

PONDICHERRY UNIVERSITY

Puducherry



Regulations and Syllabus

Bachelor of Science (Physician Assistant)

B.Sc. (PA)

2022-2023

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Bachelor of Science in Physician Assistant

I. Aim

The aim of the undergraduate Physician Assistant program is to prepare graduates to provide diagnostic, therapeutic and preventive healthcare services, under the supervision of a qualified and licensed Physician or Surgeon.

II. Objectives:

On completion of B.Sc. in Physician Assistant program the graduates will be able to:

- preparing patient.
- arranging for hospital admission and lab services.
- taking down a patient medical history or list of symptoms.
- assisting doctors with patient examination.
- assisting Medical Practitioners during examination.
- preparing patient for x rays or other tests, explain procedures, handling basic wound care.
- completes records by recording patient's examination, treatment and test results
- manage electronic health records.
- updating medical records, answering phones, and sterilizing medical equipment.
- maintain patient confidentiality and patient advocacy in a trust-based environment.
- maintain hospital and clinical safety regulation and standards.
- providing patient and family education and counselling.
- Providing patient instruction about special diet and medication.
- demonstrate skills in teaching individuals and groups in clinical/community settings.
- practice within the code of ethics, professional conduct, and acceptable standards of Physician Assistant practice within the legal boundaries.

III. Program outcome:

- At the end of B.Sc Physician Assistant program the graduates are prepared to provide Physician Assistant service to patients and work under the guidance of specialized doctors, care and support patients in almost every medical and surgical treatment.

IV. Regulations

1. Eligibility for Admission

- The admission is based on the CENTAC process. The reservation and other process in as per the Govt norms from time to time. Candidates should have completed a minimum of 17 years of age as on 31st December of the year of admission. The upper age limit is 25 years. (Relaxation up to 5 years for SC/ST candidate and up to 3 years for MBC/OBC candidates.)
- Candidates should have a pass in the Higher Secondary Examination conducted by Board of Higher Secondary Examination of Tamil Nadu, or any other equivalent examination accepted by the University, there to with a minimum of 50% marks (40% for SC, ST, MBC, OBC the candidates) in aggregate of the Science subjects (Physics, Chemistry, Biology/ Botany & Zoology) and should have English as one of the subjects.
- Candidate shall be medically fit to undergo the Physician Assistant Technology program.

2. Duration of the program

- The duration of the program shall be **Three years** of full-time study and **One year** of compulsory rotatory internship.

3. Medium of Instruction

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

4. The program detail

The program detail is shown in Table I.

- ***The detailed syllabus in respect of the program is appended to this regulation.***

5. Attendance required for appearing examination

- Examination will be conducted in both theory and practical, as prescribed.
- Candidate will be permitted to appear for the University Examination in the subject only if they secure not less than 80% attendance (irrespective of the kind of absence) in each subject of that semester.
- Condonation of shortage of attendance in aggregate upto 10% in each semester may be granted by the College Academic Committee and as per regulations of University. For Students internship offered during VII and VIII semesters, 100% attendance is compulsory. However, the students may be condoned upto 15%, under extraordinary situation, by the Dean based on the genuineness of the case upon the recommendation of the concern program teaching and Head of the Department.
- The students failing to attend classes/examinations on non-official ground will be treated as absent. Student deputed for Sports, Cultural Meets, etc with prior permission of Principal / Dean of the College shall be given attendance for the period of absent.

6. Internal Assessment

- Internal assessment will be done in each subject of study and the marks will be awarded to the candidates as detailed in the scheme of examinations.
- The marks awarded will be on the basis of candidate's performance in the assignments, class tests, laboratory work, preparation and presentation of seminars and clinical cases.
- The marks secured by the candidate during each semester in each subject shall be forwarded to the University at the end of the semester, i.e., before the commencement of the written examination.

7. Examinations

- The University Examinations will be conducted in the semester pattern for all the three years, each year consisting of two semesters.
- The particulars of subjects for various examinations and distribution of marks are shown separately in the Table II.
- The examination for the main subjects will be conducted by the University and for the non-examination subjects by the college.
- The maximum number of candidates for practical examination should not exceed 20 per day.
- One internal and one external examiner should jointly conduct practical examination for each student.
- An examiner should not be below the rank of an Assistant Professor or Tutor/Demonstrator

8. Passing minimum

- Candidate has to pass separately in theory + Viva voce and Practical by getting a minimum of 50% marks in combined internal assessment and University examination. A candidate should secure 50% of the marks in theory and 50% in practical (wherever prescribed)
- If a candidate fails in either theory or practical, he/she has to re-appear for both theory and practical.
- A candidate should secure 50% of total marks in the test conducted by the college for the non-examination subject.

