MALLA REDDY VISHWAVIDYAPEETH

(Deemed to be University)

Suraram X Roads, Jeedimetla, Hyderabad 500055

School of Public Health, Emerging Healthcare & Technology

(SPHEHT)

COURSE STRUCTURE & SYLLABUS DOCUMENT

B.Sc. Orthopedic Technology

Year 2025–29 Batch

COURSE STRUCTURE

I year I semester

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	Max. Marks		
							INT	EXT	TOTAL
1	BTO3410101	Human Anatomy - I	4	-	-	4	30	70	100
2	BTO3410102	Human Physiology - I	4	-	-	4	30	70	100
3	BTO3410103	Medical Bio-chemistry	4	-	-	4	30	70	100
4	BTO3410104	English and Communication Skills	2	-	-	2	30	70	100
5	BTO3410105	Basics of Computers	1	-	2	2	30	70	100
6	BTO3410101P	Human Anatomy - I Practical	-	-	4	2	30	70	100
7	BTO3410102P	Human Physiology - I Practical	-	-	4	2	30	70	100
	BTO3410106	Sociology	2	-	-	2	30	70	100
8	BTO3410107VA	Environmental Awareness	2	-	-	2	100	-	100
TOTAL			**19**	**-**	**10**	**24**	**340**	**560**	**900**

I year II semester

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	Max. Marks		
							INT	EXT	TOTAL
1	BTO3410201	Human Anatomy – II	4	-	-	4	30	70	100
2	BTO3410202	Human Physiology - II	4	-	-	4	30	70	100
3	BTO3410203	Pathology	2	-	-	2	30	70	100
4	BTO3410204	Microbiology	3	-	-	3	30	70	100
5	BTO3410205	Introduction to Orthopedics	3	-	-	3	30	70	100
6	BTO3410201P	Human Anatomy – II Practical	-	-	4	2	30	70	100
7	BTO3410202P	Human Physiology – II Practical	-	-	2	1	30	70	100
8	BTO3410206VA	Stress Management	1	-	-	1	100	-	100
TOTAL			**17**	**-**	**6**	**20**	**310**	**490**	**800**

II-year III semester

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	Max. Marks		
							INT	EXT	TOTAL
1	BTO3410301	Basic Orthopedics Techniques	3	-	2	4	30	70	100
2	BTO3410302	Pharmacology	3	-	-	3	30	70	100
3	BTO3410303	Health Care Administration	2	-	-	2	30	70	100
4	BTO3410304	Medical Law, Ethics and Medical Records	3	-	-	3	30	70	100
5	BTO3410305	Clinical Posting	-	-	16	8	100	-	100
6	BTO3410306VA	Soft Skills Development	2	-	-	2	100	-	100
7		AI in Healthcare: Foundation	1	-	-	1			
TOTAL			**14**		**19**	**23**	**320**	**280**	**600**

II year IV semester

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	Max. Marks		
							INT	EXT	TOTAL
1	BTO3410401	Orthopedic Diagnostic	3	-	-	3	30	70	100
2	BTO3410402	Infection Control in Orthopedics	3	-	-	3	30	70	100
3	BTO3410403	First Aid Procedures	2	-	2	3	30	70	100
4	BTO3410404	Plaster Technology	2	-	2	3	30	70	100
5	BTO3410405	Clinical Posting	-	-	16	8	100	-	100
6	BTO3410406VA	Health and Well-being	1	-	-	1	100	-	100
TOTAL			**11**	**-**	**20**	**21**	**320**	**280**	**600**

III year – V semester

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	Max. Marks		
							INT	EXT	TOTAL
1	BTO3410501	Trauma Care and Management in Orthopedics	4	-	-	4	30	70	100
2	BTO3410502	Applied Orthopedic Technology	3	-	2	4	30	70	100
3	BTO3410503	Orthopedics Instruments, Its Maintenance & Quality Assurance	3	-	-	3	30	70	100
4	BTO3410504	Clinical Posting	-	-	16	8	100	-	100
5	BTO3410505VA	Interpersonal Communication	1	-	-	1	100	-	100
TOTAL			**11**		**18**	**20**	**290**	**210**	**500**

III year – VI semester

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	Max. Marks		
							INT	EXT	TOTAL
1	BTO3410601	Advanced Orthopedic Surgery Assistance	3	-	2	4	30	70	100
2	BTO3410602	Prosthetics and Orthotics	3	-	-	3	30	70	100
3	BTO3410603	Physiotherapy in Orthopedics	3	-	2	4	30	70	100
4	BTO3410604	Research Methodology and Biostatistics	3	-	-	3	30	70	100
5	BTO3410605	Clinical Posting	-	-	12	6	100	-	100
6	BTO3410606VA	Art of Being a Better Person	1	-	-	1	100	-	100
TOTAL			**13**		**16**	**21**	**320**	**280**	**600**

IV year – VII semester

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	Max. Marks		
							INT	EXT	TOTAL
1	BTO3410701	Internship - I	-	-	40	20	30	70	100
2	BTO3410702VA	Healthy Eating for Healthy Living	1	-	-	1	100	-	100
3	BTO3410703	Project Work - I	-	-	2	1	100		100
TOTAL			**1**		**42**	**22**	**230**	**70**	**300**

IV year – VIII semester

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	Max. Marks		
							INT	EXT	TOTAL
1	BTO3410801	Internship - II	-	-	20	10	30	70	100
2	BTO3410802	Project work - II	-	-	20	10	30	70	100
3	BTO3410803VA	Professionalism in the Workplace	1	-	-	1	100	-	100
TOTAL			**1**		**40**	**21**	**160**	**140**	**300**

1.1 Under Graduate Programme

Sl. No.	Course	Duration	Eligibility for admission
1	BSc Orthopedic Technology	4 years	Intermediate Bi PC, 10+2 or equivalent

1.2. Medium of Instruction:

English shall be the medium of instruction for all subjects of study and for examinations.

1.3. Duration of the Course

Duration details are mentioned under clause no. 1.1 of this booklet.

1.4 Examination Regulations

1.4.1 Attendance: 75% of attendance (physical presence) is mandatory.
Medical leave or other types of sanctioned leaves will not be counted as physical presence. Attendance will be counted from the date of commencement of the session to the last day of the closing of attendance before the final examination.

1.4.2 Internal Assessments:

a) Regular periodic assessment shall be conducted throughout the course. In each semester there will be **two one hour internal assessments (10 marks each)** and a continuous assessment **(10 marks).** Thus a total of 30 marks for the internal exam. (i.e. weightage for internal assessment shall be 30% of the total marks in each subject).

b) **Exam pattern for internal assessment** in each semester will be

(a) Essay question 1 no. (5 marks)
(b) Short questions 1 no. (2 marks)
(c) Very short question 3 nos. (each carries 1 mark i.e. 1 x 3 = 3 marks)
Thus a total of 10 marks for one internal assessment
Two such internal examinations will be conducted.
(b) Continuous assessment of the student will be done. Students overall attendance, performance in class, behaviour of the student, extra-curricular activities etc will be assessed. Continuous assessment carries 10 marks.

(d) Thus a total of 30 marks for the internal examination. (10 + 10 + 10 = 30 marks). A candidate should secure a minimum of 40% marks in the internal assessment in each subject to be eligible to appear for the University examination

(e) For value added courses, only internal examination will be conducted. The minimum pass is 40% marks.
(f) For project both internal and external examination will be conducted.

1.4.3 University Examinations (External):

a) University Examination shall be conducted at the end of every semester.

b) A candidate who satisfies the requirement of attendance and internal assessment marks, as stipulated by the University shall be eligible to appear for the University Examination.

c) Examination will be of 3 hours duration (for theory). The question paper pattern for those subjects without practical examination (70 marks) will be (a) Three essay questions out of which the student should answer 2 questions each carrying 10 marks (i.e. 2 x 10 = 20 marks) (b) Eight short note questions out of which the student should attempt six questions, each carrying 5 marks (6 x 5 = 30 marks). (c) Ten very short questions each carrying 2 marks (i.e. 10 x 2 = 20 marks). Thus a total of 70 marks.

d) The question pattern for practical examination (a) Spotters/major practical/minor practical/Viva/practical record.

The minimum pass for internal assessment is 40% and for the University Examination is 50% . i.e. a student should score a total of 50% (adding the internal and external examination) to pass in each subject.

SEMESTER-I

HUMAN ANATOMY – I

L/T/P/C: 4/-/-/4

UNIT-I

GENERALANATOMY AND HISTOLOGY

1. Introduction to anatomy, anatomical terms, planes, axis.
2. General Anatomy:
   - Fascia
   - Muscles
   - Bones
   - Joints
   - Vessels
   - Nerve

3. General Histology:
   - Epithelial
   - Connective tissue
   - Muscle
   - Bone and cartilage
   - Nerve and vessels

- Embryology

UNIT-II

UPPEREXTREMITY:

1. Osteology: Clavicle, Scapula, Humerus, Radius, Ulna, Carpals, Metacarpals, Phalanges.
2. Muscles: Origin, insertion, nerve supply and actions.

UNIT-III

BASIC ANATOMY OF UPPEREXTREMITY:

1. Joints: Shoulder girdle, shoulder joint, elbow joints, radio ulnar joint, wrist joint and joints of the hand.
2. Breast, pectoral region, axilla, cubital fossa, Arches of hand
3. Brachial plexus, nerves of upper extremity
4. Blood vessels and lymphatic drainage

UNIT-IV

CARDIOVASCULAR & RESPIRATORY ANATOMY

1. Thoracic wall
2. Anatomy of circulatory system
3. Heart: Anatomy of heart, blood Supply, nerve supply, conducting System and major blood vessels
4. Lungs: Basic Anatomy of lungs, bronchial tree, pleura, Broncho pulmonary segments, blood Supply and nerve supply
5. Diaphragm: Origin, insertion, nerve supply and action.
6. Intercostal muscles and Accessory muscles of Respiration: Origin, insertion, nerve supply and action
7. Basic anatomy of Ribs and sternum

UNIT-V

SYSTEMIC ANATOMY

1. Digestive system:
   - List the parts of the digestive system
   - Basic Anatomy of stomach, liver, gallbladder, spleen, pancreas, intestines.

2. Urinary system:
   - Basic Anatomy of kidney, urinary bladder

3. Endocrine system:
   - Position and hormones secreted by each organ

4. Genital system:
   - Basic anatomy of Male organs and female organs

RECOMMEMDEDTEXTBOOKS

1. Human Anatomy-Snell
2. Anatomy-Chaurasia, Volume-I,II &III

3. Neuro anatomy-Inderbir Singh
4. Human Anatomy-Kadasne, Volume-I,II&III
5. Neuro anatomy—Vishrsam Singh
6. Human Anatomy-Datta

HUMAN PHYSIOLOGY – I

L/T/P/C: 4/-/-/4

UNIT-I

GENERALPHYSIOLOGY

Cell:

1. Structure of cell membrane
    a) Fluid mosaic model
    b) Lipidbi-layer
    c) Functions of cell membrane
2. Transport across cell membrane

A. Basic mechanism of transport
    a) Channel proteins
    b) Carrier proteins

B. Methods of transport
    a) Passive transport
    b) Active transport

3. Body fluids
    a) Intracellular fluid
    b) Extracellular fluid
    c) Body electrolytes
    d) Regulation of body fluid volume
4. Homeostasis
    a) Regulation of body function
    b) Homeostatic regulatory mechanism

BLOOD:

1. Composition of blood &it's volume
2. Plasma
3. Heamopoiesis
    a) Composition
    b) Plasma protein
4. Erythrocytes
    a) Normal count
    b) Structure of RBC (shape &size)
    c) Functions of RBC
    d) Hemoglobin (Normal Value, Fate, Function)
    e) Anemia& polycythemia
    f) ESR&PCV

5. Leukocytes
    a) Classification
    b) Functions of leukocytes
6. Platelets
    a) Normal count
    b) Functions of thrombocytes
    c) Blood Coagulation
    d) Bleeding time &clotting time
7. Blood group
    a) ABO system
    b) Landsteiner's law
    c) ABO incompatibility
    d) Rh system
    e) Rh incompatibility& erythroblastosis fetalis
8. Blood transfusion
    a) Collection & storage of blood
    b) Precautions
    c) Cross matching
    d) Hazards of blood transfusion

NERVE:

1. Structure of a neuron
2. Classification of neurons
3. Electrical activity of neuron
    a) Resting membrane potential
    b) Action potential
4. Nerve Injury
    a) Types of nerve Injury
    b) Effect of nerve Injury
    c) Regeneration of damaged nerve fiber

UNIT-II

MUSCLE PHYSIOLOGY

1. Classification
2. Properties of skeletal muscle
3. Structure of skeletal muscle
    a) Sarcomere
    b) Sarco tubular system
    c) Neuro muscular junction& disease affecting it
4. Mechanism of muscle contraction
5. Functions of skeletal muscle
6. Types of muscle contractions
7. Red& white muscles
8. Rigor mortis, muscular dystrophy, altered muscle tone, muscle cramp, atrophy, EMG

UNIT-III

CARDIOVASCULAR SYSTEM

1. Structure of heart & blood vessels
2. Properties of cardiac muscle
3. Origin &spread of cardiac pulse
4. Cardiac cycle &heart sounds
5. Cardiac out put
    a) Related terms
    b) Regulation of cardiac output
    c) Circulatory shock
6. Pulse &Heart rate and it's regulation
7. Blood pressure
    a) Definitions
    b) Factors controlling & Influencing BP
    c) Regulation of BP
8. Regional circulation
    a) Coronary circulation
    b) Cerebral circulation
9. Normal ECG.

