

DIPLOMA PROGRAMME
IN
MONTESORI EDUCATION

Diploma in Montessori Education

Sl. No.	Course Code	Title of the Course	CIA Max.	ESE Max.	TOT Max.	C
I Semester						
1.	516 11	Maria Montessori's Education	25	75	100	2
2.	516 12	Principles of Montessori Education	25	75	100	2
3	516 13	Pedagogical Aspects and Approaches in Montessori Education	25	75	100	2
4	516 14	Developing Life Work Skill (School based practicum – I)	25	75	100	2
Total			100	300	400	08
II Semester						
5.	516 21	Developing Teaching Competency in Montessori Education	25	75	100	2
6	516 21	Child Psychology and Health Education	25	75	100	2
7	516 21	Family and Child Life Education	25	75	100	2
6.	516 21	Developing Life Work Skill (School based Practicum – II)	25	75	100	2
Total			100	300	400	08
Grand Total			200	600	800	16

CIA – Continuous Internal Assessment

ESE – End Semester Examination

TOT – Total

C – Credit

Detailed Syllabi
FIRST SEMESTER

Course Code	Title of the Course
516 11	Maria Montessori's Education

Max Marks: 100

Credits: 02

OBJECTIVE

To enable the X standard and XII standard students to understand the Montessori Education related to Philosophy, Psychology, Sociology and Educational bodies.

UNIT I Philosophy and Educational

Philosophy Education, meaning - Definition Meaning, Definition Montessori Philosophy and Education; Relationship between philosophy and education; Education for modification of behaviour; Epistemological approach of Education- Educare and Educere.

UNIT II Indian Philosophical thoughts and Montessori Education

Rabindranath Tagore- Mahatma Gandhi, Radhakrishnan, Vivekananda, Dayanand, Dr. Zahir Hussain, Thiruvalluvar- Bharathiar and Bharathidasan and their contributions related to Montessori Education.

UNIT III Western Philosophical thoughts and Montessori Education

Idealism-Naturalism-Pragmatism-John Jacques Rousseau- John Dewey- Soren Kier Kegaard's Existentialism – Mechanicalism- Humanism.

UNIT IV Psychological Contributions in Montessori Education

Thorndikes Trial and Error; Pavlov's Classical Conditioning; BF Skinner's Operant conditioning; Jean Piaget's cognitive development; Deniel Coleman – Emotional Intelligence.

UNIT V Sociological thoughts in Montessori Education

Max Webers's view on Social / human behaviorism - Ottaway's view on Social relations- Durkhiem's view of Methodological socialization- Brom's Group behavior-John Madge's view on social interaction.

UNIT VI Role of Educational Bodies in Montessori Education

NCERT-NCTE-SCERT-NIEPA- NIPCCD- MHRD- NEP

REFERENCES

1. Agarwal, J.C. (1999). Theory and Principles of Education. New Delhi: Vikas Publications House Pvt. Ltd.
2. Biswal, U.N. (2005). Philosophy of Education. New Delhi: Dominant Publishers and Distributors.
3. Chandra, S.S. (1996). Principles of Education. New Delhi: Atlantic Publishers.
4. Ghanta, R. and Dash, B.N. (2005). Foundations of Education. Hyderabad: Neelkamal Publications.
5. Mathur, S.S. (1997). Sociological and Philosophical Foundations of Education. Agra: Vinod Pustak Mandir.
6. Patel, M.S. (1953). The Educational Philosophy of Mahatma Gandhi. Ahmedabad: Navjeevan Pub. House. 8
7. Sharma, R.A. (2008). Development of Educational System in India. Meerut: R.Lall books depot.
8. Sharma, R.N. (2008). Education in the Emerging Indian Society. Delhi: Surjeet Publications. 9. Saraswathi, T.S. (1999). Culture, Socialisation and Human Development. New Delhi: Sage Publications.

Course Code	Title of the Course
516 12	Principles of Montessori Education

Max Marks: 100

Credits: 02

OBJECTIVE

To give awareness on the Principles of Montessori Education

UNIT I: Free Learning and Health

Free Learning: Definition, meaning; Health-improving their health and wellbeing; Teaching children to have sense of control; Freedom control; Free decision making-improving the skill; sensitize in work-Nature of work and time bound work.

UNIT II: Congenial Learning Environment

Learning environment for Montessori Education; Effective learning in congenial atmosphere; Environment promotes development on child; organized classroom; Physical Environment (layout); conceptual progressive learning (Effective use of material progress).

UNIT III: Learning Interest

Intrinsic motivation; learner and learning interest; children's rights and their feeling with strength and courage; superficial learning and goal oriented test; Creating interest for better learning.

UNIT IV: Group Learning

Peer tutoring - using imitation model in Montessori classroom; mixed age class - Young learning from old – Questioning- observing the work; Repetitive learning - Reciprocal learning; knowledge enhancement to promote learning skills - social skills.

UNIT V: Cognition and Learning by Doing

Relationship of cognitive and physical activities; Physical classroom environment is not for learning - learning is for physical classroom - Enhancement of Learning; Negligence of Teacher and Text in child learning - Montessori programmes; Classroom learning with objects and action; Predicting the children's interests.

UNIT VI: Teacher is a Guide

Teacher is a director for making boundary for child learning; sensitive interaction between teacher learner based on learner's needs and levels of aspiration; Authoritative parenting – traditional attitudes and authoritarian attitude.

REFERENCES

1. Erikson H Erick, "Childhood and Society", Penguin, 1969.
2. George G Thompson, "Child Psychology", The Times of India, 1965.
3. Issacc Susan, "The Nursery Years", Routledge, London, 1956.
4. Craig Grace J, and Marguerite Kermis, "Children Today", Allyn and Bacon, New Jersey, 1995.
5. Gordon Ira J, "Human Development", D.B.Taraporevala, Mumbai, 1970.
6. Todd V E and HelersHeffernon, "The Years Before School", Macmillan, London, 1970.
7. Ali Mohamad: "Food and Nutrition in India", K.B. Publications, New Delhi.
8. "National Seminar on Nutrition Education", NCERT, 1975.
9. Rirchie A S Jean, "Learning Better Nutrition", Raner, Italy, 1967.
10. Holmes C Alan, "Visual Aids in Nutrition Education", FAO, Rome, 1969.

Course Code	Title of the Course
516 13	Pedagogical Aspects and Approaches in Montessori Education

Max Marks: 100

Credits: 02

Objective

To enable the learners to get awareness on methods and approaches in Montessori education

Unit I Life Activity Method

Practical life activities - Child Promotes activities and learn to Interact with environment; Real life projects - Promote five Motor skills, Concentration of mind and Independent nature (transferring, sorting, Personal hygiene, grooming, Dusting and sweeping).

Unit II Language and Mathematical Learning Activity Method

Learning to Recognize; Learning the sound variation and writing; Grammar and etymology; Group work and hand on work; learn to count the numbers; Decimal System and geometry. Individualized and abstract work.

Unit III Cultural and Mental Activity Method (Learning)

Geographical, astronomical, artistic, Musical Learning enhance cultural activities; Multicultural activities expressing to the global culture; Develop observation Skill, Comparative Skill and Decision making skill; Visual ability and Visual Discrimination.

Unit IV Motor Skill - Sensory Skill Approach

Motor skills improve muscular movements - Perceiving the different sounds; Writing - Reading Skills approach - Learn to write (phonetic practices).

Unit V Experience- Vocabulary cum Storytelling - Reading Approach

Performance of Real nature and action before artificial one; Grasping ability; Pleasurable Reading; Narrative Interaction; Loud Reading and Exploration of New facts; Pronunciation and vocabulary; Storytelling and lifelong Reading.

Unit VI Sensorial Experience Approach

Memorization and recognition of objects; Manipulation of letters and constructing words; Recognize and matching the Words - Secret Words, Action Words; Reading, Friendly Environment / Adaptation to Environment; Logical and Perceptual Ability; Enhancement of Visible Sensibility.

REFERENCES

1. Francis Soundararaj, F. (1995). Teaching Spoken English and Communication Skills.Chennai:
2. Joyce., & Well., (2004). Models of Teaching. U.K: Prentice hall of India.
3. Kohli, A. L. (2006). Techniques of Teaching English. New Delhi: Dhanpat Rai pub.co
4. Fletcher F.G Some lessons in mathematics OUP.
5. Hogben Lancelot, Mathematics for the Million George Allen and Unwin Ltd., London.
6. Joseph Crescimbeni teaching of New Mathematics Parker publishing Co. New York.
7. NCERT Brochure on themes relating to Mathematics Education.
8. NCTMS year Books 15. Siddhu R.S teaching of Secondary Mathematics Sterling publishers 21 S.M.S.G Books Yale University.

Course Code	Title of the Course
516 14	Developing Life Work Skill (School based Practicum)

SCHOOL BASED PRACTICUM – 100 marks (2 credits)

LIFE WORK FOR PRACTICAL COURSE

I –Caring for self

1. Watching the table
2. Washing face, hands
3. Dressing dress clap cloth
4. Holding the tray

II –Caring for Environment

1. Caring for plants and Animals
2. Sitting in a chair
3. Mopping a Floor
4. Transferring

III –Grace and

1. Select mate
2. Shaking hands
3. Spooning
4. Polishing

IV –Control and Coordination of Body

1. Cutting fruits and vegetables
2. Folding
3. Carrying the glass of water
4. Opening and closing bottles

SECOND SEMESTER

Course Code	Title of the Course
516 21	Developing Teaching Competency in Montessori Education

Max Marks: 100

Credits:02

OBJECTIVE

To enable the learners to have familiarity with teaching competency

UNIT I: Motivation

Level of Motivation; Motivational environment; Dynamic classroom activity; Effective involvement and effective teaching is pursued in class room - simplification, enthusiastic participation and sensibility to children's needs.

UNIT II: Preparation

Careful planning and competent performance; well preparation; Cherished of presentation and positive emotional impact; Intellectual Excitement; Acquisition of basic teaching skills; Associated with student learning - Habit of reflective practice - new direction for pursuing the performance - Self correction, self-confident, self-direction and self-evaluation.

UNIT III: Personal Philosophy

Developing self-competency; promoting self-esteem; value characterized activities; sequential development in teaching activities; Teacher's role model - Effective implicit approach rather than direct approach - Enriched varieties of skill practice including language skill, Managerial skill and other relevant skills.

UNIT IV: Interpersonal Rapport

Social climate; Socialization; Social relationship; Developing prosocial behavior, congenial classroom climate- Open, Warm and non-authoritarian attitude; Student centred and student friendly and predictable practices in classroom; Degrees of Effectiveness - Adequate, Socratic, competent, masterful facilitator and holistic behaviour of classroom master.

UNIT V: Teacher Commitment

Commitment based on priorities offered by Teacher in classroom; values – Social, ethical and moral values; Attitude – professional attitudes; Excellence in Teaching - knowledge, values and reflection.

UNIT VI: Emotional Intelligence and Professional Competency

Teachers emotional intelligence - competency; (Sensitivity and Maturity) Teaching competency - Developing capacity to elicit varieties of stimuli in different environment; sensitivity- Identifying and expressing feelings - balancing rate of heart and mind adaptability; sensorial activities s- broaden and refine a child's senses - it is logical, perceptive and aware; maturity -managing the immediate environment maintaining rapport; harmony and comforts etc.

REFERENCES

1. Albrecht G.L, Katherine D Seelman. & Michael Bury, (2001). *Hand Book of Disability Studies*. Sage, London
2. Arcus, H.E. and Others (1993), *Handbook of Family Life Education: The Practice of family Life Education (Vol II)*, New York:
3. Bandarkar, P.L. and Wilkinson T.S. (2000): *Methodology and Techniques of Social research*, Himalaya Publishing House, Mumbai.
4. Bigner, Jerry . (2010, 8th edition). *Parent-child Relations*. Pearson Merrill Prentice Hall: Columbus Ohio.
5. Blau,D.M. (Ed)(1991) *Quality cost and parental choice of Child Care*. New York: Russel Sage

Course Code	Title of the Course
516 22	Child Psychology and Health Education

Max Marks: 100

Credits: 02

Objective

To enable students to get awareness on psychological practices in child hood stage and maintain their health

Unit –I Understanding the Child

Learning parents role to understand the child; effective guidance and nurturing the child - growth and mature; child and unique personality traits (consistent throughout the life); professional advantage of teachers in Montessori school-observing child activities.

Unit-II Understand the Children’s Consistent Traits

Observing the desirable activities of child - sufficient time factors and familiarity with the normal characteristics - receiving crucial information for better understanding - child is unique individual.

Unit-III Child Development in Montessori Education

Children develop order, co-ordination, concentration and independency at the early age; role model to protect community - freedom within the Boundary - active seekers of knowledge - self-correction, self-introspection and self evaluation; integral part of Montessori classroom approach.

Unit –IV Society and Child Psychology

Chance for playing opportunities to develop human personality - concept of child hood is a cultural invention - Montessori school – age of child - unique period of development-hurried child - no opportunity to nurture development capabilities - play is creative and non-literal; play involving new skills and ability.

Unit-V Health Education

Mental health and mental hygiene; advantage of mental health programmes - anxiety, stress, Eustress and distress; emotional origin and common symptoms; health management of stress interpersonal relationship - case study self confidence.

Unit-VI Child psychologist Domain of Service in Montessori School

Interpersonal communication; accountability; decision making; collaborative ability and consultation; effective instruction and development of cognitive / academic skills socialization and development of life competencies; students diversity in school learning; organizational climate home, school and community collaboration research and programme evaluation; legal and ethical practice in professional activities and development.

Reference:

1. Carson, R.C., Butcher, J.N., & Mineka, S. (2007). *Abnormal Psychology and Modern Life* (11th Ed). New Delhi: Dorling Kindersley (India) Pvt. Ltd.
2. Hammer, Tommie J. & Turner, Pauline, H. (2001). *Parenting in Contemporary Society* 4th Ed. MA: Allyn & Bacon.
3. Heath, P. (2009). *Parent-child relations: Context, research, and application*. New York, NY : Pearson Education.
4. Hegarty Seamus & Mithu Alur, (2002). *Education and Children with Special Needs*. Sage, London
5. Judith Winter, (2006). *Breakthrough Parenting for Children with Special Needs*. Library of Congress Cataloguing. San Francisco, USA.

Course Code	Title of the Course
516 23	Family and Child Life Education

Max Marks: 100

Credits:02

Objective

To enable the learners to develop good character / personality and to provide good moral spiritual life for conducive to healthy living.

Unit I Family and Family Life Education

Family Life Education: Definition, aims and objectives, value education; value transformation; value oriented education; Family as a custodian of Transmitter of values; social functions of family.

Unit II Family Relationship and Child Life

Mothering; Fathering; love oriented Discipline; Child rights to Healthy Parental Attitude; Parental Responsibility; Social functions of the family; Education toward Justice; Guidelines for parents and teachers to maintain relationship with child .

Unit III Child Development and Sensorial Activities

Exploration of world around child through senses; Child development - Physical and Mental Exercises; Discrimination of contrast; Child's capacity to define the Quality - Colour, Weight, Shape, Texture, sound, etc.

Unit IV Adolescent and Personality Development

Adolescence: meaning of life; Goal of life; Personality development; Emotions and activities of Adolescents; behaviour pattern of Adolescents; Role of Teachers and Parents in shaping and guiding Adolescence.

Unit V Child Care and Responsible Parent hood

Stage of child development; Responsible parenthood; Working mother and child care; Child Diet and Diet for Adolescent to maintain Health in a family.

Unit VI Child - Skill Based Education

Skill based Education; Teaching of life skill particularly, Interpersonal relationship, Personality, Social Adjustability, etc. Responsibilities of Teachers and Parents in developing skills among children and.

REFERENCES:

1. African Books Collective Ltd., The Jam Factory, 27 Park End Street, Oxford OX1 1HU, United Kingdom (paperback: ISBN-9966-846-42-5, \$18)
2. S.K. Mangal & Uma Manga (l2012) Essentials of Educational Management, PHI Learning, Private Limited , New Delhi-110001
3. National College for School Leadership (2006) First Corporate Plan , Launch Year 2001-2002, Nottingham.
4. Carlo& Olson 1979 innovations in teaching –learning process, new delhi: vikas publishing house.
5. Gillies, & Robyn. M (2007) Cooperative Learning, Integrating Theory and Practice, Los Angels: Sage Publication

PRACTICAL COURSE

Course Code	Title of the Course
516 24	Developing life skill-II school based practicum (2 credits)

SCHOOL BASED PRACTICUM – 100 marks (2 credits)

LIFE WORK FOR PRACTICAL COURSE

V –Caring for self

1. Watching the table
2. Washing face, hands
3. Dressing dress clap cloth
4. Holding the tray

VI –Caring for Environment

1. Caring for plants and Animals
2. Sitting in a chair
3. Mopping a Floor
4. Transferring

VII –Grace and

1. Select mate
2. Shaking hands
3. Spooning
4. Polishing

VIII –Control and Coordination of Body

1. Cutting fruits and vegetables
2. Folding
3. Carrying the glass of water
4. Opening and closing bottles

DIPLOMA PROGRAMME
IN
COMPUTER APPLICATION

S.No	Course code	Name of the Course	CIA Marks Max.	ESE Marks Max.	Total Marks Max.	C Max. credits
SEMESTER I						
1	51711	Principles of Information Technology	25	75	100	2
2	51712	Open Source Software	25	75	100	2
3	51713	Office Automation	25	75	100	2
4	51714	Office Automation Lab	25	75	100	2
		TOTAL	100	300	400	8
SEMESTER II						
5	51721	Digital Logic Fundamentals	25	75	100	2
6	51722	Programming in C	25	75	100	2
7	51723	Data Structures and Algorithms	25	75	100	2
8	51724	C and Data Structure Lab	25	75	100	2
		TOTAL	100	300	400	8
GRAND TOTAL			200	600	800	16

CIA : Continuous Internal Assessment **ESE** : End semester Examination

SEMESTER I

51711 PRINCIPLES OF INFORMATION TECHNOLOGY

Course Objectives

- To understand the revolution in computers and communications
- To know about various application software
- To understand the information systems and software development

Course Outcome

At the end of the course, students will be able to;

- To know the latest trends in information technology

Unit I :

Information Technology: Introduction – Information systems – Definition of computer and system – Software and Data - IT in business and Industry – IT in the Home and at Play – It in Education and Training – IT in Entertainment and the Arts – IT in Science, Engineering, and Mathematics – Global Positioning System.

Unit II:

Introduction to Computers, History of computers, Types of computers, Characteristics of computers, Basic Anatomy of a computer, Applications of computer – Memory – Memory types.

Unit III:

Software- Kinds of Software - The five types of Applications software - Word processing – Spreadsheets - Database software, Presentation graphics software - Communications software- System Software – Operating system - functions.

Unit IV :

Computer Networks: Introduction – Definition Computer Networks - Types of Networks – Local Area Network – Metropolitan Area Network - Wide Area Network – Personal Area Network - internet – Intranet – firewalls - Network Topology – Bus – Ring – Hybrid – Star.

Unit V:

Basic Internet Concepts: – Analog and Digital Signals - modems and communication Software, ISDN lines, and Cable Modems - Definition of Internet - The World Wide Web - Connecting to the Internet – Browsing the web – Web browser – Uniform Resource Locator (URL) – E-mail communication.

Unit VI :

Internet address - Domain Name System(DNS) – Locating information on the net – Internet Search Engines – Chatting and conferencing on the Internet Online Chatting –Messaging – Usenet Newsgroup.

References:

1. Dennis P.Curtin, Kim dolwy, KunL Awn, Xrhleen morin, Information Technology, the breaking wave, TMH 2000.
2. Stacey C Sawyer, Brain K Williams, Sarah E Hutchinson Using Information Technology – Brief Version A Practical Introduction to Computer and Communications Third Edition, McGraw Hill Companies 2011
3. James O'Brien – Introduction to Information systems. 16th edition, 2005.

51712 OPEN SOURCE SOFTWARE

Course Objectives:

- To understand the need, advantages and applications of open source software in web designing.
- To know the use of mySQL in database management.
- To be able to create web pages using PHP

Course Outcome

- Attained to know and work with open source software like Linux, MySql,PHP etc in designing web pages.

Unit I :

Introduction to Open sources – Need of Open Sources – Advantages of Open Sources–Application of Open Sources.

Unit II:

Open source operating systems: LINUX: Introduction– General Overview–Kernel Mode and user mode– Process– Advanced Concepts–Scheduling – Personalities – Cloning – Signals – Development with Linux.

Unit III:

MySQL: Introduction Setting up account Starting, terminating and writing your own SQL programs - Record selection Technology– Working with strings – Date and Time

Unit IV:

MySQL: Sorting Query Results – Generating Summary – Working with metadata –Using sequences – MySQL and Web.

Unit V:

PHP: Introduction – Programming in web environment – variables – constants–data types – operators – Statements -Functions– Arrays – OOP –String Manipulation and regular expression –File handling and data storage

Unit VI:

PHP and SQL database – PHP and LDAP – PHP Connectivity –Sending and receiving E-mails – Debugging and error handling – Security – Templates.

Text Books:

1. Remy Card, Eric Dumas and Frank Mevel, “The Linux Kernel Book”, Wiley Publications, 2003
2. Steve Suchring, “MySQL Bible”, John Wiley, 2002

Books for Reference:

1. Rasmus Lerdorf and Levin Tatroe, “Programming PHP”, O’Reilly, 2002
2. Steven Holzner, “PHP: The Complete Reference”, 2nd Edition, Tata McGraw-Hill Publishing Company Limited, Indian Reprint 2009.
3. Vikram Vaswani, “MYSQL: The Complete Reference”, 2nd Edition, Tata McGraw-Hill Publishing Company Limited, Indian Reprint 2009.

51713 OFFICE AUTOMATION

Objective of the Course:

- To help the students to understand how to format, edit, and print text documents and prepare for desktop publishing.
- Students will be able to create various documents newsletters, brochures, making document using photographs, charts, presentation, documents, drawings and other graphic images.
- To work with the worksheet and presentation software.

Learning Outcomes:

After completion of the course, students would be able to;

- know the basics of computers and prepare documents, spreadsheets, make small presentations with audio, video and graphs and would be acquainted with internet.
- create, edit, save and print documents with list tables, header, footer, graphic, spellchecker, mail merge and grammar checker
- attain the knowledge about spreadsheet with formula, macros spell checker etc.
- go for higher studies such as diploma, bachelors or master's degree in related discipline.

Unit I :

MS-Word: Working with Files – Working with Text – Formatting, Moving, copying and pasting text Styles – Lists – Bulleted and numbered lists, Nested lists, Formatting lists. Table Manipulations. Graphics – Adding clip Art, add an image from a file, editing graphics, Spelling and Grammar, AutoCorrect - Page formatting, Header and footers, page numbers, Mail Merge, Macros - Creating & Saving web pages, Hyperlinks.

Unit II:

MS-Excel- Modifying a Worksheet – Moving through cells, Adding worksheets, rows and columns Resizing rows and columns, Selecting cells, Moving and copying cells, Freezing panes - Macros – recording and running. Formatting cells – Formatting toolbar, Dates and times, Auto formatting. Formula and Functions. Linking worksheets.

Unit III:

MS-Excel : Sorting and Filling, Alternating text and numbers with Auto fill, Auto filling functions. Graphics – Adding clip art, add an image from a file, Charts – Using chart Wizard, Copy a chart to Microsoft Word.

Unit IV

MS-Power Point -Create a Presentation from a template- Working with Slides – Insert a new slide, Applying a design template, Changing slide layouts -Slides: Reordering slides, Hide slides, Create a Custom slide show. Adding Content – Resizing a text box, Text box properties, Delete a text box. Video and Audio effects, Color Schemes & Backgrounds Adding clip art, Adding an image from a file, Save as a web page.

UNIT V

MS-Access - Using Access database wizard, pages and projects. Creating Tables – Create a Table in design view. Datasheet Records – Adding, Editing, deleting records, Adding and deleting columns Resizing rows and columns, finding data in a table & replacing, Print a datasheet. Queries.

UNIT VI

MS-Access Forms - Forms – Create a form using the wizard, Create a form in Design View. Form Controls. Sub forms-Create a form and sub form at once, Sub form wizard, Drag and drop method. Reports – Using the wizard, Create in Design View, Printing reports. Importing, Exporting, Linking.

REFERENCE BOOKS:

1. Sanjay Saxena, A First Course in Computers (Based on Windows 8 and MS Office 2013) Vikas Publishing 2015.
2. Jennifer fulton, Sherri Kinkoph, and Joe Kraynak, The Big Basics Book of Microsoft Office 1997, PHI, 1998.
3. Laura Acklen et al, Microsoft Office 97 Professional Essentials,EEE Que E&T, PHI (1998).

51714 OFFICE AUTOMATION LAB

Objective of the Course:

- To help the students to understand how to format, edit, and print text documents and prepare for desktop publishing.
- Students will be able to create various documents newsletters, brochures, making document using photographs, charts, presentation, documents, drawings and other graphic images.
- To work with the worksheet and presentation software.

