the calculation of mean, median, mode, and range. Determine which measure of **central tendency** is best to use in a given circumstance.
5. To explain the purpose of measures of dispersion, compute and explain the range, the interquartile range, the standard deviation, and the variance, select an appropriate measure of dispersion and correctly calculate and interpret the statistic.
6. To identify the direction and strength of a **correlation** between two factors, compute and interpret the Pearson **correlation coefficient** and test for significance.
7. To understand the purpose of a two regression lines, understand how to draw a linear regression equation into a scatterplot.
8. To equip students with various forecasting techniques and knowledge on modern statistical methods for analyzing time series data.

Course Outcomes (CO):

SL NO.	Course Outcome	Mapped Modules
1	Ability to demonstrate knowledge of the importance of the Descriptive and Inferential statistics.	Module I – Unit 1
2	Able to interpret the meaning of the collection and data presentation in a business environment.	Module I – Unit 2
3	Able to produce appropriate graphical and numerical descriptive statistics for different types of data.	Module I – Unit 3
4	Able to independently calculate basic statistical parameters (mean, median, mode, quartiles).	Module I – Unit 4
5	Able to apply measures of dispersion to describe and summarize the data set.	Module I – Unit 5
6	Able to interpret Pearson correlation coefficient and the coefficient of determination, and test for significance.	Module II – Unit 6

7	Able to use regression models to analyze the underlying relationships between the variables.	Module II – Unit 7
8	Able to understand the important features that describe a time series, and perform simple analyses and computations on series.	Module II – Unit 8

Module-I:

Unit 1: Introduction to Statistics: Statistics as a Subject, Functions, Importance and Limitations of Statistics, Census and Sample Investigation, Descriptive and Inferential Statistics. **[4L]**

Unit 2: Collection, Editing and Presentation of Data: Primary Data and Secondary Data, Methods of Collection, Scrutiny of Data. Presentation of Data: Textual and Tabular Presentations, Construction of a Table and the Different Components of a Table, Diagrammatic Representation of Data: Line Diagrams, Bar Diagrams, Pie Charts and Divided-Bar Diagrams. **[6L]**

Unit 3: Frequency Distributions: Variables and Attributes, Frequency Distribution of An Attribute; Discrete and Continuous Variables, Frequency Distributions of Discrete and Continuous Variables, Diagrammatic Representation of a Frequency Distribution: Case of An Attribute, Case of a Discrete Variable: Column Diagram, Frequency Polygon and Step Diagram, Case of a Continuous Variable: Histogram and Ogive, Frequency Polygon. **[8L]**

Unit 4: Measures of Central Tendency: Definition and Utility, Characteristics of Average, Different Measures of Average: Arithmetic Mean, Median, Mode, Partitional Values: Quartile, Percentile and Deciles. Geometric and Harmonic Mean. Choice of a Suitable Measure of Central Tendency. **[8L]**

Unit 5 : Measures of Dispersion: Meaning and Objective of Dispersion, Characteristics of a Good Measure of dispersion, Different measures of dispersion – Range, Quartile deviation, Mean deviation, Mean Absolute Deviation, Standard Deviation; Comparison of the Different Measures of Dispersion. Measures of Relative Dispersion: Coefficient of Variation. Measures of Skewness, Kurtosis and its Measures. **[10L]**

Module-II

Unit 6: Correlation Analysis: Analysis of Bivariate data. Correlation Analysis – Meaning of Correlation: Scatter Diagram, Karl Pearson's Coefficient of Linear Correlation, Calculation of the Correlation Coefficient from Grouped Data, Properties of the Correlation Coefficient Advantages and Limitations of the Correlation Coefficient, Idea of Rank Correlation; Spearman's Rank Correlation Coefficient (without tie) **[10L]**

Unit 7: Regression Analysis: Two Lines of Regression: Some Important Results Relating to Regression Lines, Calculation of Regression Coefficients, Relation Between Regression Coefficient and Correlation Coefficient, Identification Problem. **[6L]**

Unit 8 : Analysis of Time Series: Objective of time series analysis; Causes of variations in time series data, Components of a time series, Additive Models, Multiplicative Models, Moving averages method and method of least squares; Measurement of secular trend. **[8L]**

Suggested Readings:

1. N.G Das: Statistical Methods (Volume I): Tata McGraw-Hill.
2. A.M Goon, M.K Gupta & B, Dasgupta: Basic Statistics: World Press
3. Levin & Rubin- Statistics for Management, PHI.
4. G. C. Beri : Statistics for Management: Tata McGraw- Hill

Module No.	Content	Total Hours	%age of questions	Covered CO	Covered PO	Blooms Level (if applicable)	Remarks (if any)
Module I Unit 1	**Introduction to Statistics**	4	6	1	10		
Module I Unit 2	**Collection, Editing and Presentation of Data**	6	10	2	10		
Module I Unit 3	**Frequency Distributions**	8	14	3	10		
Module I Unit 4	**Measures of Central Tendency**	8	14	4	10		
Module I Unit 5	**Measures of Dispersion**	10	16	5	10		
Module II Unit 6	**Correlation Analysis**	10	16	6	10		
Module II Unit 7	**Regression Analysis**	6	10	7	10		
Module II Unit 8	**Analysis of Time Series**	8	14	8	10		

Mathematics for Machine Learning
(GE3B-08)

Subject: Mathematics for Machine Learning	
Course Code:(GE3B-08)	**Semester: I**
Duration: 60 Hrs	**Maximum Marks: 100**
Teaching Scheme	**Examination Scheme**
Theory: 5	**End Semester Exam: 70**
Tutorial:1	**Attendance: 5**
Practical:0	**Continuous Assessment: 25**
Credit:6	**Practical Sessional internal continuous evaluation: NA**
	Practical Sessional external examination: NA

Aim:

Sl. No.	
1.	To develop formal reasoning.
2.	Create habit of raising questions
3.	Knowledge regarding the use of Mathematics in Machine Learning
4.	Ability to communicate knowledge, capabilities and skills related to the computer engineer profession

Objective: Throughout the course, students will be expected to demonstrate their understanding of Mathematics by being able to do each of the following

Sl. No.	
1.	To understand and solve mathematical problems
2.	To impart knowledge regarding relevant topics .
3.	To familiarize students with linear Algebra, numerical methods and Machine Learning Techniques.

Pre-Requisite:

Sl. No.	
1.	**Knowledge of basic algebra, geometry.**

Contents		**6 Hrs./week**	
Chapter	**Name of the Topic**	**Hours**	**Marks**

01	**Linear Algebra** Systems of Linear Equations, Matrices, Solving Systems of Linear Equations, Vector Spaces, Linear Independence, Basis and Rank, Linear Mappings, Affine Spaces.	**10**	**14**
02	**Analytic Geometry** Norms, Inner Products, Lengths and Distances, Angles and Orthogonality, Orthonormal Basis, Orthogonal Complement, Inner Product of Functions, Orthogonal Projections, Rotations.	**10**	**12**
03	**Matrix Decompositions** Determinant and Trace, Eigenvalues and Eigenvectors, Cholesky Decomposition, Eigen decomposition and Diagonalization, Singular Value Decomposition, Matrix Approximation, Matrix Phylogeny.	**10**	**14**
04	**Vector Calculus** Differentiation of Univariate Functions, Partial Differentiation and Gradients, Gradients of Vector-Valued Functions, Gradients of Matrices, Useful Identities for Computing Gradients, Back propagation and Automatic Differentiation, Higher-Order Derivatives, Linearization and Multivariate Taylor Series	**10**	**12**
05	**Probability and Distributions** Construction of a Probability Space, Discrete and Continuous Probabilities, Sum Rule, Product Rule, and Bayes' Theorem, Summary Statistics and Independence, Gaussian Distribution, Conjugacy and the Exponential Family, Change of Variables/Inverse Transform	**10**	**12**
06	***Continuous Optimization*** Optimization Using Gradient Descent, Constrained Optimization and Lagrange Multipliers, Convex Optimization	**6**	**6**
	Sub Total:	**56**	**70**
	Internal Assessment Examination & Preparation of Semester Examination	**4**	**30**
	Total:	**60**	**100**

Assignments:

Based on the curriculum as covered by subject teacher.

List of Books

Text Books:

Name of Author	**Title of the Book**	**Edition/ISSN/ISBN**	**Name of the Publisher**

Marc Peter Deisenroth, Aldo Faisal, et al.	Mathematics For machine Learning		Cambridge University Press
David Barber	Bayesian Reasoning and Machine Learning		Cambridge University Press

End Semester Examination Scheme. Maximum Marks-70. Time allotted-3hrs.

Group	**Unit**	**Objective Questions** (MCQ only with the correct answer)		**Subjective Questions**			
		No of question to be set	Total Marks	No of question to be set	To answer	Marks per question	Total Marks
A	**1 to 11**	**10**	**10**				
B	**1 to 11**			**5**	**3**	**5**	**70**
C	**1 to 11**			**5**	**3**	**15**	

- Only multiple choice type questions (MCQ) with one correct answer are to be set in the objective part.
- Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper.

Examination Scheme for end semester examination:

Group	**Chapter**	**Marks of each question**	**Question to be set**	**Question to be answered**
A	**All**	**1**	**10**	**10**
B	**All**	**5**	**5**	**3**
C	**All**	**15**	**5**	**3**

Mathematics for Computing
(GE3B-09)

Subject: Mathematics for Computing	
Course Code: (GE3B-09)	**Semester: I**
Duration: 60 Hrs	**Maximum Marks: 100**
Teaching Scheme	**Examination Scheme**
Theory: 5	**End Semester Exam: 70**
Tutorial:1	**Attendance: 5**
Practical:0	**Continuous Assessment: 25**
Credit:6	**Practical Sessional internal continuous evaluation: NA**
	Practical Sessional external examination: NA

Aim:

Sl. No.	
1.	To develop formal reasoning.
2.	Create habit of raising questions
3.	Knowledge regarding the use of Mathematics in Computer Science
4.	Ability to communicate knowledge, capabilities and skills related to the computer engineer profession

Objective:Throughout the course, students will be expected to demonstrate their understanding of Mathematics by being able to do each of the following

Sl. No.	
1.	To understand and solve mathematical problems
2.	To impart knowledge regarding relevant topics .
3.	To familiarize students with linear Algebra, differential and integral calculus, numerical methods and statistics.

Pre-Requisite:

Sl. No.	
1.	**Knowledge of basic algebra, trigonometry and calculus .**

Contents		**6 Hrs./week**	
Chapter	**Name of the Topic**	**Hours**	**Marks**

01	**Modern algebra** Set, Relation, Mapping, Binary Operation, Addition Modulo n, Multiplication modulo n, semi group, properties of groups, subgroup.	**3**	**7**
02	**Trigonometry** Radian or circular Measure, Trigonometric Functions, Trigonometric ratios of angle θ when θ is acute, trigonometric ratios of certain standard angles, allied angles, compound angles, multiple and sub- multiple angles.	**6**	**5**
03	**Limits and Continuity** The real number system, The concept of limit, concept of continuity.	**6**	**5**
04	**Differentiation** Differentiation of powers of x, Differentiation of ex and log x, differentiation of trigonometric functions, Rules for finding derivatives, Different types of differentiation, logarithmic differentiation, differentiation by substitution, differentiation of implicit functions, differentiation from parametric equation. Differentiation from first principles.	**6**	**7**
05	**Integrations** Integration of standard Functions, rules of Integration, More formulas in integration, Definite integrals.	**6**	**7**
06	**Differential equations** First order differential equations, practical approach to Differential equations, first order and first degree differential equations, homogeneous equations. Linear equations, Bernoulli's equation, Exact Differential Equations.	**6**	**6**
07	**Complex Numbers** Complex Numbers, Conjugate of a complex number, modulus of a complex Number, geometrical representation of complex number, De Moivre's theorem, n^{th} roots of a complex number.	**5**	**5**
08	**Matrices and Determinants** Definition of a matrix, Operations on matrices, Square Matrix and its inverse, determinants, properties of determinants, the inverse of a matrix, solution of equations using matrices and determinants, solving equations using determinants.	**5**	**8**
09	**Infinite Series** Convergence and divergence, series of positive terms, binomial series, exponential series,logarithmic series.	**5**	**7**
10	**Probability**	**5**	**5**

	Concept of probability, sample space and events, three approaches of probability, kolmogorov's axiomatic approach to probability, conditional probability and independence of events, bay's theorem.		
11	**Introduction to Statistics** Measures of central Tendency, Standard Deviation, Discrete series. Methods, Deviation taken from assumed mean, continuous series, combined standard deviation, coefficient of variation, variance.	**3**	**8**
	Sub Total:	**48**	**70**
	Internal Assessment Examination & Preparation of Semester Examination	**4**	**30**
	Total:	**52**	**100**

Assignments:

Based on the curriculum as covered by subject teacher.