9. Procedure for passing the program

- The maximum period to complete the program successfully should not exceed a period of eight years.

10. Internship

- There shall be a compulsory full-time rotatory Internship after the candidate having passed all the subjects prescribed in the scheme of examination.
- The Internship should be done for a period of one year, in an Institution/ Hospital approved.
- No candidate shall be eligible for the award of the degree without successfully completing one-year Internship.

Desirable:

- A Research study to be done and submit the report before the one year of Internship.
- One or more value added courses (like Swayam) during final year or Internship.

11. Eligibility for award of degree

- The candidates shall be eligible for the *Degree of Bachelor of Physician Assistant* when they have undergone the prescribed program of study for a *period of three years* in an institution approved by the University and *have passed the prescribed examinations in all subjects* and *have completed a compulsory internship over a period of one year* in an approved institution.

12. Declaration of class

- A successful candidate obtaining **75% and more marks** in the grand total aggregate in the *First attempt* shall be declared to have passed these subjects with **Distinction**.
- A successful candidate obtaining **60% and more but less than 74.9% marks** in the grand total aggregate in the *First attempt* shall be declared to have passed with **First Class**.
- A successful candidate obtaining **50% and more but less than 59.9% marks** in the grand total aggregate in the *First attempt* and the candidate who *passed with more than one attempt* irrespective of the percentage of marks secured shall be declared to have passed these subjects with **Second Class**.
- Ranks shall be declared on the basis of the aggregate marks obtained by a candidate in the University examination subjects of the program.
- Only those candidates who *have passed all the subjects in all examinations in the First attempt* shall be eligible for the **Award of rank**.

V. Program Structure – Physician Assistant

Table I

Year	Sem	S.No	Subject	Theory Hrs	Practical Hrs	Clinical Hrs	Total Hrs
I Year	I Sem	1.	Anatomy	60	30		90
		2.	Physiology	60	30		90
		3.	Biochemistry	60	30		90
		C 1	Communication and soft skills	60			60
			Library/Co-curricular	30			30
			Clinical Hours			140	140
			Total Hours	270	90	140	500
	II Sem	4.	Pathology	60	30		90
		5.	Microbiology	60	30		90
		C 2	Computer Application	30	30		60
		C 3	First Aid	30	30		60
			Library/Co-curricular	30			30
			Clinical Hours			270	270
			Total Hours	210	120	270	600
			I Year Overall Total	480	210	410	1100
II Year	III Sem	6.	General Medicine & Geriatrics	60		200	260
		7.	Gastroenterology & Orthopedics	60		130	190
		8.	Pharmacology	60	30		90
		C 4	Sociology	30			30
			Library/Co-curricular	30			30
			Total Hours	240	30	330	600
	IV Sem	9.	Surgery & Anesthesiology	60		230	290
		10.	Pediatrics	60		160	220
		C 5	Community Medicine & EVS	30			30
		C 6	Psychology	30			30
			Library/Co-curricular	30			30
			Total Hours	210		390	600
			II Year Overall Total	450	30	720	1200
III year	V Sem	11.	Cardiology & Cardiac surgery	60		230	290
		12.	Neurology	60		160	220
		C 7	Medical Ethics & Bio safety	30			30
		C 8	Physician's office management	30			30
			Library/Co-curricular	30			30
			Total Hours	210		390	600
	VI Sem	13.	Obstetrics & Gynecology	60		150	190
		14.	Nephrology & Pulmonology	60		260	320
		C 9	Biostatistics and Research Methodology	30			30
			Library/Co-curricular	30			30
			Total Hours	180		420	600
			III Year Overall Total	390		810	1200
IV year			Internship				1 year

Note: C 1 to C 9 -Subsidiary Subjects

Internship Details (1 Year)

S.No	Clinical Area	In months
1.	General Medicine	3 months
2.	Surgery	3 months
3.	O&G	1 month
4.	ENT	1 month
5.	Orthopedics	1 month
6.	Pediatrics	1 month
7.	Intensive Care Unit	1 month
8.	Emergency Medicine	1 month
	Total	12 Months