UNIT-IV

RESPIRATORYSYSTEM

1. Introduction, structure & function of RS
    a) Upper respiratory tract
    b) Lower respiratory tract
    c) Respiratory membrane
2. Mechanism of breathing
    a) Mechanics of breathing
    b) Respiratory pressure change
    c) Compliance
    d) Surfactant
3. Respiratory volumes & capacities
4. Pulmonary ventilation& Dead space
5. Nervous &chemical regulation of respiration
6. Pulmonary function test-direct& indirect method

RECOMMENDED TEXT BOOKS

1. Text book on Medical Physiology-Guyton
2. Textbook of Physiology-AK Jain (for MBBS students)
3. Human Physiology-C.C. Chatterjee
4. Essentials of Medical Physiology -Sembulingam, K.
5. Comprehensive Textbook of Medical Physiology: Vol-1 & 2 - Pal, Gopal Krushna
6. Physiology: Prep Manual for Undergraduates- Joshi, Vijaya D.
7. Practical Physiology -Joshi, Vijaya D.

MEDICAL BIOCHEMISTRY

L/T/P/C: **4/-/-/4**

UNIT-I

CARBOHYDRATE CHEMISTRY

- Definition, general classification with examples
- Composition and functions of Monosaccharides, Disaccharides ani Polysaccharides
- Anomers, Epimers, Enantiomers, Mutarotation
- Glycosaminoglycans (mucopolysaccharides)

LIPID CHEMISTRY

- Definition, classification with examples.
- Classification and Functions of Fatty acids, Phospholipids, Lipoprotein
- Structure and functions of Cholesterol
- Sources and functions of Ket one bodies

UNIT-II

AMINOACIDCHEMISTRY

- Definition, Classification of amino acids with examples.
- Definition, Classification of proteins with examples
- Structural organization of proteins
- Biologically important peptides

NUCLEICACIDSANDNUCLEOTIDECHEMISTRY

- Composition and Functions of Nitrogen bases, Nucleosides, Nucleotides
- Structure and Functions of DNA
- Structure, Types and Functions of RNA
- Differences between DNA and RNA

UNIT-III

ENZYMES

- Definition, Classification of enzymes with examples
- Active site, Enzyme specificity.
- Factors affecting enzyme activity
- Enzyme inhibition
- Iso enzymes and their clinical significance - LDH, creatine kinase, ALP

VITAMINS

- Definition, Classification
- Fat soluble Vitamins-Sources, RDA, Functions and Deficiency.
- Water soluble Vitamins- Sources, RDA, Functions and Deficiency

UNIT-IV

INTERMEDIARYMETABOILISM

- Glycolysis
- TCA cycle
- B-oxidation of fatty acids (Palmitic acid)
- Ketone body formation and utilization Urea cycle

UNIT-V

MINERALMETABOLIS

- Definition, Classification. Sources, RDA, Functions and Deficiency of Calcium, Phosphorous, Iron, Sodium, Potassium

CLINICALBIOCHEMISTRY

- Normal and abnormal constituents of Urine and Blood and their clinical significance:
- Normal constituents:
- Organic: Urea, Uric acid, Creatinine
- Inorganic: Ca, phosphate, chloride, electrolytes
- Abnormal constituents:
- Glucose, Ketone bodies, Protein, Blood, Bile salts, Bile pigments

RECOMMENDED BOOKS

1. Essentials of Biochemistry by U. Satyanarayana.
2. Text book of Biochemistry for Medical students. DM Vasudevan
3. Integrated textbook of Biochemistry Volume-l and II. Indumathi.
4. Textbook of Biochemistry for Medical students. MN Chatterjee and Rana Shinde.
5. Harper's Illustrated Biochemistry.
6. Essentials of Biochemistry. Pankaja Naik

ENGLISH AND COMMUNICATION SKILLS

L/T/P/C: 2/-/-/2

Course Objectives:

To enhance the lexical and grammatical skills of the learners.
To develop reading competencies for academic and professional requirements.
To write effectively to meet professional needs.
To hone speaking and listening skills.
To enhance empathy and other vital interpersonal skills of the learners

UNIT 1: Sympathy (Poem) by Charles Mackay

Reading - Reading and its importance, techniques of effective reading.

Writing - Paragraph Writing (Topic sentence, Supporting sentences, and Conclusion)

Grammar - Parts of Speech (Parsing), Articles

Vocabulary - Pain and Symptoms, and Common Illness

ELCS LAB

CALL LAB: Phonetics - Vowel Sounds (Monophthongs and Diphthongs)

Listening - Introduction to listening, Purpose of Listening, and Barriers to effective listening

ICS LAB: Speaking - Self-introduction and Introducing others, JAM

UNIT 2: A Birthday Letter by Jawaharlal Nehru

Reading - Skimming and Scanning

Writing - Letter writing (Requests, Leave applications, Purchase letters, Letters in correspondence with medical insurance companies)

Grammar - Phrase, Clause and Sentence; Prepositions

Vocabulary - Body parts and diseases, Definitions / One-word substitutes

ELCS LAB

CALL LAB: Phonetics - Consonant Sounds

Listening - Listening for gist and specific information ICS LAB: Speaking - Small talk, Narration of anecdotes

UNIT 3: The secret of work by Swami Vivekananda

Reading - Making inferences and predictions

Writing - E-mail writing

Grammar - Tenses, Reported speech

Vocabulary - Food and lifestyle, Instruments and Equipment

ELCS LAB

CALL LAB: Intonation

Listening - Listening and identifying facts and opinions

ICS LAB: Speaking - Role Plays (OET) (Giving and taking instructions, Interacting with and explaining processes, conditions and instructions to the patients and their attenders,

UNIT 4: All the world's a stage (Poem) by William Shakespeare

Reading - Reading for explicit and implicit meaning

Writing - Short essays: 2-Paragraph Essay, Thesis Statement

Grammar - Subject-Verb agreement, Degrees of Comparison

Vocabulary - Caring and Emotions, Medical Abbreviations and Acronyms

ELCS LAB

CALL LAB: Consonant Clusters

Listening - Listen- Comprehend - Speak, Health Care

ICS LAB: Speaking - Formal Discussions, Physical Description/Personality

UNIT 5: Sister Nivedita: Calcutta's Angel of Mercy (Article/Essay) by Monidipa Dey

Reading - Intensive and Extensive Reading, reading comprehension passages from OET and IELTS

Writing - Report writing (Analyzing tests and Reporting patient condition)

Grammar – Voice, If conditionals

Vocabulary - Health, Hygiene and Wellness, Medical Vocabulary/Terminology

ELCS LAB

CALL LAB: Past Tense Markers and Plural Markers

Listening - Listening tasks from OET and IELTS

ICS LAB: Speaking - Conversation practice, Short oral presentations specifying the condition of the patient

COURSE OUTCOMES:

Construct grammatically correct sentences with appropriate vocabulary.

Analyze, interpret and synthesize a diverse range of profession-specific concepts through better comprehension of the text.

Draft various types of written communication pieces useful to their professional lives.

Understand and apply norms of scientific communication, soft skills and positive interpersonal communication.

Listen effectively and speak fluently in formal and informal situations, especially in their workplace.

TEXTBOOK:

English for nurses by Vijaya Laxmi Naidu. Nirali Prakashan. 2008.

RECOMMENDED BOOKS:

1. Practical English Usage by Michael Swan. OUP. 1995.
2. On Writing Well by William Zinsser, Harper Resource Book. 2001.
3. Cambridge English for nursing by Virginia Allum and Patricia Mc Garr. CUP. 2010.
4. English for nursing by Ross Wright and Bethany Cagnol. Pearson. 2001.
5. English for nursing-2 by Maris Spada Symonds and Ross Wright. Pearson. 2001.
6. Everyday English for International nurses by Joy Parkinson and Chris

Brooker. Elsevier. 2004.
7. Oxford English for career Nurses by Tony Grice. Oxford University Press. 2007.

SOCIOLOGY

L/T/P/C: 2/-/-/2

SUBJECT DISCRIPTION Sociology will introduce student to the basic sociology concepts, principles and social process, social institutions in relation to the individual, family and community and the various social factors affecting the family in rural and urban communities in India will be studied

UNIT 1

1. *Introduction:*

a. Meaning- Definition, Nature and Scope of Sociology
b. Methods of Sociological Investigations, Case Study, Social Survey, Questionnaire and Interview methods.
c. Importance of its study with special reference to Health Care Professionals.

2. *Social Factors in health and disease situations:*

a. Role of Social factors in health
b. Role of social factor in illness
c. Decision making in taking treatment

UNIT-2

1. *Socialization:*

a. Definition and Meaning of Socialisation
b. Primary, Secondary and Anticipatory socialisation
c. Agencies of Socialisation

2. *Social Groups:*

a. Definition and Features of Social Group
b. Primary Social Group
c. Secondary Social Group
d. The role of Primary and Secondary Groups in Hospitals.

UNIT-3

1. *Family:*

a. The family, meaning and definition
b. Functions of family
c. Changing family patterns
d. Influence of Family on the individuals health, the effects of sickness in the family.

2. *Community:*

a. Rural community: meaning and features- Health problems of rural community.
b. Urban community: meaning and features – Health problems in urbanities.

UNIT-4

1. *Culture and Health:*

a. Concept of Health
b. Concept of Culture
c. Cultural factors affecting Health and diseases

2. *Social Change:*

a. Meaning of social change
b. Factors of social change
c. Human adaptation and social change
d. Social planning and Health

UNIT-5

1. *Social Problems:*

a. Population explosion
b. Juvenile delinquency
c. Alcoholism
d. Unemployment
e. Poverty
f. Problems of women

2. *Social Security:*

Social security and social legislation

Recommended Books:

1. Principles of sociology C.N. Shankar Rao
2. Sociology for physiotherapy students - K.P Neeraja

BASICS OF COMPUTERS

L/T/P/C 1/-/2/2

COURSE OBJECTIVES:

To understand all components of computer, different working environments and operations of computer.

To learn creating different types of word documents, MS Excel manipulations, Power point documents.

To understand basic requirements of computer network hardware, software and its network architecture.

UNIT – I

Introduction to computers:-Definition of Computer-Characteristics of computer-Components of Computer Hardware – Input & Output devices- Memories– RAM and ROM–MB, GB their conversions – Software : Application Software and Systems software-Data and Information –Different computer languages- Number systems- Binary and decimal conversions.

UNIT – II

MS WORD: Typing text in MS Word– Manipulating text¬– formatting text–using different font sizes, bold, italic– bullets and numbering –Pictures, Aligning the text and justify– choosing paper size– adjusting margins– header and footer, inserting page no's in a doc– printing a file with options– using spell check and grammar– find and replace– mail merge – insert tables in a document.

UNIT – III

MS EXCEL: Creating MS Excel-Cell editing, using formulas and functions, manipulating data with excel– using sort function to sort numbers and alphabets– drawing graphs and charts using data in excel.

MS POWERPOINT: Slide transition and animation-slides with sounds– inserting clip arts–Pictures, table sand graphs.

UNIT – IV

Introduction to Computer Networks: Introduction, Computer Network Devices(Hubs, Switches, Routers, Gateway, Bridge, Modems, Wireless Access Points, Firewalls & NIC), Types of computer Networks (LAN, MAN & WAN), Network Topologies (Star, Ring, Mesh, Tree, Hybrid Topologies), Internet Based Applications, Advantages & Disadvantages of Computer Networks, E-Mail, Components of E-Mail, Attaching Files in E-mail, Different Search Engines.

UNIT – V

Introduction to Artificial Intelligence & ML: History of AI, Sub Areas of AI, Applications of AI in Healthcare, Benefits of AI in Health Care, Challenges of AI in Healthcare, Introduction to Machine Learning, Applications of Machine Learning, Machine Learning Algorithms, Real world Machine Learning Use Cases.

COURSE OUTCOMES:

At the end of the course the student will be able

To understand peripherals of the computer how it works and understand various languages of the computer.

To create any kind of presentations for presenting their knowledge anywhere in the form of document or ppt.

To create excel sheets to save data and process the data efficiently.

To understand basic requirements of computer network hardware, software and its network architecture.

RECOMMENDED BOOKS:

1. Computer Fundamentals by Goel, Anita Pearson
2. Computer Fundamentals : Concepts, Systems & Applications- 8th Edition by Priti Sinha, PradeepK., Sinha
3. MS-Office 2010 Training Guide by Prof. Satish Jain, M. Geetha
4. Computer Networks, Andrews S Tanenbaum, 5th Edition, Pearson Education
5. Artificial Intelligence : A modern Approach, Stuart J. Russell and Peter Norvig, Third Edition, PearsonEducation
6. Hands-on Machine Learning with Scikit-Learn, Keras, and TensorFlow,

Aurelien Geron-Oreilly, 2ndEdition.

HUMAN ANATOMY PRACTICAL – I

L/T/P/C-/-/4/2

Human anatomy practicals are essential for understanding the structure of the human body, its systems, and their functional relationships. These practicals focus on giving students hands-on experience in identifying anatomical structures and understanding the musculoskeletal, nervous, and cardiovascular systems.

GROSS SPECIMENS/SPOTTERS

UPPER EXTREMITY

- Identify the spotter- (Cross section of shoulder Joint, Elbow Joint, Wrist complex, Hand)
- Identify the bone- UPPER EXTREMITY BONES (Scapula, Clavicle, Humerus, Radius and Ulna, Carpals, Metacarpals and Phalanges) Including side determination
- Surface Anatomy of the Upper Extremity – UPPER EXTREMITY BONES AND MUSCLES
- Spotters of Blood vessels (Profunda Brachii, Brachial, Radial, Ulnar)
- Spotter of Nerves (Axillary, Musculocutaneous, Radial, Median, Ulnar)
- Gross Specimen of Heart, Lung
- Spotters of Bronchial tree, Bronchopulmonary segments

SYSTEMIC ANATOMY

- Gross Specimen/Spotter (Stomach, Liver, Gall Bladder, Spleen, Pancreas, Intestines, Kidney, Uterus)
- Cross section of Kidney

HUMAN PHYSIOLOGY PRACTICAL – I

L/T/P/C: -/-/4/2

These practical's typically align with the theoretical aspects of physiology and help students apply concepts to real-world clinical scenarios. Key Areas Covered in Human Physiology for this semester includes the following.