List of Books

Text Books:

Name of Author	**Title of the Book**	**Edition/ISSN/ISBN**	**Name of the Publisher**
S. K. Mapa	Higher Algebra		Levant Books
O'Regan, Gerard	Mathematics in Computing		
Chakravorty and Ghosh	Advanced Higher Algebra		U N Dhar Pvt. Ltd

Reference Books:

Das and Mukherjee	Integral Calculus		U N Dhar Pvt. Ltd
Das and Mukherjee	Differential Calculus		U N Dhar Pvt. Ltd

End Semester Examination Scheme. Maximum Marks-70. Time allotted-3hrs.

Group	**Unit**	**Objective Questions** (MCQ only with the correct answer)		**Subjective Questions**			
		No of question to be set	Total Marks	No of question to be set	To answer	Marks per question	Total Marks
A	**1 to 11**	**10**	**10**				

B **C**	**1 to 11** **1 to 11**			**5** **5**	**3** **3**	**5** **15**	**60**

- Only multiple choice type question (MCQ) with one correct answer are to be set in the objective part.
- Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper.

Examination Scheme for end semester examination:

Group	**Chapter**	**Marks of each question**	**Question to be set**	**Question to be answered**
A	**All**	**1**	**10**	**10**
B	**All**	**5**	**5**	**3**
C	**All**	**15**	**5**	**3**

Probability & Statistics
(GE3B-10)

Subject: Probability & Statistics	
Course Code: (GE3B-10)	**Semester: I**
Duration: 60 Hrs	**Maximum Marks: 100**
Teaching Scheme	**Examination Scheme**
Theory: 5	End Semester Exam: 70
Tutorial:1	Attendance: 5
Practical:0	Continuous Assessment: 25
Credit:6	Practical Sessional internal continuous evaluation: NA
	Practical Sessional external examination: NA

Aim:

Sl. No.	
1.	The aim of this course is to equip the students with standard concepts and tools at an intermediate to advanced level that will serve them well towards tackling various problems in the discipline.
2.	The objective of this course is to familiarize the students with statistical techniques.

Objective: Throughout the course, students will be expected to demonstrate their understanding of probability & statistics by being able to learn each of the following

Sl. No.	
1.	The ideas of probability and random variables and various discrete and continuous probability distributions and their properties.
2.	The basic ideas of statistics including measures of central tendency, correlation and regression.
3.	The statistical methods of studying data samples.

Pre-Requisite:

Sl. No.	
1.	Knowledge of basic algebra, calculus.
2.	Ability to learn and solve mathematical model.

Contents		**6 Hrs./week**	
Chapter	**Name of the Topic**	**Hours**	**Marks**
01	Definition of Partial Differential Equations, First order partial differential equations, solutions of first order linear PDEs; Solution to homogenous and nonhomogeneous linear partial differential equations of second order by complimentary function and particular integral method. Second-order linear equations and their classification, Initial and boundary conditions, D'Alembert's solution of the wave equation; Duhamel's principle for one dimensional wave equation. Heat diffusion and vibration problems, Separation of variables method to simple problems in Cartesian coordinates. The Laplacian in plane, cylindrical and spherical polar coordinates, solutions with Bessel functions and Legendre functions. One dimensional diffusion equation and its solution by separation of variables.	**18**	**20**
02	Probability spaces, conditional probability, independence; Discrete random variables, Independent random variables, the multinomial distribution, Poisson approximation to the binomial distribution, infinite sequences of Bernoulli trials, sums of independent random variables;	**18**	**25**

	Expectation of Discrete Random Variables, Moments, Variance of a sum, Correlation coefficient, Chebyshev's Inequality. Continuous random variables and their properties, distribution functions and densities, normal, exponential and gamma densities.Bivariate distributions and their properties, distribution of sums and quotients, conditional densities, Bayes' rule.		
03	Basic Statistics, Measures of Central tendency: Moments, skewness and Kurtosis - Probability distributions: Binomial, Poisson and Normal - evaluation of statistical parameters for these three distributions, Correlation and regression – Rank correlation. Curve fitting by the method of least squares- fitting of straight lines, second degree parabolas and more general curves. Test of significance: Large sample test for single proportion, difference of proportions, Tests for single mean, difference of means, and difference of standard deviations. Test for ratio of variances - Chi-square test for goodness of fit and independence of attributes.	**20**	**25**
	Sub Total:	**56**	**70**
	Internal Assessment Examination & Preparation of Semester Examination	**4**	**30**
	Total:	**60**	**100**

Assignments:
Based on the curriculum as covered by subject teacher.

List of Books
Text Books:

Name of Author	**Title of the Book**	**Edition/ISSN/ISBN**	**Name of the Publisher**
Erwin Kreyszig	Advanced Engineering Mathematics	9 th Edition	John Wiley & Sons
N. G. Das	Statistical Methods	0070083274, 9780070083271	Tata Mc.Graw Hill
Reference Books:			
P. G. Hoel, S. C. Port and C. J. Stone	Introduction to Probability Theory		Universal Book Stall
W. Feller	An Introduction to Probability Theory and its Applications	3rd Ed.	Wiley

End Semester Examination Scheme. Maximum Marks-70. Time allotted-3hrs.

Group	**Unit**	**Objective Questions** (MCQ only with the correct answer)		**Subjective Questions**			
		No of question to be set	Total Marks	No of question to be set	To answer	Marks per question	Total Marks
A	**1 to 3**	**10**	**10**				
B	**1 to 3**			**5**	**3**	**5**	**70**
C	**1 to 3**			**5**	**3**	**15**	

- Only multiple choice type question (MCQ) with one correct answer are to be set in the objective part.
- Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper.

Examination Scheme for end semester examination:

Group	**Chapter**	**Marks of each question**	**Question to be set**	**Question to be answered**

A	**All**	**1**	**10**	**10**
B	**All**	**5**	**5**	**3**
C	**All**	**15**	**5**	**3**

Bayesian Statistics
(GE3B-11)

Subject: Bayesian Statistics	
Course Code: (GE3B-11)	**Semester: I**
Duration: 60 Hrs.	**Maximum Marks: 100**
Teaching Scheme	**Examination Scheme**
Theory: 5	**End Semester Exam: 70**
Tutorial: 1	**Attendance : 5**
Practical: 0	**Continuous Assessment: 25**
Credit: 6	**Practical Sessional internal continuous evaluation: NA**
	Practical Sessional external examination: NA

Aim:

Sl. No.	
1.	The aim of this course is to equip students with the skills to perform and interpret Bayesian statistical analyses.

Objective:

Sl. No.	
1.	To describing the fundamentals of Bayesian inference by examining some simple Bayesian models.
2.	To explore more complicated models, including linear regression and hierarchical models in a Bayesian framework

Pre-Requisite:

Sl. No.	
1.	Knowledge in mathematics

Contents		**6 Hrs./week**	
Chapter	**Name of the Topic**	**Hours**	**Marks**
01	Introduction to Statistical Science Scientific Data Gathering Logic, Probability, and Uncertainty Discrete Random Variables	**14**	**15**
02	Bayesian Inference for Discrete Random Variables Continuous Random Variables Bayesian Inference for Binomial Proportion Comparing Bayesian and Frequentist Inferences for Proportion Bayesian Inference for Poisson	**14**	**20**
03	Bayesian Inference for Normal Mean Comparing Bayesian and Frequentist Inferences for Mean Bayesian Inference for Difference Between Means	**14**	**20**
04	Bayesian Inference for Simple Linear Regression Bayesian Inference for Standard Deviation Robust Bayesian Methods	**14**	**15**
	Sub Total:	**56**	**70**
	Internal Assessment Examination & Preparation of Semester Examination	**4**	**30**
	Total:	**60**	**100**

List of Books
Text Books:

Name of Author	Title of the Book	Edition/ISSN/ISBN	Name of the Publisher
William M. Bolstad	Introduction to Bayesian statistics	2nd ed. ISBN 978-0-470-141 15-1	
Andrew Gelman, John Carlin, Hal Stern, David	Bayesian Data Analysis	Third edition	

Dunson, Aki Vehtari, and Donald Rubin.			
Reference Books:			

End Semester Examination Scheme. Maximum Marks-70. Time allotted-3hrs.

Group	**Unit**	**Objective Questions** (MCQ only with the correct answer)		**Subjective Questions**			
		No of question to be set	Total Marks	No of question to be set	To answer	Marks per question	Total Marks
A	1,2,3,4	10	10				
B	3, 4,			5	3	5	70
C	1,2,3,4			5	3	15	

- Only multiple choice type question (MCQ) with one correct answer are to be set in the objective part.
- Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper.

Examination Scheme for end semester examination:

Group	**Chapter**	**Marks of each question**	**Question to be set**	**Question to be answered**
A	All	1	10	10
B	All	5	5	3
C	All	15	5	3

Examination Scheme for Practical Sessional examination:

Practical Internal Sessional Continuous Evaluation

Internal Examination:

Continuous evaluation			**40**

Operations Research
(GE3B-12)

Subject: Operations Research	
Course Code: (GE3B-12)	**Semester: I**
Duration: 60Hrs	**Maximum Marks: 100**
Teaching Scheme	**Examination Scheme**
Theory: 5	**End Semester Exam: 70**
Tutorial: 1	**Attendance : 5**
Practical:0	**Continuous Assessment:25**
Credit: 6	**Practical Sessional internal continuous evaluation: NA**
	Practical Sessional external examination: NA

Aim:

Sl. No.	
1.	To learn how to solve problem in optimized way.
2.	Use various technique like game theory, LPP in real life problem.

Objective:

Sl. No.	
1.	Understand the optimization method
2.	To evaluate the reliability and validity of a measuring
3.	Apply the method to other Real life Problem

Pre-Requisite:

Sl. No.	
1.	Mathematics
2.	Linear Algebra

Contents	6 Hrs./week

Chapter	Name of the Topic	Hours	Marks
01	Linear Programming Problems (LPP): Basic LPP and Applications; Various Components of LP Problem Formulation.	8	10
02	Solution of Linear Programming Problems: Solution of LPP: Using Simultaneous Equations and Graphical Method; Definitions: Feasible Solution, Basic and non-basic Variables, Basic Feasible Solution, Degenerate and Non-degenerate Solution, Convex set and explanation with examples. Solution of LPP by Simplex Method; Charnes' Big-M Method; Duality Theory. Transportation Problems and Assignment Problems.	12	20
03	Network Analysis: Shortest Path: Floyd Algorithm; Maximal Flow Problem (Ford-Fulkerson); PERT-CPM (Cost Analysis, Crashing, Resource Allocation excluded).	8	5
04	Inventory Control: Introduction to EOQ Models of Deterministic and Probabilistic ; Safety Stock; Buffer Stock.	8	10
05	Game Theory: Introduction; 2-Person Zero-sum Game; Saddle Point; Mini-Max and Maxi-Min Theorems (statement only) and problems; Games without Saddle Point; Graphical Method; Principle of Dominance.	10	15
06	Queuing Theory: Introduction; Basic Definitions and Notations; Axiomatic Derivation of the Arrival & Departure (Poisson Queue). Poisson Queue Models: (M/M/1): (∞ / FIFO) and (M/M/1: N / FIFO) and problems.	10	10
	Sub Total:	**56**	**70**
	Internal Assessment Examination & Preparation of Semester Examination	**4**	**30**
	Total:	**60**	**100**

List of Books

Text Books:

Name of Author	Title of the Book	Edition/ISSN/ISBN	Name of the Publisher
H. A. Taha	Operations Research		Pearson

Reference Books:

P. M. Karak	Linear Programming and Theory of Games		ABS Publishing House

Ghosh and Chakraborty	Linear Programming and Theory of Games		Central Book Agency

End Semester Examination Scheme. Maximum Marks-70. Time allotted-3hrs.