Learning Outcomes:

Upon successful completion of this assignment, students will be able to:

- Integrate both graphs and tables created in Microsoft Excel into a laboratory report in Microsoft Word.
- Generate equations, sample calculations, and basic diagrams in Microsoft Word.
- Input experimental data into Microsoft Excel.
- Perform calculations in Microsoft Excel using both manually inputting formulas and built-in functions.
- Generate simple and effective tables and graphs to describe experimental data in MS Excel.
- Properly format and organize a formal laboratory report in Microsoft Word.

Exercises based on MS-Word

- ❖ Working with Text, spell check and grammar
- ❖ Table manipulation
- ❖ Flow chart drawing
- ❖ Mail merge
- ❖ Create organization chart
- ❖ Real-time document preparation (Covering letter, greeting cards, invitation, brochure etc)

Exercises based on MS-Excel

- ❖ Performing arithmetic calculations using worksheet
- ❖ Using functions
- ❖ Using Graphs and charts
- ❖ Sorting and filtering

Exercises based on MS-Power Point

- ❖ Designing slides for real time applications
- ❖ Using image, audio and video effects
- ❖ Using Animation and transition
- ❖ Using Wizard
- ❖ Using template

Exercises based on MS Access

Table manipulation

- ❖ Creating, altering and drop tables
- ❖ Inserting values
- ❖ Selecting and calculating values from the table
- ❖ Real-time application development (employee database , student database etc.,)

REFERENCE BOOKS:

1. Sanjay Saxena, A First Course in Computers (Based on Windows 8 and MS Office 2013) Vikas Publishing 2015.
2. Jennifer fulton, Sherri Kinkoph, and Joe Kraynak, The Big Basics Book of Microsoft Office 1997, PHI, 1998.
3. Laura Acklen et al, Microsoft Office 97 Professional Essentials,EEE Que E&T, PHI (1998).

SEMESTER II

51721 DIGITAL LOGIC FUNDAMENTALS

Course Objectives:

- To impart the knowledge in the field of digital electronics
- To impart knowledge about the various components of a computer and its internals.

Course Outcome:

After the completion of this course, the student will be able to :

- Basic principles of number system
- Concepts of digital, Boolean and instruction
- Design and realize the functionality of the computer hardware with basic gates and other components using combinational and sequential logic.

Unit I:

Number Systems: Binary, Octal, Decimal and Hexadecimal number systems – Conversion from one base to another base – Use of complements – binary arithmetic – Numeric and Character codes.

Unit II:

Boolean algebra and Combinational Circuits: Fundamental concepts of Boolean Algebra – DeMorgan's theorems.

Unit III:

Simplification of expressions – Sum of products and products of sums – Karnaugh map simplification – Quine - McKluskey method – two level implementation of Combinational Circuits.

Unit IV:

Combinational Circuits: Half Adder – Full Adder – Subtractors – Decoders – Encoders – Multiplexers – Demultiplexer.

Unit V:

Sequential Circuits: Flip flops – Registers – Shift Registers – Binary Counters – BCD Counters – Memory Unit.

Unit VI:

Data Representation : Data Types – Complements – Fixed Point Representations – Floating Point Representations – Other Binary Codes – Error detection codes.

Reference Books:

1. Digital Computer Fundamentals, 6th Edition, Thomas C. Bartee, Tata McGraw Hill, 2008.
2. Digital Logic and Computer Design, M. Morris Mano, Pearson Education, 2008.
3. Digital fundamentals, Floyd & Jain, eighth edition, 2005, Pearson Education.
4. Digital Principles and applications, Donald P leach, Albert Paul Malvino, Goutam saha, Sixth edition, Tata McGraw Hill, 2006.

51722 PROGRAMMING IN C

Course Objectives:

- To provide an overview of working principles of C language.
- To understand and apply the functions, arrays, pointers.
- To implement the features of C language in real world applications

Course Outcome:

At the end of the course, student will be able to:

- understand the C programming techniques
- solve the real-time problems using programming constructs

Unit I:

Introduction and Features: History of C, Importance of C, Basic Structure of C program, character set, Tokens, keywords and identifiers - Constants and variables and data types - declaration of variables, defining symbolic constants, declaring a variable as a constant - Operators and expressions: Evaluation of expressions, precedence of arithmetic operators.

Unit II:

Managing I/O operations: reading and writing a character, formatted input, output - Decision making and branching: IF statement, If..else statement, nesting if else statement, else if ladder, switch statement, goto statement, while statement, do statement, for statement.

Unit III:

Arrays: one-dimensional arrays, declaration, initialization, two dimensional arrays, multi-dimensional arrays, dynamic arrays. Strings : Declaration, Initialization of string variables, reading and writing strings, string handling functions.

Unit IV:

Functions basics: Elements of user defined functions, definitions, return values and their types, function calls, declaration, nesting of functions, recursion.

Unit V

Structures and Unions: Defining a structure, declaring a structure variable, accessing structure members, array of structures, array within structures, structures within structures, structures and functions.

Unit VI:

Pointers: Basics, declaring, initialization of pointer variables, address of variable, accessing a variable through its pointer - Files: Introduction, Defining, opening and closing files, I/O operations on files.

Books for Reference

1. Yashavanth Kanetkar, Let Us C, BPB publications, 2016.
2. Programming with C, Schaum outline series, Gottfried, TataMcHill, 2010.
3. Programming with ANSI and Turbo C, Ashok N Kamthane, Pearson Education, 2008.

51723 DATA STRUCTURES AND ALGORITHMS

Course Objectives:

- The learner should be well versed with the fundamentals of Algorithms, learn various data structures, should be able to use them appropriately as per need during development of programs.
- Also, the learner should know different sorting and searching techniques so that correct techniques can be used in different programs so that the complexity of the program does not increase due the sorting/ search technique employed.

Course Outcome

After the completion of this course, the student will able to;

- Write programs using structures, strings, arrays, pointers and strings for solving complex computational problem using the data structures real time applications
- Able to analyze the efficiency of Data Structures

Unit I :

Introduction to Data Structure : Types of Data Structure , Primitive data types -Algorithms –Time and space Complexity of algorithms.

Unit II:

Arrays: Array initialization, Definition of Array, Characteristic of Array ,One- dimensional Array, Two-dimensional array and Multi-dimensional array

Unit III:

Stack : Stack related terms, Operations on a stack - Representation of Stack: Implementation of a stack – application of Stack. Expression Evaluation Polish notation. Queues: Operations on queue Circular Queue, Representation of Queues, Application of Queues.

Unit IV:

List: Merging lists, Linked list, Single linked list, Double Linked List, Header - Linked list - Operation on Linked List : Insertion and Deletion of linked list -Traversal: Traversing a linked list , Representation of linked list.

Unit V:

Trees: Binary Trees, Types of Binary trees, Binary Tree Representation - Binary Tree operations / Applications : Traversing Binary Trees, Binary Search tree -Operations on Binary Tree: Insertion and Deletion operations, Hashing Techniques.

Unit VI:

Searching Techniques : Introduction, Searching, Types of searching, Linear Search, Binary search technique.

Books for reference:

1. Fundamentals of data structures, Second edition, Ellis Horowitz and Sartaj Sahini, Universities press, 2007.
2. Data Structures, Seymour Lipschutz, G.A. Vijayalakshmi Pai, Second Edition, Schaum's Outlines, Tata Mc-Graw Hill Private Ltd., 2006.

51724 C AND DATA STRUCTURE LAB**Course Objectives**

- To be able to solve data structure problems using C language
- To learn and implement C language programming techniques.
- To know about the implementation of data structures

Course Outcome

- Students can develop programming knowledge
- Students can solve any kind of problems using C language
- Data Structure based problems can be solved

Lab Experiments based on C programming and Data Structures**Contents**

Simple C Programs

Using if and switch constructs Programs

Looping statements Problems

Functions and Recursive programs

Arrays, Strings and Matrices Programs

File Handling Programs

Pointers and Arrays Programs

Programs using structure and union

Programs based on file handling

Exercises using Stacks

Exercises using queues, expression evaluation programs

Infix to postfix conversion Program

Linked List programs: Single linked list, Double Linked List, Insertion and Deletion of linked list

REFERENCE BOOKS:

1. Programming in ANSI C, Fifth Edition, E. Balagurusamy, Tata McGraw-Hill Publishing Company Ltd, 2011
2. Data Structures, Seymour Lipschutz, G.A. Vijayalakshmi Pai, Second Edition, Schaum's Outlines, Tata Mc-Graw Hill Private Ltd., 2006.

3. Fundamentals of Data structures in C, Second edition, Ellis Horowitz and Sartaj Sahini, Universities press, 2007.
4. Programming and Data Structure, Pearson Edition, Ashok N Kamthane, 2007.

**DIPLOMA PROGRAMME
IN
ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING**

Course of Study and Scheme of Examinations

S.No	Course code	Name of the Course	CIA Marks Max.	ESE Marks Max.	Total Marks Max.	C Max.	Hrs
1	51811	Fundamentals of Artificial Intelligence	25	75	100	2	6
2	51812	Relational Database Management System (RDBMS)	25	75	100	2	6
3	51813	R Programming	25	75	100	2	6
4	51814	R Programming Lab	25	75	100	2	60
TOTAL			100	300	400	8	78
Semester II							
5	51821	Fundamentals of Machine Learning	25	75	100	2	6
6	51822	Principles of Soft Computing	25	75	100	2	6
7	51823	Python Programming	25	75	100	2	6
8	51824	Machine Learning using Python Lab	25	75	100	2	60
TOTAL			100	300	400	8	78
GRAND TOTAL			200	600	800	16	156

CIA :Continuous Internal Assessment **ESE** : End semester Examination **Max.** Maximum Marks; **C** : Credits**Hrs**: Hours

SEMESTER I

Semester	Course Code	Title of the Course	Credits	Hours
I	11	FUNDAMENTALS OF ARTIFICIAL INTELLIGENCE	2	6

Course objectives

- The objective of the course is to present an overview of artificial intelligence (AI) principles and approaches.
- Develop a basic understanding of the building blocks of AI as presented in terms problem, problem space: Search, Knowledge representation, inference, logic, and learning.

Course outcome

By the end of this course, you should be able to:

- Create AI solutions for various business problems.
- Build and deploy production grade AI applications.
- Apply methods, techniques and tools immediately.
- To gain experience of doing independent study and research.

Unit 1:

AI - Problems and Search: Introduction: The Artificial Intelligence (AI) Problem – What is an AI technique - Criteria for success. Problems, Problem Spaces, Search: Defining Problems, Problem Spaces, Search State space search - Production Systems – Problem characteristics - Production system characteristics – Application areas.

Unit 2 :

Heuristic Search techniques: Generate and Test - Hill Climbing- Best-First search – Problem reduction – constraint satisfaction - Means-end analysis.

Unit 3:

AI - Knowledge Representation: Knowledge representation issues: Representations and mappings -Approaches to Knowledge representations -Issues in Knowledge representations - Frame Problem.

Unit 4 :

Using Predicate logic: Representing simple facts in logic – Representing Instance and ISA relationships - Computable functions and predicates -Resolution. Representing knowledge

using rules: Procedural Vs Declarative knowledge –Logic programming - Forward Vs Backward reasoning - Matching – Control knowledge.

Unit 5 :

AI –Learning : What is learning – Rote learning - Learning by taking advice – learning in problem solving.

Unit 6 :

Learning from examples: Induction - Explanation-based learning – discovery – analogy – formal learning theory – Neural Net Learning and Genetic Learning.

Reference and text books:

1. Dan W. Patterson, “*Introduction to AI and ES*”, Pearson Education.
2. Dheeraj Mehrotra(2019), *Basics of Artificial Intelligence & Machine Learning*, Notion Press.
3. Elaine Rich and Kevin Knight(1991), "*Artificial Intelligence*", Second Edition, Tata McGraw Hill, Publishers company Pvt Ltd.
4. Kevin Night, Elaine Rich, Nair B.(2008), “*Artificial Intelligence (SIE)*”, McGraw Hill.
5. Stuart Russel, Peter Norvig (2007), “*AI – A Modern Approach*”, 2nd Edition, Pearson Education.
6. Venugopal C.K(2019), *Artificial Intelligence and Machine Learning*, Pacific Books International.

Semester	Course Code	Title of the Course	Credits	Hours
I	12	RELATIONAL DATABASE MANAGEMENT SYSTEM (RDBMS)	2	6

Course Objectives:

- To understand the fundamentals of data models
- To make a study of SQL and relational database design.
- To know about data storage techniques and query processing.
- To impart knowledge in transaction processing, concurrency control techniques and External storage

Course Requirements:

- Knowledge about the basic concepts of the database.

Course Outcome:

By the end of this course, you should be able to:

- Design a database using ER diagrams and map ER into Relations and normalize the relations
- Acquire the knowledge of query evaluation to monitor the performance of the DBMS.
- Develop a simple database application using normalization.

Unit 1 :

Data base System Applications, data base System VS file System – View of Data – Data Abstraction –Instances and Schemas – data Models – the ER Model - Relational Model – Other Models – Database Languages – DDL – DML – database Access for applications Programs – data base Users and Administrator – Transaction Management – data base System Structure – Storage Manager – the Query Processor.

Unit 2

History of Data base Systems - Data base design and ER diagrams – Beyond ER Design Entities, Attributes and Entity sets – Relationships and Relationship sets – Additional features of ER Model – Concept Design with the ER Model – Conceptual Design for Large enterprises.

Unit 3 :

Relational Model: Introduction– Integrity Constraint Over relations – Enforcing Integrity constraints – Querying relational data – Logical data base Design – Introduction to Views – Destroying / altering Tables and Views.

Unit 4 :

Relational Algebra – Selection and projection set operations – renaming – Joins – Division – Examples of Algebra overviews - Relational calculus – Tuple relational Calculus – Domain relational calculus – Expressive Power of Algebra and calculus.

Unit 5 :

Form of Basic SQL Query – Examples of Basic SQL Queries – Introduction to Nested Queries – Correlated Nested Queries Set – Comparison Operators – Aggregative Operators – NULL values – Logical connectivity's – AND, OR and NOT – Impact on SQL Constructs – joins- Outer Joins – Disallowing NULL values – Complex Integrity Constraints in SQL Triggers and Active Data bases. Schema refinement.

Unit 6 :

Normal forms:Problems Caused by redundancy – Decompositions – Problem related to decomposition – reasoning about FDS – FIRST, SECOND, THIRD Normal forms – BCNF.

Reference and text Books:

1. Colin Ritchie (2004), *Relational Database Principles*, 3rd Edition, Cengage Learning Business Press.
2. ElmasriNavrate, *Fundamentals of Database Systems*, Pearson Education.
3. Peter Rob & Carlos Coronel, *Data base Systems design, Implementation, and Management*, 7th Edition.
4. Raghurama Krishnan, Johannes Gehrke(2003), *Data base Management Systems*, 3rd Edition, TATA McGrawHill.
5. Silberschatz, Korth(2011), *Data Base System Concepts*, 6th Edition, Tata McGraw Hill.
6. Sharad Maheswari and RuchinJain(2006), *Database management systems Complete Practical Approach*, Firewall media.

Semester	Course Code	Title of the Course	Credits	Hours
I	13	R PROGRAMMING	2	6

Course objectives

- This course aims to provide a knowledge about R programming language.
- Student will learn how to use R for effective data analysis.
- By the end of the day-long course, the user will be comfortable operating in the R environment, including importing external data, manipulating data for specific needs, and running summary statistics, machine learning algorithms and visualizations.
- This course helps participants to have a good understanding of the methods, methodologies and techniques from the basics of statistics to obtain supporting evidence through data

Course outcome

By the end of this course, you should be able to:

- Download and install R
- Navigate and optimise the R integrated development environment (IDE) R Studio
- Install and load add-in packages
- Import external data into R for data processing and statistical analysis
- Learn the main R data structures
- Compute basic summary statistics
- produce data visualizations

Unit 1

Introduction to R – History of R - Features of R - Essentials of the R language – R-Environment setup – Basic syntax: command prompt, script file, comments. Data types - Variables – assigning, finding, deleting variables- operators: operator types – arithmetic operator – logical operators -assignment operators – logical operators -expressions.

Unit 2

Control statements – Decision making- if – if-else – nested if - switch– loops – repeat-while – for – loop control statements - break – next statement. Functions: function definition -function components –built-in functions – user defined function - calling function - Recursion - Strings: Rules of strings - string manipulation

.

Unit 3

Objects in R: Vectors – Vector creation – Vector Manipulation – Lists: Creating a list, naming, accessing, manipulating list elements- merge list -converting list to Vector – Arrays- Names columns and rows – Accessing array elements, manipulating array elements – operations of array elements.

Unit 4

Matrices – Accessing elements of Matrix – operations on matrix– Factors – Frames – Create data frames - getting the structure of data frame- Extract data from data frame. Packages – available R packages - install a new package – load package to library - Data reshaping – joining columns and rows in a data frame- merging dt frames – melting and casting

.

Unit 5

Working with files: CSV file – input CSV, read CSV, analyzing CSV, writing into CSV, Excel file: install, load, input, read excel files - Binary files: reading and writing – XML files: input and read XML files. MySQL package – connection R with MySQL – querying the table – table manipulation: create, insert, drop and update.

Unit 6

Visualizing: R charts and Graphs: R Pie charts: Pie chart title, color- slice percentages and chart legend – 3D Pie chart - Bar charts – Histograms – Line graphs – Scatter plots – creating scatterplot – scatterplot matrices.

Reference and text books:

1. Andrie de Vries, Joris Meys(2016), *R Programming for Dummies*, 2nd edition, Wiley.

2. Brett Lantz(2013), *Machine Learning with R*, Packt Publishing Ltd.
3. Mark Gardener(2013), *Beginning R The Statistical Programming Language*, Kindle edition.
4. Rajendra B. Patil,HirenDand& Rupali Dahake(2017), *A practical Approach to R*, Shroff/X-Team; First edition.
5. Scott Burger(2018), *Introduction to Machine Learning with R: Rigorous Mathematical Analysis*, Shroff/O'Reilly.
6. UCI Machine Learning Repository :<http://archive.ics.uci.edu/ml/index.php>

Semester	Course Code	Title of the Course	Credits	Hours
I	14	R Programming LAB	2	60

Course objectives

- This course aims to provide a knowledge about practical R programming language.
- Student will learn how to use R for effective data analysis.
- By the end of the day-long course, the user will be comfortable operating in the R environment, including importing external data, manipulating data for specific needs, and running summary statistics, machine learning algorithms and visualizations.

Course outcome

By the end of this course, you should be able to:

- Download and install R
- Navigate and optimize the R integrated development environment (IDE) R Studio
- Install and load add-in packages
- Import external data into R for data processing and statistical analysis
- Learn the main R data structures
- Compute basic summary statistics and machine learning
- produce data visualizations

Experiments based on R Programming

- Simple R Programs
- Programs using conditional control statements
- Programs using functions and recursion.
- Problems based on Vectors, List, Arrays, Matrices, Factors and Frames.
- Experiments using packages.
- Problems using files and database.

- Experiments using charts and graphs.
- Experiments to perform statistics(mean, mode, median, normal distribution, binomial distribution) in R.
- Experiments for forecasting numeric data: Regression Methods.
- Experiments for data Visualizations.

Reference books:

7. Andrie de Vries, Joris Meys(2016), *R Programming for Dummies*, 2nd edition, Wiley.
8. Brett Lantz(2013), *Machine Learning with R*, Packt Publishing Ltd.
9. Mark Gardener(2013), *Beginning R The Statistical Programming Language*, Kindle edition.
10. Rajendra B. Patil, Hiren Dand & Rupali Dahake(2017), *A practical Approach to R*, Shroff/X-Team; First edition.
11. Scott Burger(2018), *Introduction to Machine Learning with R: Rigorous Mathematical Analysis*, Shroff/O'Reilly.
12. UCI Machine Learning Repository : <http://archive.ics.uci.edu/ml/index.php>

SEMESTER II

Semester	Course Code	Title of the Course	Credits	Hours
II	21	FUNDAMENTALS OF MACHINE LEARNING	2	6

Course Objectives:

- To discover patterns in your data and then make predictions based on often complex patterns to answer business questions, detect and analyze trends and help solve problems.
- To introduce students to the state-of-the-art concepts and techniques of Machine Learning.

Course Outcome:

By the end of this course, you should be able to:

- Have a good understanding of the fundamental issues and challenges of machine learning: data, model selection, model complexity, etc. ...
- Be able to design and implement various machine learning algorithms in a range of real-world applications.
- be capable of confidently applying common Machine Learning algorithms in practice and

- implementing their own.
- be capable of performing experiments in Machine Learning using real-world data.

Unit 1

Introduction: Basic definitions – Learning - Machine Learning vs AI - Machine Learning – features – samples – labels - Real-world applications and problems – hypothesis test - approaches of machine learning model - Data preprocessing.

Unit 2:

Representation of formal ML model: The statistical learning framework – training - testing – validation - cross validation - parametric and non parametric methods - Difference between Parametric and Non-Parametric Methods and examples.

Unit 3

Supervised learning Algorithms: Introduction – Approaches for classification – Decision Tree classification algorithm – Tree pruning - Rule based Classification –IF-THEN rules classification - Naïve Bayesian classification - Neural Network classification -Classification by Backpropagation algorithm. Support Vector Machines (SVM) - Lazy learners: k-Nearest Neighbor (k-NN) Algorithm – Case Based Reasoning (CBR) - Random Forest algorithm.

Unit 4

Unsupervised learning algorithms: Introduction– Defining Unsupervised learning – Cluster Analysis – Distance measures - Types of Clustering – Partition algorithms of clustering – Hierarchical clustering algorithms - Density based methods.

Unit 5

Reinforcement Learning and ELM: Introduction: Markov Decision process - Monte Carlo Prediction - case studies – Applications. Introduction to Extreme Learning Machine (ELM) - Software Tools: Introduction to Weka, Matlab, Rapidminer, tensorflow and keras –case studies.

Unit 6

Deep learning fundamentals: Introduction –Deep Belief Networks (DBN), A Restricted Boltzmann machine (RBM) - Recurrent Neural Networks (RNN) - Time series forecasting. Convolutional Neural Networks (CNN) - Auto-encoders: Auto-encoders and unsupervised learning - Regularization - Dropout and Batch normalization.

Reference and text Books.

1. Anuradha Srinivasaraghavan,Vincy Joseph (2019),*Machine Learning*, Wiley.

2. BalasKausikNatarajan(1991), “*Machine Learning: A Theoretical Approach*”, Morgan Kaufmann
3. Dinesh Kumar U ManaranjanPradhan(2019), *Machine learning using Python*, Wiley.
4. EthamAlpaydin(2015), *Introduction to Machine Learning*, third edition, PHI Learning Pvt. Ltd.
5. Jiawei Han, Micheline Kamber, Jian Pei(2012), *Data mining concepts and techniques*, Morgan Kaufmann Publishers, Elsevier.
6. Lovelyn Rose S, Dr. L Ashok Kumar, Dr. D KarthikaRenuka(2019), *Deep Learning Using Python*,Wiley,
7. Rajiv Chopra(2018), *Deep Learning - A Practical Approach*, Khanna Books 2018.
8. Shai Shalev-Shwartz and Shai Ben-David(2014), *Understanding machine learning from theory to algorithms*,Cambridge university press.
9. UCI Machine Learning Repository :<http://archive.ics.uci.edu/ml/index.php>

Semester	Course Code	Title of the Course	Credits	Hours
II	22	PRINCIPLES OF SOFT COMPUTING	2	6

Course Objective:

- To learn the key aspects of Soft computing.
- To know about the components and building block hypothesis of Genetic algorithm.
- To study the fuzzy logic components.

Course Outcome:

- Write Genetic Algorithm to solve the optimization problem
- Understand fuzzy concepts and develop a Fuzzy expert system to derive decisions.

Unit 1

Introduction: Soft Computing Constituents – Soft Computing Vs Hard Computing – Characteristics – Applications - Artificial Neural Network (ANN): Fundamental Concept – Application Scope - Basic Terminologies – Neural Network Architecture – Learning Process.

Unit 2

Perceptron Network – Adaline and Madaline Networks – Back Propagation Network - Radial Basis Function Network. Associative Memory Networks – BAM - Hopfield Network - Boltzmann Machine.

Unit 3

Unsupervised Learning Networks: Kohonen Self Organizing Network – Counter Propagation Network – ART Network.

Unit 4

Fuzzy Sets: Basic Concept – Crisp Set Vs Fuzzy Set - Operations on Fuzzy Set – Properties of Fuzzy Sets. Fuzzy Relations: Concept – Fuzzy Composition – Fuzzy Equivalence and Tolerance Relation. Membership Functions: Features – Fuzzification – Methods of Membership value assignments – Defuzzification – Methods

Unit 5

Fuzzy Arithmetic – Extension Principle – Fuzzy Measures - Fuzzy Rules and Fuzzy Reasoning: Fuzzy Propositions – Formation of Rules – Decomposition of Rules – Aggregation of Rules – Approximate Reasoning - Fuzzy Inference and Expert Systems – Fuzzy Decision Making – Fuzzy Logic Control Systems.