VI. Scheme of Examination with mark details

Table II

Duration: 3 Hours

Sem	S.No	Subject	University marks		Internal Marks		Viva		Total		Total Theory + Practical	
			Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
I Sem	1.1.1	Anatomy	80	32	25		20	10	125	63	200	100
	1.1.2	Anatomy - Practical	50	25	25				75	37		
	1.1.3	Physiology	80	32	25		20	10	125	63	200	100
	1.1.4	Physiology - Practical	50	25	25				75	37		
	1.1.5	Biochemistry	75	30	25				100	50	100	50
	1.1.6*	Communication and soft skills			50	25			50	25	50	25
II Sem	1.2.1	Pathology	75	30	25				100	50	100	50
	1.2.2	Microbiology	75	30	25				100	50	100	50
	1.2.3*	Computer Application			50	25			50	25	50	25
	1.2.4*	First Aid			50	25			50	25	50	25
III sem	2.3.1	General Medicine & Geriatrics	80	32	25		20	10	125	63	200	100
	2.3.2	General medicine & Geriatrics - practical	50	25	25				75	37		
	2.3.3	Gastroenterology & orthopedics	75	30	25				100	50	100	50
	2.3.4	Pharmacology	75	30	25				100	50	100	50
	2.3.5*	Sociology			50	25			50	25	50	25
IV sem	2.4.1	Surgery & Anesthesiology	80	32	25		20	10	125	63	200	100
	2.4.2	Surgery & Anesthesiology – practical	50	25	25				75	37		
	2.4.3	Paediatrics	75	30	25				100	50	100	50
	2.4.4*	Community medicine & EVS			50	25			50	25	50	25
	2.4.5*	Psychology			50	25			50	25	50	25
V sem	3.5.1	Cardiology & Cardiac Surgery	80	32	25		20	10	125	63	200	100
	3.5.2	Cardiology & Cardiac Surgery – practical	50	25	25				75	37		
	3.5.3	Neurology	75	30	25				100	50	100	50
	3.5.4*	Medical Ethics & Bio safety			50	25			50	25	50	25
	3.5.5*	Physician office management			50	25			50	25	50	25
VI sem	3.6.1	Obstetrics & Gynecology	75	30	25				100	50	100	50
	3.6.2	Nephrology & Pulmonology	80	32	25		20	10	125	63	200	100
	3.6.3	Nephrology & Pulmonology - practical	50	25	25				75	37		
	3.6.4*	Biostatistics and research methodology			50	25			50	25	50	25

VII. Course Description

1. Anatomy

Placement: I Year (I Semester)

Time: Theory: 60 Hours
Practical: 30 Hours (Lab)

Course Description: The course is designed to assist students to acquire comprehensive knowledge of the normal structure of human body, to facilitate understanding of anatomical basic health, identify alteration in structure with emphasis on clinical application to practice.

Course Outline

Unit	Time (Hrs)	Content
I	15	Introduction to anatomy terms and organizations of the human body <ul style="list-style-type: none">• Introduction to Anatomical terms relative to position - anterior, ventral, posterior dorsal, superior, inferior, median, lateral, proximal distal superficial, deep, prone, supine, palmar and planter• Anatomical planes (axial/ transverse /horizontal, sagittal /vertical plane and coronal/ frontal/ oblique plain)• Movement (flexion, extension, abduction, adduction, medial, rotation lateral rotation, inversion, eversion, supination, pronation, plantar flexion, dorsi flexion and circumduction)• Cell structure, cell division• Tissues – Definition, types, characteristic, classification, location• Membranes and glands -classification and structures• Identify major surface and body landmarks in each body region organization of human body• Hyaline, fibro cartilages elastic cartilages• Features of skeletal, smooth and Cardiac muscles
II	4	The Respiratory system <ul style="list-style-type: none">• Structures of organ of Respiration• Muscles of Respiratory System
III	4	The Digestive system <ul style="list-style-type: none">• Structures of alimentary canal and organs of digestion
IV	5	The Circulatory and Lymphatic system <ul style="list-style-type: none">• Structures of blood components, anterior and venous system• Position of heart related to Associated structures• Chambers of heart, layers of heart• Nerve supply to and blood supply to heart• Veins used for IV injections• Lymphatic tissues
V	3	The Endocrine System <ul style="list-style-type: none">• Structures of hypothalamus, Pineal gland, Pituitary gland, Thyroid Parathyroid, Thymus, Pancreas and Adrenal gland.