Group	Unit	Objective Questions (MCQ only with the correct answer)		Subjective Questions			
		No of question to be set	Total Marks	No of question to be set	To answer	Marks per question	Total Marks
A	**1 to 5**	**10**	**10**				**70**
B	**1 to 5**			**5**	**3**	**5**	
C	**1 to 5**			**5**	**3**	**15**	

- Only multiple choice type question (MCQ) with one correct answer are to be set in the objective part.
- Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper.

Examination Scheme for end semester examination:

Group	Chapter	Marks of each question	Question to be set	Question to be answered
A	**All**	**1**	**10**	**10**
B	**All**	**5**	**5**	**3**
C	**All**	**15**	**3**	**3**

Data Analytics
(GE3B-13)

Subject: Data Analytics	
Course Code:(GE3B-13)	**Semester: I**
Duration: 60 Hrs.	**Maximum Marks: 100**
Teaching Scheme	**Examination Scheme**
Theory: 5	**End Semester Exam: 70**
Tutorial: 1	**Attendance : 5**
Practical: 0	**Continuous Assessment: 25**
Credit: 6	**Practical Sessional internal continuous evaluation: NA**
	Practical Sessional external examination: NA

Aim:

Sl. No.	
1.	Find a meaningful pattern in data
2.	Graphically interpret data
3.	Implement the analytic algorithms
4.	Handle large scale analytics projects from various domains

Objective:

Sl. No.	
1.	The process of data analysis uses analytical and logical reasoning to gain information from the data.
2.	To find meaning in data so that the derived knowledge can be used to make informed decisions.
3.	Develop intelligent decision support systems

Pre-Requisite:

Sl. No.	
1.	A strong mathematical background in Probability and Statistics
2.	Critical thinking and problem solving skills

Contents		**6 Hrs./week**	
Chapter	**Name of the Topic**	**Hours**	**Marks**
01	**Data Definitions and Analysis Techniques** Elements, Variables, and Data categorization Levels of Measurement Data management and indexing	**10**	**14**
02	**Descriptive Statistics** Measures of central tendency Measures of location of dispersions	**10**	**14**
03	**Basic Analysis Techniques** Basic analysis techniques Statistical hypothesis generation and testing Chi-Square test t-Test Analysis of variance Correlation analysis	**12**	**14**

	Maximum likelihood test		
04	**Data analysis techniques** Regression analysis Classification techniques Clustering Association rules analysis	**12**	**14**
05	**Case studies** Understanding business scenarios Feature engineering and visualization	**12**	**14**
	Sub Total:	**56**	**70**
	Internal Assessment Examination & Preparation of Semester Examination	**4**	**30**
	Total:	**60**	**100**

List of Books
Text Books:

Name of Author	Title of the Book	Edition/ISSN/ISBN	Name of the Publisher
Hastie, Trevor, et al.	The elements of statistical learning		Vol. 2. No. 1. New York: springer, 2009.
Montgomery, Douglas C., and George C. Runger	Applied statistics and probability for engineers		John Wiley & Sons, 2010

Reference Books:

End Semester Examination Scheme. Maximum Marks-70. Time allotted-3hrs.

Group	Unit	Objective Questions (MCQ only with the correct answer)		Subjective Questions			
		No of question to be set	Total Marks	No of question to be set	To answer	Marks per question	Total Marks
A	1,2,3,4,5	10	10				
B	3, 4, 5			5	3	5	70
C	1,2,3,4,5			5	3	15	

- Only multiple choice type question (MCQ) with one correct answer are to be set in the objective part.
- Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper.

Examination Scheme for end semester examination:

Group	Chapter	Marks of each question	Question to be set	Question to be answered
A	All	1	10	10
B	All	5	5	3
C	All	15	5	3

Examination Scheme for Practical Sessional examination:

Practical Internal Sessional Continuous Evaluation

Internal Examination:			
Continuous evaluation			**40**
External Examination: Examiner-			
Signed Lab Assignments		**10**	
On Spot Experiment		**40**	
Viva voce		**10**	**60**

Applied Cryptography
(GE3B-14)

Subject:Applied Cryptography	
Course Code: (GE3B-14)	**Semester: I**
Duration: 60 Hrs	**Maximum Marks: 100**
Teaching Scheme	**Examination Scheme**
Theory: 5	**End Semester Exam: 70**
Tutorial: 1	**Attendance : 5**
Practical: 0	**Continuous Assessment:25**
Credit: 6	**Practical & Sessional internal continuous evaluation: NA**
	Practical & Sessional external examination: NA

Aim:

Sl. No.	
1	To learn fundamentals of theoretical and practical areas of cryptography.
2	To learn fundamentals of digital signature and secure data transmission.

Objective:

Sl. No.	
1.	Understand various types of attacks and their characteristics.
2.	Understand the basic concept of encryption and decryption for secure data transmission.
3.	Analyze and compare various cryptography techniques.
4.	Understand the concept of digital signature and its applications.

Contents		**6 Hrs./week**	
Module	**Name of the Topics**	**Hours**	**Marks**
1	Introduction: Need for Security, Security approaches, Principles of Security, Types of Attacks, Plain Text & Cipher	**14**	**18**

	Text, Transposition Techniques, Substitution Techniques, Encryption & Decryption, Symmetric Key & Asymmetric Key Cryptography, Key Range & Key Size.		
2	Introduction to Number Theory, Modular Arithmetic, Prime Numbers, Residue Classes, Euler's Totient Function, Fermat's Theorem and Euler's Generalization, Euclidean Algorithm, Extended Euclidean Algorithm for Multiplicative Inverse, Primitive Roots & Discrete Logarithm, Chinese Remainder Theorem, Gauss Theorem.	**14**	**15**
3	Symmetric Key Cryptography: Overview, Block Cipher, DES Algorithm, Strength of DES, AES Algorithm, Evaluation Criteria for AES, Modes of Operations.	**8**	**10**
4	Asymmetric Key Cryptography: Principles of Public Key Cryptography, RSA Algorithm, Key Management, Man in the Middle Attack, Diffie-Hellman Key Exchange Algorithm.	**10**	**15**
5	Authentication: Authentication Requirement, Functions, Message Digest, Hash Function, Security of Hash Function, Kerberos, Digital Signature Standard, Digital Signature Algorithms – DSA, ElGamal Signature, Authentication Protocols.	**10**	**12**
Sub Total:		**56**	**70**
Internal Assessment Examination & Preparation of Semester Examination		**4**	**30**
Total:		**60**	**100**

List of Books
Text Books:

Name of Author	Title of the Book	Edition/ISSN/ISBN	Name of the Publisher
William Stallings	Cryptography and Network Security: Principles and Practice	7th edition	PEARSON

Reference Books:

AtulKahate	Cryptography and Network Security	3rd edition	McGraw Hill Education (India) Private Limited
B. Schneier	Applied Cryptography	2nd Edition	J. Wiley and Sons

End Semester Examination Scheme. Maximum Marks-70. Time allotted-3hrs.

Group	Module	Objective Questions (MCQ only with the correct answer)		Subjective Questions			
		No of question to be set	Total Marks	No of question to be set	To answer	Marks per question	Total Marks
A	**All**	**12**	**10**				
B	**All**			**5**	**3**	**5**	**70**
C	**All**			**5**	**3**	**15**	

- Only multiple choice type question (MCQ) with one correct answer are to be set in the objective part.
- Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper.

Examination Scheme for end semester examination:

Group	Chapter	Marks of each question	Question to be set	Question to be answered
A	**All**	**1**	**12**	**10**
B	**All**	**5**	**5**	**3**
C	**All**	**15**	**3**	**3**

Inferential Statistics
(GE3B-15)

Subject: Inferential Statistics	
Course Code: (GE3B-15)	**Semester: I**
Duration: 60 Hrs	**Maximum Marks: 100**
Teaching Scheme	**Examination Scheme**
Theory: 5	**End Semester Exam: 70**
Tutorial: 1	**Attendance : 5**
Practical:0	**Continuous Assessment:25**
Credit: 6	**Practical Sessional internal continuous evaluation:NA**
	Practical Sessional external examination:NA

Aim:

Sl. No.	
1	To learn how to set up and perform hypothesis tests
2	Use regression analysis to analyze and interpret data collected from ANOVA and ANCOVA designs.

Objective:

Sl. No.	
1.	To enable students to analyze and interpret data
2.	Understand the types of questions that the statistical method addresses
3.	To evaluate the reliability and validity of a measuring
4.	Apply the method to other examples and situations
5.	Use data to make evidence based decisions that are technically sound

Pre-Requisite:

Sl. No.	

1.	Mathematics
2.	Probability Statistics

Contents		**6 Hrs./week**	
Chapter	**Name of the Topic**	**Hours**	**Marks**
01	Estimation: Concepts of estimation, unbiasedness, sufficiency, consistency and efficiency. Factorization theorem. Complete statistic, Minimum variance unbiased estimator (MVUE) and Rao-Blackwell theorem with applications. Cramer-Rao inequality and MVB estimators (statement and applications).	**12**	**10**
02	Methods of Estimation: Method of moments, method of maximum likelihood estimation.	**8**	**5**
03	Principles of test of significance: Null and alternative hypotheses (simple and composite), Type-I and Type-II errors, critical region, level of significance, size and power, best critical region, most powerful test, uniformly most powerful test,	**12**	**20**
04	Neyman Pearson Lemma (statement and applications to construct most powerful test). Likelihood ratio test and relevant problems, properties of likelihood ratio tests (without proof).	**12**	**15**
05	Interval estimation - Confidence interval for the parameters of various distributions, Confidence interval for Binomial proportion, Confidence interval for population correlation coefficient for Bivariate Normal distribution, Pivotal quantity method of constructing confidence interval, Large sample confidence intervals.	**12**	**20**
	Sub Total:	**56**	**70**
	Internal Assessment Examination & Preparation of Semester Examination	**4**	**30**
	Total:	**60**	**100**

List of Books

Text Books:

Name of Author	**Title of the Book**	**Edition/ISSN/ISBN**	**Name of the Publisher**

Goon A.M., Gupta M.K.: Das Gupta.B.	Fundamentals of Statistics		World Press

Reference Books:

Rohatgi V. K. and Saleh, A.K. Md. E.	An Introduction to Probability and Statistics	2ndEdn	John Wiley & Sons.
Dudewicz, E. J., and Mishra, S. N.	Modern Mathematical Statistics		John Wiley & Sons.
Bhattacharjee , D. & Das, K. K.	A Treatise on Statistical Inference and Distributions		Asian Books
Hogg, R.V., Tanis, E.A. and Rao J.M	Probability and Statistical Inference	Seventh Ed	Pearson Education

End Semester Examination Scheme. Maximum Marks-70. Time allotted-3hrs.

Group	**Unit**	**Objective Questions** (MCQ only with the correct answer)		**Subjective Questions**			
		No of question to be set	Total Marks	No of question to be set	To answer	Marks per question	Total Marks
A	**1 to 5**	**10**	**10**				**70**
B	**1 to 5**			**5**	**3**	**5**	
C	**1 to 5**			**5**	**3**	**15**	

- Only multiple choice type question (MCQ) with one correct answer are to be set in the objective part.
- Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper.