Unit 6

Genetic Algorithm: Fundamental Concept – Basic Terminologies – Traditional Vs Genetic Algorithm - Elements of GA - Encoding - Fitness Function - Genetic Operators– Classification of Genetic Algorithm – Applications of GA.

Reference and Text Books:

1. Goldberg David E.(2003), “*Genetic Algorithms*”, Pearson Education.
2. Haykin Simon (1999) , “*Neural Networks*”, Prentice Hall, 1993/Pearson Education.
3. JangJ.S.R., C.T. Sun, E. Mizutani(2004), “*Neuro-Fuzzy and Soft Computing*”, Prentice Hall India.
4. Kumar Satish, “*Neural Networks: Classroom Approach*”, Tata McGraw Hill.
5. Koza J. (1993), “*Genetic Programming*”, MIT Press.
6. KecmanVojislav(2001), “*Learning and Soft Computing*”, MIT Press.
7. Konar Amit (2008), “*Artificial Intelligence and Soft Computing – Behavioural and Cognitive Modeling of the Human Brain*”, Special Indian Edition, CRC Press.
8. Rajasekaran S (2004), G.A.V. Pai, “*Neural Networks, Fuzzy Logic, Genetic Algorithms*”, Prentice Hall India, 2004.
9. Rajase, Kharan S. and VijayalakshmiPai S. A.(2003), “*Neural Networks, Fuzzy Logic & Genetic Algorithms*”, Prentice-Hall of India
10. Sivanandam, “*Introduction to Neural Networks with MATLAB 6.0*”, Tata McGraw Hill Publications.
11. Sivanandam S.N, S.N. Deepa (2007), “*Principles of Soft Computing*”, Wiley India.
12. Yen John and Langari Reza (2003), “*Fuzzy Logic, Intelligence, Control, and Information*”, Pearson Education.

Semester	Course Code	Title of the Course	Credits	Hours
II	23	PYTHON PROGRAMMING	2	6

Course Objectives:

The learning objectives of this course are;

- To understand why Python is a useful scripting language for developers.
- To learn how to design and program Python applications.
- To learn how to use lists, tuples, and dictionaries in Python programs.
- To learn how to identify Python object types.
- To define the structure and components of a Python program.
- To learn how to write loops and decision statements in Python.
- To learn how to write functions and pass arguments in Python.
- To learn how to build and package Python modules for reusability.
- To learn how to read and write files in Python.

Course Requirements:

- Before studying this course, the student has knowledge about basic principles of programming
- Experience with a high-level language (C/C++, Java, MATLAB) is suggested. Prior knowledge of a scripting language (Perl, UNIX/Linux shells) and Object-Oriented concepts is helpful but not mandatory.

Course Outcome:

After the completion of this course, the student will able to;

- To write programs using structures, strings, arrays, pointers and strings for solving complex computational problem.
- Use if-else statements and switch-case statements to write programs in Python to tackle any decision-making scenario
- Master Object-oriented programming to create an entire Python project using objects and classes
- Store and retrieve information using variables
- Develop cost-effective robust applications using the latest Python trends and technologies

Unit 1

Introduction – Overview of programming languages - History of Python – Installing Python – Executing Python programs – Comments - Python Character set – token core datatypes – printf() function – Assigning value to variables – input() – eval() – formatting Number and strings – Inbuilt functions - Operators and Expressions.

Unit 2

Decision Statements: Introduction - if , if-else , nested if statements – multi-way if-elif statements. Loop Control Statements: Introduction – while loop – range() function – for loop = nested loops – break and continue statements.

Unit 3

Functions: Introduction – Syntax and basics of function – use of function – parameters and arguments in function – local and global variables – return statement. Strings: Introduction – The str class – built in functions for string – index[] operator - traversing string – immutable strings – string operators – string operations.

Unit 4

Lists : Introduction – creating lists – accessing the elements of a list – negative list indices – list slicing – built-in functions for list – list operator – list methods – passing list to a function – returning list from function. Introduction to tuples - creating – tuple() function – built-in functions for tuples - indexing -slicing – operators – list and tuples – sorting -traversing.

Unit 5

Introduction to tuples - creating – tuple() function – built-in functions for tuples - indexing - slicing – operators – list and tuples – sorting -traversing. Sets – creating – set in and not in operator – set classes - operations. Dictionaries: Introduction – creating, adding, replacing, retrieving values – formatting – deletion of items – comparing dictionaries – methods of dictionary class – nested dictionaries - traversing dictionaries

Unit 6

File Handling: Introduction – Need for file handling – Text input and output using file – seek() function. Introduction to Scientific computing with Scipy, Mathematical computing with Numpy, Scikit learn, Data visualization using Matplotlib, Data manipulation with pandas and sympy – Case studies.

Reference and text books:

1. Ashok NamdevKamthane(2018), Amit Ashok Kamthane, *Programming and Problem solving with Python*, Mc GrawHill Education.
2. Dinesh Kumar UManaranjanPradhan(2019), *Machine learning using Python*, Wiley
3. Manisha Bharambe(2019), *Python programming*, NiraliPrakashan.
4. Robert Sedgewick, Kevin Wayne, Robert Sedgewick(2016), *Introduction to Programming in Python: An Interdisciplinary Approach*, 1e, Pearson.
5. Wesley J. Chun(2009), *“Core Python Programming”*, 2nd Edition, Prentice Hall.

Semester	Course Code	Title of the Course	Credits	Hours
II	24	MACHINE LEARNING USING PYTHON LAB	2	60

Course Objectives:

The learning objectives of this course are:

- To understand why Python is a useful scripting language for developers.
- To learn how to design and program Python applications.
- To learn how to use lists, tuples, and dictionaries in Python programs.
- To learn how to identify Python object types.
- To learn how to use indexing and slicing to access data in Python programs.
- To define the structure and components of a Python program.
- To learn how to write loops and decision statements in Python.
- To learn how to write functions and pass arguments in Python.
- To learn how to build and package Python modules for reusability.
- To learn how to read and write files in Python.
- To learn how to design object-oriented programs with Python classes.
- To learn how to use class inheritance in Python for reusability.

Course Requirements:

- Before studying this course, the student has knowledge about basic principles of programming.
- Experience with a high-level language (C/C++, Java, MATLAB) is suggested. Prior knowledge of a scripting language (Perl, UNIX/Linux shells) and Object-Oriented concepts is helpful but not mandatory.

Course Outcome:

After the completion of this course, the student will be able to;

- To write programs using structures, strings, arrays, pointers and strings for solving complex computational problems.
- Use if-else statements and switch-case statements to write programs in Python to tackle any decision-making scenario.
- Master Object-oriented programming to create an entire Python project using objects and classes.
- Store and retrieve information using variables.
- Develop cost-effective robust applications using the latest Python trends and technologies.
- Write program to solve real-world machine learning problems.

Lab Experiments based on Python programming and machine learning problems.

Simple Python programs.

Experiments using decision control statements.

Exercises using functions and recursion.

Exercises using arrays and strings.

Experiments using list processing.

Object oriented Programming Lab Problems using Python.

Experiments using Tuples, sets and dictionaries.

Programs using file handling.

Programs using graphics programming.

Experiments for data visualization using Matplotlib.

Scientific computing with Scipy.

Data manipulation with pandas and sympy.

Mathematical computing with Numpy.

Programs to perform Supervised learning algorithms (k-NN algorithm.)

Programs to perform Unsupervised learning algorithms (k-means clustering.).

Reference Books:

1. Ashok NamdevKamthane(2018), Amit Ashok Kamthane, *Programming and Problem solving with Python*, Mc GrawHill Education.
2. Dinesh Kumar UManaranjanPradhan(2019), *Machine learning using Python*, Wiley
3. Manisha Bharambe(2019), *Python programming*, NiraliPrakashan.
4. Robert Sedgewick, Kevin Wayne, Robert Sedgewick(2016), *Introduction to Programming in Python: An Interdisciplinary Approach*, 1e, Pearson.
5. Wesley J. Chun(2009), *“Core Python Programming”*, 2nd Edition, Prentice Hall.

DIPLOMA PROGRAMME
IN
CYBER SECURITY

Course of Study and Scheme of Examinations

S.No	Course Code	Name of the Course	CIA Marks Max.	ESE Marks Max.	Total Marks Max.	Credits
I SEMESTER						
1	51911	Cryptography and Network Security	25	75	100	2
2	51912	Fundamentals of Cyber Security	25	75	100	2
3	51913	Cyber Security Law & Practice	25	75	100	2
4	51914	Cryptography – LAB	25	75	100	2
II SEMESTER						
5	51921	Web Application Security	25	75	100	2
6	51922	Malware Analysis and Network Security	25	75	100	2
7	51923	Mobile Security	25	75	100	2
8	51924	Cyber Security - LAB	25	75	100	2
TOTAL			200	600	800	16

CIA: Continuous Internal Assessment ESE: End semester Examination

Detailed Syllabi

11 - CRYPTOGRAPHY AND NETWORK SECURITY

Course Objectives

- To understand the computer security concepts
- To understand the Data Encryption Standard mechanism

Course Outcome

- At the end of this course, the student will be able to;
- Able to know AES, RSA cryptography principles
- Able to know Digital Signatures, E-mail security

UNIT 1:

Introduction: The OSI security architecture, security attacks, Security Services, Security mechanism, A model for network security, classical Encryption techniques, Symmetric cipher model, Substitution techniques.

UNIT 2:

Block cipher principle, the data encryption standard, The strength of DES, Differential and Linear cryptanalysis, Block cipher design principles, Advanced Encryption Standard: Finite Field arithmetic, AES structure, AES transformation function, Implementation

UNIT 3:

Principles of public-key cryptosystems, The RSA algorithms, Other public key cryptosystems: Diffie-Hellman key Exchange, ElGamal cryptographic system, Elliptic curve cryptography, pseudorandom number generation based on asymmetric cipher

UNIT 4:

Message authentication requirements, functions, message authentication codes, Security of MACs, MAC based Hash functions, MAC based ciphers

UNIT 5:

Digital Signatures: ElGamal Digital Signature scheme, Schnorr digital signature schemes, digital signature standard

UNIT 6:

Web security considerations, Socket layer and transport layer and transport layer security
Electronic mail security: pretty good privacy, IP security overview, IP security policy, encapsulating security payload

Text Book:

1. William Stallings, “Cryptography and Network Security Principles and Practice”, Pearson, 5th Edition.

Book for Reference:

1. A Handbook of Applied Cryptography by Alfred J. Menezes, Paul C. Van Oorschot and Scott A. Vanstone, CRC Press Series on Discrete Mathematics and Its Applications

12- FUNDAMENTALS OF CYBER SECURITY

Course Objectives

- To understand the Basic Concepts in Cyber Security
- To know about Classification of Cyber Security
- To understand the Present and Future Cyber Security

Course Outcome

At the end of the course, students will be able to;

- To know the latest trends in Ethical Hacking
- To understand the fundamentals of computer forensics, Evidence Collection Etc.

UNIT-1:

Introduction to Cyber Crime – Types of Cyber Crime – Classification of Cyber Criminals – Tools used in Cyber Crime – Challenges – Strategies – Cryptocurrency – Bitcoin – Blockchain - Ransomware.

UNIT-2:

Cyber Forensics Definition – Disk Forensics – Network Forensics – Wireless Forensics – Database Forensics – Malware Forensics – Mobile Forensics – Email Forensics

UNIT-3:

Ethical Hacking: Essential Terminology, Hacking windows – Network hacking – Web hacking – Password hacking, Malware, Scanning, Cracking.

UNIT-4:

Digital Evidence in Criminal Investigations: The Analog and Digital World, Training and Education in digital evidence, Evidence Collection and Data Seizure: Why Collect Evidence, Collection Options Obstacles, Types of Evidence, The Rules of Evidence, Volatile Evidence,

UNIT-5:

Intrusion, Physical Theft, Abuse of Privileges, Unauthorized Access by Outsider, Malware infection, Intrusion detection and Prevention Techniques, Anti-Malware software, Network based Intrusion detection Systems, Network based Intrusion Prevention Systems, Host based Intrusion prevention Systems, Security Information Management, Network Session Analysis, System Integrity Validation.

UNIT-6:

Cyber Security Vulnerabilities-Overview, vulnerabilities in software, System administration, Complex Network Architectures, Open Access to Organizational Data, Weak Authentication, Unprotected Broadband communications, Poor Cyber Security Awareness. Cyber Security Safeguards- Overview, Access control, Audit, Authentication, Biometrics.

Reference Books:

1. Deje, Dr.Murugan, “Cyber Forensics”, Oxford University Press, India, 2018.
2. William Stallings and Lawrie Brown, “Computer Security: Principles and Practice”, Prentice Hall.
3. Swiderski, Frank and Syndex, “Threat Modeling”, Microsoft Press.
4. John W. Rittinghouse, William M. Hancock, “Cyber Security Operations Handbook”, ElsevierPub.
5. Deborah G Johnson, “Computer Ethics”, 4th Edition, Pearson Education Publication.
6. Earnest A. Kallman, J.P Grillo, “Ethical Decision making and IT: An Introduction with Cases”, McGraw Hill Publication.

13 - CYBER SECURITY LAW & PRACTICE

Objective of the Course:

- To help the students to understand Cyber Law and its need.
- Students will be able to know Information Technology Act 2000 and its benefits.
- To know about IPR, Patent etc.

Learning Outcomes:

After completion of the course, students would be able to;

- Know the basics of Cyber Security Law and Practices.
- Attain the knowledge about Intellectual Property Rights, Patent, Copy right, Trade Mark Law.

UNIT-1:

Introduction – Need for Cyber Law - Evolution of the IT Act, Genesis and Necessity - Salient features of the IT Act, 2000, various authorities under IT Act and their powers, Penalties & Offences, amendments.

UNIT-2:

Impact on other related Acts (Amendments) - Amendments to Indian Penal Code, Indian Evidence Act, Bankers Book Evidence Act, Reserve Bank of India Act - Cyber Space Jurisdiction.

UNIT-3:

E – commerce and Laws in India - Digital / Electronic Signature in Indian Laws - E – Commerce Issues and provisions in Indian Law - E – Governance concept and practicality in India - E – Taxation issues in Cyberspace - E – Contracts and its validity in India (f) Cyber Tribunal & Appellate Tribunal.

UNIT-4:

Intellectual Property Rights - Domain Names and Trademark Disputes - Concept of Trademarks / in Internet Era - Cyber Squatting - Reverse Hijacking - Jurisdiction in Trademark Disputes - Copyright in the Digital Medium - Copyright in Computer Programmes.

UNIT-5:

Cyber Laws in India – Crime against Individual – Crime against Property – Crime against Nation – Indian Case Laws.

UNIT-6:

International Cyber Laws Introduction – Cybercrime Legislation in the Netherlands – Cyber Laws in Malaysia – Cyber Laws in UK – Cyber Laws in United States – Australian Law related to Privacy.

TEXT BOOK:

4. Deje, Dr.Murugan, Cyber Forensics, 2018, Oxford University Press.

REFERENCE BOOKS:

1. Harish Chander, Cyber Law and IT Protection, PHI Publication, 2012.
2. Philips, Computer Forensics and Investigations, Cengage Learning India Edition.

14 -CRYPTOGRAPHY - LAB**Objective of the Course:**

- To implement the cryptographic algorithms.
- To implement the security algorithms.
- To implement cryptographic, digital signatures algorithms.

Learning Outcomes:

Upon successful completion of this assignment, students will be able to:

List of Experiments:

1. Write a C program that contains a string (char pointer) with a value 'Hello World'. The program should XOR each character in this string with 0 and displays the result.
2. Implementation of Diffie-Hellman algorithm
3. Write a C program that contains a string (char pointer) with a value 'Hello World'. The program should AND or and XOR each character in this string with 127 and display the result.
4. Write a Java program to perform encryption and decryption using the following algorithms: a) Ceaser Cipher b) Substitution Cipher c) Hill Cipher
5. Write a Java program to implement the DES algorithm logic.
6. Write a C/JAVA program to implement the BlowFish algorithm logic.
7. Write a C/JAVA program to implement the Rijndael algorithm logic.
8. Implementation of RSA based signature system
9. Write a Java program to implement RSA Algorithm
10. Calculate the message digest of a text using the SHA-1 algorithm in JAVA.

II SEMESTER

21- WEB APPLICATION SECURITY

Course Objectives

- To understand the web basics, HTML commands
- To know about various Web Penetration Testing methods
- To understand the Web Application Technologies and Attacks

Course Outcome

At the end of the course, students will be able to;

- To know the latest trends in Web Application Security Methods
- To understand the various Web Attacks and other techniques.

UNIT-1:

Web Fundamentals – HTML, HTTP 1.0 and 1.1- Client-side scripting, Server-side scripting- Web server architecture - Windows & Linux, IIS and LAMP servers- Network topologies and DMZ

UNIT-2:

Web Penetration Testing Methodology - Types of Web Penetration Testing - Web Pen Testing Approach – Core Defense Mechanisms

UNIT-3:

Web Application Technologies – Mapping the Application – Bypassing the Client-side Controls

UNIT-4:

Attacking the Authentication – Attacking the Session Management – Attacking access Controls

UNIT-5:

Attacking Back-End Components – Attacking Users: Cross-Site Scripting – Attacking Users: Other Techniques.

UNIT-6:

Automating Customized Attacks – Attacking Application Architecture – Attacking the Application Server

Text Books:

1. Shostack, Adam. Threat modeling: Designing for security. John Wiley & Sons, 2014.
2. Dafydd Stuttard, and Marcus Pinto, The Web Application Hacker's Handbook: Finding and Exploiting Security Flaws, 2nd Edition, John Wiley & Sons, 2011.

References:

1. Wenliang Du, Computer Security – A hands-on Approach, First Edition, Createspace Independent Pub, 2017
4. <https://www.owasp.org>

22- MALWARE ANALYSIS AND NETWORK SECURITY

Course Objectives

- To protect the network itself;
- To reduce the susceptibility of computer systems and applications to threats originating from the network; and,
- To protect data during transmission across the network.

Course Outcome

At the end of the course, students will be able to;

- To know the latest trends in malware attacks, monitoring and execution methods
- To understand the fundamentals of firewall, LAN attacks and Network Sniffing.

Unit I

Goals of Malware Analysis, AV Scanning, Hashing, Finding Strings, Packing and Obfuscation, PE file format, Static, Linked Libraries and Functions, Static Analysis tools, Virtual Machines and their usage in malware analysis, Sandboxing, Basic dynamic analysis, Malware execution, Process Monitoring, viewing processes, Registry snapshots, Creating fake networks,

Unit II

X86 Architecture- Main Memory, Instructions, Opcodes and Endianness, Operands, Registers, Simple Instructions, The Stack, Conditionals, Branching, Rep Instructions, Disassembly, Global and local variables, Arithmetic operations, Loops, Function Call Conventions, C Main Method and Offsets. Portable Executable File Format, The PE File Headers and Sections, IDA Pro, Function analysis, Graphing,

Unit III

Live malware analysis, dead malware analysis, analyzing traces of malware, system calls, api calls, registries, network activities. Anti-dynamic analysis techniques, VM detection techniques, Evasion techniques, Malware Sandbox, Monitoring with Process Monitor, Packet Sniffing with Wireshark, Kernel vs. User-Mode Debugging, OllyDbg, Breakpoints, Tracing, Exception Handling, Patching

Unit IV

Techniques for Network Protection: Firewalls, packet filter and stateful firewalls, application aware firewalls, personal firewalls-iptables, Proxies, NAT, Intrusion Detection System-Snort, Signature and Anomaly based detection, Honeypots and Honeynets, Network Log management-syslog or SPLUNK

Unit V

LAN attacks: ARP Cache poisoning, MAC flooding, Man in the middle attacks, Port Stealing, DHCP attacks, 10 VLAN hopping; Network Sniffing-wireshark and Password Cracking-John the Ripper;

Unit VI

Secure Network Communication: SCP, SSH, SSL3.0, TLS 1.2, STARTTLS, IPSec, VPN and Secure HTTP; Understanding the dark web, TOR traffic, Attacks on SSL/TLS: SSL stripping, Drown and Poodle attack; Encrypting and Signing Emails: PGP- GPG/openPGP, DKIM and SPF; Single Sign On (SSO)-OAUTH and OPENID; Network packet creation and Manipulation using scapy and dpkt libraries.

Text Books:

1. Michael Sikorski, Andrew Honig, Practical Malware Analysis: The Hands-On Guide to Dissecting Malicious Software.

References:

1. Mike Shema, Anti-hacker toolkit, Tata McGraw Hill Publications, 2014.

23- MOBILE SECURITY

Course Objectives

- To understand the Android Architecture and Framework
- To know about various Android Permission management
- To understand the information systems and software development

Course Outcome

At the end of the course, students will be able to;

- To know the latest trends in Android Application Package, Installation Process
- To understand the Android Device Security

UNIT-1:

Introduction - Android Versions – Android Architecture – Android Security Model – Android Framework

UNIT-2:

The Nature of Permissions – Permission Enforcement – System Permission – Custom Permission – Content Provider Permission

UNIT-3:

Android Application Package Format – Code Signing – APK Install Process – Package Verification

UNIT-4:

Android User Management – Types of Users – User Management – User Metadata – Per user Application Management – External Storage

UNIT-5:

Cryptographic Service Providers – JCA Engine Classes – Android JCA Providers

UNIT-6:

Network Security and PKI – Credential Storage – Device Security – Enterprise Security

Text Book:

1. Nikolay Elenkov, Android Security Internals, No Starch Press, 2015.

References:

1. Karim Yaghmour, Embedded Android, O'Reilly Publications, 2013.

24 - CYBER SECURITY - LAB

Course Objectives

- To understand the TCP, Port Scanning using NMAP Tool
- To know about various SQL Injection methods
- To understand the information about Sniffing and E-mail Security
-

Course Outcome

At the end of the course, students will be able to;

- To know the latest trends in Cyber Security Tools.
- To understand the fundamentals of configuring your E-mail account against threats.

List of Experiments:

1. TCP Scanning using NMAP.
2. Port Scanning using NMAP
3. TCP/UDP Connectivity using Netcat
4. Network Vulnerability using OpenVAS
5. Web Application Testing using DVWA
6. Manual SQL Injection using DVWA
7. XSS using DVWA
8. Automated SQL Injection with SQLMAP
9. Demonstrate Sniffing using packet tool i.e. snort.
10. Configure your e-mail account against various threats. i.e. spam attack, phishing, spoofing etc.

References:

1. http://www.pearsonhighered.com/assets/hip/us/hip_us_pearsonhighered/samplechapter/013_1407333.pdf
2. http://www.cs.nyu.edu/courses/fall04/G22.2262-01/assignments/assignment4_files/Ethereal_TCP.pdf
3. <http://www.snort.org/docs>
4. <http://manual.snort.org/node27.html>

**DIPLOMA PROGRAMME IN
FOOD AND NUTRITION**

COURSE OF STUDY AND SCHEME OF EXAMINATION

S. No.	Title of the Course	No. of Credits	T/P	Marks		Total
				Internal	External	
1	Food Science and Nutrition	2	T	25	75	100
2	Food Processing and Preservation	2	T	25	75	100
3	Food Microbiology	2	T	25	75	100
4	Lab. I: Food Science, Microbiology and Preservation	4	P	25	75	100
	Total	10		100	300	400
5	Innovation in Food Product Development	2	T	25	75	100
6	Nutritional Biochemistry and Meal Management	2	T	25	75	100
7	Public Health Nutrition	2	T	25	75	100
8	Lab. II: Food Product Development and Nutrition	4	P	25	75	100
	Total	10		100	300	400
	Grand Total	20		200	600	800

T – Theory

P – Practical

Title of the Course		FOOD SCIENCE AND NUTRITION					
Paper Number		1					
Category	Core	Year	I	Credit	2	Course Code	52011
		Semester	I				
Objectives							
1. Understand the classification, composition, nutritive value and uses of different food groups. 2. Learn the effects of cooking, storage, and spoilage on the quality and nutrients of foods. 3. Understand the functions, digestion, absorption, and requirements of carbohydrates, proteins, fats, vitamins, minerals, water, and energy. 4. Learn the nutritional needs of individuals based on age, activity, and health status. 5. Develop the ability to select, store, and use foods to prepare healthy and balanced diets.							
Course Outcomes						Knowledge Levels	
The student will be able to:							
CO1: Recall the classification, composition, nutritive value and functions of different food groups and nutrients.						K1	
CO2: Learn the effects of cooking, storage and spoilage on food quality and nutrient content.						K2	
CO3: Apply the principles of food science to select, store, and prepare nutritious foods.						K3	
CO4: Analyze the nutritional value of foods and identify the nutrient requirements of different individuals.						K4	
CO5: Evaluate food choices and recommend balanced diets for maintaining good health and nutrition.						K5	
K1 - Remember	K2 - Understand	K3 - Apply	K4 - Analyze	K5 - Evaluate	K6 - Create		
Block: I	Cereals, Millets and Pulses						
Unit-1: Cereals & Millets – classification, structure, composition and nutritive value of cereals & millets; effect of cooking on nutrients; storage and spoilage of cereals & millets.							
Unit-2: Pulses - classification, structure, composition and nutritive value of pulses; effect of cooking on nutrients; anti-nutritional factors in pulses and methods of removal; storage and spoilage of pulses.							
Block - II	Fruits, Vegetables, Milk and Milk Products						
Unit- 3: Fruits – classification, composition and nutritive value of fruits; ripening, storage and spoilage changes, enzymatic browning and its prevention; storage and spoilage of fruits.							
Vegetables: classification, composition and nutritive values of vegetables; Effect of cooking, storage and spoilage of vegetables.							
Unit-4: Milk and milk products – nutrient composition of milk and milk products; homogenization and sterilization.							
Block - III	Meat, Fish, Egg, Sugar, Oils and Beverages						
Unit-5: Flesh foods - Composition, changes during cooking, rigor mortis, storage and spoilage.							
Fish- types, selection, storage and spoilage of fish. Egg- Structure, nutritive value, quality of egg, effect of heat on egg proteins.							
Unit-6: Sugar and Oils - Properties, crystallization, stages of sugar cookery, artificial sweeteners. Oils- types, sources, properties, smoking point, role of fats/oils in cookery, Fat Substitutes.							
Beverages – classification, processing and labelling, storage.							
Block - IV	Macronutrients						
Unit-7: Carbohydrate, Protein, Fat: Physiological functions, digestion, absorption, food sources and requirements. Metabolic adaptation to fasting and starvation.							
Unit-8: Energy: Energy requirements of individuals and groups, RDA. Concept of energy balance, energy input and expenditure; measurement of energy input and expenditure; factors influencing energy expenditure.							
Water: Physiological role, requirements.							
Block - V	Micronutrients						
Unit-9: Vitamins: Physiological functions, digestion, absorption, food sources, requirements, deficiency and toxicity.							