Unit	Time (Hrs)	Content
VI	3	The Sensory organ <ul style="list-style-type: none"> Structures of skin, eyes, ears, nose and tongue.
VII	5	The Musculo Skeletal System Muscular Systems <ul style="list-style-type: none"> Types and structures of muscles Muscle groups - Muscles of head, neck, thorax, abdominal, pelvis upper and lower Limb Principles of Muscles – deltoid, biceps, triceps, respiratory, abdominal, pelvic floor muscles gluteal muscle and vastus laterals Major muscles involved in procedure Skeletal System <ul style="list-style-type: none"> Anatomical position Bones - type, structures, growth and ossification Axial and appendicular skeleton Joints – Classification, major joints and structures
VIII	8	The Renal System <ul style="list-style-type: none"> Structures of Kidney, Ureters, bladder, urethra
IX	5	The Reproductive System <ul style="list-style-type: none"> Structures of Male Reproductive Organs Structures of Female Reproductive Organs Structures of Breast
X	7	The Nervous Systems <ul style="list-style-type: none"> Review and structures of neurons Central Nervous system, Autonomic Nervous system, and Peripheral Nervous system Structures of brain, spinal cord, cranial nerve, spinal nerves, functional areas of cerebral cortex Ventricles of the brain- formation, circulation and drainage
XI	2	Anatomical Techniques Basic principles of Karyotyping.

Practical's:

- Histology of Types of Epithelium
- Histology of Serous, Mucous and Mixed Salivary gland
- Histology of the types of Cartilage
- Demo of all bones showing parts, radiographs of normal bones & Joints
- Histology of Skeletal (TS & LS), Smooth and Cardiac muscle
- Demonstration of Heart and Vessels of the body
- Histology of Large artery, Medium sized artery and vein, Large Vein
- Microscopic appearance of Large and Medium sized Artery and Vein, Large Vein
- Demonstration of all muscles of the body

- Pericardium
- Histology of Lymph node, Spleen, Tonsil and Thymus
- Demonstration of parts of Respiratory system
- Normal Chest radiograph showing Heart shadows
- Histology of Lung and Trachea
- Normal Angiograms
- Histology of Lymphatic tissues
- Radiographs of Abdomen – IVP, Retrograde cystogram
- Demonstration of parts of the Urinary system and Histology of Kidney, Ureter and Urinary bladder
- Demonstration of Male and Female Pelvis with organs in situ.
- Histology of Male and Female Reproductive organs
- Histology of Pituitary, Thyroid, parathyroid and Suprarenal glands
- Histology of peripheral nerve and optic nerve.
- Demo of all parts of brain.

Reference Books:

1. Inderbir Singh, Textbook of Anatomy, Jaypee, 7th Edi, Vol I to III, 2019
2. Chaurasia, Human Anatomy, CBS Publisher, 5th Edi, Vol 1 to 3, 2010.
3. Ross and Wilson Anatomy and Physiology in Health and illness, Elsever, 13th Edi, 2018.

Examination Pattern		Duration
Theory exam: (one paper)	80 marks	3 hours
Practical exam	50 marks	3 hours
Oral exam	20 marks	
Internal assessment (Theory)	25 marks	
Internal assessment (Practical)	25 marks	

	200 marks	

The practical examination will have the following components

Identification of Osteology Spotters	20 marks
Identification of Gross Spotters	15 marks
Viva voce	15 marks

	50 marks

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 80 marks
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Distribution of Course Content

80 marks

Musculo Skeletal, blood, renal, GI tract, endocrines and reproductive
 Cardio vascular system, respiratory system, nervous system and special sense

Pattern of Question Paper:

Long answer question	-	2 X 10 = 20 marks
Short answer question	-	8 X 5 = 40 marks
Very Short answer	-	10 X 2 = 20 marks

2. Physiology

Placement: I Year (I Semester)

Time: Theory: 60 Hours
Practical: 30 Hours (Lab)

Course Description: The course is designed to assist students to acquire comprehensive knowledge of the normal functions of the organ systems of the human body to facilitate understanding of physiological basis of health, identify alteration in functions and provide the student with necessary physiological knowledge to practice.