- Determination of blood group, bleeding time and clotting time
- Estimation of haemoglobin concentration
- Peripheral pulse determination
- Auscultation of Heart sounds
- Determination of blood pressure
- Auscultation of breath sounds
- Assessment of respiratory rate

ENVIRONMENTAL AWARENESS

L/T/P/C: 2/-/-/2

Course Description:

This course introduces students to the fundamental concepts of environmental awareness, examining the relationship between humans and the environment. It emphasizes the impact of human activities on the planet and promotes sustainable practices. Students will explore key environmental issues, such as climate change, biodiversity, pollution, and resource conservation, and develop practical knowledge for contributing to environmental protection.

Course Objectives:

- By the end of the course, students will be able to:
- Understand the basic concepts of environmental science and sustainability.
- Identify the major environmental challenges facing the world today.
- Analyze the impact of human activities on ecosystems, biodiversity, and natural resources.
- Explore global environmental policies and local solutions to environmental problems.
- Implement sustainable practices in everyday life.

UNIT-I

1. Introduction to Environmental Awareness
2. What is environmental awareness?
3. The importance of environmental education.
4. Key environmental concepts: ecosystems, biodiversity, sustainability. Historical perspective on environmental awareness.

UNIT-II

1. Earth's Ecosystems and Biodiversity
2. What are ecosystems?
3. Types of ecosystems: forests, oceans, wetlands, etc. Importance of biodiversity.
4. Threats to biodiversity: habitat loss, invasive species, climate change.

UNIT-III

1. Pollution and Its Impact
2. Types of pollution: air, water, soil, noise, and light pollution. Causes and effects of pollution on health and ecosystems. Case studies of major pollution events.

UNIT-IV

1. Climate Change and Global Warming
2. The science of climate change.
3. Greenhouse effect and human contributions.
4. Impacts of climate change: rising temperatures, sea levels, extreme

weather. Mitigation and adaptation strategies.

UNIT-V

1. Resource Conservation
2. Renewable vs. non-renewable resources.
3. The importance of conserving water, energy, and other resources.
4. Techniques for conservation: recycling, energy efficiency, and water-saving practices.

UNIT-VI

1. Sustainable Agriculture and Food Systems
2. Environmental impact of conventional farming practices.
3. Sustainable agriculture: organic farming, permaculture, and agroecology. The role of diet in environmental sustainability.

UNIT-VII

1. Waste Management
2. Types of waste: municipal, industrial, hazardous, electronic. The 3 Rs: Reduce, Reuse, Recycle.
3. Landfills, incineration, and composting. Zero waste lifestyle.

UNIT-VIII

1. Water Conservation and Management
2. The global water crisis: causes and consequences. Water management practices and policies.
3. The importance of clean water for all living organisms.

UNIT-IX

1. Environmental Policy and Legislation
2. Global environmental treaties: Paris Agreement, Kyoto Protocol. National environmental policies and regulations.
3. Role of NGOs, governments, and individuals in policy development.

UNITX

1. Green Technologies and Innovations
2. Introduction to renewable energy sources (solar, wind, hydro, etc.). Electric vehicles and sustainable transportation.
3. Innovations in waste-to-energy and sustainable agriculture.
4. The Role of Individuals in Environmental Protection
5. How individual actions impact the environment.
6. Eco-friendly lifestyles: reducing waste, sustainable consumption, green travel. Community action and grassroots movements.

Reference Textbook

Environmental Science: A Global Concern" by William P. Cunningham & Mary Ann Cunningham

SEMESTER-II

HUMAN ANATOMY – II

L/T/P/C: 4/-/-/4

UNIT-I

BASIC ANATOMY OF LOWER EXTREMITY:

1. Osteology including features, side determination, clinical and applied anatomy of the following lower extremity bones Innominate bone, femur, tibia, fibula, patella, tarsals, metatarsals and phalanges.
2. Myology: Origin, insertion, nerve supply, action, function, clinical and applied anatomy
・Gluteal Region

UNIT-II

BASIC ANATOMY OF LOWER EXTREMITY:

1. Arthrology: Joint structure, articulating components, relations, joint actions, Clinical and Applied Anatomy including Radiography
2. Hip Joint, Knee joint, Ankle joint, joints of the foot.
3. Femoral triangle, femoral canal and inguinal canal, Adductor canal, popliteal fossa, arches of foot
4. Lumbar plexus, Sacral plexus, Nerves of the Lower Extremity including cutaneous Nerves
5. Blood vessels and lymphatic drainage

UNIT-III

BASIC ANATOMY OF VERTEBRAL COLUMN AND PELVIC GIRDLE:

1. Types of vertebrae
2. Basic Structure and features of Cervical, thoracic, lumbar, sacral and coccygeal vertebrae
3. Muscles of Trunk and Abdomen
4. Core muscle Anatomy
5. Joints of vertebral column, structure and composition of intervertebral disc including the Radiography Evaluation
6. Basic Joint structure, articulating components, relations, joint actions, Clinical and Applied Anatomy including Radiography of Sacro- Iliac joint
7. Basic Structure of Innominate bone Pelvic girdle and muscles of the pelvic floor including Applied Anatomy

UNIT-IV

BASIC ANATOMY OF HEAD AND NECK:

1. Bones of the skull and face
2. Muscles of the face and neck

UNIT-V

BASIC NEURO ANATOMY:

1. General organization of Nervous System
2. Central Nervous System-Gross structure of Brain and Spinal Cord
3. Diencephalon- Gross structure of Thalamus, Hypothalamus and Basal Ganglia
4. Cerebro-Spinal Fluid
5. Spinal Cord- Segmental features, Laminae, Nuclei
6. Spinal nerves
7. Basic blood supply to brain and spinal cord with clinical and applied anatomy
8. Peripheral Nervous system
9. Cranial nerves- Applied Anatomy

RECOMMEMDED TEXT BOOKS

1. Human Anatomy – Snell
2. Anatomy- Chaurasia, Volume- I,II & III
3. Neuro anatomy -- Inderbir Singh
4. Human Anatomy – Kadasne, Volume- I, II & III
5. Neuroanatomy -- Vishrsam Singh
6. Human Anatomy – Datta

HUMAN PHYSIOLOGY -II

L/T/P/C: 4/-/-/4

UNIT-I

NERVOUS SYSTEM-I

1. Introduction to nervous system - CNS, PNS and ANS
2. Neurotransmitters - Definition, fate of neurotransmitter, types
3. Synapse - Definition, type, structure, transmission of impulse across a synapse, properties.
4. Receptors and Sensation - Types of sensations, Classification of receptors, properties
5. Sensory System - Organization of the sensory system, sensory Homunculus
6. Pathophysiology of pain - Definitions, hyperalgesia and allodynia, deep pain, referred pain and its theories, management of chronic pain, endogenous opioid analgesic system
7. functions of various parts of brain in brief.

UNIT-II

NERVOUS SYSTEM-II

1. Spinal cord - Introduction, effects of complete transection of the spinal cord, effects of hemi section of the spinal cord (Brown-Sequard Syndrome)
2. Reflexes - Reflex action, reflex arc, classification, properties, types – superficial and deep reflexes
3. Regulation of tone, Posture and it’s reflexes, Equilibrium and vestibular apparatus
4. Higher Functions - Learning, Memory, Speech

5. Autonomic Nervous System - Sympathetic division, Parasympathetic division, control of autonomic functions
6. Cerebrospinal fluid - Formation and circulation, composition, functions, applied aspect - Hydrocephalus, lumbar puncture

UNIT-III

SPECIAL SENSES:

1. Vision - Anatomy of eye, visual pathway, pupillary reflexes, dark adaptation, light adaptation, photosensitivity
2. Hearing - Anatomy of ear, auditory pathway, tests for hearing - Watch test, Rinne's test, Weber's test, deafness, Audiometry
3. Taste and Smell: Taste sensations, taste pathway, olfactory pathway

ENDOCRINOLOGY:

1. Hormones - Definition, types, functions
2. Secretion, regulation, function and applied aspect of Hypothalamus, Pituitary Gland, Thyroid Gland, Parathyroid Gland, Pancreas, Adrenal Gland.

UNIT-IV

REPRODUCTIVE SYSTEM:

1. Sex determination and differentiation & it's abnormalities, puberty, importance of sex hormones
2. Female reproductive system - Internal & external genital organs, Oogenesis, Structure of egg, Follicle development, ovulation, menstrual cycle, menopause
3. Male reproductive system - Testes, accessory sex organs, Spermatogenesis, structure of sperm
4. Physiology of pregnancy - Fertilization, Implantation, Placenta (formation, function, hormones), maternal changes during pregnancy, pregnancy tests, infertility

UNIT-V

GASTROINTESTINAL SYSTEM:

1. Physiological stages of digestion
2. Liver function

EXCRETORY SYSTEM:

1. Kidneys-structure & function
2. Urine formation (to exclude concentration and dilution)
3. Juxtaglomerular apparatus
4. Fluid and electrolyte balance – Na, K, H2O
5. Renal circulation
6. Applied physiology: Types of bladders

RECOMMENDED TEXT BOOKS

1. Text book on Medical Physiology – Guyton
2. Textbook of Physiology – A K Jain

PATHOLOGY

L/T/P/C: 2/-/-/2

1. Cellular adaptation, Cell injury & cell death. - 17 Hours

- Introduction to pathology.
- Overview: Cellular response to stress and noxious stimuli. Cellular adaptations of growth and differentiation.
- Overview of cell injury and cell death.
- Causes of cell injury. Mechanisms of cell injury.
- Reversible and irreversible cell injury.
- Examples of cell injury and necrosis.

2. Inflammation: 8 Hours

- General features of inflammation Historical highlights
- Acute inflammation
- Chemical mediators of inflammation Outcomes of acute inflammation Morphologic patterns of acute inflammation Summary of acute inflammation
- Chronic inflammation

3. Immunity disorders. - 6 Hours

- General features of the immune system Disorders of the immune system

4. Infectious diseases. - 6 Hours

- General principles of microbial pathogenesis viral infections.
- Bacterial infections-Rheumatic heart disease.
- Fungal infections.
- Parasitic infections.

5. Neoplasia. - 5 Hours

- Definitions Nomenclature.
- Biology of tumor growth benign and malignant neoplasms Epidemiology.
- Carcinogenic agents and their cellular interactions Clinical features of tumors.
- **Environmental and nutritional disorders. -** 8 Hours
- Environmental and disease.
- Common environmental and occupational exposures Nutrition and disease.
- Coronary artery disease.

RECOMMENDED TEXT BOOK:

Pathology, Harsh Mohan e. Basic Pathology by Robbin

MICROBIOLOGY

L/T/P/C: 3/-/-/3

1. Morphology - 6 Hours

- Classification of microorganisms, size, shape and structure of bacteria. Use of microscope in the study of bacteria.

2. Growth and nutrition. - 4 Hours

- Nutrition, growth and multiplications of bacteria, use of culture media in diagnostic bacteriology.

3. Culture media. - 4 Hours

- Use of culture media in diagnostic bacteriology, antimicrobial sensitivity test.

4. Sterilization and Disinfection. - 2 Hours

- Principles and use of equipment of sterilization namely hot air oven, autoclave, and serum inspissate, pasteurization, antiseptic and disinfectants.

5. Immunology. - 6 Hours

- Immunity, vaccines, types of vaccine and immunization schedule, principles, and interpretation of common serological tests namely Widal, VDRL, ASLO, CRP, RF & ELISA.
- Rapid tests for HIV and HBsAg (excluding technical details).

6. Systematic Bacteriology. - 10 Hours

- Morphology, cultivation, diseases caused, laboratory diagnosis including specimen collection of the following bacteria (excluding classification, antigenic structure, and pathogenicity),
- Staphylococci, Streptococci, Pneumococci, Gonococci, Meningococci, C. diphtheriae, Mycobacteria, Clostridia, Bacillus, Shigella, Salmonella, E. coli, Klebsiella, Proteus,
- Vibrio cholerae, Pseudomonas & Spirochetes.

7. Parasitology. - 6 Hours

- Morphology, life cycle, laboratory diagnosis of following parasites: E.histolytica, Plasmodium, tape worms, Intestinal nematodes.

8. Mycology. - 6 Hours

- Morphology, diseases caused and lab diagnosis of following fungi. Candida, Cryptococcus, Dermatophytes, opportunistic fungi

9. Virology. - 6 Hours

- General properties of viruses, diseases caused lab diagnosis and prevention of following viruses, Herpes, Hepatitis, HIV, Rabies and Poliomyelitis.

RECOMMENDED TEXT BOOKS:

1. Microbiology, Ananthanarayan and Paniker's,
2. CP. Baveja. Textbook of Microbiology for nurses.

3. A textbook of Microbiology-Chakraborty.

INTRODUCTION TO ORTHOPEDICS

L/T/P/C: 3/-/-/3

1. Infection of bone and joints: Outline the etiology, clinical features, management and complications of:

- Acute osteomyelitis
- Chronic osteomyelitis
- Septic arthritis
- Tuberculosis of hip, knee and spine

2. Infection of the hand

3. CTEV (congenital talipes equino varus)

4. Congenital dislocation of hip

5. Poliomyelitis and other neuromuscular disorders:

- Outline the management of residual paralysis including use of orthosis, and principles of muscle transfer

6. Bone tumors:

- General outline of classification, clinical features and management of benign and malignant bone tumors.
- General principles, study of specific individual bone tumors

7. Evaluation of low back ache:

Aetiological factors of LBA- prolapsed intervertebral disc, spondylitis, spondylolisthesis, lumbar canal stenosis.