Unit-10: Minerals: Physiological functions, digestion, absorption, food sources, requirements, deficiency and toxicity.

Text Books:

1. Bamji, M. S., Krishnaswamy, K., & Brahmam, G. N. V. (2017). Textbook of human nutrition (4th ed.). Oxford & IBH Publishing.
2. Mudambi, S. R., & Rajagopal, M. V. (2017). Fundamentals of foods, nutrition and diet therapy (7th ed.). New Age International Publishers.
3. Srilakshmi, B. (2023). Nutrition science (8th ed.). New Age International Publishers.
4. Srilakshmi, B. (2026). Food science (9th ed.). New Age International Publishers.
5. Swaminathan, M. (2015). Advanced textbook on food and nutrition (Vols. I & II). The Bangalore Printing & Publishing Co. Ltd.

Suggested Readings

1. Belitz, H. D., Grosch, W., & Schieberle, P. (2009). Food chemistry (4th ed.). Springer.
2. Gropper, S. S., & Smith, J. L. (2021). Advanced nutrition and human metabolism (8th ed.). Cengage Learning.
3. Potter, N. N., & Hotchkiss, J. H. (1998). Food science (5th ed.). Springer.
4. Wardlaw, G. M., & Smith, A. M. (2020). Contemporary nutrition (11th ed.). McGraw-Hill Education.
5. Whitney, E., & Rolfes, S. R. (2022). Understanding nutrition (16th ed.). Cengage Learning.

E-Resources

1. <https://www.fao.org>
2. <https://www.fssai.gov.in>
3. <https://www.ift.org>
4. <https://www.who.int>
5. <https://www.ncbi.nlm.nih.gov>
6. [e-PG Pathshala](#)
7. [SWAYAM](#)

Title of the Course		FOOD PROCESSING AND PRESERVATION					
Paper Number		2					
Category	Core	Year	I	Credit	2	Course Code	52012
		Semester	I				
Objectives							
1. Understand the basic concepts and importance of food processing and preservation. 2. Learn different methods used to process and preserve foods. 3. Understand the processing of cereals, pulses, fruits, vegetables, milk, meat, fish, beverages, and bakery products. 4. Learn the basics of food packaging, quality control, and value addition. 5. Develop knowledge of safe food processing methods for improving food quality and shelf life.							
Course Outcomes The student will be able to:							Knowledge Levels
CO1: Recall the basic principles and methods of food processing and preservation.							K1
CO2: Explain different food processing, preservation, packaging, and quality control methods.							K2
CO3: Apply suitable food processing and preservation methods to different food products.							K3
CO4: Analyze the effects of processing and preservation on food quality and shelf life.							K4
CO5: Evaluate food processing methods and recommend suitable techniques to produce safe and quality foods.							K5
K1 – Remember		K2 – Understand		K3 – Apply	K4 – Analyze	K5 – Evaluate	K6 - Create
Block-I	Introduction to Food Processing and Preservation						
Unit-1: Concept, scope and objectives of food processing; importance in food security; classification of food processing. Unit-2: Concept and principles of food preservation; importance of preservation; shelf- life extension; causes of food spoilage (microbial, enzymatic, chemical and physical); factors affecting spoilage; prevention of spoilage.							
Block-II	Methods of Food Preservation						
Unit-3: Traditional methods: Introduction to drying, salting, sugaring, fermentation and pickling; Advantages and limitations. Unit-4: Modern methods: Introduction to refrigeration, freezing, pasteurization, sterilization, canning and irradiation. Use of natural and chemical preservatives; Advantages and limitations.							
Block-III	Processing of Food Commodities -I						
Unit-5: Processing of Cereals and Pulses – Introduction to Milling; polishing; malting; extrusion; storage; preservation techniques; quality changes during processing; value-added cereal and pulse products. Unit-6: Processing of Fruits and Vegetables- Introduction to Cleaning, grading and blanching; processing into jam, jelly, marmalade, squash, pickles and chutneys; dehydration; freezing; canning; storage and preservation techniques.							
Block-IV	Processing of Food Commodities -II						
Unit-7: Processing of milk and milk products (paneer, cheese, khoa, curd, yogurt and butter); preservation of milk products; processing and preservation of meat, fish, poultry and egg. Unit-8: Processing of beverages, carbonated and non-carbonated beverages; processing of bakery products- Biscuits, bread, cakes and pizza base.							
Block-V	Food Packaging and Quality Control & Value Addition and Emerging Trends						
Unit-9: Concept, Functions and types of food packaging; packaging materials (glass, metal, plastic, paper and biodegradable materials). Unit-10: Principles of value addition- Introduction to food fortification; functional foods; nutraceuticals; emerging preservation technologies; waste utilization; by-product recovery; sustainable food processing.							

Text Books:

1. Chakraverty, A. (2019). Postharvest technology of cereals, pulses and oilseeds. Oxford & IBH Publishing.
2. Fellows, P. J., & Rathod, N. B. (Indian reprint). (Use Indian edition if prescribed by institution). (Note: If strictly Indian authors are required, use the books below instead.)
3. Lal, G. (2020). Food processing and preservation. Agrotech Publishing Academy.
4. Manay, N. S., & Shadaksharaswamy, M. (2022). Foods: Facts and principles (3rd ed.). New Age International Publishers.
5. Srilakshmi, B. (2026). Food science (9th ed.). New Age International Publishers.
6. Srivastava, R. P., & Kumar, S. (2021). Fruit and vegetable preservation: Principles and practices (6th ed.). International Book Distributing Company.

Suggested Readings:

1. DeMan, J. M. (2023). *Principles of Food Chemistry*. Springer.
2. Fellows, P. J. (2022). *Food Processing Technology: Principles and Practice* (5th ed.). Woodhead Publishing.
3. Potter, N. N., & Hotchkiss, J. H. (2022). *Food Science*. Springer.
4. Rahman, M. S. (2023). *Handbook of Food Preservation*. CRC Press.
5. Ranganna, S. (2021). *Handbook of Analysis and Quality Control for Fruit and Vegetable Products*. Tata McGraw-Hill.
6. Robertson, G. L. (2022). *Food Packaging: Principles and Practice*. CRC Press.

E-Resources

1. <https://www.fao.org/>
2. <https://www.nin.res.in/>
3. <https://www.aoac.org/>
4. <https://swayam.gov.in/>
5. <https://vlab.co.in/>

Title of the Course		FOOD MICROBIOLOGY					
Paper Number		3					
Category	Core	Year	I	Credit	2	Course Code	52013
		Semester	I				
Objectives							
1. Understand the principles and scope of food microbiology and the characteristics of food microorganisms. 2. Explain the causes of microbial contamination and spoilage in different food commodities. 3. Describe the beneficial applications of microorganisms in food fermentation and human health. 4. Understand the major food-borne diseases and their prevention. 5. Explain the methods used to control microorganisms for ensuring food safety and preservation.							
Course Outcomes							Knowledge Levels
The student will be able to:							
CO1: Recall the classification and characteristics of food microorganisms.							K1
CO2: Explain the causes of microbial contamination and spoilage in foods.							K2
CO3: Apply the principles of beneficial microorganisms in food fermentation and gut health.							K3
CO4: Analyze food-borne diseases and their preventive measures.							K4
CO5: Evaluate methods for controlling microorganisms to ensure food safety and preservation.							K5
K1 – Remember		K2 – Understand		K3 – Apply		K4 – Analyze	
						K5 – Evaluate	
						K6 – Create	
Block - I	Introduction to Food Microbiology						
Unit-1: Introduction to food microbiology, Classification of microorganisms- General characteristics of bacteria, yeast, molds, algae and viruses.							
Unit -2: Important microorganisms in foods and their sources. Role of microorganisms in food quality and safety. Intrinsic and extrinsic factors affecting microbial growth in foods. Sources of contamination during handling, processing, and storage.							
Block - II	Microbial Spoilage and Contamination of Foods						
Unit – 3: Spoilage of common foods including cereals (Rice, Maize); fruits and vegetables (Tomato, cabbage, banana and mango).							
Unit-4: Spoilage of common foods - Milk and milk products (milk and curd), meat (fresh chicken, mutton and beef), fish (Shell- fish, Fin fish) and eggs. Indicators of spoilage and methods of prevention.							
Block - III	Beneficial Microorganisms in Food						
Unit – 5: Role of microorganisms in food fermentation: dairy products (curd, cheese, kefir, buttermilk), bakery products (Bread, sourdough, bun, pizza base), alcoholic beverages (Beer, wine, cider, palm wine) and pickled foods (Sauerkraut, Kimchi, Fermented Cucumber Pickles, Fermented Olives).							
Unit – 6: Introduction to prebiotics, probiotics and synbiotics and intestinal microflora in health.							
Block - IV	Food-Borne Diseases						
Unit – 7: Food poisoning- Introduction to Bacterial food poisoning caused by organisms such as <i>Staphylococcus aureus</i> , <i>Clostridium botulinum</i> , <i>Bacillus cereus</i> , and <i>Clostridium perfringens</i> ,							
Unit – 8: Food Infections- Introduction to salmonellosis, shigellosis, cholera, and gastroenteritis.							
Block - V	Control of Microorganisms in Food						
Unit – 9: Physical methods of controlling microorganisms in foods: Control by heat (thermal processing), low temperature (refrigeration and freezing), reduced water activity, drying, low pH, modified atmosphere, and preservatives.							
Unit – 10: Chemical methods of controlling microorganisms in foods- Introduction to disinfection, Sanitization, Sterilization using chemical agents in food processing industries.							

Text Books:

1. Adams, M. R., McClure, P. J., & Moss, M. O. (2024). *Food microbiology* (5th ed.). Royal Society of Chemistry.
2. Dubey, R. C., & Maheshwari, D. K. (2023). *A textbook of microbiology*. S. Chand Publishing.
3. Jain, R., Bagade, P., Patil-Doke, K., & Ramamurthi, G. (2023). *Food microbiology*. In N. Chhikara, A. Panghal, & G. Chaudhary (Eds.), *Microbes in the Food Industry*. Wiley.
4. Srilakshmi, B. (2023). *Food science* (8th ed.). New Age International Publishers.
5. Vinayaka, K. S. (2024). *Textbook of food, dairy and environmental microbiology*. Association of Indian Biologists Publications.

Suggested Readings

1. Matthews, K. R., Kniel, K. E., & Critzer, F. J. (2024). *Food microbiology: An introduction* (5th ed.). ASM Press.
2. Ray, B., & Bhunia, A. K. (2026). *Fundamental food microbiology* (6th ed.). CRC Press. Jay, J. M. (2023). *Modern Food Microbiology* (9th ed.). Springer.
3. Montville, T. J., et al. (2023). *Food Microbiology: An Introduction*. ASM Press.
4. Parija, S. C. (2012). *Textbook of Microbiology and Immunology*. Elsevier India.
5. Ray, B., & Bhunia, A. (2022). *Fundamental Food Microbiology*. CRC Press.
6. Tortora, G. J., Funke, B. R., & Case, C. L. (2023). *Microbiology: An Introduction* (13th ed.). Pearson.
7. Robertson, G. L. (2022). *Food Packaging: Principles and Practice*. CRC Press.

E-Resources

- 1 <https://www.fao.org/>
- 2 <https://www.nin.res.in/>
- 3 <https://www.aoac.org/>
- 4 <https://swayam.gov.in/>
- 5 <https://vlab.co.in/>

Title of the Course		LAB. I: FOOD SCIENCE, MICROBIOLOGY AND PRESERVATION					
Paper Number		4					
Category	Core	Year	I	Credit	4	Course Code	52014
		Semester	I				
Objectives							
1. Learn basic laboratory techniques used in food science, microbiology, and food preservation. 2. Develop laboratory skills in food microbiology and food safety analysis. 3. Understand principles and techniques of food preservation. 4. Prepare and preserve different food products using suitable preservation techniques. 5. Enhance competency in safe food handling and application of preservation methods.							
Course Outcomes							Knowledge Levels
The student will be able to:							
CO1: Apply principles of food science in analyzing physical and chemical properties of foods.							K1
CO2: Demonstrate microbiological techniques for food safety and quality assessment.							K2
CO3: Perform preservation methods to enhance shelf life of food products.							K3
CO4: Evaluate microbial load and identify spoilage organisms in foods.							K4
CO5: Develop and standardize preserved food products with quality attributes.							K5
<i>K1 – Remember</i>		<i>K2 – Understand</i>		<i>K3 – Apply</i>	<i>K4 – Analyze</i>	<i>K5 – Evaluate</i>	<i>K6 – Create</i>
Block- I	Food Measurement and Cooking Quality						
Unit 1:							
- Determination of raw weight, cooked weight, and edible portion. - Calculation of cooking yield.							
Unit 2:							
- Effect of cooking on cereals and pulses. - Effect of cooking on vegetables and fruits.							
Unit 3:							
- Effect of cooking on milk and meat products. - Evaluation of changes in texture, colour, flavour and taste.							
Block- II	Food Quality Evaluation						
Unit 4:							
- Principles of sensory evaluation. - Organoleptic assessment of food products. - Hedonic rating test. - Difference tests (Triangle and Duo-Trio tests).							
Unit 5: Identification of sugar cookery stages:							
➤ Thread ➤ Soft ball ➤ Firm ball ➤ Hard ball ➤ Soft crack ➤ Hard crack ➤ Caramelization							
Block- III	Food Microbiology						
Unit 6:							
- Laboratory safety and aseptic techniques. - Preparation of culture media. - Isolation of microorganisms from food samples.							
Unit 7:							
- Enumeration using serial dilution and plate count methods. - Demonstration of Shelf- life study of food sample.							

Unit 8:	
• Pure culture techniques. • Gram staining. • Motility test.	
Block- IV	Biochemical Identification and Food Preservation
Unit 9:	
• Starch hydrolysis test. • Gelatin hydrolysis test. • Casein hydrolysis test.	
Unit 10:	
• Drying and dehydration. • Refrigeration and freezing.	
Unit 11:	
• Heat processing (pasteurization and sterilization). • Preservation using sugar, salt, and chemical preservatives.	
Block- V	Preparation of Preserved Food Products
Unit 12: Preparation of Fruit and Vegetable Preserves	
• Jam. • Jelly. • Marmalade. • Pickles.	
Unit 13: Preparation of Beverages	
• Squash. • Fruit beverages.	
Unit 13: Packaging and storage- (Glass bottles, PET bottles, aseptic cartons, aluminium cans, and flexible pouches).	
Unit 15: Quality assessment and shelf-life evaluation of preserved products.	
Text Books:	
1. Aneja, K. R. (2022). Experiments in microbiology, plant pathology and biotechnology (5th ed.). New Age International Publishers. 2. Potter, N. N., & Hotchkiss, J. H. (Indian Reprint). (2021). Food science (5th ed.). CBS Publishers & Distributors. 3. Sivasankar, B. (2021). Food processing and preservation. PHI Learning Pvt. Ltd. 4. Srilakshmi, B. (2023). Food science (8th ed.). New Age International Publishers.	
Suggested Readings:	
1. Fellows, P. J. (2022). Food processing technology: Principles and practice (5th ed.). Woodhead Publishing. 2. Jay, J. M., Loessner, M. J., & Golden, D. A. (2019). Modern food microbiology (8th ed.). Springer. 3. Tortora, G. J., Funke, B. R., & Case, C. L. (2021). Microbiology: An introduction (13th ed.). Pearson. 4. Vaclavik, V. A., & Christian, E. W. (2019). Essentials of food science (5th ed.). Springer. 5. Nielsen, S. S. (2017). Food analysis (5th ed.). Springer.	
E-Resources	
1. https://www.fssai.gov.in 2. https://www.who.int/health-topics/food-safety 3. https://www.fao.org 4. https://www.nin.res.in 5. https://www.fao.org/fao-who-codexalimentarius	

Title of the Course		INNOVATION IN FOOD PRODUCT DEVELOPMENT					
Paper Number		5					
Category	Core	Year	I	Credit	2	Course Code	52021
		Semester	II				
Objectives							
1. Understand the principles and stages involved in new food product development. 2. Explain consumer research, sensory evaluation and market testing in food product development. 3. Understand innovative food processing technologies used for developing safe and functional foods. 4. Describe smart packaging, food storage methods and factors influencing shelf life. 5. Understand food safety, quality control systems and food regulations for quality assurance.							
Course Outcomes							Knowledge Levels
The student will be able to:							
CO1: Recall the principles and stages of new food product development.							K1
CO2: Understand sensory evaluation and consumer research in food product development.							K2
CO3: Apply innovative food processing technologies in food product development.							K3
CO4: Analyze the role of packaging and storage in maintaining food quality and shelf life.							K4
CO5: Evaluate food safety, quality control and regulatory systems in the food industry.							K5
K1 - Remember	K2 - Understand	K3 - Apply	K4 - Analyze	K5 - Evaluate	K6 - Create		
Block-I	New Food Product Development						
Unit-1: Basic principles of food product development: Sensory properties of food and their role in product development. Evaluation of food- objective and subjective methods, selection and training of judges, development of score cards and analysis of data. Unit-2: Concept of new food product development – General classes of new food products, reasons for new food product, new food product life cycle.							
Block - II	Stages of New Product Development						
Unit-3: Consumer Surveys, Idea Generation, Sources, Screening, Translation of idea to product prototype, Product testing. Unit-4: Consumer research evaluation- development of schedule and data analysis. Market testing, Pre-Commercialization and Product launch.							
Block-III	Innovative Food Processing Technologies						
Unit-5: Introduction to modern food processing methods; principles and applications of extrusion, fermentation, and encapsulation technologies; non-thermal food processing techniques - advantages, limitations, and applications in improving food quality, safety, and shelf life. Unit-6: Biotechnology in food development; Smart and sustainable processing technologies – Microwave processing, Ultrasound processing, High Pressure processing (HPP), Pulse Electric Field (PEF) processing; Use of functional foods and bioactive components in new food product development.							
Block-IV	Smart Packaging and Storage Techniques						
Unit-7: Smart packaging- types, packaging materials (Glass bottles, PET bottles, metal cans, flexible laminated pouches and rigid plastic containers) and packaging technologies for food products. Unit-8: Introduction to food storage and shelf life, Factors affecting storage- temperature, moisture, light and microorganisms; Dry storage methods, Refrigerated and frozen storage, Storage of processed and ready-to-eat foods; Quality changes during storage; Shelf-life evaluation of new food products.							
Block-V	Food safety and quality control						
Unit-9: Introduction to food safety and quality control, Food contamination- physical, chemical and microbial hazards, Good Manufacturing Practices (GMP) and Good Hygienic Practices (GHP). Unit-10: Hazard Analysis and Critical Control Point (HACCP), Food standards and regulations; Food adulteration and food labelling, Quality assurance in food industries.							

Text book:

1. Earle, M., Earle, R., & Anderson, A. (2023). *Food product development: Maximising success* (2nd ed.). Woodhead Publishing.
2. Fellows, P. J. (2022). *Food processing technology: Principles and practice* (5th ed.). Woodhead Publishing.
3. Varzakas, T., & Tzia, C. (2023). *Handbook of food processing: Food preservation and processing technologies*. CRC Press.
4. Siddiqui, M. W. (Ed.). (2023). *Postharvest management and value addition of fruits and vegetables*. Apple Academic Press.
5. Sharma, H. K., & Kaur, B. (Eds.). (2022). *Food engineering and processing technology*. CRC Press.

Suggested Readings:

1. Fuller, G. W. (2023). *New food product development: From concept to marketplace* (4th ed.). CRC Press.
2. Earle, M., Earle, R., & Anderson, A. (2024). *Food product development: Maximising success* (2nd ed.). Woodhead Publishing.
3. Gordon, W. V. (2023). *Principles and applications of food product development*. Springer.
4. Man, D., & Jones, A. A. (2025). *Shelf life evaluation of foods* (3rd ed.). Springer.
5. Hui, Y. H. (2024). *Handbook of food products manufacturing* (2nd ed.). Wiley Publishers.
6. Robertson, G. L. (2023). *Food packaging: Principles and practice* (4th ed.). CRC Press.
7. Sun, D. W. (2025). *Emerging technologies for food processing* (3rd ed.). Academic Press.

E- Resources:

1. <https://www.fao.org>
2. <https://www.fssai.gov.in>
3. <https://www.ift.org>
4. <https://www.who.int>
5. <https://www.ncbi.nlm.nih.gov>

Title of the Course		NUTRITIONAL BIOCHEMISTRY AND MEAL MANAGEMENT					
Paper Number		6					
Category	Core	Year	I	Credit	2	Course Code	52022
		Semester	II				
Objectives							
1. Understand the metabolism and functions of carbohydrates, proteins, fats, vitamins, minerals, enzymes and nucleic acids. 2. Learn the basics of bioenergetics, enzyme action, acid-base balance and fluid and electrolyte balance. 3. Understand the principles of meal planning and nutrition counselling for different age groups. 4. Learn to plan and modify diets for normal health, pregnancy, lactation, weight management and sports. 5. Develop skills to prepare balanced meal plans based on nutritional needs.							
Course Outcomes The student will be able to:							Knowledge Levels
CO1: Recall the functions, metabolism and importance of nutrients and other biochemical components.							K1
CO2: Explain the principles of metabolism, meal planning and nutritional needs at different stages of life.							K2
CO3: Apply the principles of meal planning and diet modification for healthy individuals and special conditions.							K3
CO4: Analyze the nutritional requirements of different age groups, weight management, and sports persons.							K4
CO5: Evaluate meal plans and recommend suitable diets to promote health and improve nutritional status.							K5
K1 <i>Remember</i>	K2 – <i>Understand</i>	K3 – <i>Apply</i>	K4 – <i>Analyze</i>	K5 – <i>Evaluate</i>	K6 – <i>Create</i>		
Block-I	Metabolism of Biomolecules-I						
Unit 1: Carbohydrates- classification, properties, metabolism – (glycolysis, glycogenesis, glycogenolysis, gluconeogenesis, TCA cycle) utilization and biological significance. Unit 2: Protein- classification, properties, metabolism (ketogenesis, and urea cycle), utilization and biological significance. Introduction to nucleic acids and its biological significance.							
Block-II	Metabolism of Biomolecules-II						
Unit 3: Fat- classification, properties, metabolism beta-oxidation of fatty acids, utilization and biological significance. Unit 4: Bioenergetics and transport mechanisms. Enzymes and coenzymes – classification and factors affecting enzyme activity. Biological buffer systems, acid-base balance, fluid and electrolyte balance, and biochemical functions of vitamins and minerals.							
Block-III	Principles of Meal Management -I						
Unit-5: Objectives of meal management, role of dietitian and nutritionist, Meal planning, Modifications of diet - liquid, semi-liquid, soft, bland, light, and regular diets; Nutrition counselling. Unit-6: Principles of meal management during Pregnancy and lactation.							
Block-IV	Principles of Meal Management-II						
Unit- 7: Principles of meal management during Infancy, Preschool and School- going children. Unit- 8: Principles of meal management during Adolescents, Adults and Old-age.							
Block-V	Weight Management and Sports Nutrition						
Unit-9: Nutritional management of underweight, obesity.							

Unit- 10: Sports Nutrition- Introduction to sports nutrition; Energy requirements of athletes; carbohydrates, proteins and fats requirements in sports performance; Importance of hydration and electrolyte balance; Pre-, during-, and post-exercise nutrition. Sports supplements: types, benefits, and precautions.