Course Outline

Unit	Time (Hrs)	Content
I	4	General Physiology – Basic concepts <ul style="list-style-type: none">• Cell physiology including transportation across cell membrane• Body fluid compartments, Distribution of total body fluid, intracellular and extracellular compartments, major electrolytes and maintenance of homeostasis• Cell cycle• Tissue – formation, repair• Membranes and glands – functions
II	6	Respiratory system <ul style="list-style-type: none">• Functions of respiratory organs• Physiology of respiration• Pulmonary circulation – functional features• Pulmonary ventilation, exchange of gases• Carriage of oxygen and carbon-dioxide,• Exchange of gases in tissue• Regulation of respiration• Hypoxia, cyanosis, dyspnea, periodic breathing• Respiratory changes during exercise
III	8	Digestive system <ul style="list-style-type: none">• Functions of the organs of digestive tract• Saliva – composition, regulation of secretion and functions of saliva• Composition and functions of gastric juice, mechanism and regulation of gastric secretion• Composition of pancreatic juice, functions, regulation of pancreatic secretion• Functions of liver, gall bladder and pancreas• Composition of bile and functions• Secretion and functions of small and large intestine• Movements of alimentary tract• Digestion in mouth, stomach, small intestine, large intestine, absorption of food

Unit	Time (Hrs)	Content
IV	6	Circulatory and Lymphatic system <ul style="list-style-type: none"> • Functions of heart, conduction system, cardiac cycle, Stroke volume and cardiac output • Blood pressure and Pulse • Circulation – principles, factors influencing blood pressure, pulse • Coronary circulation, Pulmonary and systemic circulation • Heart rate – regulation of heart rate • Normal value and variations • Cardiovascular homeostasis in exercise and posture
V	5	Blood <ul style="list-style-type: none"> • Blood – Functions, Physical characteristics • Formation of blood cells • Erythropoiesis – Functions of RBC, RBC life cycle • WBC – types, functions • Platelets – Functions and production of platelets • Clotting mechanism of blood, clotting time, bleeding time, PTT • Homeostasis – role of vasoconstriction, platelet plug formation in hemostasis, coagulation factors, intrinsic and extrinsic pathways of coagulation • Blood groups and types • Functions of reticuloendothelial system, immunity
VI	5	The Endocrine system <ul style="list-style-type: none"> • Functions and hormones of Pineal Gland, Pituitary gland, Thyroid, Parathyroid, Thymus, Pancreas and Adrenal glands. • Other hormones • Endocrine Alterations in diseases
VII	4	The Sensory Organs <ul style="list-style-type: none"> • Functions of skin • Vision, hearing, taste and smell • Errors of refraction, aging changes
VIII	6	Musculoskeletal system <ul style="list-style-type: none"> • Bones – Functions, movements of bones of axial and appendicular skeleton, Bone healing • Joints and joint movements • Joint diseases • Properties and Functions of skeletal muscles – mechanism of muscle contraction • Structure and properties of cardiac muscles and smooth muscles
IX	4	Renal system <ul style="list-style-type: none"> • Functions of kidney in maintaining homeostasis • GFR • Functions of ureters, bladder and urethra • Micturition • Regulation of renal functions

Unit	Time (Hrs)	Content
X	4	The Reproductive system <ul style="list-style-type: none"> Female reproductive system – Menstrual cycle, function and hormones of ovary, oogenesis, fertilization, implantation, Functions of breast Male reproductive system – Spermatogenesis, hormones and its functions, semen
XI	8	Nervous system <ul style="list-style-type: none"> Overview of nervous system Review of types, structure and functions of neurons Nerve impulse Review functions of Brain-Medulla, Pons, Cerebrum, Cerebellum Sensory and Motor Nervous system Peripheral Nervous system Autonomic Nervous system Limbic system and higher mental Functions - Hippocampus, Thalamus, Hypothalamus Vestibular apparatus Functions of cranial nerves Autonomic functions Physiology of Pain-somatic, visceral and referred Reflexes CSF formation, composition, circulation of CSF, blood brain barrier and blood CSF barrier

Practical's :

- Hemoglobinometry
- White Blood Cell Count
- Red Blood Cell Count
- Determination of Blood Groups
- Leishman's Staining and Differential WBC Count
- Determination of Packed Cell Volume
- Erythrocyte Sedimentation Rate (ESR)
- Determination of Clotting Time, Bleeding Time
- Recording of Blood pressure
- Auscultation for Heart sounds
- Artificial Respiration
- Determination of Vital capacity.