Examination Scheme for end semester examination:

Group	**Chapter**	**Marks of each question**	**Question to be set**	**Question to be answered**

A	**All**	**1**	**10**	**10**
B	**All**	**5**	**5**	**3**
C	**All**	**15**	**3**	**3**

Course Name: Operating Systems with LINUX
Course Code: GE4B-01

Mode-Offline/ Blended

Course Objective: The course is designed to understand the fundamental utilities which are required on daily basis to work on a modern operating system. The course will cover an introduction on the policies for scheduling, deadlocks, memory management, synchronization, system calls, and file systems. On successful completion of this course students will be able to make effective use of Linux utilities to solve problems

Sl	Course Outcome	Mapped modules
1	Remember fundamental components of a computer operating system	M1
2	Remember and Understand policies for scheduling, deadlocks, memory management, synchronization, system calls, and file systems	M2, M3
3	Understand the basic commands of Linux operating system	M4
4	Understand & Apply the knowledge to create file system and directories	M1, M4, M5
5	Apply the knowledge to create processes, perform pattern matching	M1, M4, M6
6	Application of the gathered knowledge to develop simple programs	M1, M4, M5, M6

Module	Content	Total Hours	%age of questions	Blooms Level	Remarks (If any)
M 1	Introduction	4	5	1	
M 2	Process	10	20	1,2	
M 3	Resource Manager	6	15	2	
M 4	Introduction to Unix OS	12	20	2,3	
M 5	Files	12	20	3	
M 6	Shells & Process	12	20	4	
		56	100		

Detailed Syllabus:

Paper: Operating system with LINUX

Module 1: Introduction

Importance of OS, Basic concepts and terminology, Types of OS, Different views, Journey of a command execution, Design and implementation of OS.
(Total hours -4)

Module 2: Process (10L)

Concept and views, OS view of processes, OS services for process management, Scheduling algorithms, Performance evaluation; Inter-process communication and synchronization, Mutual exclusion, Semaphores, Hardware support for mutual exclusion, Queuing implementation of semaphores, Classical problem of concurrent programming, Critical region and conditional critical region, Monitors, Messages, Deadlocks.
(Total hours -10)

Module 3: Resource Manager

Memory management, File management, Processor management, Device management.
(Total hours -6)

Module 4: Introduction to UNIX Operating System

Introduction to UNIX UNIX operating system, UNIX architecture: Kernel and Shell, Files and Processes, System calls, Features of UNIX, POSIX and single user specification, Internal and external commands.

Utilities of UNIX Calendar (cal), Display system date (date), Message display (echo), Calculator (bc), Password changing (password), Knowing who are logged in (who), System information using uname, File name of terminal connected to the standard input (tty)

UNIX file system File system, Types of file, File naming convention, Parent – Child relationship, HOME variable, inode number, Absolute pathname, Relative pathname, Significance of dot (.) and dotdot (..), Displaying pathname of the current directory (pwd), Changing the current directory (cd), Make directory (mkdir), Remove directories (rmdir), Listing contents of directory (ls), Very brief idea about important file systems of UNIX: /bin, /usr/bin, /sbin, /usr/sbin, /etc, /dev, /lib, /usr/lib, /usr/include, /usr/share/man, /temp, /var, /home
(Total hours – 6)

Assignment –
LINUX Utilities - Calendar, Display system date, Message display, Calculator, Password changing, Knowing who are logged in, Knowing System information
Directory creation, removal, listing, navigation –
Displaying pathname of the current directory (pwd), Changing the current directory (cd), Make directory (mkdir), Remove directories (rmdir), Listing contents of directory (ls and its options), Absolute pathname, Relative pathname, Using dot (.) and dotdot (..)
(Total Hours – 6)

Module 5: Files
Ordinary file handling Displaying and creating files (cat), Copying a file (cp), Deleting a file (rm), Renaming/ moving a file (mv), Paging output (more), Printing a file (lp), Knowing file type (file), Line, word and character counting (wc), Comparing files (cmp), Finding common between two files (comm), Displaying file differences (diff), Creating archive file (tar), Compress file (gzip), Uncompress file (gunzip), Archive file (zip), Extract compress file (unzip), Brief idea about effect of cp, rm and mv command on directory.
File attributes File and directory attributes listing and very brief idea about the attributes, File ownership, File permissions, Changing file permissions – relative permission & absolute permission, Changing file ownership, Changing group ownership, File system and inodes, Hard link, Soft link, Significance of file attribute for directory, Default permissions of file and directory and using umask, Listing of modification and access time, Time stamp changing (touch), File locating (find).
(Total Hours – 6)

Assignment –
Ordinary File Handling - Displaying and creating files, Copying a file, Deleting a file, Renaming/ moving a file, Paging output, Knowing file type, Line, word and character counting (wc), Comparing files, Finding common between two files, Displaying file differences
File attributes – File and directory attributes listing, File ownership, File permissions, Changing file permissions – relative permission & absolute permission, Changing file ownership, Changing group ownership, File system and inodes, Hard link, Soft link, Default permissions of file and directory and using umask, Listing of modification and access time, Time stamp changing, File locating **(Total Hours – 6)**

Module 6: Shell and Process
Shell Interpretive cycle of shell, Types of shell, Pattern matching, Escaping, Quoting, Redirection, Standard input, Standard output, Standard error, /dev/null and /dev/tty, Pipe, tee, Command substitution, Shell variables
Process Basic idea about UNIX process, Display process attributes (ps), Display System processes, Process creation cycle, Shell creation steps (init ->getty -> login -> shell), Process state, Zombie state, Background jobs (& operator, nohup command), Reduce priority (nice), Using signals to kill process, Sending job to background (bg) and foreground (fg), Listing jobs (jobs), Suspend job, Kill a job, Execute at specified time (at and batch)
(Total Hours – 6)

Assignment –

Shell - Types of shell, Pattern matching, Escaping, Quoting, Redirection, Pipe, tee, Command substitution, Shell variables

Process - Display process attributes, Display System processes, Background jobs, Reduce priority, Sending job to background and foreground, Listing jobs **(Total Hours – 6)**

Readings

1.Operating Systems, Galvin, John Wiley
2.Operating Systems ,Milankovic, TMH
3.UNIX-Concepts & Applications, Sumitava Das, TMH
4.Learning UNIX Operating System, Peek, SPD/O'REILLY
5.Understanding UNIX, Srirengan, PHI 4. Essentials Systems Administration, Frisch, SPD/O'REILLY

(GE4B-02): ENTREPRENEURSHIP THEORY & PRACTICE

CreditPoint:6Total
Credit Hours: 60 Hrs.

Course Objective

1. To understand the function of the entrepreneur in the successful, commercial application of innovations.
2. To investigate methods and behaviours used by entrepreneurs to identify business opportunities and put them into practice.
3. To discuss how ethical behavior impacts on business decisions for a selected business startup.
4. To get better knowledge about the necessary traits for an Entrepreneurs.
5. To build and check the feasibility of business projects and the development of the projects for the same.
6. To provide the overview of Business Ethics and its importance.
7. To understand the various Management and Business scenarios of Ethics.
8. To get the overall knowledge on corporate culture and its impact on business.

Course Outcomes (CO):

SL NO.	Course Outcome	Mapped Modules
1.	This will help to understand the basics and needs of Entrepreneurship.	Module I - Unit 1
2	This will help Entrepreneurs develop the need and nature so, that they can run their business.	Module I - Unit 2
3	This unit helps to generate startups with various business decisions.	Module I - Unit 3
4	Helps the student to develop certain skills of Entrepreneurship.	Module I - Unit 4
5	This helps to develop business projects which develop to build business projects.	Module II - Unit 5
6	Student will able to describe examples of entrepreneurial business and actual practice, both successful and unsuccessful, and explain the role and significance of entrepreneurship as a career, in the firm, and in society.	Module II - Unit 6
7	Student will able to understand the importance and role of ethical, sustainability, innovation and global	Module II - Unit 7

	issues for strategic decision making.	
8	Student will evaluate different modes of entering into enterpreurship. Student will able to understand the importance and role of ethical, sustainability, innovation and global issues for strategic decision making.	Module II - Unit 8

Module I

Unit1:Introduction to Entrepreneurship [4L] Theories of Entrepreneurship, Role and Importance of Entrepreneur in Economic Growth.

Unit 2: Entrepreneurial Behaviour [10L]

Entrepreneurial Motivation, Need for Achievement Theory, Risk-taking Behavior, Innovation and Entrepreneur

Unit 3: Entrepreneurial Traits [8L]

Definitions, Characteristics of Entrepreneurs, Entrepreneurial Types, Functions of Entrepreneur

Unit 4: Project Feasibility Analysis [12L]

Business Ideas – Sources, processing; Input Requirements, Sources of Financ ing, Technical Assistance, Marketing Assistance, Preparation of Feasibility Reports, Legal Formalities and Documentation.

Module II

Unit 5: Creativity [8L]

Introduction – Meaning - Scope – Types of Creativity – Importance of Creativity – Steps of Creativity

Unit 6: Innovation [8L]

Introduction –Steps in Innovation – Stages of of Innovation – Technology aspects in Innovation.

Unit 7: Understanding the Market [4L]

Types of Business: Manufacturing, Trading and Services – Market Research - Concept, Importance and Process - Market Sensing and Testing

Unit 8: Resource Mobilization [6L]

Types of Resources - Human, Capital and Entrepreneurial tools and resources- Selection and utilization of human resources and professionals like Accountants, Lawyers, Auditors, Board Members, etc. Role and Importance of a Mentor- Estimating Financial Resources required. Methods of meeting the financial requirements – Debt vs. Equity

Suggested Readings:

1. Entrepreneurship, Arya Kumar, Pearson.
2. Introducing Entrepreneurship Development, Chakraborty, Tridib, Modern Book Agency.
3. Entrepreneurial Policies and Strategies, Manimala, M.J., TMH
4. Everyday Entrepreneurs - The harbingers of Prosperity and creators of Jobs , Dr. Aruna Bhargava.

Module No.	Content	Total Hours	%age of questions	Covered CO	Covered PO	Blooms Level (if applicable)	Remarks (if any)
Module I Unit 1	Introduction to Entrepreneurship	6	10	1	8		
Module I Unit 2	Entrepreneurial Behaviour	8	13	2	8		
Module I Unit 3	Entrepreneurial Traits	8	13	3	8		
Module I Unit 4	Project Feasibility Analysis	12	20	4	8		
Module II Unit 5	Creativity	6	10	5	8		
Module II Unit 6	Innovation	8	14	6	8		
Module II Unit 7	Understanding the Market	6	10	7	8		
Module II Unit 8	Resource Mobilization	6	10	8	8		

Course Name: Basics of Computing

Code: GE4B-03

Mode- Offline/ Blended **Credits: 6**

OBJECTIVE: The course is a right blend of Basic Computing and Mathematics, which enables students to gather important basic knowledge of Computers and Mathematics. This course will bridge the fundamental concepts of computers and mathematics with the present level of knowledge of the students. After completing the course students will be able to understand the fundamentals of computer, different problem solving techniques, basics of operating systems, different office operation tools, differential and integral calculus**.**

Duration: 60 Hours. (Theory: 40 hours + Practical: 10 hours + Tutorial: 10 hours)

Course Outcomes (CO):

Sl.	Course Outcome	Mapped modules
1.	Bridge the fundamental concepts of computers with the present level of knowledge of the students	Module-I
2.	Familiarize Organization, Peripheral Devices, Hardware and Software	Module-I
3.	Understand problem solving techniques, basics of Unix and Windows O.S. and its operations	Module-II, Module-III
4.	Demonstrate the Office Automation Tools	Module-III, Module-IV
5.	Understand Differential Calculus and Integral Calculus	Module-V, Module-VI

Module	Content	Total Hours	%age of questions	Blooms Level	Remarks (If any)
Module-I	Fundamentals of Computing	10	15	1,2	Theory
Module-II	Approaches to Problem Solving	5	25	3	Theory
Module-III	Operating System and Services in O.S.	5	15	3	Theory
Module-IV	Office Automation Tools	10	10	4	Lab
Module-V	Differential Calculus	18	20	5	Theory
Module-VI	Integral Calculus	12	15	5	Theory

Detailed Syllabus:

Module-I: Introduction to Computers
[10]

Introduction and Characteristics, History and Evolution, **Generations of Computer** (I-V), **Organization of Computers**, Block Diagram of a Computer, Von Neumann Architecture, Applications of Computers in Various Fields, **Input Devices** and functions of the different units, **Output Devices** and functions of the different units, Memory Unit, CPU (ALU+CU) , **Computer Languages** – Machine Language, Assembly Language, High-level Language, Features of Good Language. **Language Translators** - Compiler, Interpreter, Assembler, **Memories** [Memory Hierarchy], Registers [Types of Registers], Cache Memory, **Primary Memory** - RAM, DRAM and SRAM, ROM, ROM BIOS/ Firmware, Types of ROM, **Secondary Memory** - Hard Disk, Structure of a Hard Disk, how data is stored in a hard disk, concept of tracks, sectors, clusters, cylinders, formatting of hard disk (Low Level Formatting and High Level Formatting), Blu-Ray Disc [Data Storage Mechanism], Flash Drives/e-MMC, **Concept of Hardware & Software**, System Software, Operating System, Functions and Types of O/S, Utility Programs, Communication Software, Performance Monitoring Software, Application Software

MODULE-II: Approaches to Problem Solving
[5]

Approaches To Problem Solving, Algorithm : Introduction, Definition, Characteristics, Expressing Algorithm and General Approaches in Algorithm Design, Analysis of Algorithms, Advantages and disadvantages, Examples **Flowchart:** Definition, When to Use Flowcharts, Flowchart Symbols and Guidelines, Types of Flowcharts, Examples, Advantages and Disadvantages, Limitations of using Flowcharts.