Text Books:

1. Chawla, R. (2020). Textbook of nutritional biochemistry (3rd ed.). Jaypee Brothers Medical Publishers.
2. Gopalan, C. (2019). Nutritive value of Indian foods (Revised ed.). National Institute of Nutrition (ICMR).
3. Mudambi, S. R., & Rajagopal, M. V. (2021). Fundamentals of foods, nutrition and diet therapy (7th ed.). New Age International Publishers.
4. Srilakshmi, B. (2023). Nutrition science (9th ed.). New Age International Publishers.
5. Swaminathan, M. (2021). Advanced textbook on food and nutrition (Vol. 1). The Bangalore Printing & Publishing Co.

Suggested Readings

1. Gibney, M. J., Lanham-New, S. A., Cassidy, A., & Vorster, H. H. (2023). Introduction to human nutrition (3rd ed.). Wiley-Blackwell.
2. Gropper, S. S., & Smith, J. L. (2023). Advanced nutrition and human metabolism (8th ed.). Cengage Learning.
3. Nelson, D. L., & Cox, M. M. (2021). Lehninger principles of biochemistry (8th ed.). W. H. Freeman.
4. Rodwell, V. W., Bender, D. A., Botham, K. M., Kennelly, P. J., & Weil, P. A. (2023). Harper's illustrated biochemistry (32nd ed.). McGraw-Hill Education.
5. Whitney, E., & Rolfes, S. R. (2022). Understanding nutrition (16th ed.). Cengage Learning.

E-Resources

1. <https://www.nih.gov>
2. <https://www.who.int>
3. <https://www.fao.org>
4. <https://www.nin.res.in>
5. <https://www.ncbi.nlm.nih.gov>
6. <https://nptel.ac.in>
7. <https://www.coursera.org>
8. <https://medlineplus.gov>

Title of the Course		PUBLIC HEALTH NUTRITION					
Paper Number		7					
Category	Core	Year	I	Credit	2	Course Code	52023
		Semester	II				
Objectives							
1. Understand the fundamental concepts, scope and importance of public health nutrition in improving population health. 2. Examine the determinants of nutritional status, food security, and public health systems in India. 3. Develop knowledge on various forms of malnutrition and methods of nutritional assessment. 4. Apply nutrition interventions and community-based strategies for improving health across the life cycle. 5. Evaluate national nutrition programmes, policies, and nutritional surveillance systems for effective implementation.							
Course Outcomes						Knowledge Levels	
The student will be able to:							
CO1: Recall concepts related to public health nutrition, malnutrition, food security and nutritional surveillance.						K1	
CO2: Explain the role of nutrition in health promotion, disease prevention and well-being across the life cycle.						K2	
CO3: Apply nutrition intervention strategies to improve the nutritional status of individuals and communities.						K3	
CO4: Analyze the various determinants of malnutrition and their socio-economic, cultural, and environmental influences.						K4	
CO5: Evaluate the effectiveness of national nutrition programmes, policies and surveillance systems.						K5	
K1 - Remember		K2 - Understand	K3 - Apply	K4 - Analyze	K5 - Evaluate	K6 - Create	
Block - I	Introduction to Public Health Nutrition						
Unit-1: Concept, scope and importance of public health nutrition. Role of nutrition in promoting health and preventing deficiency diseases. Unit-2: Concepts of positive health, malnutrition (undernutrition, overnutrition, micronutrient deficiencies), nutritional status, nutrition education, supplementation and food substitutes.							
Block - II	Determinants of Nutrition and Food Security						
Unit- 3: Determinants of nutritional status including biological, socio-cultural, economic and environmental factors. Food and nutrition security: availability, accessibility, utilization and stability. Unit-4: Structure of primary health care and public health systems in India. Strategies to improve nutrition including food-based approaches, supplementation, fortification and behavior change communication.							
Block - III	Malnutrition and Nutritional Assessment						
Unit-5: Major nutritional problems in India such as Protein-Energy Malnutrition, Anemia, Vitamin A deficiency, and Iodine deficiency disorders. Causes, prevalence and prevention of malnutrition. Unit-6: Methods of assessing nutritional status including anthropometric, biochemical, clinical, and dietary assessment, along with indirect indicators such as morbidity and mortality.							
Block - IV	National Nutrition Intervention Programmes						
Unit-7: Importance of nutrition during different stages of the life cycle with emphasis on the first 1000 days. Infant and young child feeding practices, maternal nutrition; National prophylaxis programmes for IDA, VAD and IDD. Unit-8: Planning, implementation and evaluation of nutrition education and intervention programmes.							
Block - V	Nutritional Surveillance						
Unit-9: Concept, types, and importance of nutritional surveillance in planning and evaluation. National nutrition surveillance programmes and surveys (National Family Health Survey (NFHS),							

Comprehensive National Nutrition Survey (CNNS) and Poshan Tracker).

Unit-10: Overview of major National Nutrition Programmes- Ministry of Health and Family Welfare, Ministry of Women and Child Development (MWCD), Indian Council of Medical Research (ICMR), National Institute of Nutrition (NIN), Food Safety and Standards Authority of India (FSSAI), National Health Mission (NHM), Integrated Child Development Services (ICDS).

International Nutrition Programmes - World Health Organization (WHO), Food and Agriculture Organization (FAO), United Nations Children's Fund (UNICEF).

Text Books:

1. Gopalan, C. (2019). Nutritive value of Indian foods (Revised ed.). National Institute of Nutrition (ICMR).
2. Mudambi, S. R., & Rajagopal, M. V. (2021). Fundamentals of foods, nutrition and diet therapy (7th ed.). New Age International Publishers.
3. Park, K. (2023). Park's textbook of preventive and social medicine (27th ed.). Banarsidas Bhanot Publishers.
4. Srilakshmi, B. (2023). Dietetics (9th ed.). New Age International Publishers.
5. Swaminathan, M. (2021). Advanced textbook on food and nutrition (Vol. 2). The Bangalore Printing & Publishing Co.

Suggested Readings

1. Gibney, M. J., Lanham-New, S. A., Cassidy, A., & Vorster, H. H. (2023). Introduction to human nutrition (3rd ed.). Wiley-Blackwell.
2. Mahan, L. K., & Raymond, J. L. (2024). Krause's food and the nutrition care process (16th ed.). Elsevier.
3. Mann, J., & Truswell, A. S. (2023). Essentials of human nutrition (6th ed.). Oxford University Press.
4. Whitney, E., & Rolfes, S. R. (2022). Understanding nutrition (16th ed.). Cengage Learning.
5. World Health Organization. (2021). Guideline: Healthy diet. World Health Organization.

E-Resources

1. <https://www.unicef.org/>
2. <https://www.who.int/>
3. <https://www.wfp.org/>
4. <https://www.nin.res.in/>
5. <https://www.undp.org/>

Title of the Course		LAB. II: FOOD PRODUCT DEVELOPMENT AND NUTRITION					
Paper Number		8					
Category	Core	Year	I	Credit	4	Course Code	52024
		Semester	II				
Objectives							
1. Develop skills in formulation and standardization of food products. 2. Apply principles of nutrition in product development for different population groups. 3. Understand nutrient enhancement and value addition techniques. 4. Evaluate sensory, nutritional, and shelf-life quality of developed products. 5. Promote innovation and entrepreneurship in food product development.							
Course Outcomes							Knowledge Levels
The student will be able to:							
CO1: Design and develop nutritionally balanced food products.							
CO2: Apply principles of applied nutrition in planning functional foods.							
CO3: Perform sensory and nutritional evaluation of developed products.							
CO4: Analyze shelf-life and storage stability of food products.							
CO5: Demonstrate skills in product standardization, packaging, and labelling.							K5
K1 – Remember	K2 – Understand	K3 – Apply		K4 – Analyze	K5 – Evaluate	K6 - Create	
Block- I	Principles of Food Product Development						
Unit 1: - Standardization of recipes through trial preparation. - Cost calculation of food products.							
Unit 2: - Portion size determination and Yield calculation. - Demonstration of baking techniques.							
Unit 3: - Moist and dry heat cooking methods. - Evaluation of processed food quality.							
Block- II	Development of Value-Added Food Products						
Unit 4: Development of value-added products using: - Cereals and millets - Pulses and legumes - Fruits and vegetables - Milk and milk products							
Unit 5: - Formulation of energy-rich foods. - Development of protein-rich foods.							
Unit 6: - Preparation of fibre-enriched foods. - Development of convenience and ready-to-eat foods.							
Block- III	Applied Nutrition in Product Development						
Unit 7: Low-cost Food Product development for: - Pregnant and lactating women - Infants and children							
Unit 8: Low-cost Food Product development for: - Adolescents - Adults - Elderly individuals							
Block- IV	Public Health Nutrition Practices						
Unit 9: Preparation of IEC materials: Posters							

	○ Pamphlets ○ Flip charts
Unit 10:	Designing nutrition awareness campaigns.
Unit 11:	
	• Conducting nutrition education sessions. • Community and school-based nutrition awareness activities.
Block- V	Community Nutrition and Field Exposure
Unit 12:	
	• Planning low-cost balanced diets. • Meal planning for vulnerable groups- Iron deficiency anemia, Protein-energy malnutrition (PEM), Iodine Deficiency Disorders (IDD), Vitamin A Deficiency (VAD).
Unit 13:	Field visit to:
	○ Anganwadi Centre ○ Primary Health Centre (PHC)
Unit 14:	Assess the nutritional status and dietary practices of individuals in a community.
Unit 15:	Report writing and presentation.
Text Books	
	1. Manay, N. S., & Shadaksharaswamy, M. (2021). Foods: Facts and principles (3rd ed.). New Age International Publishers. 2. Mudambi, S. R., & Rajagopal, M. V. (2021). Fundamentals of foods, nutrition and diet therapy (7th ed.). New Age International Publishers. 3. Srilakshmi, B. (2022). Food science (8th ed.). New Age International Publishers. 4. Srilakshmi, B. (2023). Nutrition science (7th ed.). New Age International Publishers. 5. Swaminathan, M. (2020). Food science, chemistry and experimental foods. The Bangalore Printing & Publishing Co. Ltd.
Suggested Readings	
	1. Gopalan, C., Rama Sastri, B. V., & Balasubramanian, S. C. (2024). Nutritive value of Indian foods (Revised ed.). Indian Council of Medical Research–National Institute of Nutrition (ICMR-NIN). 2. Khader, V. (2021). Textbook of food science and nutrition. Kalyani Publishers. 3. Longvah, T., Ananthan, R., Bhaskarachary, K., & Venkaiah, K. (2017). Indian food composition tables. Indian Council of Medical Research–National Institute of Nutrition (ICMR-NIN). 4. National Institute of Nutrition. (2024). Dietary guidelines for Indians – A manual (2nd ed.). Indian Council of Medical Research (ICMR-NIN). 5. Potter, N. N., Hotchkiss, J. H., & Banwart, G. J. (2019). Food science (5th ed.). CBS Publishers & Distributors (Indian Reprint).
E-Resources	
	1. https://www.fssai.gov.in 2. https://www.nin.res.in 3. https://www.fao.org 4. https://www.fao.org/fao-who-codexalimentarius 5. https://www.who.int/nutrition

DIPLOMA PROGRAMME IN YOGA

COURSE OF STUDY AND SCHEME OF EXAMINATION

S. No.	TITLE OF THE COURSE	Course Code	No. of Credits	T/P	Marks		Total
					Internal	External	
1	Historical Development of Yoga	52111	2	T	25	75	100
2	Human Anatomy and Physiology – I	52112	2	T	25	75	100
3	Principles and Methodology of Yoga Teaching	52113	2	T	25	75	100
4	Yoga Practical – I	52114	4	P	25	75	100
	Total		10		100	300	400
5	Yogic Texts	52121	2	T	25	75	100
6	Human Anatomy and Physiology – II	52122	2	T	25	75	100
7	Application of Yoga in Modern Life	52123	2	T	25	75	100
8	Yoga Practical – II	52124	4	P	25	75	100
	Total		10		100	300	400
	Grand Total		20		200	600	800

T-Theory

P-Practical

Title of the Course		HISTORICAL DEVELOPMENT OF YOGA					
Paper Number		1					
Category	Core	Year	I	Credit	2	Course Code	52111
		Semester	I				
Objectives							
1. To understand the origin, evolution, and development of yoga through different historical periods. 2. To study the contributions of ancient yogic texts, traditions, and eminent yoga scholars. 3. To explain the growth of yoga from traditional practices to modern global applications. 4. To familiarize students with the historical, cultural, and philosophical background of yoga. 5. To develop an appreciation of the role of yoga in promoting health, wellness, and human development across generations							
Course Outcomes							
The Student will be able to: 1. Explain the origin, evolution, and historical development of Yoga from the Vedic period to the contemporary era. 2. Describe the contribution of major yogic traditions, classical texts, and eminent sages in the development of Yoga philosophy and practice. 3. Differentiate the characteristics of Yoga during the Pre-Vedic, Vedic, Epic, Classical, Medieval, and Modern periods, highlighting significant developments in each era. 4. Analyze the influence of various schools of Yoga (Raja, Hatha, Bhakthi, Karma, Jnana, Tantra etc.) on the evolution of yogic traditions and contemporary yoga practices. 5. Evaluate the role of Yoga in promoting health, spirituality, and global well-being, and appreciate its relevance in the present-day context.							
Block: I		Foundations and Pre-Vedic Roots of Yoga					
Unit-1: Meaning and Definitions of Yoga: Etymology of the word <i>Yoga</i> (root <i>Yuj</i>); traditional and contemporary definitions; the ultimate goals of yoga. Antiquity of Yoga: The Indus Valley Civilization: Archaeological findings at Harappa and Mohenjo-daro; analysis of the Pashupati seal and terracotta figures in yogic postures. Yoga in Buddhism Traditions: The ascetic movement; Arya Astangamarga; the technique of Anapanasati.							
Unit-2: Core concept in Early Jainism: Evolution of asceticism (<i>Tapas</i>) in Jain history; the concepts of <i>Asrava</i> (influx of karma) and <i>Samvara</i> (stoppage) as early yogic mechanics. Early Buddhism and the Ascetic Path: Siddhartha Gautama's practices under early teachers (Alara Kalama and Uddaka Ramaputta); Arya Astangamarga; the technique of Anapanasati.							
Block - II		VEDIC AND UPANISHAD IN EVOLUTION					
Unit- 3: Elements if Yoga in the Vedas: Seeds of yogic thought in the Rig Veda (metaphor of the two birds, the Kesin hymn); early concepts of <i>Tapas</i> (austerity) and <i>Rta</i> (cosmic order). The Internalization of Rituals in the Aranyakas and Brahmanas: Shift from external fire sacrifices (<i>Yajna</i>) to internal mental sacrifices (<i>Prana-Agnihotra</i>). Yoga in the Principal Upanishads: The dawn of Jnana (knowledge); early references to meditation and the soul (<i>Atman</i>) in the Brihadaranyaka and Chandogya Upanishads.							
Unit-4: Systematic Yoga in the Katha and Shvetashvatara Upanishads: The first formal definition of yoga as control of the senses in the Katha Upanishad; description of the ideal							

environment and physical signs of yoga progress in the Shvetashvatara Upanishad. The Later Yoga Upanishads: Overview of the minor Upanishads dedicated explicitly to yogic anatomy, <i>Nadis</i> (energy channels), <i>Chakras</i> , and <i>Pranayama</i> .	
Block - III	EPIC AND CLASSICAL PERIODS (THE SYNTHESIS)
Unit-5: Yoga in the Mahabharata : The concepts of <i>Sankhya</i> (philosophy) and <i>Yoga</i> (practice) in the MokshadharmaParva; the introduction of the legendary figure Hiranyagarbha. The Gita Synthesis :Karma and Bhakti Yoga: Historical context of the Bhagavad Gita; <i>Karma Yoga</i> (the yoga of selfless action) and <i>Bhakti Yoga</i> (the yoga of devotion) as paths to liberation. The Gita Synthesis: Jnana and Dhyana Yoga: <i>Jnana Yoga</i> (the yoga of knowledge) and <i>Dhyana Yoga</i> (the yoga of meditation); the integration of life style balance(<i>Mitahara</i>). Unit-6: Patanjali's Yoga Sutras: Codification of Classical Yoga: The background of Maharishi Patanjali ;the historical transition from pre-classical diversity to classical Raja Yoga. The Eight Limbs (Ashtanga Yoga) and the Mind: Brief historical overview of the structural framework of the Yoga Sutras: Chitta Vritti (mental fluctuations),Kriya yoga, and the journey from Yama to Samadhi	
Block - IV	POST-CLASSICAL,TANTRIC,AND HATHA YOGA FOUNDATIONS
Unit-7: The Tantric Shift and the Sacred Body : The rise of Tantra; viewing the physical body not as an obstacle to liberation, but as a vehicle for spiritual awakening. Origins and Masters of Hatha Yoga: The Natha Line age; the historical contributions of Matsyendranath and Gorakshanath; the transition from asceticism to a structured physical science. Evolution of Hatha Texts: Hatha Yoga Pradipika: Analysis of Swami Swatmarama's text; the four limbs: Asana, Pranayama, Mudra /Bandha, and Nadanusandhana (concentration on inner sound). Unit-8: Evolution of Hatha Texts: Gheranda Samhita and Shiva Samhita: The Saptanga Yoga (seven- fold path) of Sage Gheranda featuring Shat karmas(cleansing practices);philosophical foundations of the Shiva Samhita. Bhakti Movements and Yoga in Medieval India: The interaction of SantMat, Sufism, and vernacular Bhakti saints (like Kabir,Mirabai, and Tukaram) with regional yogic practices.	
Block - V	THE RENAISSANCE AND MODERN GLOBAL YOGA
Unit-9: The 12th-Century Revival and Swami Vivekananda : The socio-religious renaissance in India; Swami Vivekananda's address at the 1893 Parliament of Religions; the publication of his book RajaYoga. The Modern Pioneers: Sri Aurobindo and Swami Sivananda: Sri Aurobindo's Integral Yoga; Swami Sivananda of Rishikesh, the Divine Life Society, and the synthesis of the "Yoga of Synthesis." The Mysore Palace Renaissance: T.Krishnamacharya: Tirumalai Krishnamacharya's revival of physical yoga; blending traditional Hatha practices with dynamic movements; his influence as the "Father of Modern Yoga." Unit-10: The Global Dispersion of Yoga: The line ages of Krishnamacharya's prominent students: B.K.S.Iyengar (alignment and props), K.PattabhiJois (Ashtanga Vinyasa), Indra Devi, and T.K.V.Desikachar (Vini yoga). Yoga in the 21st Century: The scientific validation of yoga; its integration in to modern health care, mental health, and education; the establishment of International Day of Yoga(June21).	

Text Books:

1. **Bryant, Edwin F.** (2009). *The Yoga Sutras of Patanjali: A new Translation and Commentary*. North Point Press.
2. **Dasgupta, Surendranath.** (1922). *A History of Indian Philosophy*(Vol.1). Cambridge University Press.
3. **Eliade, Mircea.** (1958). *Yoga: Immortality and Freedom*. Princeton University Press.
4. **Feuerstein, Georg.** (2008). *The Yoga Tradition: Its History, Literature, Philosophy and Practice*. Hohm Press.
5. **Mallinson, James, Singleton, Mark.**(2017). *Roots of Yoga*. Penguin Classics.

Suggested Readings:

1. **Saraswati, Swami Satyananda.**(2002). *Asana Pranayama Mudra Bandha*. Yoga Publications Trust, Munger.
2. **Singleton, Mark.** (2010). *Yoga Body: The Origins of Modern Posture Practice*. Oxford University Press.
3. **Swami Swatmarama.** *The Hatha Yoga Pradipika*, Kaivalyadhama
4. **Ramesh B Jones** : A Brief history of Yoga
5. **Alistair Shearer:** The Story of Yoga from India to the Contemporary World

E-Resources

1. <https://www.sacred-texts.com/hin/yog/index.htm>
2. <https://www.gutenberg.org>
3. <https://archive.org>
4. <https://archive.org/details/digitallibraryindia>

Title of the Course		HUMAN ANATOMY AND PHYSIOLOGY – I					
Paper Number		2					
Category	Core	Year	I	Credit	2	Course Code	52112
		Semester	I				
Objectives							
1. To understand the structure of the human body by studying the organization, location, and relationships of cells, tissues, organs, and organ systems. 2. To explain the functions of body systems and how different organs work together to maintain normal physiological processes. 3. To relate anatomical structures to physiological functions, demonstrating how the form of each organ supports its specific role in the body. 4. To apply the anatomical and physiological knowledge to ensure safe and effective yoga instruction 5. To develop an understanding of the principles of health, hygiene, Nutrition and healthy Lifestyle Practices for the promotion of physical and mental wellbeing.							
Course Outcomes							
The Student will be able to:							
1. Explain the basic concepts of human anatomy and physiology, including anatomical terminology, body organization, tissues, and body systems. 2. Describe the structure and functions of bones, joints, and the skeletal system, and explain their role in movement, posture, and yogic practices. 3. Explain the composition and functions of blood, and describe the structure and functions of the heart and circulatory system in maintaining homeostasis. 4. Describe the anatomy and physiology of the respiratory and digestive systems, and explain their importance in breathing, metabolism, nutrition, and overall health. 5. Apply the knowledge of human anatomy and physiology to understand the physiological effects of yoga practices and promote safe and effective yoga instruction.							
Block: I	Introduction						
Unit-1: Definition of Anatomy, physiology- Cell- structure and function							
Unit-2: Tissue -structure and function. Types of tissues- Muscular system- types of muscles and its functions							
Block - II	Skeletal system						
Unit- 3: Anatomy of skeleton- structure and functions- Classification of bones							
Unit-4: Joints-Definition and types with examples- Functions- Effects of Yoga on Skeletal Diseases							
Block - III	Circulatory system						
Unit-5: Blood - composition and function- Classification of blood cells and plasma.							
Unit-6: Heart structure and function- Mechanism of circulation: Systemic and Pulmonary.							
Block - IV	Respiratory system						
Unit-7: Respiration- Definition, parts- Mechanism of breathing							
Unit-8: Vital Capacity- Effects of Yoga on prevention of Respiratory disease							
Block - V	Digestive System						
Unit-9: Digestive system- structure and functions- Balanced diet and nutrition- carbohydrates,							

proteins, fats

Unit-10: Accessory organs- Liver, Spleen, Pancreas- Effects of yoga on Digestive system

Text Books:

01. Dr. Selvam “ Anatomy and Physiology” Bodinayakanur.
02. Dr. N.M. MUTHAYYA “Physiology” J.J. Publications, Madurai.
03. SEELEY et. all Anatomy and Physiology Mc Graw Hill.
04. Anatomy & Physiology - Anne Waugh & Allison.
05. Human Anatomy –Dr.Chaurasia B.D.
06. Yogic Human Anatomy and Physiology- Dr.Hiralal Sharma

Suggested Readings

1. Human Anatomy –Dr.Chaurasia B.D.
2. Yogic Human Anatomy and Physiology- Dr.Hiralal Sharma
3. Human Anatomy and Physiology- Dr.N.Muruges
4. Yoga Anatomy by leslie Kaminoff amy Mathews
5. Essentials of Human anatomy and Physiology by Elaine N.Marieb

E-Resources

1. <https://openstax.org/books/anatomy-and-physiology-2e/pages/1-2-structural-organization-of-the-human-body>
2. <https://www.britannica.com/science/human-body>

Title of the Course		PRINCIPLES AND METHODOLOGY OF YOGA TEACHING					
Paper Number		3					
Category	Core	Year	I	Credit	2	Course Code	52113
		Semester	I				
Objectives							
1. To understand the fundamental principles of yoga teaching, including the philosophy, ethics, and responsibilities of a yoga teacher. 2. To develop effective teaching skills for planning, organizing, demonstrating, and instructing yoga practices for individuals and groups. 3. To acquire knowledge of teaching methodologies for āsanas, prāṇāyāma, meditation, relaxation techniques, and cleansing practices, ensuring safe and systematic instruction. 4. To learn how to design and adapt yoga sessions according to the age, health status, physical abilities, and specific needs of different populations. 5. To apply effective communication, observation, and assessment techniques to create a safe, inclusive, and supportive learning environment while promoting the therapeutic and educational benefits of yoga.							
Course Outcomes							
The Student will be able to:							
1. Explain the fundamental principles, ethics, and professional responsibilities of a yoga teacher, including the importance of effective communication and teacher–student relationships. 2. Demonstrate knowledge of the methods and techniques for planning and conducting yoga classes, including lesson planning, sequencing, and time management. 3. Apply appropriate teaching methodologies for instructing yogic practices such as Āsana, Prāṇāyāma, Kriyā, Mudrā, Bandha, relaxation, and meditation to individuals and groups. 4. Identify the need for modifications, precautions, contraindications, and safety measures while teaching yoga to learners of different age groups and health conditions. 5. Evaluate and improve yoga teaching practices through observation, self-reflection, assessment, and feedback to ensure effective and learner-centred instruction.							
Block: I		FUNDAMENTALS OF INSTRUCTIONAL PEDAGOGY IN YOGA					
Unit-1: Meaning, Scope, and Purpose of Yoga Teaching: The distinction between a general fitness instructor and a yoga educator; the spiritual and educational responsibilities of a yoga teacher; understanding the unique needs of a yoga student. Communication Skills for the Yoga Teacher: Voice modulation, projection, and tone; clarity in verbal cues; the art of using concise, action-oriented directives (<i>drishti</i> , breath, and placement cues) rather than overly conversational fillers. Visual and Physical Demonstration Principles: When to demonstrate a posture vs. when to observe the room; spatial awareness and positioning the teacher's mat; mirror-image teaching techniques.							
Unit-2: The Psychology of the Student-Teacher Relationship: Establishing trust and creating a safe container (<i>Satsang</i> environment); setting professional boundaries; understanding projections and managing group energy dynamics. Traditional Lineage and the Guru-Shishya Parampara: The historical context of knowledge transmission in India; adapting the classical <i>Guru-Shishya</i> (Master-Disciple) model to a modern, respectful, and inclusive classroom dynamic.							