Reference Books:

1. Sembulingam (K), Essentials of Medical Physiology, Jaypee, 8th Edi, 2019.
2. Guyton & Hall, Textbook of Medical Physiology, Elsevier, 2nd Edi, 2018.
3. Pal (GK), Comprehensive Textbook of Medical Physiology, Jaypee, 2nd Edi, Vol I & II, 2019.
4. Surinder Singh, Principles of Human Physiology for Course in Nursing & Allied Health Sciences, CBS, 2017.
5. Ross and Wilson Anatomy and Physiology in Health and illness, Elsevier, 13th Edi, 2018.

Examination pattern		Duration
Theory exam: (one paper)	80 marks	3 hours
Practical exam	50 marks	3 hours
Oral exam	20 marks	
Internal assessment (Theory)	25 marks	
Internal assessment (Practical)	25 marks	

	200 marks	

The practical examination will have the following components

Practical Major	20 marks
Practical Minor	10 marks
Spotters	20 marks

	50 marks

Guidelines for setting Question Paper for Theory Examination:

Distribution of Course Content

1. Prepare the question papers for 80 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

80 marks

Nerve, muscle, blood, kidney, GI tract, endocrines and reproductive system.
 Cardio vascular system, respiratory system, central nervous system and special sense.

Pattern of Question Paper:

Section A:

Long answer question	-	2 X 10 = 20 marks
Short answer question	-	8 X 5 = 40 marks
Very Short answer	-	10 X 2 = 20 marks

3. Biochemistry

Placement: I Year (I Semester)

Time: Theory: 60 Hours
Practical: 30 Hours (Lab)

Course Description: The course is designed to assist the students to acquire knowledge of the normal biochemical composition and functioning of human body, its alterations in disease conditions and to apply this knowledge in to practice.

Course Outline

Unit	Time (Hrs)	Content
I	3	Introduction to Biochemistry
II	3	Biophysical aspect of Biochemistry
III	7	Carbohydrates <ul style="list-style-type: none">• Chemistry of carbohydrates, Classification and biological importance• Digestion and absorption, Glycolysis, glycogen metabolism, glucono-genesis, TCA cycle• Regulation of blood glucose, Diabetes mellitus
IV	7	Proteins <ul style="list-style-type: none">• Biological importance, Classification of amino acids & proteins• Digestion and absorption• Urea synthesis, Transamination
V	7	Lipids <ul style="list-style-type: none">• Biological importance• Classification of lipids, lipoproteins, Overview of lipid metabolism
VI	6	Enzymes <ul style="list-style-type: none">• Classification, Factors affecting enzyme action• Enzyme inhibition & Chemical enzymology
VII	7	Endocrinology <ul style="list-style-type: none">• Hormones, Role of biological important hormones• Pituitary, thyroid, adrenal cortex and medulla• Sex hormones
VIII	7	Mineral metabolism <ul style="list-style-type: none">• Regulation of blood level• Consequences of excess and deficiency of calcium, Phosphate, iron, copper & zinc
IX	7	Vitamin <ul style="list-style-type: none">• Fat soluble vitamins, Water soluble vitamins• Biochemical function, Deficiency, Manifestation, Source & RDA
X	6	Clinical Biochemistry <ul style="list-style-type: none">• LFT, RFT• Urine analysis

Practical's:

- Simple Color reactions of Carbohydrates and Proteins
- Qualitative estimations of Glucose, Urea, Creatinine, Total Protein and Cholesterol
- Normal constituents of Urine
- Abnormal (pathological) Urine
- Glucose Tolerance Test and its significance
- Demonstration of Electrophoresis and Interpretation of important clinical conditions based on Electrophoresis appearance
- Demonstration of Paper Chromatography and its utility in the diagnosis of inborn errors of metabolism.

Reference Books :

1. Vasudevan (DM), Text Book of Biochemistry for Medical Students, Jaypee Pub, 9th Edi, 2019.
2. Wilson & Walkers Principles & Techniques of Biochemistry & Molecular Biology, University Press, 8th Edi, 2018.
3. Harbans Lal and Rajesh Pandey Textbook of biochemistry, CBS, 3rd Edi, 2017
4. Harold Varley, Practical Clinical Biochemistry, CBS, 4th Edi, 2010.

Examination Pattern

Theory exam:	75 marks
Internal assessment (Theory)	25 marks

	100 marks

Duration

3 hours

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 75 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	-	2 X 10 = 20 marks
Short answer question	-	7 X 5 = 35 marks
Very Short answer	-	10 X 2 = 20 marks

C 1. Communication and Soft Skills

Placement: I Year (I Semester)

Time: Theory: 60 Hours

Course Description: The course is designed to enable students to enhance their ability to speak and write the language (and use English) required for effective communication in their professional work. Students will practice their skills in verbal and written English during clinical and classroom experience.