MODULE-III: Operating System and Services in O.S.
[5]

Fundamentals of Operating System, Types of O.S. and Functions, Structure of O.S., Components, Concepts of Multitasking, Multiprogramming, Timesharing, Basics of Memory Management.
Introduction to Unix/DOS Operating system – History, Files and Directories, Internal and External Commands, Batch Files
Windows Operating Environment - Features of MS – Windows, Control Panel, Taskbar, Desktop, Windows Application, Icons, Windows Accessories, Notepad, Paintbrush.

MODULE-IV: Office Automation Tools - Skill Enhancement MS Office
[10]

i) **Microsoft Word** - Page Layout, Fonts, Word Art, Paragraph Styling, Indentation, Mail Merge, Navigation Pane, Macro, Themes, Tables, Idea About Saving Files In Different Formats, Font Embedding.
ii) **Microsoft Excel** - Basic functionality of MS-Excel, Functions - Mathematical, Statistical and Data Retrieval (Vlookup, Hlookup), Goal Seek, Pivot Table, Cross Worksheet Operations
iii) **Microsoft PowerPoint** - Types of Layouts, Using The Slide Master View, Animations, Slide Transition, Design and themes.

MODULE V: Differential Calculus
[18]

Function of single variable: Explicit and Implicit Function, Parametric Equations, Single valued and Multiple Valued Function, Monotonic and Bounded function, Representation of functions Graphically, Limit: Definition, Cauchy General Principle for Convergence of Limit, Simple Examples, Continuity: Definition, Example on Simple and Jump Discontinuity
Differentiation: Definition, Derivative of Algebraic, Exponential, Logarithmic, Trigonometric, Inverse functions (Up to Second order), Logarithmic Differentiation, Derivative of Products, Examples.
Mean Value Theorem: Rolle's Theorem, Lagrange and Cauchy MVT (Statement Only) with applications. Taylor's Series.
Indeterminate Forms: L' Hospital Rule. Examples.

MODULE VI: Integral Calculus
[12]

Integrations: Indefinite Integrals, Integration Rules, Integration by Parts, (Algebraic Rational, Exponential, Trigonometric functions), Definite Integrals: Definition, Geometrical Interpretation, Definite Integral as Limit of a Sum, Area of Plain Regions.

Suggested Readings:

- Satish Jain, M. Geetha, Kratika, Microsoft Office 2010, BPB
- Dr. Milind M. Oka, Computer Fundamentals, Everest Publication House
- V. Rajaraman, Computer Basics and C Programming, Eastern Economy Edition
- Dr. A. K. Gupta, Management Information System, S. Chand Publisher
- Kogent Learning Solutions INC, Windows 7 in Simple Steps, dreamtech Press
- B. C. Das, B. N. Mukherjee, Differential Calculus, U. N. Dhar and Sons Pvt. Ltd.
- B. C. Das, B. N. Mukherjee, Integral Calculus, U. N. Dhar and Sons Pvt. Ltd.

Paper Code: BBA (HM) – 103 / GE5B-01

Principles of Management

Total Credit: 6

Total hours of lectures: 60 hours

Sl.	Topic/Module	Hour
1.	**Module 1 :** Introduction to Management- Nature, meaning and significance of management, Management as a Science or an Art, Difference between management & administration; management as a process, management as a functions, managerial skills, and managerial roles in organisation; quality of a good manager; relevance of management in Hospital and Health Sector	10
2.	**Module 2** : Approaches to Management – Classical, Neo-classical and Modern Contributors to Management Thought ; Taylor and Scientific Theory, Fayol's and Organization Theory, Elton Meyo & Behavioural school & human relations school ; Peter Drucker and Management Thought.; Various Approaches to Management i.e. system approach , contingency approach etc., Indian Management Thought.	10
3.	**Module 3** : Planning And Decision Making- Planning: Nature, importance, forms, types, making planning effective, Significance & Limitations of Planning; Planning Premises – Meaning & Types, Strategic Planning – Meaning & level, BCG model etc., MBO – Meaning, Process , importance ; Decision Making – Meaning, Types, Process, schools of decision making	10
4.	**Module 4** : Organization Design And Structure - Organization – Meaning, Process, Principles, Or Organization Structure – Determinants and Forms: Line, Functional, Line & Staff, Project, Matrix and Committees; Formal and Informal Organization; Departmentation – Meaning and Bases; Span of Control – Meaning and Factors Influencing; Authority, Responsibility and Accountability; Delegation – Meaning, Process; Principles; Centralization and Decentralization – Meaning; Degree of Decentralization; Difference between Delegation and Decentralization. Organization structure common in tourism industry	10
5.	**Module 5** : Directing – motivation & leadership- Motivation – Meaning , Definition, Significance & Limitations; contemporary theories of motivation; Financial and non-financial incentives of Motivation; Leadership - Definition, Significance of Leadership, Leadership styles ; Process and Barriers of Communication.	10
6.	**Module 6** : Controlling & Change- Control – meaning & importance of control, steps of controlling process, designing control systems, financial control ; Organizational change – meaning, drivers of change, process of change, resistance to change, overcoming resistance to change; Management trends in Health Sector - managing quality, innovation, concern for environment &sustainability of the organization & industry	10

Suggested Readings:

1. Management: Stoner James .A. , Freeman Edward, Gilbert Daniel , Pearson
2. Weihrich and Koontz, et al: Essentials of Management; Tata McGraw Hill
3. . V.S.P Rao & Hari Krishna: Management-Text & Cases, Excel Books
4.. Ramaswami T: Principles of Mgmt., Himalaya Publishing
5. Dipak Kumar Bhattacharyya: Principles of Management - Text and Cases, Pearson.
6. Robbins, S. P: Management, Prentice Hall.

Subject: Economics
Course Code: BBABFS102-A / GE5B-02

Name of the Course: Bachelors in Banking and Financial Services **Subject:** Economics (GE-1)			
Course Code: BBABFS102-A / GE5B-02		**Semester:** 1	
Duration:60 Hours		**Maximum Marks:** 100	
Teaching Scheme		**Examination Scheme**	
Theory: 5		**End Semester Exam**: 70	
Tutorial: 1		**Teacher's Assessment**: 10	
Practical:0		**Internal Assessment**: 20	
Credit: 6		**Practical Sessional internal continuous evaluation**:	
		Practical Sessional external examination:	
Aim:			
Sl. No.			
1.	Build a foundational understanding of economics for Capital Markets		
2.	Establish a link between various components of the Capital Markets		
Objective:			
Sl. No.			
1.	To gain an understanding of economic concepts for Capital Markets		
Pre-Requisite:			
Sl. No.			
1.	Basic knowledge of Economics		

Contents		**Hrs./week**	
Chapter	**Name of the Topic**	**Hours**	**Marks**
01 Introduction	• Scope and Importance of Business Economics • Basic tools- Opportunity Cost principle- Incremental and Marginal Concepts • Basic economic relations - functional relations: equations- Total, Average and Marginal relations • Use of Marginal analysis in decision making, The basics of market demand, market supply and equilibrium price- shifts in the demand and supply curves and equilibrium	6	14
02 Demand Analysis	• **Demand Function** - nature of demand curve under different markets Meaning, significance, types and measurement of elasticity of demand (Price, income cross and promotional)- relationship between elasticity of demand and revenue concepts • **Demand estimation and forecasting:** Meaning and significance - methods of demand estimation: survey and statistical methods (numerical illustrations on	6	14

	trend analysis and simple linear regression)		
03 Supply and Production Decisions and Cost of Production	• **Production function:** short run analysis with Law of Variable Proportions- Production function with two variable inputs- isoquants, ridge lines and least cost combination of inputs- Long run production function and Laws of Returns to Scale - expansion path - Economies and diseconomies of Scale. • **Cost concepts:** Accounting cost and economic cost, implicit and explicit cost, fixed and variable cost - total, average and marginal cost - Cost Output Relationship in the Short Run and Long Run (hypothetical numerical problems to be discussed), LAC and Learning curve - Break even analysis (with business applications)	6	14
04 Market structure: Perfect competition and Monopoly and Pricing and Output Decisions under Imperfect Competition	• Short run and long run equilibrium of a competitive firm and of industry - monopoly - short run and long-run equilibrium of a firm under Monopoly • **Monopolistic competition:** Equilibrium of a firm under monopolistic competition, debate over role of advertising (topics to be taught using case studies from real life examples) • **Oligopolistic markets:** key attributes of oligopoly - Collusive and non-collusive oligopoly market - Price rigidity - Cartels and price leadership models (with practical examples)	6	14
05 Pricing Practices	• Cost oriented pricing methods: cost – plus (full cost) pricing, marginal cost pricing, Mark up pricing, discriminating pricing, multiple – product pricing - transfer pricing • Case studies on how pricing methods are used in business world	6	14
	Sub Total:	**30**	**70**
	Internal Assessment Examination & Preparation of Semester Examination		**30**
	Total:		**100**

Practical:

Skills to be developed:

Intellectual skills:

1. Analytical skills. Economists must be able to review data, observe patterns, and draw logical conclusions. ...
2. Communication skills. Economists must be able to explain their work to others. ...
3. Critical-thinking skills. ...
4. Math skills. ...

Motor Skills:

1.Detail oriented.

2.Writing skills

List of Practical: Sl. No. 1& 2 compulsory & at least three from the rest)

1. Analytical skills. Economists must be able to review data, observe patterns, and draw logical conclusions. ...
2. Communication skills. Economists must be able to explain their work to others. ...
3. Critical-thinking skills. ...
4. Detail oriented. ...
5. Math skills. ...
6. Writing skills

Assignments:

List of Books
Text Books:

Name of Author	**Title of the Book**	**Edition/ISSN/ISBN**	**Name of the Publisher**
Roy E. Bailey	The Economics of Financial Markets	2005/978-0521612807	Cambridge University Press
Paul Heyne,Peter Boettke,David Prychitko	The Economic way of Thinking	978/0132991292	Pearson
Reference Books:			
Milton Friedman	Money Mischief	1994/ 978-0156619301	Harcourt Publishers Group

List of equipment/apparatus for laboratory experiments:	
Sl. No.	
1.	**NA**
2.	
3.	
4.	
5.	

End Semester Examination Scheme. Maximum Marks-70. Time allotted-3hrs.

Group	**Unit**	**Objective Questions** (MCQ only with the correct answer)		**Subjective Questions**			
		No of question to be set	Total Marks	No of question to be set	To answer	Marks per question	Total Marks
A	**1,2,3, 4**	**10**	**18**	**3**	**2**	**4**	**52**

B	**4,5, 6, 7, 8**	**10**		**4**	**3**		

- Only multiple choice type question (MCQ) with one correct answer are to be set in the objective part.
- Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper.