8. Scoliosis & other spinal deformities:

- Classify spinal deformities and outline the salient clinical features, management and complications

9. Arthritis & related disorders:

- Outline pathology, clinical features, mechanism of deformities, management and complications of:
  - Rheumatoid arthritis
  - Osteoarthritis of major joints and spine
  - Ankylosing spondylitis.

10. Degenerative disorders

- General outline of classification, clinical features and management of degenerative diseases

11. Affections of soft tissues

- General outline of abnormalities and injuries of soft tissue

12. Metabolic bone diseases

- General outline of classification, clinical features and management of metabolic bone diseases

13. Miscellaneous affections of bone

14. General outline of developmental abnormalities and injuries of that affect the skeletal system

15. Miscellaneous regional diseases:

Clinical features and management of Painful arc syndrome, Tennis elbow, Plantar fasciitis

16. Amputations:

- 1.Classify amputations
- 2.Outline pre-operative operative and prosthetic management.
- 3.Outline prevention and treatment or complications.

17. Sports Medicine & Arthroscopic Surgery:

- Sprains and Muscle Strains: List common sites of sprains and muscle strains and describe the clinical manifestations and treatment with special reference to ankle, knee and shoulder.
- Internal derangements of knee Joint: Meniscal injuries and injuries of the cruciate ligaments.

18. Joint Replacement Surgery

- General outline of joint replacement surgeries

19. Orthopaedic Instruments & Implants: wires, pins, nails, rods, plate and screws, external fixators and Illizarov fixator.

RECOMMENDED BOOKS:

1. "Orthopedic Physical Examination" by Bruce Reider, George J. Davies, and Matthew T. Provenche.
2. "Orthopedic Surgery: Principles and Practice" edited by Mark D. Miller, Jennifer Hart, and John M. Cuckler
3. "Current Diagnosis & Treatment in Orthopedics" edited by Harry B. Skinner and Patrick J McMahon

HUMAN ANATOMY PRACTICAL – II

L/T/P/C: -/-/4/2

GROSS SPECIMENS/SPOTTERS

SPINE, PELVIS AND LOWER EXTREMITY

- Identify the spotter- Osteology- Identify the bone, LOWER EXTREMITY BONES (Innominate bone, femur, tibia, fibula, patella, tarsals, metatarsals and phalanges.) Including side determination, Spinal Segments, Vertebrae (Cervical, Thoracic, Lumbar, Sacral and Coccyx), Pelvis and Innominate Bones
- Surface Anatomy of the Spine and Lower Extremity –Atlas, Axis, C-7 vertebrae, Spinous and Transverse process of vertebra, Locate the Innominate bone, ASIS and
  PSIS, Coccyx, Sacrum, Greater Trochanter, Condyles of femur, Patella, Tibial Tubercles and condyles, Shin Bone, Tarsal bones, Malleoli

- Arthrology- (Cross section of Hip Joint, Knee Joint, Ankle Joint, Joints of Foot, Pelvic Joints, Joints of Spine, Intervertebral Joints, Facet Joints, Sacro-Iliac Joints)

NEURO-ANATOMY IDENTIFY THE SPOTTER

- Cross Section of the Skull

SYSTEMIC ANATOMY

- Gross Specimen/Spotter (Brain and Spinal Cord)

HUMAN PHYSIOLOGY PRACTICAL – II

L/T/P/C: -/-/2/1

- Examination of superficial sensations
- Examination of deep sensations
- Examination of cortical sensations
- Examination of reflexes
- Cranial nerve examination
- Examination of Balance and coordination

STRESS MANAGEMENT

L/T/P/C: 1/-/-/1

Course Objectives:

By the end of the course, students will:

- Understand what stress is and how it affects the body and mind.
- Learn how to recognize personal stressors and individual responses to stress.
- Explore various coping strategies to manage stress effectively.
- Understand how lifestyle changes can reduce overall stress.
- Learn how to manage stress in academic and professional settings.
- Equip students with tools to build long-term resilience against stress.

UNIT-I

- Introduction to Stress and Its Effects Definition of stress: Eustress vs. Distress Types of stress: Acute vs. Chronic
- The biology of stress (fight-or-flight response, hormones)
- Short-term and long-term effects on physical and mental health The role of perception and coping mechanisms

UNIT-II

- Identifying Stressors and Personal Stress Responses
- Internal vs. external stressors (work, relationships, environment) Identifying stress patterns (thoughts, behaviours, physical reactions) Emotional regulation and its role in stress management
- The Stress Process: How stress develops and escalates

UNIT-III

- Coping Strategies and Stress Relief Techniques
- Problem-focused vs. emotion-focused coping
- Cognitive Behavioral Therapy (CBT) techniques for stress
- Relaxation techniques (deep breathing, progressive muscle relaxation) Time

management and organization as stress-relief tools

- Developing a personal coping

plan UNIT-IV

- Lifestyle Changes for Managing Stress The role of physical activity and exercise Sleep hygiene and its connection to stress Nutrition and its impact on mental health Social support and healthy relationships Mindfulness and meditation practices

UNIT-V

- Stress Management at Work and School
- Managing work and school stress: Time management, prioritization Dealing with high-pressure environments and deadlines
- Building resilience and avoiding burnout
- The importance of taking breaks and practicing self-care

UNIT-VI

- Building Long-Term Stress Resilience
- Resilience theory and how to bounce back from adversity Developing a growth mindset to handle challenges Building emotional intelligence to cope with stress Integrating stress management into daily life

RECOMMENDED TEXT BOOKS:

Stress Management: From Basic Science to Best Practice" by C. L. Cooper and Philip L. Merritt

SEMESTER-III

BASIC ORTHOPEDIC TECHNIQUES

L/T/P/C: 3/-/2/4

TECHNIQUE OF APPLICATION, INDICATIONS, CONTRAINDICATIONS AND COMPLICATIONS OF THE FOLLOWING: -

1. K-Wiring in hand fracture
2. K-Wiring in Bennet's fracture
3. K-Wiring in Distal end radius fracture
4. K-Wiring in Pediatric supracondylar fracture
5. K-Wiring in in foot fractures
6. Patella Tension Band Wiring
7. Olecranon tension band wiring
8. Tension band wiring of medial malleolus and plating of fibula fracture
9. Forearm plating

10. Interlock nailing tibia fracture
11. Interlock nailing of femur fracture
12. DHS for IT fracture
13. Surgical debridement of compound fracture
14. SSG for wound defect
15. Carpal tunnel Release
16. Ganglion cyst excision.
17. Injection techniques for
A. Trigger finger
B. De Quervain tenosynovitis
C. Planter fascitis
D. Subacromial bursitis

RECOMMENDED BOOKS:

1. Operative techniques in orthopaedic surgery 4 volume set Product Bundle - Illustrated, 1 January 2015By Sam W Wiesel Samuel W Wiesel (Author)
2. Essentials of Orthopedic Surgery Paperback Illustrated, 5 October 2010 by Sam W. Wiesel (Editor), John N. Delahay (Editor)

PHARMACOLOGY

L/T/P/C: 3/-/-/3

UNIT-I

General Pharmacology

a) Absorption, distribution, metabolism and elimination of drugs,
b) routes of drug administration.
c) Adverse reactions to drugs.
d) Factors modifying drug response

UNIT-II

Autonomic nervous system & Peripheral nervous system

a) Sympathetic nervous system - sympathomimetics, sympatholytics
b) Parasympathetic - Cholinergics, Anticholinergics Drugs
c) Skeletal muscle relaxants
d) Local anaesthetics

UNIT-III

Central nervous system

a) Drug therapy of various CNS disorders like epilepsy, depression.
b) Non-steroidal anti-inflammatory drugs
c) General anesthetics

AUTOCOIDS

a) Histamine and anti histaminics

UNIT-IV

Cardiovascular system

a) Drug therapy of hypertension, shock, angina, cardiac arrhythmias
b) Diuretics
c) Coagulants and anticoagulants, antiplatelet drugs
d) Hypo-lipidemics

Gastrointestinal and respiratory system

a) Drug treatment of peptic ulcer
b) Drug therapy of bronchial asthma

UNIT-V

Hormones

a) Drug therapy of Diabetes
b) Corticosteroids
c) Chemotherapeutic agents - b-Lactam Antibiotics, fluoroquinolones, aminoglycoside, tetracyclines, chloramphericol

PRACTICALS

a) Study of laboratory animals and their handling (a. Frogs, b. Mice, c. Rats, d. Guinea pigs, e. Rabbits).
b) Study of laboratory appliances used in experimental pharmacology.
c) Study of use of anesthetics in laboratory animals.
d) Effects of skeletal muscle relaxants using rota-rod apparatus.
e) Effect of drugs on locomotor activity using actophotometer.
f) Anticonvulsant effect of drugs by MES and PTZ method.
g) Study of local anesthetics by different method

RECOMMENDED BOOKS:

1. Padmaja Uday kumar - Pharmacology for Dental & Allied Health Sciences - 4th edition, 2017.
2. Joginder Singh Pathania, Rupendra Kumar Bharti, Vikas Sood-Textbook of Pharmacology for Paramedical Students 2019
3. KD Tripathi- Essentials of Pharmacology - 8th edition, 2018.
4. HL Sharma & KK Sharma - Principles of Pharmacology - 3rd edition, 2017.

HEALTH CARE ADMINISTRATION

L/T/P/C: 2/-/-/2

1. **Introduction to Health Care Systems**
   - Overview of Health Care Organizations (Hospitals, Systems, Clinics); Governance and Leadership in Health Care Organizations; Decision-Making and Communication Flows;
   - Health Care Policies and Regulations
   - Financial Management and Budgeting
   - Health Insurance and Reimbursement

- Health Information Systems

2.Human Resources in Health Care:

- Health care workforce: Challenges and Trends; Workforce planning and job analysis; Recruitment and selection in health care; Employee retention and turnover; orientation, training, and professional development; Performance appraisal systems; Workplace safety, Wellness, and burnout prevention; HR analytics and Strategic planning

3.Quality Improvement and Patient Safety:

- Health care errors and adverse events; Root cause analysis (RCA) and Failure mode and effects analysis (FMEA); Quality measurement and performance indicators; Lean and six sigma in health care; Accreditation and regulatory requirements; Reporting systems and learning from errors

4.Legal and Ethical Issues
5.Strategic Planning and Marketing
6. merging Trends in Health Care

RECOMMENDED TEXTBOOKS:

1. Hospital Administration and Human Resource Management by Sharma, D.C
2. Principles of Hospital Administration and Planning by B.M. Sakharkar
3. Essentials of Hospital Management & Administration by S.L. Goel and R.K. Sharma
4. Health Care Management: Organization Design and Behaviour by Shortell & Kaluzny
5. Organizational Behaviour in Health Care by Nancy Borkowski
6. Introduction to Healthcare Quality Management by Patrice Spath
7. Patient Safety and Healthcare Improvement at a Glance by Sukhmeet Panesar et al.

MEDICAL LAW/ ETHICS AND MEDICAL RECORDS

L/T/P/C: 3/-/-/3

MEDICAL LAW

UNIT-I

- Medical ethics - Definition - Goal Scope
- Introduction to Code of conduct

UNIT-II

- Basic principles of medical ethics Confidentiality Malpractice and negligence - Rational and irrational drug therapy

UNIT-III

- Autonomy and informed consent - Right of patients
- Care of the terminally ill- Euthanasia

UNIT-IV

- Organ transplantation
- Medico legal aspects of medical records-Medico legal case and type-Records and document related to MLC-ownership of medical records-Confidentiality Privilege communication Release of medical information - Unauthorized disclosure retention of medical records - other various aspects.
- Professional Indemnity insurance policy

UNIT-V

- Development of standardized protocol to avoid near miss or sentinel events Obtaining an informed consent

RECOMMENDED BOOKS:

1. Law relating to medical negligence and compensation- Dr. K.P.D.A. Prabakar & Dr. J.Paulraj Joseph-2023
2. A textbook of medical jurisprudence and toxicology-Justice K Kannan -25 edition-1" edition-2016
3. Law the doctor must know-Hitesh J Bhatt & Geetebdra Sharma-2017
4. Law on medical negligence and legal remedies-Dr. Annu Bahl Mehra & Harshit Kiran-2022

RECORD KEEPING

UNIT-I

- Commonly Used Prefixes, Suffixes and root words in Medical Terminology, Common Latin Terms used in Prescription Writing, Study of Standard Abbreviations.

UNIT-II

- Medical Records Management. Meaning, functions, principles of record keeping, Importance of medical records to patients, doctors, and hospitals, classification of records like coding system, indexing system, types of forms basic and special, legal aspects of medical records.

UNIT-III

- International Classification of Diseases (ICD), Electronic Medical Record (EMR), Records Management: Registers, forms, retention and preservation of MR, Role of

MRD personnel.

UNIT-IV

- Medical Registers: Meaning, types, advantages of Medical Registers, registers used in various departments, Statutory registers and reports to be maintained-specimens

UNIT-V

- Medical Audit: its process, role and importance in hospitals.

RECOMMENDED BOOKS:

Davies, Juanita. Essentials of Medical Terminology. 3rd edition. New York. Delmar. 2008
Mogli. J.D. Medical Records: Organization & Management 2nd edition New Delhi Jaypee Brothers.
The body by Bilbirson Agreed for Occupance

ETHICS

UNIT-I

- Introduction to Public Health Ethics.
- Theories of Justice and Distribution of Public Health Resources.
- Principle for Public Health Ethics.

UNIT-II

- Priority-Setting and Resource Allocation at the Macro Level.
- Priority-Setting and Resource Allocation at the Micro Level.

UNIT-III

- Medical Ethics, Legal Aspects and Medical Terminology.