Course Outline

Unit	Time (Hrs)	Content
I	10	Review of Grammar <ul style="list-style-type: none"> • Remedial study of Grammar • Building Vocabulary • Phonetics • Public Speaking
II	3	Communication <ul style="list-style-type: none"> • What is communication? • What are communication roles of listeners, speakers, readers and writers as healthcare professionals?
III	5	Introduction to LSRGW <ul style="list-style-type: none"> • L – Listening: Different types of listening • S – Speaking: Understanding Consonants, Vowels, Word and Sentence Stress, Intonation • R – Reading: Medical vocabulary • Gr – Grammar: Understanding tenses, linkers • W – Writing simple sentences and short paragraphs – emphasis on correct grammar
IV	7	Attentive Listening <ul style="list-style-type: none"> • Focusing on listening in different situations, announcements, descriptions, narratives, instructions, discussions, demonstrations • Reproducing Verbatim • Listening to academic talks/ lectures • Listening to presentation
V	12	Speaking – Effective Conversation <ul style="list-style-type: none"> • Conversation situations – informal, formal and neutral • Factors influencing way of speaking – setting, topic, social relationship, attitude and language • Greetings, introductions, requesting, asking for and giving permission, speaking personally and casual conversations • Asking for information, giving instructions and directions • Agreeing and disagreeing, giving opinions • Describing people, places, events and things, narrating, reporting & reaching conclusions • Evaluating and comparing • Complaints and suggestions • Telephone conversations • Delivering presentations

Unit	Time (Hrs)	Content
VI	8	Reading <ul style="list-style-type: none"> • Reading strategies, reading notes and messages • Reading relevant articles and news items • Vocabulary for everyday activities, abbreviations and medical vocabulary • Understanding visuals, graphs, figures and notes on instructions • Reading reports and interpreting them • Using idioms and phrases, spotting errors, vocabulary for presentations • Remedial Grammar
VII	7	Writing Skills <ul style="list-style-type: none"> • Writing patient history • Note taking • Summarizing • Anecdotal records • Letter writing • Diary/Journal writing • Report writing • Paper writing skills • Abstract writing
VII	8	LSRW Skills <ul style="list-style-type: none"> • Critical thinking strategies for listening and reading • Oral reports, presentations • Writing instructions, letters and reports • Error analysis regarding LSRW

Reference Books:

1. Clement, I, Essentials of English for Paramedical Courses, EMMESS, 2nd Edi, 2018.
2. Lakshminarayanan K.R., English for Technical Communication, Scitech publication, 2nd Edi 2015

4. Pathology

Placement: I Year (II Semester)

Time: Theory: 60 Hours
Practical: 30 Hours(Lab)

Course Description: The course is designed to understand pathology laboratory reports, the normal ranges of investigations, severity and specificity of disease conditions which will help to perform International Classification of diseases to clinical pertinence.

Course Outline

Unit	Time (Hrs)	Content
I	3	Basic Concepts in Cellular Adaption's Cell injury and Cell death Cellular response to stress and other stimuli Over view of Cell injury and Cell death
II	5	Basic Principles in Inflammatory Process General features including inflammatory mediators and Basic Mechanisms of disorders of Immunity, General features of the immune system, Disorders of the Immune System, Acute and Chronic inflammation
III	5	Infectious Diseases Infectious diseases, Bacterial Infections (Typhoid, Tuberculosis and Leprosy) Viral infections (HIV, HbSAg and Polio) Specific Examples of Fungal, Parasitic and Syphilis infections
IV	3	Neoplasia Nomenclature, Rudimentary aspects on Tumor growth and Metastasis Definition of Neoplasia, Differences between Benign and Malignant tumors Staging and Grading of Tumors (Basic Aspects), Oncogenes and Tumor Suppressor genes
V	5	Hematology Structure and functions of Formed elements Objective use of anticoagulants, Mechanisms of Hemostasis Tests to monitor Coagulation, Blood Grouping and Blood Bank (Basic aspects on Blood Components) Fixatives and Basic details in Cytology, Aspiration Cytology of Bone marrow Basic concepts in Anemia, Cellular aspects of Leukemia (Basic Concepts)
VI	3	Histopathology Use of Microscopes, Grossing and Mounting Techniques Processing of Biopsy specimen, Paraffin sections
VII	3	Biomedical Waste Management and Environmental Pathology Biomedical waste management from perspectives of Pathology Environment and Disease – Smoking hazards, Asbestosis and Silicosis & Occupational Exposure
VIII	3	Clinical Pathology Collection, transport, preservation and processing of Clinical Specimen Clinical Pathology of specialized Body Fluids (CSF), Synovial fluid, Pleural Fluid Urine Examination (Urinalysis)