Block - II	ART OF ASANA SEQUENCING AND CLASS ARCHITECTURE
Unit- 3: Principles of Smart Sequencing (Vinyasa Krama): The science of step-by-step progression (Vinyasa Krama); preparing specific joint groups and target muscles before attempting complex or demanding postures. Class Arche types and Structuring a 60 Minute Session: Anatomy of a class: Centering/Opening, Warm-up (Dynamic movements/Surya Namaskar), Standing Poses, Balancing Poses, Inversions, Back bends, Twists, Forward Folds, and Shavasana. Theme-Based Class Design: How to weave structural focuses (e.g.,hip-opening, core stability) or philosophical Topics (e.g., Ahimsa, the Chakras) organically in to physical practice without disrupting flow. Unit-4: Pacing, Transitioning, and Rhythm: Managing the biologicalar of a class (raising the heart rate and bringing it down); smooth transitions between floor work, standing poses, and prone/supine states. Designing Practices for Non-Asana Limbs: Methodologies for integrating <i>Pranayama</i>, basic <i>Kriyas</i>, and guided meditation or <i>Yoga Nidra</i> in to a standard curriculum format.	
Block - III	Adjustment Dynamics, Props, and Class room Safety
Unit-5: The Ethics and Mechanics of Hands-On Adjustments: Obtaining explicit consent; standard guidelines for safe physical contact; directional assists vs. forcing a student deeper in to a posture. Verbal and Visual Trouble shooting: Identifying common structural errors from across the room (e.g., hyper extended knees, collapsed lower backs);using anatomical benchmarks to trigger self-correction. Technical Mastery of Yoga Props: Integrating blocks , straps, bolsters, blankets, and wall setups into standard classes to maximize accessibility, modify range of motion, and deepen restoration. Unit-6: Injury Prevention and Kinesiological Limits: Understanding vulnerability in high-risk zones: knees, lower back, neck, and shoulder girdles; modifying postures instantly for student safety. EMERGENCY PROTOCOLS AND RISK MANAGEMENT: Handling physical emergencies in class (dizziness, fainting, hyper ventilation, cramping); legal liabilities, waiver designs, and basic first-aid awareness for yoga centers.	
Block - IV	INCLUSIVE INSTRUCTION AND SPECIAL POPULATIONS
Unit-7: Teaching Beginners and Intro/Foundational Classes: Deconstructing complex terminology; teaching structural building blocks; managing performance anxiety or intimidation in first-time practitioners. Principles of Prenatal and Postnatal Yoga Instruction: Contra indicated movements during different trimesters; adapting positions for pelvic stability; modifying breath work for safety. Yoga for Seniors (Geriatric Yoga) and Accessible Yoga: Adapting practices to counter reduced bone density, arthritic constraints, and balance loss; introduction to Chair Yoga methodologies. Unit-8: Managing Multi-Level and Large Group Classes: The art of layered instruction (offering stage-1, stage-2, and stage-3 variations simultaneously); maintaining visual command over a crowded room. Trauma-Informed Yoga Teaching Foundations: Creating a non-trigger in learning atmosphere; avoiding demanding language; Understanding somatic responses to stress and emotional releases during practice	

Block - V	LESSON PLANNING, CLASS ROOM MANAGEMENT, AND PROFESSIONAL ETHICS
Unit-9: Formal Lesson Plan Documentation: structured lesson plans (objectives, time lines, target cues, modifications); alignment with educational regulatory bodies (e.g., Ministry of Ayush/Yoga Alliance standards). Classroom Logistics and Environment Curation: Optimizing room temperature, lighting, acoustics, and mat layouts; managing late arrivals; maintaining general hygiene and equipment cleanliness. Code of Conduct and Professional Ethics: The modern application of <i>Yamas</i> and <i>Niyamas</i> to business operations; avoiding financial or emotional exploitation of students; honoring intellectual honesty across yoga traditions. Unit-10: Student Assessment, Feedback, and Home work Design: Evaluating student progress safely; providing constructive, private feedback; designing balanced daily home routines(<i>Sadhana</i>) for individual students. Marketing, Digital Teaching, and Career Pathways: Transitioning from in-person teaching to hybrid/online frame works; understanding basic microphone and video setup ergonomics; navigating studio employment vs. freelance entrepreneurship.	
Text Books: 1. Stephens, Mark. (2010). <i>Teaching Yoga: Essential Foundations and Techniques</i>. North Atlantic Books. 2. Stephens, Mark. (2012). <i>Yoga Sequencing: Designing Transformative Yoga Classes</i>. North Atlantic Books. 3. Stephens, Mark. (2014). <i>Yoga Adjustments: Philosophy, Principles and Techniques</i>. North Atlantic Books. 4. Gharote, M.L. (2014). <i>Guidelines for Yoga Teaching</i>. Lonavala Yoga Institute. 5. Kraftsow, Gary. (2002). <i>Yoga for Transformation: Ancient Teachings and Practices for Healing the Body, Mind and Heart</i>. Penguin.	
Suggested Readings 1. Teaching Yoga : A Comprehensive Guide for Yoga Teachers and Trainers by Mark Stephens 2. Asana Pranayama Mudra Bhandas by Swami Satyananda Saraswathi 3. Teaching Methods for yogic Practices by Dr.M.L.Gharote and Dr.S.K.Ganguly 4. The Professional Yoga Teacher Handbook by Sage Rountree 5. Teaching Yoga: Essential Foundations and Techniques by mark stephens	
E-Resources 1. https://www.yogabreezebali.com/blog/yoga-teaching-methodology-essential-techniques-for-teacher-training/ 2. http://www.icyer.com/documents/Principle_and_methods.pdf 3. https://www.siddhiyoga.com/yoga/teach/yoga-teaching-methodology 4. https://www.scribd.com/presentation/867460400/introduction-to-teaching-method-in-yoga	

Title of the Course			YOGA PRACTICAL – I				
Paper Number			4				
Category	Core	Year	I	Credit	4	Course Code	52114
		Semester	I				
Objectives							
To develop proficiency in the practice of Shatkarmas, Surya Namaskar, loosening practices, and a range of basic and advanced āsanās for improving physical fitness, flexibility, strength, and balance. To understand and practice prāṇāyāma, bandhas, and mudrās with proper technique to enhance respiratory efficiency, energy regulation, concentration, and mental well-being. To cultivate correct alignment, breathing coordination, body awareness, and safe practice habits during yogic practices to prevent injury and maximize benefits. To experience the physiological, psychological, and therapeutic effects of yoga practices and apply them for maintaining health, preventing lifestyle disorders, and promoting overall wellness. To develop regular self-discipline, mindfulness, and confidence through systematic yoga practice, integrating yogic techniques into daily life for holistic health and personal growth							
Course Outcomes							
The Student will be able to: - Demonstrate correct performance of basic yogic practices, including asanas, pranayama, mudras, relaxation techniques, and meditation. - Apply proper breathing, body alignment, and safety principles during yoga practice to prevent injuries and improve effectiveness. - Develop physical fitness, flexibility, strength, balance, and endurance through regular yoga practice. - Practice yogic techniques to improve concentration, emotional stability, stress management, and overall well-being. - Integrate yoga into daily life by planning and practicing a simple yoga routine for health promotion and disease prevention.							
Block: I		SHATKARMAS (YOGIC CLEANSING TECHNIQUES) AND SUKSHMA VYAYAMA					
Unit-1: JalaNeti (Nasal Cleansing with Water): Technique, preparation of saline water, dynamic performance, precautions, and subsequent <i>Kapalabhati</i> drying sequence. Sutra Neti (Nasal Cleansing with Thread/Catheter): Technique of inserting rubber catheter/cotton thread through the nasal passage, retrieval via the mouth, friction movement, and hygienic care. Vaman Dhauti /Kunjla Kriya (Gastric Cleansing): Drinking luke warm saline water voluntarily on an empty stomach and inducing vomiting to cleanse the upper gastro intestinal tract. Unit-2: Kapalabhati (Frontal Brain Cleansing Kriya): Technique of active,vigorous exhalation and passive inhalation; learning rhythm control across three rounds of 20, 40, and 60 strokes. Yogic Sukshma and Sthula Vyayama: Mobilization movements for minor joints (toes, ankles, knees, hips, fingers, wrists, elbows ,shoulders ,neck)and full-body warming sequences.							

Block - II	PREPARATORY POSTURES AND SURYA NAMASKAR
Unit- 3: Bihar School of Surya namaskar – Children School of Suryanamaskar- Classic 12-StepSuryaNamaskar(Sun Salutation)	
Unit-4: Breath Synchronization in Surya Namaskar- Surya Namaskar with Mantra Chanting	
Block - III	FOUNDATIONAL ASANAS
Unit-5: Standing Balancing Poses : Tadasana, Vrikshasana, Garudasana, Natarajasana, Uthitha Hasta Padaangustasana- Lateral Extension Poses: Trikonasana, Parvrita Trikonasana, Parsvakonasana, Parivrita Parshvakonasana, Prasaritapadaotanasana-	
Backward bending asanas: Ustrasana, dhanurasana, purna bhujangasana, purna shalabhasana, ekapada rajakapotasna, Chakrasana, Chakra garudasana, Sethubandhasana.	
Unit-6: Inverted Pose: Adhomukhasvanasana ,sarvangasana, Halasana, karnapeedasana, Sirshasana- Handbalance: Bhujapeedasana, Uthitha Padmasana, Bakasana, Thithpasana	
Block - IV	ADVANCED ASANAS
Unit-7: Standing Asanas: Urdhva prasarita lambakonasana, Veerabhadrasana variation1, Ardha Chakrasana ,Katichakrasna, Natarajasana, Urdhvuhamuha veerabhadrasana Seated Asanas: Bhrunasana Urdhva pada padmasarvangasana, Kurmasana, Virasana, hanumanasana, Uthitha Pachimotanasana, Ubhaya Paddaangushtasana	
Unit-8: Twisting Asanas: Bharadvajasana, MarichyasanaIII, Parivrtta Utkatasana, Parivrtta Ashwa Sanchalanasana, Eka Pada JatharaParivartanasana- Hand Balance and Head stand: Parsva Bakasana, Hamsasana ,Adho Mukha Vrksasana ,Pindasana in Sirsasana, Sirsasana, Salamba Sirsasana	
Block - V	SECTIONAL BREATHING, FOUNDATIONAL PRANAYAMA, AND RELAXATION
Unit-9: Sectional Breathing- Nadi Shodhana Pranayama(AlternateNostrilBreathing)- Sheetali and Sitkari Pranayama	
Unit-10: Bhramari Pranayama (Humming BeeBreath)- Jalandhra Bandha, Uddiyana Bandha, Moola Bandha, Yoni Mudra (Hand Gesture) Shanmukhi Mudra, Anjali Mudra, Abhaya Mudra, Dhyana Mudra, Matangi Mudra ,Kalesvara Mudra, Garuda Mudra,(Padma)Mudra, and Deep Relaxation Techniques	
Text Books: 1. Saraswati, Swami Satyananda. (2018). <i>Asana Pranayama Mudra Bandha</i>. Yoga Publications Trust, Munger. 2. Iyengar, B.K.S. (2012). <i>Lighton Yoga</i>. Schocken Books. 3. Tiwari, O.P. (2002). <i>Asanas: Whyand How</i>. Kaivalyadhama, Lonavla. 4. Gharote M.L.(2008). <i>Guideline for Yogic Practices</i>. Medha Publications. 5. Swami Kuvalayananda. (1993). <i>Pranayama</i>. Lonavla: Kaivalyadhama.	
Suggested Readings 1. Niranjanananda Saraswati, Swami. (200G). <i>Gheranda Samhita</i>. Yoga Publications Trust, Munger (For Shatkarma and Asanatextual guidance). 2. Joshi, K.S. (1G8G). <i>Yogic Pranayama: Principles and Practice</i>. Orient Paper backs. 3. Tiwari, O.P. (2009). <i>Asanas: Why and How</i>. Lonavla: Kaivalyadhama. 4. Gharote, M.L .(2018). <i>Guidelines for Yoga Practices</i>. Lonavla: Medha Publications.	

5. Morarji Desai National Institute of Yoga (MDNIY). (2021). *Common Yoga Protocol (CYP)*. New Delhi: Ministry of AYUSH, Government of India.
6. Yoga its theory and practice by swami Abdedananda

E-Resources:

1. <https://yogainternational.com/>
2. <https://www.yogapublications.org/product/asana-pranayama-mudra-bandha/>
3. <https://iyengaryoga.org/books/light-on-yoga/>
4. <https://tamilbookspdf.com/books/learn-yogasanas-tamil-pdf-books/>
5. <https://www.youtube.com/playlist?list=PLui6Eyny-UzzWwB4h9y7jAzLbeuCuczAl>

Title of the Course			YOGIC TEXTS				
Paper Number			5				
Category	Core	Year	I	Credit	2	Course Code	52121
		Semester	II				
Objectives							
1. To understand the historical development and philosophical foundations of yoga through the study of classical yogic texts. 2. To acquire knowledge of the teachings and concepts presented in major yogic scriptures, including the <i>Yoga Sutras</i>, <i>Bhagavad Gita</i>, <i>Hatha Yoga Pradipika</i>, <i>Gheranda Samhita</i>, and <i>Shiva Samhita</i>. 3. To interpret the fundamental principles of yoga, such as the eight limbs of yoga, ethics, self-discipline, meditation, and self-realization, as described in the classical texts. 4. To analyze the relevance and application of the teachings of yogic texts in contemporary life, health promotion, yoga education, and yoga therapy. 5. To develop an appreciation of the spiritual, ethical, and practical dimensions of yoga and apply these principles to foster holistic well-being and personal development.							
Course Outcomes							
The student will be able to 1. Explain the fundamental concepts and teachings of major yogic texts, including the Yoga Sūtras of Patañjali, Bhagavad Gītā, Haṭha Yoga Pradīpikā, and selected Upaniṣads. 2. Describe the philosophical foundations of Yoga presented in classical yogic scriptures, including the concepts of Aṣṭāṅga Yoga, Karma Yoga, Bhakti Yoga, Jñāna Yoga, and Rāja Yoga. 3. Interpret selected verses (sūtras and ślokas) from important yogic texts and explain their relevance to yogic practice and daily life. 4. Analyze the similarities and differences among major yogic texts with respect to their objectives, practices, ethical values, and spiritual teachings. 5. Apply the teachings of classical yogic texts to promote ethical living, self-discipline, mental well-being, and professional yoga practice.							
Block: I		THE BHAGAVAD GITA					
Unit-1: Context and Introduction to the Bhagavad Gita: Historical and philosophical background within the Mahabharata; the existential crisis of Arjuna (Vishada Yoga)as a metaphor for the human condition. Karma Yoga (The Yoga of Selfless Action): the concept of Nishkama Karma(action without attachment to fruits); understanding duty(Dharma)and Yajna(sacrifice). Jnana Yoga(The Yoga of Knowledge): Textual study of the attributes of the soul (Atman); distinguishing between the transient body and the eternal self; the definition of a stable mind(Sthita prajna).							
Unit-2: Bhakti Yoga (The Yoga of Devotion): paths of surrender, cultivation of emotional purity, and the characteristics of an ideal devotee(Bhakta). Dhyana Yoga and Dietetics in the Gita : practical guidelines for meditation, posture, and concentration; the importance of moderated life style and diet (Mitahara).							
Block - II		PATANJALI'S YOGA SUTRAS-SAMADHI AND SADHANAPADA					
Unit- 3: Structure of the Yoga Sutras and Definition of Yoga : four Padas(chapters); analysis of Sutras 1.1 to 1.4; definition of Yoga as Chitta Vritti Nirodha (cessation of mental fluctuations). Chitta Vrittis and Chitta Bhoomis: The five types of mental modifications (Vrittis); the five states of							

the mind (Chitta Bhoomis: Kshiptha ,Moodha ,Vikshiptha, Ekagra, Nirodha). **Methods of Mind Control: Abhyasa and Vairagya:** Sutras 1.12 to 1.16; the dual pillars of practice (*Abhyasa*) and detachment(*Vairagya*); definition of *Ishvara Pranidhana* (surrender to the divine).

Unit-4: Obstacles on the Path:Chitta Vikshepas and Kleshas: The nine mental distractions (Antarayas /Vikshepas) and their co-existents; introduction to the five afflictions(Kleshas: Avidya, Asmita, Raga, Dvesha, Abhinivesha). **Kriya Yoga and the External Limbs of Yoga:** The definition and purpose of Kriya Yoga(discipline, self-study, and surrender);detailed study of the five Yamas and five Niyamas.

Block - III	PATANJALI'S YOGA SUTRAS- VIBHUTI AND KAIVALYA PADA
--------------------	---

Unit-5: The Internal Limbs (Antaranga Yoga): Transitioning from external disciplines to internal ones: textual definitions of Dharana (concentration), Dhyana (meditation), and Samadhi (absorption). **The Concept of Samyama:** Definition of Samyama (the combined application of Dharana, Dhyana, and Samadhi); its application to internal and external objects. **Mental Transformations(Parinamays):** The structural changes of the mind during meditation: *Nirodha Parinama*, *Samadhi Parinama* ,and *Ekagrata Parinama*.

Unit-6: Introduction to Vibhutis (Accomplishments): Philosophical overview of the *Siddhis* (psychic powers/accomplishments) arising from *Samyama*; Patanjali's warning regarding *Siddhis* as obstacles to liberation. **Concept of Kaivalya (Liberation):** The process of *Karmic* dissolution; dissolution of the *Gunas* (cosmic qualities); the return of consciousness(*Purusha*)to its pristine, isolated state.

Block - IV	HATHA YOGA PRADIPIKA
-------------------	-----------------------------

Unit-7: Introduction and Pre –requisites for Hatha Yoga: Author and historical context of Swami Swatmarama's text; the relationship between Hatha and Raja Yoga; obstacles (Badhaka Tattva) and facilitators (Sadhaka Tattva) of practice. **Asanas and Mitahara in Hatha Yoga:** primary *Asanas* described by Swatmarama (such as *Svastikasana*, *Gomukhasana*, *Padmasana*, *Mayurasana*, *Paschimottanasana*); rules of Hatha dietetics. **Shatkarmas (The Six Purification Elements):** Textual methodology, indications, and benefits of the six cleansing acts: Dhauti, Basti, Neti, Trataka,Nauli, and Kapalabhati.

Unit-8: Pranayama and Kumbhakas: The signs of purified Nadis (energy channels); the mechanics of breath control; study of the eight Kumbhakas (including Suryabhedana, Ujjayi, Sitkari, Sitali, Bhastrika).**Mudras, Bandhas, and Nadanusandhana:** The ten primary Mudras and Bandhas for awakening Kundalini; the process of internal sound absorption(Nadanusandhana) and its four stages(Arambha,Ghata,Parichaya, Nishpatti).

Block - V	GHERANDA SAMHITA AND SHIVA SAMHITA
------------------	---

Unit-9: Introduction to Gheranda Samhita and Ghatastha Yoga: Dialogue between Sage Gheranda and King Chandakapali; the concept of the body as an earthen warepot (*Ghata*); overview of the *Saptanga Yoga*(seven-foldpath). **Asanas, Mudras, and Pratyahara in**

Gheranda Samhita: 32 *Asanas*, the 25 *Mudras / Bandhas*, and the specific internal withdrawal (*Pratyahara*) methods highlighted in the text. **Dhyana and Samadhi in Gheranda Samhita:** The three types of *Dhyana* (*Sthula, Jyotis, Sukshma*); the six methods of achieving *Samadhi* (including *Dhyana- Yoga Samadhi* and *Rasa-Ananda Samadhi*).

Unit-10: Shiva Samhita: Philosophical Foundations: Introduction to the text; liberation frame works; the concept of *Maya* (illusion); the micro-macro cosmic relationship (the universe with in the body). **Nadis, Chakras, and Kundalini in Shiva Samhita:** 14 major *Nadis*; structural mapping of the six *Chakras*; the awakening of *Kundalini* and the specific descriptions of *Mantra Yoga* and *Laya Yoga*

Text Books:

1. **Bryant, Edwin F.** (2009). *The Yoga Sutras of Patanjali: A New Translation and Commentary*. North Point Press.
2. **Karambelkar, P.V.** (1986). *Patanjala Yoga Sutras*. Kaivalyadhama, Lonavala.
3. **Swami Swatmarama.** (1992). *The Hatha Yoga Pradipika* (Digambarji C Raghunathashastri Kokaje, Eds.). Kaivalyadhama, Lonavala.
4. **Swami Digambarji Gharote, M.L.** (1978). *Gheranda Samhita*. Kaivalyadhama, Lonavala.
5. **Rai Bahadur Srisa Chandra Vasu.** (1914). *The Shiva Samhita*. The Panini Office (or Munshiram Manoharlal publishers reprint).

Suggested Readings

1. **Saraswati, Swami Satyananda.** (2002). *Four Chapters on Freedom: a Commentary on the Yoga Sutras of Patanjali*. Yoga Publications Trust, Munger.
2. **Swami Chidbhavananda.** (1965). *The Bhagavad Gita*. Sri Ramakrishna Tapovanam.
3. **Feuerstein, Georg.** (2001). *The Yoga Tradition: Its History, Literature, Philosophy and Practice*. Hohm Press.
4. **B.K.S Iyengar** : Light on the Yoga Sutras of Patanjali
5. **Swami niranjanananda saraswathi:** Gheranda Samhita

E-Resources

1. <https://jahm.co.in/index.php/jahm/article/view/1808>
2. <https://www.yogavidya.com/Yoga/shiva-samhita.pdf>
3. <https://www.yogaeasy.com/artikel/what-is-hatha-yoga>
4. <https://healthsiren.in/wp-content/uploads/2023/09/Hatha-Yoga-Pradipika-Muktibodhananda.pdf>
5. https://ignca.gov.in/Asi_data/279.pdf

Title of the Course		HUMAN ANATOMY AND PHYSIOLOGY – II					
Paper Number		6					
Category	Core	Year	I	Credit	2	Course Code	52122
		Semester	II				
Objectives							
1. To study the structure and functions of the endocrine, lymphatic, and sensory systems and their importance in maintaining homeostasis, immunity, growth, and overall health. 2. To examine the anatomical and physiological effects of yogic practices such as āsanās, prāṇāyāma, meditation, and relaxation techniques on the nervous, endocrine, and lymphatic systems. 3. To evaluate the therapeutic applications of yoga in promoting mental well-being, improving hormonal balance, enhancing immune function, reducing stress, and supporting the management of selected health conditions. 4. To integrate knowledge of human anatomy and physiology with yogic principles for promoting health, preventing disease, and developing evidence-informed therapeutic yoga practices. 5. To enable learners to apply anatomical and physiological knowledge for the safe, effective, and scientific practice and teaching of yoga.							
Course Outcomes							
The student will be able to: 1. Explain the structure and functions of the nervous system, including the central and peripheral nervous systems, and describe their role in coordination, control, and the physiological effects of yoga. 2. Describe the anatomy and physiology of the endocrine system, including major endocrine glands and hormones, and explain their role in growth, metabolism, reproduction, and homeostasis. 3. Explain the structure and functions of the reproductive system, special sense organs (eye, ear, nose, tongue, and skin), and discuss their importance in maintaining health and well-being. 4. Describe the anatomy and physiology of the excretory (urinary) system and lymphatic system, and explain their roles in waste elimination, fluid balance, immunity, and overall body function. 5. Apply the knowledge of anatomy and physiology to understand the influence of yoga practices on the nervous, endocrine, reproductive, excretory, lymphatic, and sensory systems, ensuring safe and effective yoga instruction.							
Block: I		NERVOUS SYSTEM					
Unit-1: Parts of central Nervous system and their function- Brain – cerebrum, cerebellum, pons, medulla oblongata.							
Unit-2: Peripheral nervous system – cranial and spinal cords- Functions of Autonomous Nervous system.							
Block - II		ENDOCRINE, REPRODUCTIVE					
Unit- 3: Endocrine system – Pitutary, Thyroid, Parathyroid, Thymus, Adrenals, Pancreas, Gonads – secretion regulation							
Unit-4: Reproductive system - Function of male and female reproduction system- Physiology of pregnancy and menstruation.							