Subject: Accounting
Course Code: BBABFS102-B / GE5B-03

Name of the Course: Bachelors in Banking and Financial Services **Subject:** Accounting (GE-1)	
Course Code: BBABFS102-B / GE5B-03	**Semester:** 1
Duration: 60 Hours	**Maximum Marks:** 100
Teaching Scheme	**Examination Scheme**
Theory: 5	**End Semester Exam**: 70
Tutorial: 1	**Teacher's Assessment**: 10
Practical:0	**Internal Assessment**: 20
Credit: 6	**Practical Sessional internal continuous evaluation**:
	Practical Sessional external examination:

Aim:	
Sl. No.	
1.	Build a foundation to understand the various concepts of Financial Accounting
2.	Gain a better understanding of Accounting Mechanics, Accounting Standards and dealing with Financial Statements of Companies

Objective:	
Sl. No.	
1.	To articulate the financial concepts of accounting in companies
2.	To gain a clear understanding of Financial Accounting with the help of case studies

Pre-Requisite:	
Sl. No.	
1.	NA

Contents		**Hrs./week**	
Chapter	**Name of the Topic**	**Hours**	**Marks**
01 Introduction to Accounting	• Introduction to concepts of Accounting • Concept and necessity of Accounting • An Overview of Income Statement and Balance Sheet.	2	6
02 Introduction and Meaning of GAAP	• Introducing the meaning of GAAP • Concepts of Accounting • Impact of Accounting • Concepts on Income Statement and Balance Sheet.		
03 Accounting Mechanics	• Understanding of Accounting Mechanics • Process leading to preparation of Trial Balance and Financial Statements		
04 Preparation of Financial Statements	• Understanding the Preparation of Financial Statements with Adjustment Entries.	2	6

with Adjustment Entries.			
05 Revenue Recognition and Measurement	• Describing Revenue Recognition and Measurement • Capital and Revenue Items • Treatment of R & D Expenses • Preproduction Cost • Deferred Revenue Expenditure etc.	2	6
06 Fixed Assets and Depreciation Accounting	• Describing Fixed Assets and Depreciation Accounting • Evaluation and Accounting of Inventory	2	6
07 Preparation and Complete Understanding of Corporate Financial Statements	• Preparation and Complete Understanding of Corporate Financial Statements • 'T' Form and Vertical Form of Financial Statements.	2	6
08 Important Accounting Standards	• Corporate Financial Reporting – Analysis of Interpretation thereof with reference to Ratio Analysis. Fund Flow, Cash Flow. • Corporate Accounting. Accounting of Joint Stock Companies: Overview of Share Capital and Debentures, Accounting for Issue and forfeiture of Shares, Issue of Bonus Share, Issue of Debentures.	2	6
09 Financial Statements of Companies	• Financial Statements of Companies: Income Statement and Balance Sheet in Schedule VI. Provisions of the Companies Act: Affecting preparation of Financial Statements, Creative Accounting, Annual Report, Presentation and analysis of Audit reports and Directors report. (Students should be exposed to reading of Annual Reports of Companies both detailed and summarized version).	2	6
10 Inflation Accounting & Ethical Issue in Accounting	• Describing Inflation Accounting & Ethical Issue in Accounting	2	6
11 Case Studies and Presentations	• Case Studies and Presentations	**10**	**10**
	Sub Total:	**30**	**70**
	Internal Assessment Examination & Preparation of Semester Examination		**30**
	Total:		**100**

Practical:

Skills to be developed:

Intellectual skills:

1. Analytical Skills.
2. Critical Thinking. ...

Motor Skills:

1. Attention to Detail
2. Interpersonal Communication. ...
3. Adaptability. ...
4. Time Management. ...

List of Practical: Sl. No. 1& 2 compulsory & at least three from the rest)

1. Analytical Skills.
2. Critical Thinking. ...
3. Attention to Detail

4.Interpersonal Communication. ...

5. Adaptability. ...

Assignments:

List of Books

Text Books:

Name of Author	**Title of the Book**	**Edition/ISSN/ISBN**	**Name of the Publisher**
P C Tulsian ,	Financial Accounting	2002/ 9788177582284	Pearson
Gregory Becker	Accounting Principals:The ultimate Begineers Guide to Accounting	978-1081670290	Pearson
Reference Books:			
M C ShuklaS C GuptaT S Grewal	Advanced Accounting Vol - I	2018/ 978-9352533022	S.CHAND
M C ShuklaS C GuptaT S Grewal	Advanced Accounting Vol - II	2018/ 978-8121911009	S.CHAND

End Semester Examination Scheme. Maximum Marks-70. Time allotted-3hrs.

Group	**Unit**	**Objective Questions** (MCQ only with the correct answer)		**Subjective Questions**			
		No of question to be set	Total Marks	No of question to be set	To answer	Marks per question	Total Marks
A	**1,2,3, 4**	**10**	**18**	**3**	**2**	**4**	**52**
B	**4,5, 6, 7, 8**	**10**		**4**	**3**		

- Only multiple choice type question (MCQ) with one correct answer are to be set in the objective part.

- Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper.

(GE5B-04): PRINCIPLES OF MANAGEMENT & ORGANIZATIONAL BEHAVIOUR

Credit Point 6

Total Credit Hours: 60 Hrs.

Course Objective

1. To help the students to develop cognizance of the importance of management principles.
2. To understand the planning process in the organization.
3. To enable them to analyze and understand the environment of the organization.
4. To study the system and process of effective controlling in the organization.
5. To understand the concept of behavior in a organizational settings & to explain, predict and influence behavior of others.
6. To help the students to develop the concepts of Human Behaviour.
7. To know the concept of motivation &how to motivate people for their work according to various theories.
8. To enable them to understand the group behavior & the communication process in an organization.
9. To help the students to develop the process of leading individuals, managing conflicts.
10. To enable them to understand the culture of the organization & execute the strategy according to the situation.

Course Outcomes (CO):

SL NO.	Course Outcome	Mapped Modules
1	Students will be able to have clear understanding of managerial functions like planning, and have same basic knowledge on international aspect of management	Module I – Unit 1
2	Students will be able to explain the relationship between strategic, tactical and operational plans	Module I – Unit 2
3	Students will be able to understand the concept of organization.	Module I – Unit 3
4	Students will be able to analyze isolate issues and formulate best control methods	Module I – Unit 4
5	Students will be able to develop insight on how employees behave & perform in the workplace.	Module II – Unit 5

6	Students will get knowledge to improve personal adjustment & interpersonal relationship	Module II – Unit 6
7	Students will be able to analyze & compare different models used to explain individual behavior related to motivation & rewards.	Module II – Unit 7
8	Students will be able to explain group dynamics & demonstrate skills required for working in groups.	Module II – Unit 8
9	Students will learn to explore & will develop a sense of confidence & belief in themselves & their ideas.	Module II – Unit 9
10	Students will be able to understand that how organizational culture influences the behavior of organizational members.	Module II – Unit 10

Module I

Unit 1: Introductionto Management **[4L]**

Nature, purpose and scope of management, Skills and roles of a Manager, Functions, Development of Management Theories (Classical, Neo-Classical and Modern)

Unit 2: Planning Process **[6L]**

Types of plans, Levels of planning, planning process, Management by objectives, Strategic Management, premising and forecasting; Decision-Making process, barriers, styles of decision making

Unit 3: Organizing Procedure **[8L]**

Organizational design and structure, Coordination, centralization and de- centralization, Delegation, Authority & power – concept & distinction, Line and staff organizations.

Unit 4: Controlling System **[8L]**

Concept, planning-control relationship, process of control, Types of Control, Control Techniques, and Staffing: Human Resource Management and Selection

Module II

Unit 5: Introduction to Organizational Behaviour **[4L]**

The nature and determinants of organizational behaviour, need for knowledge of OB, contributing disciplines to the field, OB Model

Unit 6: Individual differences **[6L]**

Learning, Values, attitudes, Personality (MBTI, Big Five Model), Emotional

Intelligence, Perception, Attribution theory

Unit 7: Work Motivation[6L]

Early Theories (Mc. Gregory's Theory X & Y , Abraham Maslow's Need Hierarchy Theory Herzberg's Two Factor Theory) & Contemporary Theories (Mc. Clelland's 3 Needs Theory , Alderfer's ERG Theory , Adam's Equity Theory & Vroom's Expectancy Theory, Goal Setting Theory), Application of Motivation Theories & workers participation management.

Unit 8: Group Behaviour[6L]

Types of Groups, Stages of Group Development, Group Decision Making, understanding Teamwork: Types of Teams, Creating Effective teams, Communication: significance, types, barriers, overcoming barriers.

Unit 9: Leadership[6L]

Basic Approaches (Trait Theories, Behavioral Theories & Contingency Theories) & Contemporary Issues in Leadership. Conflict: levels of conflict, resolving conflicts; power and politics: sources of power, use of power

Unit 10: Organization culture and Change[6L] Effects of culture, changing Organizational culture forces of change, Resistance to change, the change process.

Suggested Readings:

1. Management, Robbins, Stephen P, and Mary Coulter, Prentice Hall, New Delhi. Robbins, Stephen P: Organizational Behavior" Prentice Hall
2. Principles of Management, Govindarajan & Natarajan, Prentice Hall of India Private Limited.
3. Management, Stoner, Freeman & Gilbert, Jr., Prentice Hall of India private Limited
4. Organizational Behavior: Human Behavior at Work, Newstrom, John W. and Keith Davis, Tata McGraw-Hill.

Module No.	Content	Total Hours	%age of questions	Covered CO	Covered PO	Blooms Level (if applicable)	Remarks (if any)
Module I Unit 1	Introduction to Management	4	7	1	8		
Module I Unit 2	Planning Process	6	10	2	8		
Module I Unit 3	Organizing Procedure	8	10	3	8		
Module I Unit 4	Controlling System	8	10	4	8		

Module II Unit 5	Introduction to Organizational Behavior	4	7	6	8		
Module II Unit 6	Individual differences	6	12	6	8		
Module II Unit 7	Work Motivation	6	12	7	8		
Module II Unit 8	Group Behavior	6	10	8	8		
Module II Unit 9	Leadership	6	12	9	8		
Module II Unit 10	Organization culture and Change	6	10	10	8		

(GE5B-05): BASICS OF ACCOUNTING AND FINANCE IN HEALTHCARE MANAGEMENT

Credit Point: 6

Total Credit Hours: 60 Hrs.

Course Objective

1. To understand the meaning of accounting, different accounting concepts and principles.
2. To understand the rules of journal, ledger and trial balance.
3. To understand different concepts and methods of depreciation and provision.
4. To understand the preparation of final accounts with different adjustment.
5. To understand the knowledge of business finance, financial management and management decision.
6. To understand the concept and classification of working capital and importance of working capital management.
7.

Course Outcomes (CO):

SL NO.	Course Outcome	Mapped Modules
1	Ability to know the objective and advantages of accounting.	Module I – Unit 1
2	Ability to know how to record the journal entries, posting to the ledger and preparation of trial balance.	Module I – Unit 2
3	Ability to calculate depreciation by applying various methods.	Module I – Unit 3
4	Ability to prepare trading account, profit & loss account and balance sheet along with different	Module I – Unit 4

	adjustments.	
5	Ability to determine the value and wealth maximization of business and scope of financial management.	Module II – Unit 5
6	Ability to compute working capital using both the cash cost approach and the operating cycle approach.	Module II – Unit 6

Module 1

Unit1: Meaning and Scope of Accounting[5L] Accounting: meaning, Objective, Scope and Advantages; Accounting Principles: GAAP, Accounting Concepts and Accounting Conventions; Cash Basis and Accrual Basis of Accounting.

Unit2: Recording of Business Transactions[15L] Accounting Cycle, Golden Rule of Accountancy, Journal, Ledger, Trial Balance, Capital and Revenue expenditure.

Unit 3: Depreciation and Provision [8L] Concept of Depreciation; Causes of Depreciation; Depletion, Amortization; Depreciation accounting; Methods of recording depreciation; Straight line and Diminishing Balance method.

Provision and Reserve: Preparation of provision for doubtful debt account, provision for discount on Debtors, provision for discount on Creditors, Differentiate between Provision and Reserve.

Unit4: Preparation of Final Accounts[12L] Trading account; Profit and Loss Account; Balance Sheet; Adjustment entries with respect to Closing stock, Outstanding Expenses, Prepaid Expenses, Pre-received Income, Accrued Income, Depreciation, Provision for Bad Debts, Stock lost by Fire, Goods withdrawal by Proprietors, Free sample

Module II[8L]

Unit 5: Introduction to Financial Management

Meaning, Core Elements, Objectives and Scope, Role of Finance Manager, Profit Vs Goal Maximization, Investment Decision, Financing Decision, Dividend Decision.