1) Role Definition and Interaction, Ethical, Moral, and Legal Responsibilities
2) Medical terminology
3) Medical waste Management

UNIT-IV

- Contemporary Ethical and Legal Issues in Health Care: Legal regulation of a standalone diagnostic center, medico-legal cases and medical negligence, ethical aspects of health care.
- Balancing Individual and Community Interests.
- Ethics and Health Promotion.

UNIT-V

- Role of Human Rights in Public Health

- Ethics of Beath Promotion and Disease Prevention

RECOMMENDED BOOKS:

1. Ethics and Public Health Archana Rani Sahoo & Patitapahan Das-2017
2. Public Health, Ethics and Equity-Sudhir Anand, Fabienne Peter and Amartya Sen-2006
3. Nursing and healthcare ethics-Robinson & Doody-6 edition-2022
4. Ethics- William K. Frankena 2 edition-2015

SOFT SKILLS DEVELOPMENT

L/T/P/C: 1/-/-/1

Course Objectives:

By the end of the course, students will:

- Improve their communication and interpersonal skills.
- Develop emotional intelligence (EQ) and conflict resolution strategies.
- Enhance their ability to work in teams and exhibit leadership qualities.
- Gain confidence in public speaking and professional writing.
- Master time management and personal organization strategies.

UNIT-I

- Introduction to Soft Skills
- Definition of soft skills vs. hard skills
- The importance of soft skills in the workplace

Key soft skills: communication, teamwork, adaptability, problem-solving, leadership, etc.
Activities: Icebreakers, group discussions on soft skills in the workplace
Assignment: Self-assessment on current soft skills

UNIT-II

Communication Skills

- The communication process: sender, message, receiver, feedback Active listening techniques
- Body language and non-verbal cues Effective speaking: tone, clarity, and pacing Email and phone communication etiquette

Activities: Role-playing scenarios (e.g., client interaction, conflict resolution)
Assignment: Practice active listening and send an email incorporating effective communication principles.

UNIT-III

Emotional Intelligence (EQ)

- What is emotional intelligence? (Self-awareness, self-regulation, motivation, empathy, and social skills) Recognizing and managing your emotions
- Understanding others' emotions and building empathy Developing

emotional resilience

Activities: Emotional intelligence quizzes, group discussion on handling emotions in stressful situations
Assignment: Journaling emotional responses and reflection on EQ practices.

UNIT-IV

- Teamwork and Collaboration Roles and dynamics within teams Effective communication in teams Conflict resolution in teams
- Building trust and fostering a collaborative environment
- Activities: Team exercises, problem-solving tasks, and brainstorming sessions Assignment: Work on a team project or task, and present it in class.

UNIT-V

Conflict Resolution

- Sources of conflict (miscommunication, differing priorities, etc.)
- Conflict resolution strategies (e.g., negotiation, mediation, compromise) The role of active listening in resolving conflicts
- Managing personal emotions during conflict

Activities: Case studies, role-playing conflict resolution scenarios
Assignment: Reflect on a personal or professional conflict and propose a resolution strategy.

UNIT-VI

- Time Management and Personal Organization
- The importance of time management in personal and professional success Prioritization techniques (e.g., Eisenhower Matrix, ABCDE method)
- Tools for time management (digital calendars, to-do lists, Pomodoro technique) Setting SMART goals
- Managing procrastination and avoiding distractions

Activities: Time-blocking exercises, goal-setting workshop
Assignment: Create a personal time management plan and track daily productivity for a week.

UNIT-VII

- Leadership and Influence
- Types of leadership (e.g., transformational, transactional, servant leadership) Leading by example: qualities of effective leaders
- Building and maintaining team morale The art of persuasion and influence

Activities: Leadership style assessment, group discussions on leadership challenges
Assignment: Write a reflection on a leader you admire and why.

UNIT-VIII

- Public Speaking and Presentation Skills
- Overcoming fear of public speaking
- Structuring a presentation (opening, body, conclusion) Effective use of visual aids

(PowerPoint, etc.)

- Engaging the audience through storytelling, eye contact, and body language

Activities: Group presentations, peer feedback sessions, impromptu speaking exercises

Reference Textbook

The 7 Habits of Highly Effective People" by Stephen R. Cove

CLINICAL POSTING

L/T/P/C: -/-/16/8

Students will undergo rotational clinical postings in key departments of hospitals affiliated with the college, including the Orthopaedic Outpatient Department (OPD), Orthopaedic Inpatient Departments (male and female surgical wards). During these postings, students will observe clinical procedures and treatment protocols involved in the care of orthopaedic patients. They will also have the opportunity to assist the clinical staff in executing non-clinical aspects of service delivery, such as patient preparation, equipment setup, and documentation, under supervision. Each student is required to maintain a clinical log book which should include recording daily observations, procedures witnessed or assisted, and key learnings from each department. This log book must be submitted at the end of the clinical rotation and will be assessed by the college as part of the final internal evaluation, with grades awarded based on participation, documentation, and overall engagement during the postings.

1. Clinical Case Discussions:

- Engage in interactive case discussions with peers and faculty members to analyze and evaluate orthopedic cases,
- Apply knowledge of anatomy, biomechanics, and clinical assessment to formulate appropriate management plans for different orthopaedic conditions.
- Enhance critical thinking skills in evaluating treatment options and considering patient-specific factors

AI in Healthcare: Foundation

Category: Skill Enhancement Course (SEC) | **L-T-P:** 1-0-0 | **Credits:** 1

Course Objectives

- · Explain fundamental artificial intelligence concepts, machine learning principles, and health data types without complex mathematics.
- · Identify and examine major clinical, diagnostic, public health, and operational AI use cases across the healthcare ecosystem.
- · Evaluate AI performance metrics, clinical validation strategies, algorithmic bias, and limitations of medical AI tools.

- · Apply ethical, legal, regulatory, and human-in-the-loop principles to ensure patient safety and privacy in AI deployment.
- · Demonstrate practical competency with no-code AI platforms to formulate a realistic solution for a discipline-specific healthcare challenge.

Course Outcomes: On completion, students will be able to:

- · **CO1:** Explain core AI concepts (machine learning, deep learning, NLP, generative AI) and their applications across healthcare systems in plain language.
- · **CO2:** Identify and describe major healthcare use cases of AI, including diagnostics, clinical decision support, drug discovery, public health surveillance, and hospital operations.
- · **CO3:** Critically evaluate AI tools by interpreting performance measures (accuracy, sensitivity, specificity) and recognizing bias and data-quality limitations.
- · **CO4:** Apply ethical, legal, and regulatory principles (privacy, consent, fairness, accountability, transparency) to healthcare AI implementation.
- · **CO5:** Use no-code AI tools responsibly to design and propose realistic AI solutions for discipline-specific healthcare challenges.

Graduate Attributes Addressed: GA1 (Disciplinary & Interdisciplinary Knowledge), GA2 (Critical Thinking & Problem Solving), GA3 (Digital & Technological Literacy), GA5 (Effective Communication), GA7 (Ethical Reasoning & Professional Integrity), GA9 (Entrepreneurship & Innovation Mindset), GA10 (Lifelong Learning & Self-Directed Growth)

Unit I: Introduction to AI and Health Data

- · Fundamental definitions and scope: What AI is and isn't; distinguishing AI, Machine Learning (ML), and Deep Learning (DL)
- · Basic principles of how machines learn patterns from data without advanced mathematics
- · Structure and taxonomy of health data: Electronic Health Records (EHR), medical imaging, genomics, and wearable sensor streams
- · Health data quality, data curation, and the principle of "garbage in, garbage out" in healthcare algorithms
- · **Practical/Hands-on Session:** Building and training a simple medical/healthcare image classifier using no-code platforms (e.g., Teachable Machine)

Unit II: AI Applications Across Healthcare Domains

- · Medical imaging applications in radiology, digital pathology, and ophthalmology
- · Clinical Decision Support Systems (CDSS), symptom checkers, and patient risk prediction

models

- · Natural Language Processing (NLP) for unstructured clinical notes, voice recognition, and EHR documentation
- · Generative AI, LLMs, drug discovery workflows, public health surveillance, hospital operations, and AI-enabled telemedicine
- · **Practical/Case Demo Session:** Case demonstrations and critical group discussion on real-world AI deployment in clinical settings

Unit III: Evaluating AI Performance, Bias, and Validation

- · Interpreting performance metrics in plain clinical terms: accuracy, sensitivity, specificity, and false positives/negatives
- · Understanding overfitting, model generalizability across diverse patient populations, and performance degradation
- · Clinical validation frameworks, clinical trials for AI algorithms, and black-box explainability/interpretability
- · Identifying algorithmic bias, data representation gaps, and evaluating fitness-for-purpose
- · **Practical/Tutorial Session:** Critical appraisal exercise evaluating and critiquing a published AI tool's clinical claims

Unit IV: Ethics, Law, and Healthcare AI Governance

- · Patient data privacy, consent frameworks, and regulatory awareness (HIPAA, GDPR, and India's DPDP Act)
- · Algorithmic fairness, health equity, and preventing bias against vulnerable patient demographics
- · Clinical liability, accountability when AI systems err, and Software as a Medical Device (SaMD) regulatory oversight
- · Human-in-the-loop principles and maintaining practitioner oversight in automated healthcare decision-making
- · **Practical/Interactive Session:** Ethical dilemma role-play and decision-making scenario analysis

Unit V: Responsible Practice and Capstone Project

- · Prompt engineering techniques for generative AI tools (e.g., ChatGPT, Claude) in clinical and academic contexts
- · Managing AI hallucinations, fact-verification protocols, and ethical academic/professional use
- · Tracking fast-moving AI developments and future trajectories in medical technology
- · **Practical/Capstone Presentation:** Group formulation, design pitch, and presentation proposing

a realistic AI solution to a domain-specific healthcare problem

Recommended Readings

Key Textbooks & Reference Books

1. **Topol, E.** (2019). *Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again*. Basic Books.
2. **Bohr, A., & Memarzadeh, K.** (Eds.). (2020). *Artificial Intelligence in Healthcare*. Academic Press.
3. **Agrawal, A., Gans, J., & Goldfarb, A.** (2018). *Prediction Machines: The Simple Economics of Artificial Intelligence*. Harvard Business Review Press.

Regulatory Reports & Ethical Guidelines

1. **World Health Organization.** (2021). *Ethics and governance of artificial intelligence for health: WHO guidance*. Geneva: World Health Organization.
2. **Ministry of Law and Justice, Government of India.** (2023). *The Digital Personal Data Protection Act, 2023 (DPDP Act)*. Gazette of India.
3. **U.S. Food and Drug Administration (FDA).** (2021). *Artificial Intelligence/Machine Learning (AI/ML)-Based Software as a Medical Device (SaMD) Action Plan*.

Online Interactive & No-Code Resources

1. **Google Teachable Machine:**
   `[https://teachablemachine.withgoogle.com/](https://teachablemachine.withgoogle.com/)`
2. **Orange Data Mining (Visual Programming & Interactive Workflows):**
   `[https://orangedatamining.com/](https://orangedatamining.com/)`
3. **WHO / ITU Focus Group on Artificial Intelligence for Health (FG-AI4H) Resources:**
   `[https://www.who.int/initiatives/cih](https://www.who.int/initiatives/cih`

SEMESTER- IV

ORTHOPEDIC DIAGNOSTIC

L/T/P/C: 3/-/-/3

UNIT-I

- Introduction to Orthopedic Diagnostics
- Definitions and scope of orthopedic diagnostics
- Importance of diagnosis in orthopedic practice
- General orthopedic examination protocol
- Orthopedic case history taking
- Inspection, palpation, percussion, and auscultation
- Basics of Gait and posture analysis

UNIT-II

- Clinical Examination of the Musculoskeletal System
- Upper Limb
    1. Shoulder: Neer's, Hawkins, Apprehension tests
    2. Elbow: Valgus/varus, Cozen's, Mill's tests
    3. Wrist & Hand: Phalen's, Tinel's, Finkelstein's tests
- Lower Limb
    1. Hip: Trendelenburg, FABER, FADIR, Thomas test
    2. Knee: Anterior drawer, Lachman, McMurray, Apley tests
    3. Ankle & Foot: Anterior drawer, Thompson, Homan's sign
- Spine
    1. Cervical: Spurling's, Lhermitte's sign
    2. Lumbar: SLR, Crossed SLR, Slump test
    3. Deformities: scoliosis, kyphosis, lordosis

UNIT-III

- Basics of Radiological Diagnostics in Orthopedics
- X-ray principles and reading
- Specific views for major joints and spine
- Fractures, dislocations, degenerative changes, infections, tumors
- Bone age estimation, growth plates

UNIT-IV

- Basics of Advanced Imaging Techniques
- CT scan: Fracture, 3D reconstructions
- MRI: Soft tissues, discs, spine
- Bone scan, PET scan, Musculoskeletal ultrasonography

- UNIT-V

- Laboratory & Functional Tests
- Blood tests: CBC, ESR, CRP, RA factor
- Synovial fluid analysis, Bone biopsy
- EMG, NCV, limb length, MRC grading

UNIT-VI

- Pediatric Orthopedic Diagnostics
- Congenital conditions: CTEV, DDH, Perthes
- DDH: Barlow & Ortolani tests
- Gait observation, skeletal dysplasia

UNIT-VII

- Documentation & Reporting
- Writing orthopedic reports
- Prescription terminology
- Communication with surgeons

RECOMMENDED BOOKS

1. Apley's System of Orthopaedics and Fractures - Solomon et al.
2. Orthopaedic Physical Assessment - David J. Magee
3. Campbell's Operative Orthopaedics - Canale & Beaty
4. Turek's Orthopaedics - Samuel L. Turek
5. Essentials of Orthopaedics - Maheshwari
6. Orthopaedic Examination - Chad Cook