Block - III	SPECIAL SENSES AND EXCRETORY SYSTEM
Unit-5: Anatomy and physiology of Eye, Anatomy and physiology of Ear Unit-6: Anatomy and Physiology of Tongue and Skin- Anatomy and Physiology of Nose.	
Block - IV	EXCRETORY SYSTEM
Unit-7: Excretory System: Parts and Functions- Mechanism of Urine Formation Unit-8: Immunity-Types of Immunity- Innate Immunity and acquired immunity- Antigen and Antibody- Hypersensitivity- Autoimmunity	
Block - V	LYMPHATICS
Unit-9: Lymphoid Organ-Bone Marrow-Thymus-Spleen- Functions of lymphatic system immunity Unit-10: Preventive and preservative aspects of Yogic practices- The therapeutic and corrective value of Yogic practices.	
Text books: 1. Dr. Selvam “ Anatomy and Physiology” Bodinayakanur. 2. Dr. N.M. MUTHAYYA “Physiology” J.J. Publications, Madurai. 3. SEELEY et. all Anatomy and Physiology Mc Graw Hill. 4. Anatomy & Physiology - Anne Waugh & Allison. 5. Human Anatomy and Physiology – Elaine N.Marieb and Katja Hoehn	
Suggested Readings: 1. Human Anatomy –Dr.Chaurasia B.D. 2. Yogic Human Anatomy and Physiology- Dr.Hiralal Sharma 3. Human Anatomy and Physiology- Dr.N.Murugesh 4. Yoga Anatomy by leslie Kaminoff amy Mathews 5. Essentials of Human anatomy and Physiology by Elaine N.Marieb	
E-Resources 1. www.innerbody.com 2. www.getbodysmart.com 3. www.teachmeanatomy.info 4. www.anatomyzone.com 5. www.kenhub.com 6. human.biodigital.com	

Title of the Course		APPLICATION OF YOGA IN MODERN LIFE					
Paper Number		7					
Category	Core	Year	I	Credit	2	Course Code	52123
		Semester	II				
Objectives							
1. To understand the role of yoga in promoting physical, mental, emotional, and spiritual well-being in the context of modern lifestyles. 2. To examine the application of yogic practices for the prevention and management of lifestyle disorders such as stress, obesity, hypertension, diabetes, anxiety, and musculoskeletal problems. 3. To develop the ability to integrate yoga into daily life for improving health, work efficiency, emotional balance, and overall quality of life. 4. To evaluate the therapeutic and preventive benefits of yoga for different age groups and special populations, including children, adults, older adults, and individuals with specific health conditions. 5. To promote awareness of yoga as a holistic approach to healthy living, encouraging ethical values, self-discipline, mindfulness, environmental harmony, and social well-being.							
Course Outcomes:							
The student will be able to:							
1. Explain the role and significance of yoga in promoting physical, mental, emotional, and spiritual well-being in modern life. 2. Describe the application of yoga in lifestyle management, stress reduction, and the prevention and management of common lifestyle disorders. 3. Apply appropriate yogic practices, including āsana, prāṇāyāma, relaxation, meditation, and yogic lifestyle principles, to enhance health and quality of life. 4. Analyze the relevance of yoga in different settings such as education, workplaces, healthcare, sports, and community wellness programmes. 5. Evaluate the benefits and limitations of yoga as a complementary approach for health promotion and develop suitable yoga-based wellness programmes for diverse populations.							
Block: I		STRESS MANAGEMENT AND MENTAL WELL-BEING					
Unit-1: The Modern Stress Epidemic : Definition, types (eustress vs. distress), and sources of modern stress; signs and symptoms of psychological burnout and chronic fatigue. Psychosomatic Mechanisms of Stress: The mind-body connection; how stress translates in to physical illness (the concept of Adhi and Vyadhi in Yoga Vasistha); the Hypothalamic - Pituitary- Adrenal (HPA)axis. Yogic Tools for Stress De-escalation: Application of cooling Pranayamas (Sitali, Sitkari, Bhramari); the science of voluntary slow breathing to activate the parasympathetic nervous system. Unit-2: Deep Relaxation Techniques: Theory and practice of Yoga Nidra(psychicsleep), Cyclic Meditation, and Progressive Muscle Relaxation (PMR) for insomnia and anxiety. Cultivating Mindfulness and Emotional Regulation Applying Pratyahara (withdrawal of senses) and Dharana (concentration)to manage digital distractions; modern mindfulness-based stress							

reduction(MBSR)anchored in yoga.	
Block - II	YOGA FOR LIFESTYLE DISEASES AND PREVENTATIVE HEALTH CARE
Unit- 3: Modern Sedentary Lifestyle and Metabolic Syndrome: The health risks of prolonged sitting and lack of movement; understanding Metabolic Syndrome(obesity, insulin resistance, dyslipidemia). Yogic Management of Diabetes Mellitus: Physiological impact of twisting and forward-bending <i>Asanas</i>(e.g.,ArdhaMatsyendrasana, Paschimottanasana)on pancreatic stimulation and insulin sensitivity. Cardio vascular Health and Hypertension: Modifying yoga practices for high blood pressure; avoiding dangerous breath retention (<i>Kumbhaka</i>);utilizing restorative poses to lower systemic vascular resistance. Unit-4: Respiratory Disorders in Polluted Environments: Addressing modern respiratory challenges (Asthma, COPD, allergies); application of <i>Shatkarmas</i> (<i>Neti</i> and <i>Kapalabhati</i>) to cleanse the respiratory tract. Obesity and Weight Management: Dynamic yogic sequences (<i>Surya Namaskar</i> variations); building lean muscle mass, boosting basal metabolicrate, and addressing emotional eating through mindfulness.	
Block - III	ERGONOMICS, CORPORATE YOGA ,AND PHYSICAL FITNESS
Unit-5: Office Ergonomics and Postural Deformities: Anatomy of sitting; common modern postural alignment issues ("TextNeck, "rounded shoulders, anterior pelvic tilt, carpal tunnel syndrome). Desk Yoga and Micro-practices: Designing short, 5-to-10-minute yogic interventions for the workplace; chair –based stretches, joint movements (<i>Sukshma Vyayama</i>),and desk alignment. Screen Fatigue and Eye Care: The impact of prolonged digital device usage on the eyes and nervous system; application of <i>Trataka</i> (candle/point gazing)and yogic eye exercises. Unit-6: Corporate Stress and Burn out Prevention: Time-management, work place dynamics ,and institutional stress; implementing group yoga sessions to boost team morale, focus ,and productivity. Core Strength and Musculo skeletal Resilience: Building physical endurance using yoga; strengthening the core, spine, and major muscle groups to prevent lower back pain and repetitive train injuries.	
Block - IV	SOCIAL HEALTH, RELATIONSHIPS ,AND APPLIED YOGIC PHILOSOPHY
Unit-7: Social Ethics Through Yamas: Applying the five <i>Yamas</i>(Ahimsa, Satya, Asteya ,Brahmacharya, Aparigraha) to modern social challenges, digital ethics, and conflict resolution. Personal Discipline Through Niyamas: Cultivating the five <i>Niyamas</i>(Saucha, Santosha, Tapas, Svadhyaya ,Ishvara Pranidhana) to build self-esteem, gratitude, and mental clarity and consumer is culture. Interpersonal Relationships and Empathy: Using the four virtues of the mind (<i>Chitta Prasadana</i>: Maitri, Karuna, Mudita, Upeksha) from the Patanjali Yoga Sutras to navigate complex modern relationships. Unit-8: Yoga and Environmental Sustainability: The concept of <i>Mitahara</i> (moderate, eco-	

conscious eating) and *Aparigraha* (non-possessiveness) as structural foundations for eco-friendly, sustainable living. **Youth, Addiction ,and Rehabilitation:** behavioral addictions (substance abuse, social media, gaming); using yoga as a complementary therapy to rebuild dopamine regulation and willpower.

Block - V

YOGA ACROSS LIFE STAGES AND SPECIALIZED DIMENSIONS

Unit-9: Yoga for Women's Health: Managing modern hormonal imbalances (PCOS/PCOD); yogic care across life milestones: Menstruation, pregnancy (prenatal/postnatal yoga), and menopause. **Yoga for Geriatric Care (Healthy Aging):** Adapting practices for the elderly; focusing on balance to prevent falls, joint mobility for osteoarthritis, and gentle breathing for vitality. **Yoga for Children and Adolescents:** Combating hyperactivity and attention deficits; using playful, story –based *Asanas* and simple concentration techniques to boost memory and focus in schools.

Unit-10: Yoga in Sports and Athletics: Integrating yoga in to modern athletic training; optimizing lung capacity, improving flexibility, reducing sports injury risks, and mental conditioning for peak performance. **Designing Custom Yoga Protocols:** Methodology for creating individualized yoga plans based on an individual's *Prakriti* (constitution), age, occupation, and existing health limitations.

Text Books:

1. **Nagendra,H.R.,sNagarathna,R.**(2005).*NewPerspectivesinStress Management*.SwamiVivekanandaYogaPrakashana.
2. **Saraswati,SwamiKarmananda.**(2006).*YogicManagementofCommon Diseases*.YogaPublicationsTrust,Munger.
3. **Udupa,K.N.**(1985).*StressandItsManagementbyYoga*.MotilalBanarsidass Publishers.
4. **Frawley,D.**(2000).*YogaandAyurveda:Self-HealingandSelf-Realization*.Lotus Press
5. **Dr.Kamakya Kumar:** The textbook of Yoga and Health

Suggested Readings

1. B.K.S.Iyengar: Yoga for Every one
2. Mohan Rayithi : Modern Yoga Ancient wisdom for Contemporary life
3. DrRajendra Reddy Akuthota: The therapeutic applications of yoga
4. Geeta S.Iyengar: Yoga: A gem for Women
5. B.K.S Iyengar: Yoga: the Path to Holistic health

E-Resources

1. <https://www.yogamdniy.nic.in/ckfinder/userfiles/files/Yoga%20for%20Women%20of%20%20Reproductive%20Age.pdf>
2. <https://www.journalofsports.com/pdf/2019/vol4issue1/PartQ/4-1-205-526.pdf>
3. https://ijemh.com/issue_dcp/Yoga%20A%20Pathway%20to%20Sustainable%20Living.pdf
4. <https://www.artofliving.org/in-en/yoga/beginners/corporate-yoga>
5. <https://theancientayurveda.com/yoga-for-lifestyle-disorders/>

Title of the Course		YOGA PRACTICAL - II					
Paper Number		8					
Category	Core	Year	I	Credit	4	Course Code	52124
		Semester	II				
Objectives							
1. To develop proficiency in the practice of intermediate, advanced, twisting, and inverted āsanās with correct alignment, stability, safety, and breath coordination. 2. To enhance strength, flexibility, balance, endurance, spinal mobility, and neuromuscular coordination through systematic and progressive yoga practice. 3. To acquire practical knowledge and skills in prāṇāyāma, mudrās, and dhāraṇā for improving respiratory efficiency, energy regulation, concentration, and mental clarity. 4. To understand the physiological, psychological, and therapeutic effects of advanced yogic practices and apply them appropriately for health promotion and disease prevention. 5. To cultivate mindfulness, self-discipline, emotional balance, and meditative awareness by integrating āsana, prāṇāyāma, mudrā, and dhāraṇā into regular practice for holistic well-being.							
Course Outcome							
The Student will be able to do							
1. Demonstrate proficiency in the practice of advanced Śatkarṃas by following appropriate techniques, safety precautions, and contraindications. 2. Perform vitalization practices and intermediate yogic techniques to improve flexibility, strength, endurance, balance, and overall physical fitness. 3. Demonstrate correct techniques, alignment, breathing, and sequencing while performing intermediate and advanced Āsanās with stability and awareness. 4. Practice and explain the purpose, benefits, precautions, and therapeutic applications of Mudrās and their integration into yogic practice. 5. Apply advanced yogic practices to design and conduct safe, effective, and goal-oriented yoga sessions for individuals with different levels of ability and wellness needs.							
Block: I		ADVANCED SHATKARṂAS AND VITALIZATION					
Unit-1: Agnisara Kriya (Activation of Digestive Fire)- Nauli Chalana (Abdominal Churning) Shankha prakshalana(LaghuVersion)							
Unit-2: Advanced Kapalabhati Variations ,Vatakrāma, Sheetkrāma, Vyuthkrāma- Sthula Vyayama(High-Energy Mobilization)							
Block - II		INTERMEDIATE ASANAS					
Unit- 3: StandingAsanas: ParivṛttaParsvakonasana, Virabhadrasana variation III, Ardha Chandrasana, Uthitha Hasta Padaangushtasana, Parsvatonasana, Prasarita Padottanasana II, Parighasana, Ardha Baddha Padmottanasana, urdhva prasarita ekapadasana Sitting pose: Gomukhasana, Baddhakonasana, SimhasanaII, Garbha Pindasana, Goraksasana, Baddha Padmasana, Janu sirsasana, Ardha Baddha Padma Pachimotanasana, Trianga Mukhaikapada Pachimotanasana,Krounchasana Twisting: Parivṛtta Janusirsasana, Parivṛtapachimotanasana,							

Parivrtta Ustrasana, Vakrasana, Ardhamatsyendrasana, Pasasana, Malayasana. Parsvapindsana, Parsvahalasana, Parsvassarvangasana Unit-4:Hand Balance: Uthitha Lolasana, Bhujapeedasana, Bakasana, Ashtavakrasana, Ekahastabhasana, Mayurasana, Ekapadagalavasana Supine and prone lying: SalambaSarvangasana, SuptaHalasana, Paryankasana, Bhekasana, Pindasana, EkapadaSarvangasana, Jathara Parivartanasana,Parsva Dhanurasana	
Block - III	ADVANCED ASANAS
Unit-5: StandingAsanas: Natarajasana, garudasana UrdhvaPrasarita Ekapadasana, Vatayanasana, Saral Natarajasana, Vamanasana, Dhandyan manjanusirsana, Pushpakasana Siiting pose: Suptavajrajasana, MarichaysanaII ,PurnaUshtrasana, Hanumanasana, UrdhvaMukha PchimottanasanaII, Purvotanasana,A karna Dhanurasana, SetuBandhaSarvangasana, UrdhvaPadmasana, EkaPada Setu Bandha Sarvangasana- Twisting:Marichyasana-4,Baddha Parivrtta Parsvakonasana, Himavanasana, Trisoolpashasana, Uddalakasana, Paripoorna matsyendrasana Unit-6: Hand Balance: Padmamayurasana, Koundinyasana, Bharamacharyasana, Vasisthasana – Supine and prone lying: Purna Bhujangasana, Purna Dhanurasana, Purnashalabhasana, Lagu Vajrasana, Ekapada Raja Kopatasana, Nirlamba Sarvangasana.	
Block - IV	CLASSICAL PRANAYAMA WITH KUMBHAKA AND MUDRAS
Unit-7: Nadi Shodhana with Kumbhaka and Bandhas- Ujjayi Pranayama(PsychicBreath)- Bhastrika Pranayama(Bellows Breath):Single Nostril and Both Nostril Variation with bandhas and Kumbhaka Unit-8: Suryabhedana and Chandrabhedana- Classical Hasta and KayaMudras: Jnana Mudra ,ChinMudra, Chinmaya Mudra, AdiMudra, Brahma Mudra ,Prana Mudra, ApanaMudra,Vyana Mudra,Udana Mudra,Samana Mudra,Vayu Mudra Kaya Mudra: Viparita Karani Mudra, Yoga Mudra, Tadagi Mudra, Manduki Mudra, Pashinee Mudra, Maha Mudra, Maha Vedha Mudra,MahaBheda Mudra ,Ashwini Mudra	
Block - V	BANDHAS, DHARANA, AND ADVANCED MEDITATION PRACTICES
Unit-9: Jalandhara Bandha and Uddiyana Bandha – MulaBandha and MahaBandha KayaSthairyam(BodySteadiness) Unit-10: Ajapa Japa and So-Ham Meditation-Preksha Dhyanam	
Text books: 1. Saraswati,SwamiSatyananda.(2018).<i>AsanaPranayamaMudraBandha</i>.Yoga PublicationsTrust,Munger. 2. Iyengar,B.K.S.(2012).<i>LightonYoga</i>.SchockenBooks. 3. SwamiKualayananda.(2005).<i>Pranayama</i>.Kaivalyadhama,Lonavla.	

4. **Svatmarama, Yogi.** (Standard Translation, e.g., by Kaivalyadhama). *Hatha Yoga Pradipika* (Focus on Chapters 1, 2, and 3 for Asana, Pranayama, and Mudra/Bandha frameworks).
5. **Muktibodhānanda, Swāmi.** (1998). *Hatha Yoga Pradipika: Light on Hatha*
6. *Yoga*. Yoga Publications Trust, Munger.

Suggested Readings

1. Tiwari, O.P. (2009). *Asanas: Why and How*. Lonavla: Kaivalyadhama.
2. Swami Kuvalayananda. (1993). *Pranayama*. Lonavla: Kaivalyadhama.
3. Gharote, M.L. (2018). *Guidelines for Yoga Practices*. Lonavla: Medha Publications.
4. Morarji Desai National Institute of Yoga (MDNIY). (2021). *Common Yoga Protocol (CYP)*. New Delhi: Ministry of AYUSH, Government of India.
5. *Yoga its theory and practice* by swami Abhedananda

E-Resources

1. <https://yogainternational.com/>
2. <https://www.yogapublications.org/product/asana-pranayama-mudra-bandha/>
3. <https://iyengaryoga.org/books/light-on-yoga/>
4. <https://tamilbookspdf.com/books/learn-yogasanas-tamil-pdf-books/>

**DIPLOMA PROGRAMME IN
CAREER GUIDANCE AND COUNSELLING**

COURSE OF STUDY AND SCHEME OF EXAMINATION

S.No	Title of The Course	No. of Credits	T/P	Marks		Total
				Internal	External	
1	Foundations of Guidance and Counselling	5	T	25	75	100
2	Theories of Career Counselling	5	T	25	75	100
3	Career Development	5	T	25	75	100
4	Assessment in Career Counselling	5	P	25	75	100
	Semester I - Total	20		100	300	400
5	Career Counselling Skills and Techniques	5	T	25	75	100
6	Career in Practice	5	T	25	75	100
7	AI in Career Guidance and Counselling	5	T	25	75	100
8	Project Work and Internship	5	P	25	75	100
	Semester II - Total	20		100	300	400
	Grand Total	40		200	600	800

T-Theory

P-Practical

Title of the Course		FOUNDATIONS OF GUIDANCE AND COUNSELLING					
Paper Number		1					
Category	Core	Year	I	Credit	5	Course Code	52211
		Semester	I				
Objectives							
1. To develop an understanding of the concepts, principles, and objectives of Guidance and Counselling. 2. To acquire the knowledge and skills required for effective counselling. 3. To understand the various fields and applications of educational and vocational guidance. 4. To familiarize students with the organization and functioning of guidance services. 5. To develop awareness of the need, ethics, and professional responsibilities in guidance and counselling							
Course Outcomes						Knowledge Levels	
Upon successful completion of the course, student will be able to:							
CO1: Understand the concepts, principles, and significance of Guidance and Counselling.						K1	
CO2: Explain the nature, process, and applications of Educational and Vocational Guidance.						K2	
CO3: Demonstrate knowledge of counselling theories, ethics, and professional responsibilities.						K3	
CO4: Apply counselling skills in planning and conducting counselling sessions.						K4	
CO5: Recognize the role of guidance services in educational and community settings.						K5	
K1 – Remember	K2 – Understand	K3 – Apply	K4 – Analyze	K5 – Evaluate	K6 – Create		
Unit 1: Conceptual Framework of Guidance - Meaning, Nature, Goals and Objectives of Guidance– Assumptions – Principles of Guidance – Early, Later and Contemporary Models of Guidance – Guidance Services – Organization of Guidance Programmes.							
Unit 2: Educational and Vocational Guidance - Educational Guidance: Nature – Functions – Stage-wise Educational Guidance (Primary, Secondary, Higher Secondary and College Level) – Role of Teacher and Counsellor in Educational Settings. Vocational Guidance: Nature – Process – Theories – Collection, Organization and Dissemination of Career Information.							
Unit 3: Conceptual Framework of Counselling - Meaning and Nature of Counselling – Historical Development – Goals and Types of Counselling – Counselling and Psychotherapy – Ethics in Counselling – Becoming an Effective Counsellor: Personal Qualities – Roles and Responsibilities – Common Pitfalls Faced by Beginning Counsellors.							
Unit 4: Counselling Process- Establishing the Counselling Relationship – Core Conditions of Counselling – Counsellor Behaviours that Facilitate and Impede Counselling – In-depth Exploration– Goal Setting – Commitment to Action – Designing and Implementing Action Plans – Termination and Follow-up.							
Unit 5: Guidance Services and Emerging Trends - Organization of Guidance Services – Guidance Organizations and Agencies – Need and Importance of Guidance Services – Guidance in Schools, Colleges and Communities – Contemporary Trends in Guidance and Counselling – Technology and Online Counselling – Challenges and Future Prospects							
Text Books:							
1. Gibson, R. L., & Mitchell, M. H. (2016). Introduction to Counseling and Guidance (7th ed.). Pearson Education. 2. Gladding, S. T. (2020). Counseling: A Comprehensive Profession (9th ed.). Pearson Education. 3. Kochhar, S. K. (2010). Educational and Vocational Guidance in Secondary Schools. Sterling Publishers Pvt. Ltd. 4. Rao, S. N. (2007). Counselling and Guidance (3rd ed.). Tata McGraw-Hill Education. 5. Aggarwal, J. C. (2011). Educational, Vocational Guidance and Counselling. Shipra Publications.							

Suggested Readings

1. Corey, G. (2021). Theory and Practice of Counseling and Psychotherapy (10th ed.). Cengage Learning.
2. Egan, G. (2019). The Skilled Helper: A Problem-Management and Opportunity-Development Approach (11th ed.). Cengage Learning.
3. Nelson-Jones, R. (2015). Practical Counselling and Helping Skills (7th ed.). Sage Publications.
4. Shertzer, B., & Stone, S. C. (1981). Fundamentals of Guidance (4th ed.). Houghton Mifflin Company.
5. McLeod, J. (2019). An Introduction to Counselling (6th ed.). Open University Press.

E-Resources

1. <https://www.counseling.org>
2. <https://www.schoolcounselor.org>
3. <https://www.ncda.org>
4. <https://www.unesco.org>
5. <https://www.ncs.gov.in>

Title of the Course		THEORIES OF CAREER COUNSELLING					
Paper Number		2					
Category	Core	Year	I	Credit	5	Course Code	52212
		Semester	I				
Objectives							
1. To develop an understanding of the major theories and approaches to career counselling. 2. To examine the philosophical and psychological foundations of career development theories. 3. To understand the concepts, techniques, and applications of trait- based developmental, learning, and constructivist approaches to career counselling. 4. To develop the ability to apply appropriate career theories to diverse client needs and settings. 5. To enhance professional competence in integrating career theory with counselling practice.							
Course Outcomes							Knowledge Levels
Upon successful completion of the course, students will be able to:							
CO1: Explain the principles, assumptions, and key concepts of major career counselling theories							K1
CO2: Compare and evaluate different theoretical approaches to career counselling							K2
CO3: Apply appropriate counselling theories and techniques in educational, clinical, and community settings.							K3
CO4: Demonstrate skills in selecting theory – based interventions situated to clients' career concern.							K4
CO5: Integrate theoretical knowledge with ethical and professional career counselling practice							K5
K1 – Remember	K2 – Understand	K3 – Apply	K4 – Analyze	K5 – Evaluate	K6 - Create		
Unit 1: Foundations of Career Counselling Practice - Meaning, Nature, and Scope of Career Counselling Theories – Historical Development from Parsons' Trait-and-Factor Model to Contemporary Approaches – Philosophical and Psychological Foundations Classification of Career Theories: Structural, Developmental, Learning, Social Cognitive and Postmodern.							
Unit 2: Trait-Oriented and Developmental Theories - Parsons' Trait-and-Factor Theory – Holland's Theory of Vocational Personalities and Work Environments (RIASEC) – Super's Life-Span, Life-Space Theory – GoHredson's Theory of Circumscription and Compromise – Ginzberg's Developmental Theory.							
Unit 3: Learning and Social Cognitive Theories - Krumboltz's Social Learning Theory of Career Decision Making – Planned Happenstance Learning Theory – Social Cognitive Career Theory (Lent, Brown & Hackett) – Self-Efficacy and Career Decision-Making.							
Unit 4: Constructivist and Narrative Approaches - Savickas' Career Construction Theory – Narrative Career Counselling – Chaos Theory of Careers – Systems Theory Framework – Cultural and Contextual Factors in Career Theory.							
Unit 5: Application of Career Counselling Theories in Practice - Selecting Theory-Based Interventions – Integrative and Eclectic Approaches – Multicultural and Gender-Sensitive Career Counselling – Ethical Issues in Applying Career Theories – Emerging Trends: Positive Psychology and Strengths-Based Career Counselling.							
Text Books:							
1. Career Development and Counseling: Putting Theory and Research to Work edited by Steven D. Brown & Robert W. Lent. John Wiley & Sons. 2. Career Counseling: Foundations, Perspectives, and Applications by Spencer G. Niles & JoAnn Harris-Bowlsbey. Pearson. 3. Career Counseling: A Holistic Approach by Vernon G. Zunker. Cengage Learning. 4. Career Development Interventions by Spencer G. Niles & JoAnn Harris-Bowlsbey. Pearson. 5. Career Development: Theory and Practice by Jane L. Swanson & Nadya A. Fouad. SAGE							

Publications.