Unit6: Working Capital Management[12L] Definition, Classification of Working Capital Management, Factors of Working Capital Management, Operating Cycle, Practical problem on Working Capital Requirement.

Suggested Readings:

1. Financial Accounting, Ashoke Banerjee, Excel Books
2. Financial Accounting, Basu & Das, Rabindra Library
3. Financial Accounting, M. Hanif, A. Mukherjee, TMH.
4. Financial Management: Theory and Practice, Chandra, P., TMH.
5. Financial Management, Pandey, I.M., Vikas Publishing House Pvt. Ltd.

Module No.	Content	Total Hours	%age of questions	Covered CO	Covered PO	Blooms Level (if applicable)	Remarks (if any)
Module I Unit 1	Meaning and Scope of Accounting	5	9	1	6		
Module I Unit 2	Recording of Business Transactions	15	25	2	6		
Module I Unit 3	Depreciation and Provision	8	13	3	6		
Module I Unit 4	Preparation of Final Accounts	12	20	4	6		
Module II Unit 5	Introduction to Financial Management	8	13	5	6		
Module II Unit 6	Working Capital Management	12	20	6	6		

(GE5B-06): HEALTH ECONOMICS

Credit Point: 6
Total Credit Hours: 60 Hrs.

Course Objectives:

1. To understand the basic concepts of economics
2. To demonstrate demand supply law and elasticity concepts
3. To overview the understanding of Cost analysis
4. To learn the market mechanism indetails
5. To understand scope of health economics
6. To know about healthcare financing avenues
7. To define the ideas about healthcare budget
8. To discuss health programmes in details

Course Outcomes (CO):

SL NO.	Course Outcome	Mapped Modules
1.	Effectively understand the basic concepts Economics	Module I - Unit 1
2	Properly demonstrate demand supply law and elasticity concepts	Module I - Unit 2
3	Able to overview the understanding of Cost Analysis	Module I - Unit 3
4	Properly understand the market mechanism in details	Module I - Unit 4
5	Able to understand scope of health economics	Module II - Unit 5
6	Explore and know about healthcare financing avenues	Module II - Unit 6
7	Effectively define the ideas about healthcare budget	Module II - Unit 7
8	Thoroughly discuss and interpret the results of health programmes	Module II - Unit 8

Module I

Unit 1: The Fundamentals of Economics **[6L]**

Economic Organizations-Utility, Wealth, Production, Capital- Central Problems of an Economy.

Unit 2: Demand & Supply **[8L]**

Meaning- determinants of demand- law of demand- elasticity of demand- price, income and cross elasticity. Supply -meaning- determinants- law of supply - Demand vs. Supply.

Unit 3: Concepts of Cost **[8L]**

Short-run and long-run costs, average and marginal costs, total, fixed and variable costs.

Unit 4: Various forms of market **[12L]**

Monopoly, Perfect Competition, Monopolistic Competition and Oligopoly- Pricing strategies.

Module II

Unit 5: Scope and coverage of Health Economics **[6L]**

Health as an investment- Population and Economic Development

Unit 6: Health financing **[8L]**

Various sources. Cost Benefit Analysis and Cost Effective Analysis.

Unit 7: Health Care Budget **[6L]**

Purpose, types and practices in Indian context.

Unit 8: Health Programmes **[6L]**

Economics of Health Programmes for Nutrition, Economics of abuse of tobacco & Alcohol, Economics of Breast feeding

Suggested Readings:

1. The Economics of Health and Health Care, Sherman Folland, Allen C. Goodman, Miron Stano, Prentice Hall
2. Health Economics-Jay Bhattacharya,Timothy Hyde & Peter Tu, Kindle Edition
3. Health Economics- Dr. Jeyasingh, Dr. D. Solomon Raj, Dr.D Jery Josephin, Creative Crows Publishers LLP
4. Health Economics for Hospital Management, Dutta, Shuvendu, Bikash, Jaypee Brothers Medical Publishers

Module No.	Content	Total Hours	%age of questions	Covered CO	Covered PO	Blooms Level (if applicable)	Remarks (if any)
Module I Unit 1	The Fundamentals of Economics	6	10	1	6		
Module I Unit 2	Demand & Supply	8	13	2	6		
Module I Unit 3	Concepts of Cost	8	13	3	6		
Module I Unit 4	Various forms of market	12	20	4	6		

Module II Unit 5	Scope and coverage of Health Economics	6	10	5	6		
Module II Unit 6	Health financing	8	14	6	6		
Module II Unit 7	Health Care Budget	6	10	7	6		
Module II Unit 8	Health Programmes	6	10	8	6		

(GE5B-07): MEDICAL MICROBIOLOGY

Credit Point:6

Total Credit Hours: 60 Hrs.

Course Objectives:

1. The objective of this course is that after 50 hours of lectures and demonstrations in Addition to clinical the student will be able to understand the causes, findings, investigations, management in relation with physiotherapy.
2. To understand various pathological conditions due to bacteria.
3. To understand viruses
4. To understand various pathological conditions due to viruses

Course Outcomes (CO):

Sl.No.	Course Outcome	Mapped Modules
1	The course will enable students to understand the conditions in Microbiology and its application in relation with physiotherapy.	Module I – Unit 1
2	Students will learn various pathological conditions due to bacteria's	Module I – Unit 2
3	After studying this course the students will understand various pathological conditions and their causative organisms.	Module II – Unit 3
4	Students will learn various pathological conditions due to viruses	Module II – Unit 4

Module I

Unit 1: Bacteria **[20L]**

Cell structure, classification of bacteria. Staining reactions— gram staining, spore staining, acid fast staining. Bacterial growth-nutritional requirement, physical factors affecting. Culture media, growth curve. Bactericidal agents- phenol, alcohol, ETC Sterilization-principles, types, methods.

Unit 2: Outline the bacteria causing the following diseases **[10L]**

RTI, Meningitis, Enteric infection, Anaerobic infection, UTI, Leprosy, TB, STD, Wound infection, Hospital acquired infection.

Module II

Unit 3: Virus **[20L]**

Elementary knowledge of viral morphology, viral genome and classification, viral replication.

Unit 4: Outline the virus causing the following diseases **[10L]**

HIV, Hepatitis, Polio, Measles, Rubella, Herpes

Suggested Readings:

1. Essentials of Medical Microbiology, Sastry Apurba S and Bhat Sandhya
2. The Short Textbook of Medical Microbiology, Satish Gupte
3. Jawetz Melnick & Adelbergs Medical Microbiology, Stefan Riedel, Stephen Morse, et al.
4. A Text Book of Microbiology, P.Chakraborty

Module No.	Content	Total Hours	%age of questions	Covered CO	Covered PO	Blooms Level (If applicable)	Remarks (If any)
Module I Unit 1	Bacteria	20	40	1	4		
Module I Unit 2	Outline the bacteria causing the following diseases	10	10	2	4		
Module II Unit 3	Virus	20	40	3	4		
Module II Unit 4	Outline the virus causing the following diseases	10	10	4	4		

(GE5B-08): BIOCHEMISTRY& NUTRITION

Credit Point: 6

Total Credit Hours: 60 Hrs.

Course Objectives:

1. To understand the concept of solutions and how PH buffers work.
2. To understand the aspects of various nutrients and its preventive effects.
3. To understand the cell and it structure.
4. To obtain knowledge on nutrition and its function.
5. To have a detailed study on nucleic acid and enzymes.
6. To gain a vivid idea on Biological oxidation.
7. To understand the process of metabolism of different energy substances.
8. To understand general Mechanism of tissues & metabolism.
9. To differentiate regulation and production of different hormones.

Course Outcomes (CO):

Sl.No.	Course Outcome	Mapped Modules
1	Ability to understand the concept of solutions and how PH buffers work.	Module I – Unit 1
2	Ability to understand the aspects of various nutrients and its preventive effects.	Module I – Unit 2
3	Ability to define cell and its structures	Module I – Unit 3
4	Ability to gain knowledge on nutrition and its function.	Module I – Unit 4
5	Ability to get an idea on nucleic acid and on enzymes	Module II – Unit 5
6	Ability to define biological oxidation.	Module II – Unit 6
7	Ability to understand To understand the process of metabolism of different energy substances.	Module II – Unit 7
8	Ability to define general Mechanism of tissues & metabolism.	Module II – Unit 8
9	Ability to differentiate regulation and production of different hormones.	Module II – Unit 9

Module I

Unit 1: Biophysics **[5L]**

Concepts of PH and buffers, Acid-base equilibrium, osmotic pressure and its physiological applications.

Unit 2: Nutrition & Prevention **[5L]**

Nutritional aspects of carbohydrate, fat and proteins, Balanced diet, metabolism in exercise and injury. Diet for chronically ill and terminally ill patients.

Unit 3: Cell Organelle **[5L]**

Morphology, Structure and functions of cell, cell membrane, Nucleus, Chromatin, mitochondria, endoplasmic reticulum, Ribosome.

Unit 4: Introduction to nutrition **[5L]**

Definition, functions, sources, classification, monosaccharide, Disaccharides, Polysaccharides, Muco-polysaccharides and its importance, Definition, functions, sources, classification, simple lipids, compound lipids, derived lipids, Saturated and unsaturated fatty acids, Essential fatty acids and their importance, Blood lipids and their implications, cholesterol and its importance. Definition, Sources, Functions, Classification, simple protein, congregated proteins and derived proteins properties and reactions of proteins. Classification, Fat-soluble vitamins A, D, E, K Water soluble

vitamins-B Complex and Vitamin C. Daily requirement physiological functions and disease of vitamin deficiency.

Unit 5: Nucleic acid & Enzymes **[5L]**

Structure and functions of DNA, RNA, Nucleosides, Nucleotides, biologically important Nucleotides including energy rich compounds. Definition, Classification, mode of action, factors, affection, enzyme action.

Module II

Unit 6: Biological Oxidation **[5L]**

Respiratory chain and process of Biological oxidation.

Unit 7: Metabolism on Energy Substances **[10L]** Metabolism of Carbohydrate, Lipid, Protein, Mineral: Glycolysis, TCA Cycle, Glycogenesis, Glycogenolysis, Gluconeogensis, maintenance of Blood glucose, Inter conversion of different sugars. Metabolism of cholesterol, Ketone bodies, Athero- sclerosis and obesity, Lipo Protein of their metabolism, Transamination, Transmethylation, Dearmination, Fate of Ammonia Urea synthesis and synthesis of creatinine, inborn errors of metabolisms.Iron, Calcium, Phosphorous, Trace elements.

Unit 8: Metabolism & the types of tissues **[10L]**

Mucopolysacharides, Connective tissue proteins, Glyco-proteins, Chemistry and metabolism of bone and teeth. Metabolism of skin. Composition, Metabolism, Chemical mediators of nerve activities. Structure, metabolism of muscles, muscle contraction.

Unit 9: Regulation & Production of Hormones **[5L]**

General characteristics and Mechanism of Hormone actions, Insulin, Glucose, Thyroid and Para-Thyroid hormones. Cortical sex hormones.