INFECTION CONTROL IN ORTHOPEDICS

L/T/P/C: 3/-/-/3

UNIT-I

- Introduction to Infection Control
- Definition and objectives of infection control in orthopedic settings
- Types and sources of infections: endogenous, exogenous
- Chain of infection: reservoir, portal of entry, mode of transmission
- Common orthopedic infections: osteomyelitis, septic arthritis, surgical site infections (SSI)
- Importance of infection control in implants and fracture surgeries

UNIT-II

- Basic Principles of Asepsis and Antisepsis
- Asepsis vs. antisepsis
- Hand hygiene techniques – surgical scrub, alcohol-based rubs
- Principles of maintaining a sterile field
- Types of antiseptics and disinfectants used in orthopedics
- Guidelines for sterilizing surgical tools and implants
- Sterilization methods:
- Autoclave
- Ethylene oxide (EtO)
- Plasma sterilization
- Formaldehyde

UNIT-III

- Surgical Site Infections (SSIs); its classification: superficial incisional, deep incisional, organ/space
- Pathogenesis and risk factors in orthopedic surgery (e.g. joint replacement)
- Pre-operative, intra-operative, and post-operative infection control measures
- Role of prophylactic antibiotics
- Identification, diagnosis, and treatment of SSIs

UNIT-IV

- Implant-Associated Infections
- Biofilm formation and its role in infection persistence
- Bacterial colonization of orthopedic implants
- Diagnosis: CRP, ESR, wound culture, imaging
- Treatment:
- Debridement
- Implant retention/removal

- Local antibiotic beads/spacers

UNIT-V

- Infection Control in the Operating Theatre (OT)
- Design and layout of orthopedic OT
- Laminar airflow systems and HEPA filters
- OT zoning and cleanroom standards
- Sterile draping techniques
- Protocol for entry, exit, and gowning
- Aseptic preparation of surgical site

UNIT-VI

- Personal Protective Equipment (PPE)
- Types of PPE: gloves, gowns, face shields, N95 masks
- Correct sequence for donning and doffing
- Indications for PPE use in orthopedic procedures
- Reuse and disposal policies for PPE in orthopedic units

UNIT-VII

- Biomedical Waste Management & Environmental Sanitation
- Biomedical waste classification (hazardous, sharps, infectious, etc.)
- Waste segregation and color coding
- Cleaning and disinfection schedules for OT and wards
- Role of housekeeping and infection control supervisors
- Needle stick injury prevention and post-exposure protocol

RECOMMENDED BOOKS

1. Apley's System of Orthopaedics and Fractures – Solomon et al.
2. Campbell’s Operative Orthopaedics – S. Terry Canale & James Beaty
3. Turek’s Orthopaedics: Principles and Their Application – Samuel L. Turek
4. CDC Guidelines for the Prevention of Surgical Site Infection (USA)
5. WHO Core Components for Infection Prevention and Control Programmes
6. Manual on Infection Control in Orthopedic Surgeries – Indian Orthopaedic Association

FIRST AID PROCEDURES

L/T/P/C: 2/-/2/3

1. Definition of first aid, aims and objectives, responsibilities and general principles for first aider
2. First aid kit, articles and purposes
3. Dressing materials and principles of wound dressing
4. Principles and uses of traction splint and slings
5. Basic trauma support
6. Transportation and triage in polytrauma patients
7. Iv cannula, needles, syringes -their proper use and disposal
8. Sterile dressing techniques
9. Different modes of administration of drugs

RECOMMENDED BOOKS:

1. The AMA Handbook of First Aid and Medical Care
2. Manual of FIRST AID: Management of General injuries, Sports injuries and Common Ailments Paperback - 1 January 2012 by LC Gupta(Author).
3. The scouting guide to wilderness first aid, Grant S. Lipman.

PLASTER TECHNOLOGY

L/T/P/C: 2/-/2/3

1. History of plaster of Paris
2. Properties of plaster of Paris
3. Preparation of plaster of Paris bandages,
4. Synthetics cast material
5. Use, advantage and disadvantages of synthetic cast 6.Different types of slabs and casts
    - A. Hip Spica
    - B. Greater trochanter Slab and Cast
    - C. Below Knee Slab and Cast
    - D. Cylindrical Slab and Cast
    - E. U-Slab and Cast
    - F. Above Elbow Slab and Cast
    - G. Below Elbow Slab and Cast
    - H. Cock up Slab and Cast
    - 1. Scaphoid Slab and Cast
    - J. Finger Splinting
    - K. Boot and Bar Cast
    - L. Hanging Cast
    - M. Minerva Cast
7. Special plaster-CTEV Cast and PTB Cast etc.
8. Functional Cast Bracing
9. Molding of cast

10. Wedge correction of limb deformities
11. Correct method of applying slabs and casts
12. Plaster removal
13. Complication of cast
14. Plaster cutter and associated instruments
15. Casting and splinting
16. Types of plaster it's advancement

RECOMMENDED BOOKS:

1. Plaster application by Rajendra Kumar Kanojia
2. "Practical Fracture Treatment" by Ronald McRae and Max Esser
3. "Orthopedic Casting, Splinting, and Traction" by Robert L. Paris Jr. and Fred T. Valentine
4. " Principles of orthopedic practice " by David J. Dandy and Dennis J. Edwards
5. " Orthopedic casts and splints: indications and techniques" by Robert W. Bucholz and Charlie Jobin

HEALTH AND WELL-BEING

L/T/P/C: 1/-/-/1

Course Description:

This course explores the holistic approach to health and well-being, focusing on physical, mental, and social aspects. Students will learn about health promotion strategies, the importance of physical activity, nutrition, mental health awareness, and stress management. The course also addresses the impact of lifestyle choices and societal factors on overall health.

Course Objectives:

- By the end of the course, students will be able to:
- Understand the physical, mental, and social determinants of health.
- Apply strategies for improving and maintaining physical health.
- Recognize the importance of mental well-being and stress management techniques.
- Understand the relationship between nutrition and overall health.
- Develop practical skills for managing time, stress, and emotions.
- Cultivate a balanced approach to achieving long-term health and well-being.

UNIT-I

1. Introduction to Health and Well-being
2. Overview of health and well-being concepts
3. Dimensions of health: Physical, mental, social, and emotional The impact of lifestyle choices on health

UNIT-II

1. Physical Health and Fitness
2. Importance of physical activity for overall health
3. Types of exercise: Aerobic, strength, flexibility, and balance Creating a personal fitness plan

UNIT-III

1. Nutrition and Healthy Eating
2. Basics of nutrition: Macronutrients and micronutrients Healthy eating habits and food groups
3. Impact of nutrition on physical and mental health

UNIT-IV

1. Mental Health and Emotional Well-being
2. Understanding mental health: Definitions, stigma, and myths Key aspects of emotional well-being
3. Building emotional resilience

UNIT-V

1. Stress Management Techniques Understanding stress and its effects on health Mindfulness and relaxation techniques
2. Time management for stress reduction

UNIT-VI

1. Sleep and Recovery
2. Importance of sleep for physical and mental health Sleep hygiene and healthy sleep habits
3. Impact of sleep deprivation on overall well-being

UNIT-VII

1. Social Health and Relationships
2. The role of social connections in well-being
3. Healthy relationships: Communication, boundaries, and support Community involvement and social well-being

UNIT-VII

1. Substance Use and Addiction
2. The impact of alcohol, tobacco, and drugs on health Understanding addiction and treatment options Preventive measures and harm reduction strategies

UNIT-IX

1. Chronic Diseases and Prevention
2. Common chronic diseases (e.g., diabetes, heart disease) Risk factors and

lifestyle modifications for prevention Screening, early detection, and health monitoring

UNIT-X

1. Building Healthy Habits
2. The psychology of habit formation
3. Strategies for adopting and maintaining healthy habits Overcoming barriers to healthy behaviour changes

Reference Textbook

Health and Wellness" by S. L. Kaskutas & K. A. A. Nielson

CLINICAL POSTINGS

L/T/P/C: -/-/16/8

Students will undergo rotational clinical postings in key departments of hospitals affiliated with the college, including the Radiology Department (X-ray, CT scan, MRI), Emergency and Trauma Care Unit, Orthopaedic Outpatient Department (OPD), Orthopaedic Inpatient Departments (male and female surgical wards), and the Plaster Room. During these postings, students will observe clinical procedures and treatment protocols involved in the care of orthopaedic patients. They will also have the opportunity to assist the clinical staff in executing non-clinical aspects of service delivery, such as patient preparation, equipment setup, and documentation, under supervision. Each student is required to maintain a clinical log book which should be used for recording daily observations, procedures witnessed or assisted, and key learnings from each department. This log book must be submitted at the end of the clinical rotation and will be assessed by the college as part of the final internal evaluation, with grades awarded based on participation, documentation, and overall engagement during the postings.

1. Splinting and Casting:

- Learn and practice the application of various types of splints and casts for immobilization and support of fractures, sprains, and other orthopedic conditions.
- Understand the principles of proper splinting and casting techniques, including patient Positioning, padding, and bandaging.
- Gain proficiency in applying different types of splints and casts to different body parts, such as the upper extremities, lower extremities, and spine.

2. Orthopedic Imaging Interpretation:

- Learn the basics of interpreting common orthopedic imaging modalities, such as X-rays, CT scans, and MRI scans
- Understand the radiographic appearances of fractures, dislocations, joint degeneration, and other orthopedic pathologies.
- Practice interpreting imaging studies and correlating findings with clinical presentations.

3. Joint Injection Techniques:

- Learn and practice joint injection techniques for the administration of corticosteroids, local anesthetics, and other therapeutic agents.
- Understand the indications, contraindications, and potential complications

associated with joint injections.

- Gain proficiency in identifying proper injection sites, using aseptic techniques, and ensuring patient comfort and safety.

4. Basic skills in management of trauma care:

- Dressing material and methods
- First aid kit description
- Iv cannula, needles, syringes -their proper use and disposal
- Wound care
- Sterile dressing techniques
- Different modes of administration of drugs

5. Clinical Case Discussions:

- Engage in interactive case discussions with peers and faculty members to analyze and evaluate orthopedic cases,
- Apply knowledge of anatomy, biomechanics, and clinical assessment to formulate appropriate management plans for different orthopaedic conditions.
- Enhance critical thinking skills in evaluating treatment options and considering patient-specific factors

SEMESTER- V

TRAUMA CARE AND MANAGEMENT IN ORTHOPEDICS

L/T/P/C: 4/-/-/4

1. Fractures-Types, Healing & Complications
2. Functional position of joints
3. Care of patients with plaster
4. How to apply traction and counter-traction.
5. Reduction techniques
6. Regional Trauma
    A. Proximal humerus fracture
    B. Shaft of humerus bone
    C. Supracondylar fracture of humerus
    D. Forearm fracture
    E. Distal radios fracture
    F. Metacarpal and finger fracture
    G. Pelvis fracture
    H. Hip fracture
    I. Femur fracture
    J. Tibial plateau fracture
    K. Leg bone fracture
    L. Ankle fracture
    M. Metatarsal fracture
7. Common dislocation and subluxations (Shoulder, Hip, Elbow, Knee and Finger)

RECOMMENDED BOKS:

1. "Rockwood and Green's Fractures in Adults" edited by Charles Court-Brown, James D. Heckman, and Michael McKee
2. "Skeletal Trauma: Basic Science, Management, and Reconstruction" edited by Bruce D. Browner, Jesse B. Jupiter, and Christian Krettek
3. "Orthopaedic Trauma: The Stanmore and Royal London Guide" edited by Sebastian Dawson-Bowling, Mohit Bhandari, and Tim Briggs

UNIT-I

APPILED ORTHOPEDIC TECHNOLOGY

L/T/P/C: 3/-/2/4

1. Fundamentals of Orthopedic Technology
2. Introduction to Orthopedic Technology
3. Roles and responsibilities of orthopedic technologists
4. Types of orthopedic conditions: Congenital, acquired, traumatic, and degenerative
5. Anatomical and physiological principles relevant to orthotics
6. Patient assessment techniques

UNIT-II

1. Assistive and Mobility Aids
2. Walking aids (crutches, canes, walkers)
3. Fitting and gait training
4. Wheelchair selection and biomechanics
5. Pressure sore prevention
6. Patient education and safety

UNIT-III

1. Material Science in Orthopedic Technology
2. Properties of orthotic materials (thermoplastics, metals, carbon fiber)
3. Fabrication processes
4. Selection of materials for different orthoses
5. Safety standards and biocompatibility

UNIT-IV

1. Pediatric Orthotics & Deformities
2. Management of:
3. Clubfoot (CTEV)
4. Developmental dysplasia of the hip (DDH)
5. Spina bifida and muscular dystrophy
6. Cerebral palsy and scoliosis
7. Pediatric orthotic considerations

UNIT V

1. Rehabilitation and Follow-Up
2. Multidisciplinary approach in rehabilitation
3. Role of orthotist in rehabilitation
4. Functional training and patient compliance
5. Monitoring progress and making adjustments
6. Psychological aspects of wearing orthoses

RECOMMENDED BOOKS

1. Campbell's Operative Orthopaedics – S. Terry Canale, James H. Beaty
2. Atlas of Orthotics: Biomechanical Principles and Application – AAOS
3. Orthotics and Prosthetics in Rehabilitation – Michelle M. Lusardi
4. Tachdjian's Pediatric Orthopaedics – John A. Herring
5. Essentials of Orthopaedics – Maheshwari
6. Orthopaedic Rehabilitation of the Injured Athlete – Kevin Wilk et al.