Suggested Readings:

1. Career Information, Career Counseling, and Career Development by Duane Brown. Pearson.
2. The Oxford Handbook of Career Development edited by Peter J. Robertson, Tristram Hooley & Phil McCash. Oxford University Press.
3. Career Choice and Development edited by Duane Brown & Robert W. Lent. John Wiley & Sons.
4. Developing Career Counseling Skills by David Capuzzi & Mark D. Stauffer. Pearson.
5. Career Development and Systems Theory: Connecting Theory and Practice by Wendy Patton & Mary McMahon. Sense Publishers.

E-Resources

1. [National Career Service \(Government of India\)](#)
2. [National Career Development Association \(NCDA\)](#)
3. [American Counseling Association \(ACA\)](#)
4. [O*NET Online](#)
5. [National Institute of Open Schooling \(NIOS\)](#)

Title of the Course		CAREER DEVELOPMENT					
Paper Number		3					
Category	Core	Year	I	Credit	5	Course Code	52213
		Semester	II				
Objectives							
1. To understand the concepts, need, and significance of career guidance and counselling. 2. To develop knowledge of career guidance programmes at different levels of schooling. 3. To familiarize students with various theories and approaches to career development. 4. To understand career choice, decision-making, and career planning processes. 5. To develop competency in the use of career information, technology, and emerging trends in career guidance.							
Course Outcomes							Knowledge Levels
Upon successful completion of the course, students will be able to:							
CO1: Explain the concepts, principles, and importance of career guidance and counselling							K1
CO2: Design and implement career guidance programmes for different educational levels							K2
CO3: Apply various theories and approaches to career development and career decision-making							K3
CO4: Utilize career information systems and technological resources for career planning							K4
CO5: Demonstrate skills in career counselling and guidance in educational and community settings.							K5
K1 Remember	K2 Understand	K3 – Apply		K4 – Analyze	K5 – Evaluate	K6 - Create	
Unit 1: Introduction to Career Guidance and Counselling - Concept of Work – Origin of Vocational Guidance and Vocational Education – Concept, Need, and Importance of Career Guidance and Counselling – Role of the Counsellor in Career Guidance in School and Non-School Settings.							
Unit 2: Career Guidance in Schools - Nature, Goals, and Programme Content of Career Guidance at the Elementary Level – Career Guidance at the Junior and Middle School Levels – Career Guidance at the Secondary, Higher Secondary, and College Levels – Role of Teachers, Career Masters, and Counsellors							
Unit 3: Career Development - Concept and Stages of Career Development – Career Choice and Career Decision-Making – Theories and Approaches: Trait-and-Factor (Matching) Theory – Decision Theory – Situational and Sociological Approaches – Psychological Approaches – Contemporary Career Development Models.							
Unit 4: Career Information and Career Planning - Nature, Importance, Functions, and Types of Career Information Sources of Educational and Occupational Information – Training and Evaluation of Career Information Services – Technology in Career Guidance – Online Career Information Systems – Recent Trends							
Unit 5: Career Counselling and Emerging Trends - Career Counselling Process – Career Planning and Career Maturity – Employability Skills and Entrepreneurship – Career Guidance for Special Groups – Digital Career Guidance, Artificial Intelligence in Career Services, and Emerging Trends in Career Development.							

Text Books:

1. Brown, D. (2016). Career Information, Career Counseling, and Career Development (11th ed.). Pearson Education.
2. Niles, S. G., & Harris-Bowlsbey, J. (2017). Career Development Interventions (5th ed.). Pearson Education.
3. Sharf, R. S. (2016). Applying Career Development Theory to Counseling (6th ed.). Cengage Learning.
4. Gibson, R. L., & Mitchell, M. H. (2016). Introduction to Counseling and Guidance (7th ed.). Pearson Education.
5. Herr, E. L., Cramer, S. H., & Niles, S. G. (2004). Career Guidance and Counseling: Through the Lifespan (6th ed.). Pearson Education.

Suggested Readings

1. Brown, D., & Lent, R. W. (Eds.). (2021). Career Development and Counseling: Putting Theory and Research to Work (3rd ed.). John Wiley & Sons.
2. Zunker, V. G. (2016). Career Counseling: A Holistic Approach (9th ed.). Cengage Learning.
3. Kochhar, S. K. (2010). Educational and Vocational Guidance in Secondary Schools. Sterling Publishers Pvt. Ltd.
4. Rao, S. N. (2007). Counselling and Guidance (3rd ed.). Tata McGraw-Hill Education.
5. Super, D. E., & Savickas, M. L. (1996). The Life-Span, Life-Space Approach to Careers. Jossey-Bass.

E-Resources

1. <https://www.ncda.org>
2. <https://www.ncs.gov.in>
3. <https://www.ilo.org>
4. <https://www.nsdcindia.org>
5. <https://www.unesco.org>

Title of the Course		ASSESSMENT IN CAREER COUNSELLING					
Paper Number		4					
Category	Core	Year	I	Credit	5	Course Code	52214
		Semester	I				
Objectives							
1. To understand the nature, need, and significance of assessment in career counselling. 2. To distinguish between assessment and evaluation and understand psychometric principles of reliability and validity. 3. To develop knowledge of aptitude, interest, personality, values, and career maturity assessment tools. 4. To acquire practical skills in administering, scoring, interpreting, and reporting career assessments. 5. To apply career assessment results ethically for career planning and counselling interventions.							
Course Outcomes						Knowledge Levels	
On successful completion of this course, the learners will be able to:							
CO1: Explain the concepts, principles, and psychometric properties of career assessment.						K1	
CO2: Differentiate between assessment and evaluation and select appropriate assessment methods.						K2	
CO3: Administer, score, and interpret aptitude, interest, personality, and career maturity instruments.						K3	
CO4: Analyse assessment results to support career planning and decision-making.						K4	
CO5: Prepare professional career assessment reports while adhering to ethical standards.						K5	
K1 – Remember		K2 – Understand		K3 – Apply		K4 – Analyze	
						K5 – Evaluate	
						K6 - Create	
Unit 1: Foundations of Assessment in Career Counselling - Concept, Nature, Scope and Goals of Career Assessment – Assessment vs Evaluation – Reliability, Validity, Norms and Standardization– Ethical and Cultural Considerations in Career Assessment.							
Unit 2: Aptitude and Ability Assessment - Nature and Types of Aptitude Tests –Differential Aptitude Test(DAT)–General Aptitude Test Battery(GATB)–Cognitive and Scholastic Aptitude Assessment – Administration, Scoring and Interpretation.							
Unit 3: Interest, Personality and Values Assessment - Holland's Self-Directed Search (SDS) and Vocational Preference Inventory – Strong Interest Inventory – Kuder Occupational Interest Survey– Myers-Briggs Type Indicator (MBTI)–Work Values Inventories–Personality Assessment (16PF, Big Five) in Career Context.							
Unit4: Career Maturity, Adaptability and Decision-Making Assessment - Career Development Inventory – Career Maturity Inventory – Career Adapt-Abilities Scale – Career Decision-Making Self-Efficacy Scale – Career Search Self-Efficacy Scale.							
Unit5: Practicum in Career Assessment - Administration of One Aptitude Test – Administration of One Interest/Personality Inventory – Preparation of Career Profile and Interpretation Sheet – Career Assessment Report Writing – Use of Online/Technology-based Assessment Platforms – Case Presentation and Viva-Voce							
Text Books:							
1. Career Counseling: Foundations, Perspectives, and Applications by Spencer G. Niles & JoAnn Harris-Bowlsbey. Pearson. 2. Career Development and Counseling: Putting Theory and Research to Work edited by Steven D. Brown & Robert W. Lent. John Wiley & Sons.							

3. Psychological Testing and Assessment by Ronald Jay Cohen, Mark E. Swerdlik & Douglas K. Sturman. McGraw-Hill Education.
4. Essentials of Psychological Testing by Susana Urbina. John Wiley & Sons.
5. Standards for Educational and Psychological Testing by American Educational Research Association (AERA), American Psychological Association (APA), & National Council on Measurement in Education (NCME).

Suggested Readings:

1. Career Information, Career Counseling, and Career Development by Duane Brown. Pearson.
2. Career Counseling: A Holistic Approach by Vernon G. Zunker. Cengage Learning.
3. Assessment Procedures for Counselors and Helping Professionals by Robert J. Drummond & Karyn Dayle Jones. Pearson.
4. Using Assessment Results for Career Development by Debra S. Osborn & James P. Sampson Jr. National Career Development Association.
5. Handbook of Career Development edited by Wendy Patton & Mary McMahon. Springer.

E-Resources:

1. [National Career Service \(Government of India\)](#)
2. [National Career Development Association \(NCDA\)](#)
3. [O*NET Online](#)
4. [American Psychological Association \(APA\)](#)
5. [Educational Testing Service \(ETS\)](#)

Title of the Course		CAREER COUNSELLING SKILLS AND TECHNIQUES					
Paper Number		6					
Category	Core	Year	I	Credit	5	Course Code	52221
		Semester	II				
Objectives							
1. To develop an understanding of the fundamental skills and techniques used in career counselling. 2. To acquire effective communication, listening, and interpersonal skills required for professional career counselling. 3. To understand the stages and processes involved in individual and group career counselling. 4. To develop competency in applying career counselling techniques in educational, organizational and community settings. 5. To understand ethical principles and professional standards in career counselling practice.							
Course Outcomes							Knowledge Levels
Upon successful completion of the course, students will be able to:							
CO1: Demonstrate effective communication and interpersonal skills in career counselling							K1
CO2: Utilize career counselling skills to address educational, occupational and career decision - making concerns.							K2
CO3: Apply appropriate career counselling techniques during different stages of the counselling process.							K3
CO4: Conduct individual and group counselling sessions using appropriate helping strategies.							K4
CO5: Adhere to ethical principles and professional practices in career counselling							K5
K1 – Remember	K2 – Understand	K3 – Apply	K4 – Analyze	K5 – Evaluate	K6 - Create		
Unit 1: Foundations of Career Counselling Skills - Meaning, Nature, Scope and Objectives of Career Counselling Skills – Characteristics of an Effective Career Counsellor Helping Relationship–Core Conditions (Empathy,Genuineness,UnconditionalPositiveRegard) Professional Ethics and Competencies.							
Unit 2: Communication and Micro - Skills in Career Counselling - Verbal and Non-verbal Communication – Active Listening – Attending Behaviour –Questioning Techniques –Reflection of Feelings – Paraphrasing – Summarizing– Building Rapport in career counselling.							
Unit 3: Career Counselling Techniques - Stages of the Counselling Process – Career Interviewing Skills – Exploration Techniques – Goal Setting – Career Decision-MakingTechniques UseofCareerGenogramsandCareerTimelines–GroupCareerCounsellingTechniques.							
Unit 4: Counselling Skills in Different Settings - Individual and Group Career Counselling – School and College Career Counselling – – Workplace Career Coaching – Counselling Job Seekers and the Unemployed – Career Counselling for Special Groups (Persons with Disabilities, First-Generation Learners, Women Returning to Work).							
Unit 5: Contemporary Career Counselling Practice - Technology-Assisted and Online Counselling – Career Coaching vs Career Counselling – Documentation andRecord Keeping – Ethical and Legal Issues – Self-Care for Career Counsellors – Emerging Trends.							
Text book:							
1. Corey, G. (2021). Theory and Practice of Counseling and Psychotherapy (10th ed.). Cengage Learning. 2. Egan, G. (2019). The Skilled Helper: A Problem-Management and Opportunity-Development Approach (11th ed.). Cengage Learning. 3. Nelson-Jones, R. (2015). Basic Counselling Skills: A Helper's Manual (4th ed.). Sage Publications. 4. Gladding, S. T. (2020). Counseling: A Comprehensive Profession (9th ed.). Pearson Education.							

5. Ivey, A. E., Ivey, M. B., & Zalaquett, C. P. (2018). *Intentional Interviewing and Counseling: Facilitating Client Development in a Multicultural Society* (9th ed.). Cengage Learning.

Suggested Readings:

1. Gibson, R. L., & Mitchell, M. H. (2016). *Introduction to Counseling and Guidance* (7th ed.). Pearson Education.
2. McLeod, J. (2019). *An Introduction to Counselling* (6th ed.). Open University Press.
3. Geldard, K., Geldard, D., & Foo, R. Y. (2017). *Counselling Children: A Practical Introduction* (5th ed.). Sage Publications.
4. Rao, S. N. (2007). *Counselling and Guidance* (3rd ed.). Tata McGraw-Hill Education.
5. Capuzzi, D., & Stauffer, M. D. (2022). *Counseling and Psychotherapy: Theories and Interventions* (7th ed.). American Counseling Association.

E- Resources:

1. <https://www.counseling.org>
2. <https://www.schoolcounselor.org>
3. <https://www.bacp.co.uk>
4. <https://www.ncda.org>
5. <https://www.nimh.nih.gov>

Title of the Course		CAREER IN PRACTICE					
Paper Number		6					
Category	Core	Year	I	Credit	5	Course Code	52222
		Semester	II				
Objectives							
1. To develop an understanding of the case history – taking process and career diagnostic assessment. 2. To acquire practical knowledge and skills required for effective career counselling practice. 3. To understand the application of career counselling approaches in diversereal – life settings. 4. To develop competencies for addressing educational, occupational and career transition concerns. 5. To enhance professional skills in consultation, intervention and ethical career counselling practice.							
Course Outcomes Upon successful completion of the course, students will be able to:							Knowledge Levels
CO1: Demonstrate skills in client assessment, case history-taking, and career counselling intervention.							K1
CO2: Utilize career counselling skills in problem exploration, goal setting, and career decision-making.							K2
CO3: Apply appropriate career counselling strategies for individuals facing educational and occupational concerns.							K3
CO4: Perform the roles and responsibilities of school, college and workplace career counsellors effectively.							K4
CO5: Integrate career counselling theories, ethical principles, and professional practices in diverse settings.							K5
K1 <i>Remember</i>	–	K2 <i>Understand</i>	–	K3 – Apply	K4 – Analyze	K5 – Evaluate	K6 - Create
Unit 1: Case History and Career Diagnostic Assessment – Case History-Taking Process in Career Counselling – Structure of the Career Counselling Interview– Interview Techniques – Career Diagnostic Formulation – Career Action Planning.							
Unit 2: Career Counselling for Diverse Needs - Career Counselling for Persons with Visual, Hearing, and Physical Disabilities – Career Counselling for Learning Disabilities and Scholastic Backwardness – Career Counselling for Anxiety, Indecision, and Adjustment Issues – Career Counselling for Persons Recovering from Illness or Trauma.							
Unit 3: Career Counselling in Educational Institutions - Role and Responsibilities of the School/College Career Counsellor – Subject and Stream Selection Counselling at the HigherSecondaryLevel–CounsellingGiftedandSlowLearnersforCareerPlanning–CounsellingParentsandTeachers on Career Matters.							
Unit 4: Career Counsellor as Consultant - Consultation Skills – Steps in the Consultation Process – Consulting with Teachers, Parents, HR Professionals and Employers – Career Transition Counselling (School-to-Work, Job Change, Retirement) – Outplacement Counselling.							
Unit 5: Contemporary Issues in Career Practice - Individual, Group, and Family Career Counselling – Career-Related Crisis and Job-Loss Counselling – Multicultural and Inclusive Career Counselling – Documentation, Referral, and Follow-up – Professional Development of Career Counsellors.							
Text Books:							
1. Career Counseling: Foundations, Perspectives, and Applications by Spencer G. Niles & JoAnn Harris-Bowlsbey. Pearson. 2. Career Development and Counseling: Putting Theory and Research to Work edited by Steven D. Brown & Robert W. Lent. John Wiley & Sons. 3. Intentional Interviewing and Counseling: Facilitating Client Development in a Multicultural							

- Society by Allen E. Ivey, Mary Bradford Ivey & Carlos P. Zalaquett. Cengage Learning.
4. Counseling Techniques: Improving Relationships with Others, Ourselves, Our Families, and Our Environment by Richard D. Parsons. Cognella Academic Publishing.
 5. The Skilled Helper: A Problem-Management and Opportunity-Development Approach to Helping by Gerard Egan. Cengage Learning.

Suggested Readings

1. Career Counseling: A Holistic Approach by Vernon G. Zunker. Cengage Learning.
2. Developing Career Counseling Skills by David Capuzzi & Mark D. Stauffer. Pearson.
3. Career Information, Career Counseling, and Career Development by Duane Brown. Pearson.
4. Basic Attending Skills by Allen E. Ivey. Microtraining Associates.
5. Facilitating Career Development: Training and Activities for Career Counselors by Jennifer M. Keller & K. Richard Pyle. National Career Development Association.

E-Resources

1. [National Career Service \(Government of India\)](#)
2. [National Career Development Association \(NCDA\)](#)
3. [American Counseling Association \(ACA\)](#)
4. [O*NET Online](#)
5. [National Institute of Open Schooling \(NIOS\)](#)

Title of the Course		AI IN CAREER GUIDANCE AND COUNSELLING					
Paper Number		7					
Category	Core	Year	I	Credit	5	Course Code	52223
		Semester	II				
Objectives							
1. To develop an understanding of the concept, scope, and applications of Artificial Intelligence (AI) in career guidance and counselling. 2. To familiarize students with AI- based career assessment, matching, and recommendation systems. 3. To acquire practical knowledge of digital platforms, labour market information systems, and career guidance technologies. 4. To develop awareness of ethical, legal, and social issues in the use of AI for career guidance. 5. To prepare students to integrate AI tools with human counselling skills for effective, technology - enabled career guidance practice.							
Course Outcomes						Knowledge Levels	
Upon successful completion of the course, students will be able to:							
CO1: Explain the concept, scope, and relevance of AI in career guidance and counselling.						K1	
CO2: Describe AI- based career assessment, matching, and recommendation systems.						K2	
CO3: Use digital platforms, career guidance applications, and labour market information systems for career planning.						K3	
CO4: Analyse ethical, legal, and social issues associated with AI-based career guidance.						K4	
CO5: Integrate AI-based tools with human career counseling skills in a hybrid, ethical, and effective manner.						K5	
K1 – Remember	K2 – Understand	K3 – Apply		K4 – Analyze	K5 – Evaluate	K6 - Create	
Unit 1: Introduction to AI in Career Guidance - Concept, Nature, and Scope of Artificial Intelligence – Basics of Machine Learning and Data-Driven Decision-Making – Need and Importance of AI in Career Guidance and Counselling – Benefits, Limitations, and Myths about AI in Counselling.							
Unit 2: AI- Based Career Assessment and Recommendation Systems - AI-Driven Psychometric and Personality Assessment Tools – Career Matching Algorithms – Recommendation Engines– Chat bots and Virtual Career Assistants – Natural Language Processing in Career Guidance.							
Unit 3: Digital Platforms and Career Guidance Technologies – Online Career Portals (National Career Service, O*NET, LinkedIn)–Labour Market Information Systems – Big Data and Predictive Analytics in Career Guidance – Career Guidance Mobile Applications – Learning Management Systems for Career Development.							
Unit 4: Ethical, Legal and Social Issues in AI- Based Career Guidance – Data Privacy and Confidentiality – Algorithmic Bias and Fairness – Informed Consent in AI – Assisted Counselling– Digital Divide and Accessibility – Regulatory and Professional Guidelines.							
Unit 5: Emerging Trends and Future of AI in Career Counselling - Generative AI Tools in Career Guidance – AI for Labour Market Forecasting and Skill-Gap Analysis – Reskilling and Upskilling Recommendations – Human-AI Collaboration: The Hybrid Counselling Model – Case Studies and Practical Applications.							

Text Books:

1. Artificial Intelligence: A Modern Approach by Stuart Russell & Peter Norvig. Pearson.
2. Career Development and Counseling: Putting Theory and Research to Work edited by Steven D. Brown & Robert W. Lent. John Wiley & Sons.
3. Career Counseling: Foundations, Perspectives, and Applications by Spencer G. Niles & JoAnn Harris-Bowlsbey. Pearson.
4. Artificial Intelligence in Education: Promises and Implications for Teaching and Learning by Wayne Holmes, Maya Bialik & Charles Fadel. Center for Curriculum Redesign.
5. Ethics of Artificial Intelligence and Robotics edited by Markus D. Dubber, Frank Pasquale & Sunit Das. Cambridge University Press.

Suggested Readings

1. The AI Revolution in Education: Changing the Future of Learning by Ryan Lufkin. Kogan Page.
2. Introduction to Artificial Intelligence by Wolfgang Ertel. Springer.
3. The Future of the Professions by Richard Susskind & Daniel Susskind. Oxford University Press.
4. Career Information, Career Counseling, and Career Development by Duane Brown. Pearson.
5. The Oxford Handbook of Career Development edited by Peter J. Robertson, Tristram Hooley & Phil McCash. Oxford University Press.

E-Resources

1. [National Career Service \(Government of India\)](#)
2. [O*NET Online](#)
3. [LinkedIn Learning](#)
4. [UNESCO – Artificial Intelligence and Education](#)
5. [Organisation for Economic Co-operation and Development \(OECD AI\)](#)

Title of the Course		PROJECT WORK AND INTERNSHIP					
Paper Number		8					
Category	Core	Year	I	Credit	5	Course Code	52224
		Semester	II				
Objectives							
1. To develop practical competencies in career guidance and counselling through supervised fieldwork and internship. 2. To apply career counselling theories, techniques, and assessment skills in real-life educational, organizational, and community settings. 3. To conduct career guidance related project using appropriate research methods, data collection, analysis, and report writing. 4. To demonstrate professional ethics, communication skills, and interpersonal competencies in career counselling practice. 5. To I-integrate theoretical knowledge with field experiences to promote career development and employability.							
Course Outcomes							Knowledge Levels
The student will be able to:							
CO1: Demonstrate professional career counselling skills in educational, organizational and community settings.							K1
CO2: Conduct career assessments and apply career counselling interventions under supervision							K2
CO3: Plan, execute, and complete a career related project using appropriate research methods and ethical practices.							K3
CO4: Prepare internship records, case reports, and project reports with professional competence.							K4
CO5: Exhibit ethical behaviour, reflective practice, teamwork, and effective communication in career guidance services.							K5
K1 – Remember	K2 – Understand	K3 – Apply		K4 – Analyze	K5 – Evaluate	K6 - Create	
Unit I: Orientation to Internship – Objectives and Significance of Internship – Roles and Responsibilities of Trainee Career Counsellors–Selection of Internship Organization – Professional Ethics and Code of Conduct – Orientation to Project Work and Report Writing.							
Unit II: Career Counselling Practice and Field Exposure – Observation of Career Counselling Sessions–Rapport Building and Communication Skills – Individual Career Counselling – Group Career Guidance Programmes – Career Guidance Services in Educational/Organizational Settings.							
Unit III: Career Assessment and Case Documentation - Administration of Career Assessment Tools – Case History Collection – Interview and Observation Techniques – Case Recording and Documentation – Referral Procedures and Follow-up.							
Unit IV: Project Work – Identification of Research Problem Related to Career Guidance–Review of Literature – Research Design – Data Collection and Analysis – Project Report Preparation Project report preparation							
Unit V: Internship Report, Viva-Voce and Professional Development - Preparation of Internship Diary – Reflective Journal Writing – Internship Report – Project Presentation – Viva-Voce Employability Skills and Professional Development.							
Text Books							
1. Gibson, R. L., & Mitchell, M. H. (2016). Introduction to Counselling and Guidance (8th ed.). Pearson. 2. Gladding, S. T. (2021). Counselling: A Comprehensive Profession (9 th ed.). Pearson. 3. Corey, G. (2021). Theory and Practice of Counselling and Psychotherapy (10th ed.). Cengage Learning. 4. Kothari, C. R., & Garg, G. (2019). Research Methodology: Methods and Techniques (4th ed.).							

New Age International.

5. Singh, A. K. (2018). Tests, Measurements and Research Methods in Behavioural Sciences. Bharati Bhawan Publishers.

Suggested Readings

1. Corey, M. S., Corey, G., & Callanan, P. (2015). Issues and Ethics in the Helping Professions (9th ed.). Cengage Learning.
2. McLeod, J. (2013). An Introduction to Counselling (5th ed.). Open University Press.
3. Brown, D., & Lent, R. W. (2019). Career Development and Counselling: Putting Theory and Research to Work (3rd ed.). Wiley.
4. American Psychological Association. (2017). Ethical Principles of Psychologists and Code of Conduct. APA.
5. Bordin, E. S. (1983). A Working Alliance Based Model of Supervision. The Counseling Psychologist.

E-Resources

1. [American Psychological Association \(APA\)](#)
2. [National Career Service \(Government of India\)](#)
3. [National Council of Educational Research and Training \(NCERT\)](#)
4. [National Institute of Open Schooling \(NIOS\)](#)
5. [ERIC – Education Resources Information Center](#)