Suggested Readings:

1. Textbook of Biochemistry, Chatterjee M.N –Jaypee Brothers
2. Textbook of Biochemistry for medical students, Vasudevan D.M – JaypeeBrothers
3. Clinical Biochemistry – Metabolic & Clinical aspects , Marshall & Bangert– Churchill Livingstone
4. Dietetics – B. Srilakshmi , New age International Publisher
5. Nutrition science -- B. Srilakshmi , New age International Publisher

Module No.	Content	Total Hours	%age of questions	Covered CO	Covered PO	Blooms Level(If applicable)	Remark (If any)
Module I Unit 1	Biophysics	5	9	1	4		
Module I Unit 2	Nutrition & Prevention	5	8	2	4		
Module I Unit 3	Cell Organelle	5	9	3	4		
Module I Unit 4	Introduction to Nutrition	10	17	4	4		
Module I Unit 5	Nucleic acids & Enzymes	5	8	5	4		
Module II Unit 6	Biological Oxidation	5	9	6	4		
Module II Unit 7	Metabolism on Energy Substances	10	16	7	4		
Module II Unit 8	Metabolism and types of tissues	10	16	8	4		
Module II Unit 9	Regulation & Production of Hormones	5	8	9	4		

(GE5B-09) : MICRO ECONOMICS IN BUSINESS

Credit Points– 6

Total Contact Hours - 60

Course Objectives

1. To demonstrate an understanding, usage and application of basic economic principles.
2. To describe and apply the methods for analysing consumer behaviour through demand and supply, elasticity and marginal utility.
3. To understand the role of Consumer behaviour in respect of demand supply elasticity
4. To identify and appraise various models of how markets are organized, and the price and output decisions for maximizing profit.
5. To know how markets uses cost concept to utilise resources efficiently to create maximum output
6. To identify and appraise various models of how markets are organized, and the price and output decisions for maximizing profit.
7. To explain theories and prices of factors of production

Course Outcomes (CO):

SL NO.	Course Outcome	Mapped Modules
1.	Students will be able to explain the concepts of insatiable wants, scarcity and choice more over identify the factors of production and production possibilities.	Unit 1
2	Students will be able to Demonstrate the measurement of individual demand, supply and market demand and how equilibrium price and quantity are determined	Unit 2
3	Students will be able to Explain the concept of consumer equilibrium and elasticity	Unit 3
4	Students will be able to understand the law of diminishing returns and Differentiate and Explain the concepts of economies of scale and diseconomies	Unit 4
5	Students will be able to Demonstrate the calculation of various production costs; fixed, variable and marginal costs	Unit 5

6	Students will be able to Distinguish between the features of the four market structures; monopoly, oligopoly, monopolistic and perfect competition & Demonstrate how firms in the four market structures determine their price, output and profit maximization	**Unit 6**
7	Students will be able to understand basic concepts of factor prices along with their determination concepts.	**Unit 7**

MODULE I

Unit 1: Introduction to Economics

Distinction between Economics and Business Economics. Tools required – Functional relationships, schedules, graphs, concept of slope and its measurement- etc. Resources-scarcity and efficiency - Production PossibilityFrontier-it's shifting. **(4L)**

Unit 2: Basics of Demand and Supply

The concept of demand and demand function - Derivation of Individual demand curve and Market demand curve– Shifting of the demand curve – The supply function and the supply curve – Derivation of individual supply curve and market supply curve – Shifting of the supply curve-Determination ofequilibrium price. **(4L)**

Unit 3: Theory of Consumer Behaviour

Cardinal analysis – Law of diminishing marginal utility – consumer surplus Ordinal approach – Indifference curve analysis – Budget line – Consumer Equilibrium – Income consumption curve and Price consumption curve – Hicksian decomposition of price effect into substitution effect and income effect – Demand curve for Normal, inferior and Giffen goods Concept of Elasticities of demand – Measurement pf various elasticities of demand – Distinction between slope of a demand curve and the elasticity of demand – Elasticity of supply – Measurement. (**6L**)

Unit 4: Theory of Production

Production Function – The Law of variable proportions – Relationships among TP, AP, and MP. Concept of Isoquant and Isocost – Finding the optimal employment of inputs – Ridge lines: the economic region of production – Output expansion path and homogeneous production function.(**6L**)

MODULE II

Unit 5: Theory of Cost

Cost analysis – Different concepts – Accounting and Economic costs, Opportunity cost, Private and social costs; short run and long run costs. **(6L)**

Unit 6: Concepts under Different Market Conditions:

TR, AR, MR and relationship among AR, MR and elasticity of demand. Perfect competition– Short run and long run equilibrium – Supply curve in the short run (shutdown and breakeven point concepts). Monopoly – Short run and long run equilibrium – Concept of Price discrimination. Monopolistic competition, Oligopoly Market – Short run and long run equilibrium. **(10L)**

Unit 7: Factor Price Determination

Theory of Wage Determination - Backward Bending Supply curve of labour; Determination of Rent, Profit and Interest rate. **(4L)**

Suggested Readings

1. Pindyke and Rubinfeld, Micro Economics
2. Gould & Ferguson, Micro Economic Theory
3. Banerjee & Majumdar, Fundamentals of Business Economics
4. Banerjee & Majumdar, Banijjik Arthaniti –o- Banijjik Paribesh

Module No.	Content	Total Hours	%age of questions	Covered CO	Covered PO	Blooms Level (if applicable)	Remarks (if any)
Module I Unit 1	**Introduction to Economics**	4	10	1	7		
Module I Unit 2	**Basics of Demand and Supply**	4	10	2	7		
Module I Unit 3	**Theory of Consumer Behaviour**	6	15	3	7		
Module I Unit 4	**Theory of Production**	6	15	4	7		
Module II Unit 5	**Theory of Cost**	6	15	5	7		

Module II Unit 6	**Concepts under Different Market Conditions**	10	25	6	7		
Module II Unit 7	**Factor Price Determination**	4	10	7	7		

(GE5B-10) : MACRO ECONOMICS IN BUSINESS

Credit Points– 6
Total Contact Hours - 60

Course Objectives

1. To understand the differentiation between macro & micro economics and scope of macro economics
2. To demonstrate the concepts of national income accounting with all the measurement parameters
3. To determine the concept of multiplier in the economy along with income and savings function
4. To describe IS LM framework and effectiveness of the fiscal & monetary policy
5. To understand the concepts of demand and supply of money with understanding of effects of inflation in the economy
6. To explore the concepts of balance of trade and payment with international trade theories.

Course Outcome

SL NO.	Course Outcome	Mapped Modules
1.	Students will be able to define macroeconomics	Unit 1
2	Students will be able to explain how economic indicators like GDP are used to assess the state of the economy and differentiate between and calculate nominal and real GDP	Unit 2

3	Students will be able to examine factors that shift aggregate supply and aggregate demand & explain why multiplies works and how to calculate its size	**Unit 3**
4	Students will be able to understand fiscal policies, including automatic, expansionary, and contractionary fiscal policies along with how monetary policy affects GDP and the interest rates and will establish general equilibrium in real and monetary sector	**Unit 4**
5	Students will be able to define money & inflation, explain the functions of money, and define liquidity and how money is created by lending, demonstrate the controlling measures of inflation.	**Unit 5**
6	Students will be able to understand Balance of Payment statement & international trade theory	**Unit 6**

MODULE I

Unit 1: Concepts of Aggregate demand & supply

Macroeconomics – scope and basic concepts, Concept of Aggregate Demand and Aggregate Supply, Marginal Propensity to Consume(MPC), APC, MPS, MPI: Basic concepts Only, Paradox of thrift. (8L)

Unit 2: National Income

National Income Accounting - Concepts and measurement of GDP, GNP, NNP, NI and DPI - Circular flow of income – Real and Nominal GDP –Implicit deflator. (10L)

Unit 3: Income Determination

Theory of Equilibrium Income Determination: Simple Keynesian Model; Consumption, saving and investment functions – National income determination; Investment and Government expenditure multipliers (10L)

MODULE II

Unit 4: IS-LM framework

Commodity market and Money market equilibrium; Derivation of IS and LM curves –Shifts of IS and LM curves-equilibrium in IS-LM model – Effectiveness of monetary and fiscal policies. (8L)

Unit 5: Money and Inflation
Concept of demand for and supply of money. Quantity theory of money and Keynesian theory of demand for money. Measures of money supply – High powered money – Money multiplier. Concept of Inflation – Demand-pull and cost-push theories of inflation – Monetary and fiscal policies to control inflation – Instruments, objectives and limitations. (12L)

Unit 6: Balance of Payments
Items of BOP, Causes of Disequilibrium in BOP, Strategies to Correct Adverse BOP Situation, Purchasing Power Parity Theory (Only basic concept), Absolute and Comparative Cost Advantage Theory, Gains from international trade. (12L)

Suggested Readings

1. W. H. Branson, Macro Economic Theory and Policy
2. Joydeb Sarkhel, Macro Economic Theory
3. Banerjee & Majumdar, Fundamentals of Business Economics
4. Dornbusch, Fischer & Startz, Macroeconomics, TMH
5. Debes Mukherjee: Essentials of Micro and Macro Economics, Central

Module No.	Content	Total Hours	%age of questions	Covered CO	Covered PO	Blooms Level (if applicable)	Remarks (if any)
Module I Unit 1	**Concepts of Aggregate demand & supply**	8	13	1	7		
Module I Unit 2	**National Income**	10	17	2	7		
Module I Unit 3	**Income Determination**	10	17	3	7		
Module I Unit 4	**IS-LM framework**	8	13	4	7		
Module II Unit 5	**Money and Inflation**	12	20	5	7		
Module II Unit 6	**Balance of Payments**	12	20	6	7		

(GE5B-11) : BUSINESS REGULATORY FRAMEWORK

Credit Points– 6
Total Contact Hours - 60

Course Objectives

1. To understand the Basic Concepts of Indian Contract Act 1872.
2. To understand the concept of Sale of Goods Act 1930.
3. To know the concept of Negotiable Instrument Act 1881.
4. To know the concept of Consumer Protection Act 1986.
5. To understand the concept of Companies Act 2013
6. To explore the issues related to IT act 2000.

Course Outcomes (CO)

Sl. No	Course Outcome	Mapped Modules
1	Memorize the Basic Concepts of Indian Contract Act	Module I/ Unit 1
2	Understand the concept of Sale of Goods Act	Module I/ Unit 2
3	Memorize the concept of Negotiable Instrument Act.	Module I / Unit 3
4	Memorize the concept of Consumer Protection Act.	Module II/ Unit 4
5	Understand the concept of Companies Act 2013	Module II/ Unit 5
6	Learn the concepts of IT act 2000	Module II/ Unit 6

MODULE I

Unit 1: Indian Contract Act 1872

Elements of contract -Offer and Acceptance - Consideration - Legal capacity -Intention to create legal relations - Free Consent -Legality of the Object - Possibility of Performance - Void and Voidable Agreement-Contingent Contract -Discharge of Contract-Indemnity and Guarantee-Quasi Contract -Bailment and Pledgement - Agency Contract. (12L)

Unit 2: Sale of Goods Act 1930

Formation of contracts of sale-Goods and their classification, price -Conditions &Warranties-Performance the contract of sale - Unpaid seller and his rights-Hire Purchase agreement, Auction (12L)

Unit 3: Negotiable Instrument Act 1881

Definition of negotiable instruments- Features-Types of negotiable instruments -Dishonor of a Negotiable Instrument (10L)

MODULE II

Unit 4: Consumer Protection Act 1986

Concept - Consumer protection Councils -Dispute Redressal Procedures (10L)

Unit 5: Companies Act 2013

Concept -Type of Companies- steps in formation of a company-Concept and features of AOA MOA and prospectus –Meetings (10L)

Unit 6: Information Technology Act 2000

Overview of Computer and Web Technology , Need for Cyber Law , Cyber Jurisprudence at International and Indian Level , Jurisdictional Aspects in Cyber Law , Issues of jurisdiction in cyberspace , Types of jurisdiction ,Prerequisites of jurisdiction, Cyber Crimes , Cyber Crimes Vs. Conventional Crime, Reasons for cybercrimes and cyber criminals ,Cyber Crimes against Individuals, Institution and State. (6L)

Suggested Readings

1. Sen & Mitra: Commercial law; World Press
2. Pathak: Legal Aspect of Business, TMH
3. Das & Ghosh: Business Regulatory Framework: Ocean Publication, Delhi
4.Pillai & Bagavathi: Business law ,S Chand
6. Tulsian: Business law: Tata Mcgrawhill

Module Number	Content	Total Hours	%age of questions	Covered CO	Covered PO	Blooms Level (if applicable)	Remarks (If any)
Module I /unit 1	**Indian Contract Act 1872**	12	20	1	7		
Module I /unit 2	**Sale of Goods Act 1930**	12	20	2	7		
Module I /unit 3	**Negotiable Instrument Act 1881**	10	16.67	3	7		
Module II /unit 4	**Consumer Protection Act 1986**	10	16.67	4	7		
Module II /unit 5	**Companies Act 2013**	10	16.66	5	7		

Module II /unit 6	**Information Technology Act**	6	10	6	7		