ORTHOPEDIC INSTRUMENTS, ITS MAINTAINENCE AND QUALITY ASSURANCE

L/T/P/C: 3/-/-/3

Introduction to Orthopaedic Instruments

Orthopaedic tools, classification: Cutting, Holding, Retracting, Fixation, etc.
Overview of instruments used in (a) Trauma surgery (b) Joint replacement (arthroplasty) (c) Arthroscopy (d) Spine surgery

Instrument Identification and Use

Bone cutting instruments (e.g., osteotomes, saws, rongeurs)
Holding and grasping tools (e.g., reduction clamps, forceps)
Drilling and reaming instruments
Implant-related instruments (screwdrivers, tapers, insertion guides)
Power tools: drills, saws, burrs

Handling and Sterilization

Pre-cleaning procedures
Manual vs. mechanical
cleaning
Disinfection and sterilization methods: Autoclaving, Ethylene oxide (ETO), Plasma sterilization
Packaging and storage guidelines

Maintenance and Repairs

Routine inspection protocols

Sharpening and calibration
Lubrication and corrosion prevention
Handling of power tools and batteries
Record-keeping and maintenance logs

Quality Assurance and Safety Standards

International Organization for Standardization (ISO) and American Society for Testing and Materials (ASTM) standards for surgical instruments
Instrument tracking systems (e.g., Radio-Frequency Identification (RFID)/barcodes)
Quality control checklists
Reporting and managing instrument failure
Regulatory requirements (Food and Drug Administration (FDA), Conformite Europeenne (CE), National Accreditation Board for Hospitals & Healthcare Providers (NABH).

PRACTICALS

a. Use of Osteotomes for cutting and preparing bone,
b. Use of Bone Cutting Forceps for cutting and removing bones during orthopedic surgery.
c. Use of Gigli Saws for flexible wire saws used by surgeons for bone cutting. Used mainly for amputations.
d. Use of Plate Benders for bend a plate to the appropriate configuration and during bone fracture surgery.

RECOMMENDED BOOKS:

1. "Orthopedic Instruments: A Manual of Their Use and Care" by Adrian D. Osbon and Sam W. Wiesel
2. "Orthopedic Surgery Instrumentation: A Comprehensive Guide" by Mihir M. Shah
3. "Orthopedic Instruments: A Pocket Guide" by John R. Goldner and John J. Burke
4. Atlas of Orthopaedic Surgical Instruments by Daniel R. Cullington
5. Surgical Exposures in Orthopaedics: The Anatomic Approach by Stanley Hoppenfeld
6. Cleaning and Sterilization of Medical Devices by Rajiv Kohli
7. WHO Guidelines on Decontamination and Reprocessing of Medical Devices
8. CDC Guidelines for Disinfection and Sterilization in Healthcare Facilities

INTERPERSONAL COMMUNICATION

L/T/P/C
1/-/-/1

COURSE DESCRIPTION:

This course explores the fundamental principles, theories, and techniques of interpersonal communication. Students will examine both verbal and non-verbal communication strategies and apply these skills to improve personal and professional interactions. Through class discussions, role-playing, and group activities, students will develop a better understanding of effective communication in various social contexts.

COURSE OBJECTIVES:

By the end of the course, students will:
Understand the theories and principles of interpersonal communication.
Develop effective verbal and non-verbal communication skills.
Analyse and enhance communication in various interpersonal relationships (e.g., friendships, family, workplace).
Improve listening, empathy, and conflict-resolution skills.
Understand cultural and gender influences on communication.
Apply communication skills in real-world scenarios.

UNIT-I

- Introduction to Interpersonal Communication
- Overview of interpersonal communication theory.
- Key principles: sender, message, receiver, feedback, noise. Importance of communication in daily life.

UNIT-II

- Verbal Communication
- The role of language in communication.
- Choosing words carefully: Clarity, precision, and ambiguity. Influence of culture and context on verbal communication.

UNIT-III

- Non-Verbal Communication
- Body language, facial expressions, and gestures. Space, posture, and touch in communication.
- The role of non-verbal cues in conveying

emotions

UNIT-IV

- Listening Skills
- Types of listening: Active, passive, reflective. Barriers to effective listening.
- Developing empathy through listening.

UNIT-V

- Self-Disclosure and Relationship Development The importance of self-disclosure in relationships. The Johari Window model.
- How self-disclosure affects trust and intimacy.

UNIT-VI

Conflict in Interpersonal Communication Types of conflict: Productive vs. destructive. Conflict management styles.

- Strategies for resolving conflict in healthy

ways.

UNIT-VII

- Cultural and Gender Differences in Communication
- Cultural influences on communication styles. Gender communication differences.
- Strategies for effective cross-cultural communication.

UNIT-VIII

- Communication in Close Relationships
- Communication patterns in romantic relationships, family, and friendships.
- Managing expectations and maintaining healthy communication in intimate relationships.

UNIT-IX

- Communication in the Workplace
- Interpersonal communication in professional settings.
- Navigating professional relationships and maintaining boundaries. Communication and leadership.

UNIT-X

- Digital Communication
- The role of technology in interpersonal communication. The impact of social media on relationships.
- Pros and cons of digital communication tools.
- The Ethics of Communication
- Ethical dilemmas in communication.
- Honesty, transparency, and privacy in conversations. Balancing openness with respect for others' boundaries.

Reference Textbook:

"Interpersonal Communication: Everyday Encounters" (Author: Julia T. Wood, 9th

CLINICAL POSTINGS

L/T/P/C: -/-/16/8

Students will undergo rotational clinical postings in key departments of hospitals affiliated with the college, including the Emergency and Trauma Care Unit, Orthopaedic Outpatient Department (OPD), Orthopaedic Inpatient Departments (male and female surgical wards),

and the Orthopaedic operation theatres. During these postings, students will observe clinical procedures and treatment protocols involved in the care of orthopaedic patients. They will also have the opportunity to assist the clinical staff in executing non-clinical aspects of service delivery, such as patient preparation, equipment setup, and documentation, under supervision. Each student is required to maintain a clinical log book which should be used for recording daily observations, procedures witnessed or assisted, and key learnin gs from each department. This log book must be submitted at the end of the clinical rotation and will be assessed by the college as part of the final internal evaluation, with grades awarded based on participation, documentation, and overall engagement during the postings

1. **Basic Skills in usage of instruments:**

- Use of Osteotomes for cutting and preparing bone,
- Use of Bone Cutting Forceps for cutting and removing bones during orthopedic surgery.
- Use of Gigli Saws for flexible wire saws used by surgeons for bone cutting. Used mainly for amputations.
- Use of Plate Benders for bend a plate to the appropriate configuration and during bone fracture surgery.

2. **Basic skills in operation theater:**

- OT preparation and draping techniques
- Identification and handling of surgical instruments
- Assisting in simulated fracture fixation (bone models)
- Bone screw and plate insertion techniques on models
- Arthroscopy setup and basic handling (dry lab)
- Joint prosthesis assembly and implant handling
- Maintenance of orthopedic instruments and power tools

3. **Clinical Case Discussions:**

- Engage in interactive case discussions with peers and faculty members to analyze and evaluate orthopedic cases,
- Apply knowledge of anatomy, biomechanics, and clinical assessment to formulate appropriate management plans for different orthopaedic conditions.
- Enhance critical thinking skills in evaluating treatment options and considering patient-specific factors

SEMESTER- VI

ADVANCE ORTHOPEDIC SURGERY ASSISTANT L/T/P/C

3/-/2/4

Unit I:

1. Basic Principles of Orthopaedic Surgery
2. Basic Aseptic techniques and sterilization: Autoclaving, gas/plasma, chemical

3. Basic Operation theatre (OT) layout and workflow for orthopaedics
4. Surgical hand scrubbing and gloving techniques
5. Types of orthopaedic surgeries: Elective, emergency, trauma, minimally invasive

Unit II:

1. Basic Instrumentation in Advanced Orthopaedic Surgery
2. AO instrumentation systems
3. Basic Power tools: drills, saws, burrs – handling and safety
4. Basic Navigation and robotic-assisted surgical tools (Basics)
5. Arthroscopic instruments
6. Basic Bone graft handling and instruments

Unit III:

1. Basic Fracture Fixation Techniques
2. Open Reduction and Internal Fixation (ORIF): plates, screws, IM nails
3. External fixation devices (Ilizarov, hybrid fixators)
4. Basic Locking plate systems (LCP)
5. Basic Minimally Invasive Percutaneous Plate Osteosynthesis (MIPPO)
6. Basic Bioabsorbable implants – introduction

Unit IV:

1. Basics of Joint Replacement and Arthroplasty
2. Total Hip Replacement (THR) – Types (cemented, uncemented)
3. Total Knee Replacement (TKR) – surgical setup, instrumentation
4. Surface replacement and unicondylar procedures
5. Revision arthroplasty – special considerations
6. Role of the technologist in prosthesis selection and assembly

Unit V:

1. Basics of Spine Surgery Techniques
2. Spinal fixation – pedicle screws, rods, cages
3. Laminectomy, discectomy, fusion surgeries
4. Endoscopic spine surgery
5. Navigation-assisted spine surgeries
6. Orthopaedic technologist's role in spine instrumentation setup

Unit VI:

1. Basics of Arthroscopy & Sports Injury Surgery
2. Knee and shoulder arthroscopy basics
3. Common arthroscopic procedures (ACL reconstruction, meniscectomy)
4. Instruments and camera system
5. Patient positioning and OT preparation
6. Fluid management and troubleshooting in arthroscopy

Unit VII:

1. Basic of Pediatric and Deformity Correction
2. Epiphysiodesis and guided growth procedures
3. External fixators for limb lengthening (Ilizarov and Taylor frame)

4. 3D printing and surgical planning in deformity correction

Unit VIII:

1. Basics of Emerging Technologies in Orthopaedics
2. Computer-Assisted Orthopaedic Surgery (CAOS)
3. Robotic Orthopaedic Surgery – overview
4. Patient-specific instrumentation (PSI)
5. 3D-printed implants and prosthetics
6. Biologic therapies (PRP, stem cells, cartilage regeneration)

PRACTICAL:

- OT preparation and draping techniques
- Identification and handling of surgical instruments
- Assisting in simulated fracture fixation (bone models)
- Bone screw and plate insertion techniques on models
- Arthroscopy setup and basic handling (dry lab)
- Joint prosthesis assembly and implant handling
- Maintenance of orthopedic instruments and power tools

RECOMMENDED BOOKS:

1. Campbell's Operative Orthopaedics – S. Terry Canale, James H. Beaty
2. Turek's Orthopaedics: Principles and Their Application – Samuel L. Turek
3. Apley's System of Orthopaedics and Fractures – Apley & Solomon
4. Manual of Orthopaedic Terminology – Taber
5. Essential Orthopaedics – J. Maheshwari
6. Techniques in Orthopaedics – Lippincott series (Journals and reviews)
7. Orthopaedic Surgical Approaches – Hoppenfeld

PROSTHETICS AND ORTHOTICS

L/T/P/C
3/-/-/3

1. Introduction to Rehabilitation: History and scope
2. Overview of disabilities requiring P&O interventions
3. Basic terminology: Orthosis, Prosthesis, levels of amputation
4. Types of orthoses: static vs dynamic, functional classification
5. Types of prostheses: exoskeletal, endoskeletal, cosmetic
6. Anatomical and biomechanical principles in P&O
7. Material science: plastics, metals, foams used in fabrication

8. Intro to tools, lab safety, and casting techniques
9. Basics of upper limb prosthesis and orthosis
10. Principles of lower limb orthotic design
11. Ankle-Foot Orthosis (AFO): types, indications
12. Knee-Ankle-Foot Orthosis (KAFO): construction and indications
13. Functional Foot Orthoses (FFO): for flat foot, cavus foot
14. Introduction to transtibial (below-knee) prosthetics
15. Socket designs: PTB, total contact
16. Suspension methods: supracondylar, thigh corset, straps
17. Alignment principles in prosthetics

RECOMMENDED BOOKS:

'Physical Rehabilitation' by Susan B. O'Sullivan
'Textbook of Rehabilitation' by S. Sundar
Supplemented with Indian curriculum guidelines and best practices.

PHYSIOTHERAPY IN ORTHOPEDICS

L/T/P/C
3/-/2/4

1. Introduction to physiotherapy
2. Types, Technique of application, indications, contraindications, effects and uses of the following: -

A) Active movement
B) Passive movement
C) Active assisted movement
D) Resisted movement
E) Relaxation
F) Hydrotherapy

G) Traction
H) Stretching exercises
I) Strengthening exercises

3. Basics of Electrotherapy: Indications, contraindications, precautions, operational skills of equipment and patient preparation:

A) Moist heat and electrical heating pads
B) Short Wave Diathermy
C) Infra-red rays
D) Ultra-violet rays (UVR)
E) Ultra sonic therapy
F) Transcutaneous Electrical Nerve stimulation (TENS)
G) Interferential Therapy (IFT)
H) Electrical Muscle Stimulation
I) Paraffin Wax Bath

PRACTICAL:

1. Measuring Joint Range of motion
2. Measuring Muscle strength
3. Limb length discrepancy
4. Muscle Girth

RECOMMENDED BOOKS:

1. "Orthopaedic Physical Assessment" by David J. Magee
2. "Orthopaedic Rehabilitation Clinical Advisor" by Derrick Sucki and Jacklyn Brecht

RESEARCH METHODOLOGY AND BIOSTATISTICS

L/T/P/C
3/-/-/3

1. INTRODUCTION TO RESEARCH METHODOLOGY

- Meaning of research
- Objectives of research
- Motivation in research
- Types of researches and research approaches
- Criteria for good research
- Problems encountered by researchers in India

2. IDENTIFYING RESEARCH PROBLEM

Research problem:

- Statement of research problem
- Statement of purpose and objectives of research problem
- Necessity of defining problem

Testing of hypothesis:

- What is hypothesis

- Basic concepts concerning testing of hypothesis
- Limitations of testing of hypothesis

3. ETHICAL ISSUES IN RESEARCH

- Introduction to research ethics
- Ethical principles
- Ethics and ethical code
- Animal research ethics
- Making ethical decision
- Components of ethical research plan

4. RESEARCH DESIGN

- Meaning of research design
- Need for research design
- Features of good research design

5. BASIC CONCEPTS OF BIOSTATISTICS

Introduction:

- Definition and characteristics of statistics
- Importance of study of statistics
- Branches of statistics
- Statistics and health sciences
- Descriptive and inferential statistics
- Variables and their types

Tabulation of data:

- Basic principles of graphical representations
- Types of diagrams- histograms, frequency polygons, smooth frequency polygon, cumulative frequency curve, non- probability curve

Measures of central tendency:

- Need for measure of central tendency
- Definition and calculation of mean- ungrouped and grouped
- Definition and calculation of Median
- Definition and calculation of mode
- Comparison of mean, median, and mode

Probability and standard deviation:

- Meaning of probability or standard deviation
- The binomial distribution
- The normal distribution
- Divergence from normality- skewness and kurtosis

6. TYPES OF DATA

- Qualitative data
- Quantitative data

7. RESEARCH TOOLS AND DATA COLLECTION METHODS

Measurement and scaling techniques:

- Measurement in research
- Scales in research sources of error in measurements
- Technique of developing measurement tools
- Meaning of scaling and its classification
- Important scaling techniques

Methods of data collection:

- Collection of primary data
- Collection of data through questionnaires and schedules
- Differences between questionnaires and schedules

8. SAMPLING METHODS

Sampling fundamentals:

- Need for sampling, and some fundamental definitions
- Important sampling distributions

Sampling design:

- Criteria for selecting procedure
- Implications for sampling design
- Steps in sampling design
- Different types of sampling designs

9. DEVELOPING A RESEARCH PROPOSAL

- Introduction to Research Proposal
- Selecting a Research Problem
- Review of Literature
- Formulating Research Objectives and Hypotheses
- Research Questions
- Theoretical or Conceptual Framework
- Research Design and Methodology
- Sampling Techniques and Sample Size
- Data Collection Methods
- Data Analysis Plan
- Ethical Considerations
- Limitations and Delimitations
- References and Bibliography
- Appendices (e.g., consent forms, tools, questionnaires)

RECOMMENDED BOOKS:

1. Methods in biostatistics by Mahajan
2. Research methodology by C R Kothari

3. Textbook of biostatistics by Sundar Rao
4. Textbook of biostatistics and research methodology by U. Satyanarayana

ART OF BEING A BETTER PERSON

L/T/P/C
1/-/-/1

Course Description:

This course explores what it means to live ethically, compassionately, and meaningfully as a human being. Students will engage in discussions about moral philosophy, empathy, self-awareness, and how to cultivate kindness, responsibility, and social engagement in everyday life.

Course Objectives:

- By the end of the course, students will:
- Understand foundational ethical principles that guide human behavior.
- Cultivate emotional intelligence and empathy.
- Learn practical strategies for self-improvement and kindness.
- Understand their role in society and how to make a positive impact.
- Reflect on personal actions, relationships, and contributions to the community.

UNIT-I

- Introduction to Being a Good Human
- Defining "goodness" and ethical living
- Overview of moral philosophies: Utilitarianism, Deontology, Virtue Ethics The role of self-awareness in personal growth

Activity: Reflective journaling on what "being good" means to you.

UNIT-II

- The Power of Empathy
- Understanding empathy vs. sympathy
- The science behind empathy and its benefits for social connections Techniques for cultivating empathy in everyday life

Activity: Empathy-building exercises and discussions.

UNIT-III

- Emotional Intelligence (EQ)
- What is Emotional Intelligence? (Self-awareness, self-regulation, motivation, empathy, and social skills) The role of EQ in personal and professional relationships
- Strategies to improve emotional intelligence

Activity: Self-assessment of emotional intelligence and EQ development exercises.

UNIT-IV

- Compassion and Kindness
- The science of kindness: How kindness benefits us and others
- Practicing kindness in small, everyday actions
- Overcoming barriers to kindness (e.g., stress, biases, indifference)

Activity: "Random Acts of Kindness" challenge.

UNIT-V

- Personal Integrity and Honesty
- The importance of integrity in personal and professional life Consequences of dishonesty and lack of integrity
- How to align actions with values

Activity: Case study discussion on ethical dilemmas and decision-making.

UNIT-VI

- Building Positive Relationships
- Communication skills for healthy relationships Setting boundaries and respecting others' boundaries Conflict resolution and forgiveness

Activity: Role-playing scenarios to practice healthy communication.

UNIT-VII

- Responsibility and Accountability
- The concept of personal responsibility in life Accountability in both personal and community contexts How to take ownership of mistakes and learn from them Activity: Reflect on past mistakes and plan for growth.

UNIT-VIII

- Contributing to the Community and Society
- The role of individuals in building strong communities Volunteering, activism, and social responsibility
- The impact of small, positive actions on a larger scale

Activity: Brainstorming session on potential ways to contribute to the local community.

UNIT-IX

- Practicing Gratitude and Contentment
- The psychological and emotional benefits of gratitude Practicing contentment in a consumer-driven world Techniques for cultivating a mindset of abundance Activity: Gratitude journal and daily reflection.

UNIT-X

- Living with Purpose and Meaning

- Discovering personal values and purpose
- The intersection of passion, skills, and service Creating a life plan that aligns with core values Activity: Create a personal mission statement.

UNIT-XI

- Overcoming Negative Traits: Greed, Anger, and Envy The psychology behind negative emotions and traits How greed, anger, and envy affect our well-being
- Strategies for managing and transforming negative

emotions Activity: Mindfulness meditation and reflection exercises.

UNIT-XII

- Bringing It All Together: A Life of Goodness Review of key learnings from the course Creating a vision for continuous personal growth
- How to maintain a positive and ethical life in a challenging world

Reference Textbook

How to Win Friends and Influence People" by Dale Carnegie
The Seven Habits of Highly Effective People" by Stephen R. Covey

CLINICAL POSTING

L/T/P/C: -/-/12/6

Students will undergo rotational clinical postings in key departments of hospitals affiliated with the college, including the Orthopaedic Outpatient Department (OPD), Orthopaedic Inpatient Departments (male and female surgical wards), orthopaedic operation theatres, prosthesis and orthosis department. During these postings, students will observe clinical procedures and treatment protocols involved in the care of orthopaedic patients. They will also have the opportunity to assist the clinical staff in executing non-clinical aspects of service delivery, such as patient preparation, equipment setup, and documentation, under supervision. Each student is required to maintain a clinical log book which should include recording daily observations, procedures witnessed or assisted, and key learnings from each department. This log book must be submitted at the end of the clinical rotation and will be assessed by the college as part of the final internal evaluation, with grades awarded based on

participation, documentation, and overall engagement during the postings.

1. Joint Range of Motion Measurement:

- Learn and practice the techniques for measuring range of motion (ROM) of various joints, such as the shoulder, elbow, wrist, hip, knee, and ankle.
- Perform goniometric measurements and use appropriate tools for accurate assessment.
- Interpret and document ROM findings for clinical evaluation.

2. Musculoskeletal Examination:

- Learn and practice systematic musculoskeletal examination techniques, including inspection, palpation, range of motion assessment, muscle strength testing, and special tests
- Perform musculoskeletal assessments for common orthopedic conditions, such as sprains, strains, fractures, and joint disorders.
- Develop proficiency in identifying abnormalities and assessing functional limitations

3. Surgical Skills Workshops

- Participate in simulated surgical skills workshops to develop an understanding of orthopedic surgical procedures.
- Practice techniques such as suturing, knot tying, and basic orthopedic surgical procedures using synthetic models or cadavers under the guidance of experienced faculty.

4. Clinical Case Discussions:

- Engage in interactive case discussions with peers and faculty members to analyze and evaluate orthopedic cases,
- Apply knowledge of anatomy, biomechanics, and clinical assessment to formulate appropriate management plans for different orthopaedic conditions.
- Enhance critical thinking skills in evaluating treatment options and considering patient-specific factors

SEMESTER – VII

Internship I

L/T/P/C: -/-/40/20

Healthy Eating for Healthy Living

L/T/P/C ` 1/-/-/1

Course Description:

This course is designed to teach students the foundational principles of nutrition, the relationship between food and health, and practical strategies for making sustainable, healthy eating choices. Students will learn how to create balanced meals, understand dietary guidelines, and navigate the modern food environment to support long-term health and well-being.

UNIT-I

Introduction to Nutrition and Healthy Eating

- What is nutrition?
- Overview of macronutrients (carbohydrates, proteins, fats) and micronutrients (vitamins, minerals).

- The importance of hydration.
- Understanding energy balance: Calories in vs. Calories out.
- Introduction to My Plate (or other dietary guidelines).

UNIT-II

Building a Balanced Plate

- The principles of meal planning.
- Portion control and serving sizes.
- Healthy fats vs. unhealthy fats.
- Carbohydrates: Simple vs. complex sugars.
- Protein sources: Animal vs. plant-based.

UNIT-III

Reading Food Labels and Understanding Food Marketing

- How to read food labels (nutritional facts, ingredients list, serving sizes).
- Decoding food claims (low-fat, organic, non-GMO).
- Understanding food marketing and its impact on consumer choices.
- Navigating grocery stores and making informed decisions.

UNIT-IV

The Role of Fruits and Vegetables in Healthy Eating

- The importance of fruits and vegetables in the diet.
- Health benefits of fiber, antioxidants, and phytochemicals.
- Incorporating more plant-based foods into your meals.
- Seasonal and local produce: Why it matters.

UNIT-V

Special Diets and Nutrition for Different Lifestyles

- Overview of popular diets (e.g., Mediterranean, vegetarian, vegan, paleo, ketogenic).
- Nutrition for athletes and active individuals.
- Special considerations for children, seniors, and pregnant women.
- Managing food allergies and intolerances (e.g., gluten, lactose).

UNIT-VI

- Mindful Eating and Emotional Health
- What is mindful eating?
- The connection between emotions and eating habits.
- Managing stress and emotional eating.
- Developing a healthy relationship with food.

UNIT-VII

Sustainable Eating and Environmental Impact

- The environmental impact of food choices (e.g., food miles, carbon footprint).
- Sustainable eating practices: Local, seasonal, and organic foods.
- Reducing food waste: Practical tips.
- The role of plant-based eating in sustainability.

UNIT-VIII

Putting It All Together: Creating a Sustainable, Healthy Eating Plan

- Review of key concepts: Macronutrients, micronutrients, balanced eating, mindful eating.
- Goal setting: How to set achievable health goals.
- Meal prep and planning for a busy lifestyle.
- Long-term strategies for maintaining a healthy diet.

RECOMMENDED TEXTBOOKS:

1. Nutrition and You" by Joan Salge Blake
2. Understanding Nutrition" by Eleanor Noss Whitney and Sharon Rady Rolfes

Project Work I

L/T/P/C: -/-/2/1

SEMESTER-VIII

INTERNSHIP II

L/T/P/C: -/-/20/10

PROJECT WORK II

L/T/P/C: -/-/20/10

PROFESSIONALISM IN THE WORKPLACE

L/T/P/C: 1/-/-/1

Course Description:

This course is designed to provide students with the foundational knowledge and skills required to demonstrate professionalism in a variety of workplace settings. Topics will include communication, ethics, accountability, time management, problem-solving, conflict resolution, and maintaining a positive and effective work ethic. Students will engage in practical activities that promote personal and professional growth.

Course Objectives:

By the end of this course, students will:

1. Understand the key elements of professional behavior in the workplace.

2. Demonstrate effective communication, both verbal and non-verbal, in a professional environment.
3. Learn to manage time effectively and handle workplace challenges with a positive attitude.
4. Cultivate emotional intelligence and adaptability in professional settings.
5. Understand workplace ethics, integrity, and how to make ethical decisions.
6. Develop skills for conflict resolution and teamwork in diverse work environments.

UNIT-I

Introduction to Professionalism

- What is professionalism?
- Characteristics of a professional: Appearance, behaviour, and attitude
- The importance of professional ethics and integrity

UNIT-II

Effective Communication in the Workplace

- Verbal and non-verbal communication
- Active listening and responding
- Communicating across cultures

UNIT-III

Workplace Etiquette and Networking

- Social etiquette in the workplace
- Networking best practices
- Building relationships with colleagues, managers, and clients

UNIT-IV

- Time Management and Organization
- Prioritizing tasks and setting goals
- Managing deadlines and avoiding procrastination
- Tools and techniques for effective time management

UNIT-V

Accountability and Reliability

- Taking responsibility for your actions
- Being reliable and dependable in the workplace
- How accountability affects professional reputation

UNIT-VI

Problem Solving and Decision Making

- Approaches to critical thinking and decision-making
- Strategies for solving workplace problems effectively
- The role of creativity and innovation in problem-solving

UNIT-VII

Teamwork and Collaboration

- Working with diverse teams
- Building trust and collaboration in teams
- Managing team conflicts and maintaining harmony

UNIT-VIII

Conflict Resolution and Handling Difficult Conversations

- Understanding conflict dynamics
- Techniques for resolving conflicts professionally
- Role-playing difficult conversations in the workplace

UNIT-IX

Ethical Dilemmas in the Workplace

- Recognizing ethical challenges
- Making decisions based on ethical principles
- The role of transparency and honesty

UNIT-X

Building Emotional Intelligence and Adaptability

- What is emotional intelligence and why does it matter?
- Developing self-awareness and self-regulation
- Adapting to changing work environments

RECOMMENDED TEXTBOOKS:

1. Professionalism: Skills for Workplace Success" by Deborah C. Dillon
2. The Professional Workplace: The Skills You Need to Succeed" by Ronald W. Holme