Unit	Time (Hrs)	Content
IX	20	Overview of Systemic Pathology Rheumatic Heart Disease Lungs: Pneumonia, COPD, Asthma, ARDS Liver: Hepatitis, Cirrhosis Muscle: Myasthenia Gravis Brain: Meningitis, Aspergillosis, CNS Tumor – (Classification)
X	10	Practical Demonstration Demo of Coagulation Profile, Phlebotomy techniques Blood Grouping and Rh typing, Urine Routine, Hemogram, Fecal Examination Safety Precautions in Clinical Pathology

Practical's:

- Blood Grouping and Rh typing
- Urine Routine
- Hb, TLC, DLC
- Gross Specimens
- Slides

Reference Books:

1. Mohan (H), Textbook of Pathology, Jaypee Pub, 5th Edi, 2019.
2. Kumar, Robbins & Cotran Pathologic Basis of Disease, WB Saunders, 10th Edi, 2020.
3. Kawthalkar(S), Essentials of Clinical Pathology, Jaypee Brothers, 2nd edi, 2018.
4. Nayak (R), Essentials of Hematology & Clinical Pathology, Jaypee Brothers, 2nd Edi, 2017.
5. Sengupta, Synopsis of Clinical Pathology & Microbiology, CBS Pub, 8th Edi, 2017.

Examination Pattern

Theory exam:	75 marks
Internal assessment (Theory)	25 marks

	100 marks

Duration

3 hours

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 75 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	-	2 X 10 = 20 marks
Short answer question	-	7 X 5 = 35 marks
Very Short answer	-	10 X 2 = 20 marks

5. Microbiology

Placement: I Year (II Semester)

Time: Theory: 60 Hours
Practical: 30 Hours (Lab)

Course Description: The course is designed to assist students to acquire understanding of fundamentals of microbiology and identification of microorganisms. It also provides opportunities for practicing infection control measures in hospital setting.

Course Outline

Unit	Time (Hrs)	Content
I	5	Introduction: History of microbiology- (contribution of Louis Pasteur, Robert Koch, Joseph Lister, Edward Jenner, Alexander Fleming) Importance of Microbiology in the practice of Radiology Microscope –Types & Uses
II	5	General Microbiology: Infection, parasite, host, vector, fomite, contagious disease, infectious disease, epidemic, endemic, pandemic, Zoonosis, Epizootic, Attack rate Normal flora of the human body Routes of infection and spread, endogenous and exogenous infections at reservoir of infections Antimicrobials: mode of action, interpretation of susceptibility tests, resistance spectrum of activity Staining techniques: Gram staining, Acid fast staining, Culture methods Laboratory diagnosis of infection
III	10	Sterilization & Disinfection: Definition of Asepsis, Sterilization and Disinfection Hospital Acquired infection, Universal safety precautions and Biomedical waste Disposal & Management
IV	10	Immunology: Antigen- Antibody-reaction & application for Diagnosis, Immune response- Normal / Abnormal, Innate Immunity & acquired immunity (Vaccination) Hyper sensitivity & auto-immunity, Serological tests, Immunoprophylaxis
V	10	Bacteriology: Morphology, Classification according to the Pathogenicity, Mode of Transmission, methods of prevention, Collection and transport of samples for laboratory diagnosis, Interpretation of laboratory reports Staphylococci, Streptococci, & Pneumococci Neisseria, Mycobacterium: Tuberculosis, M. Leprae, Enterobacteriaceae, Escherichia Coli, Salmonella, Corynebacterium, Vibrios, V. Cholerae and other medically important Vibrio's, Campylobacters and Helicobacters Pseudomonas, Mycoplasma, Rickettsiae, Chlamydia, Bacillus anthracis, Sporing & nonsporing anaerobes, Clostridium

Unit	Time (Hrs)	Content
VI	10	Virology: General Properties, Basic structure and broad Classification of Viruses. Pathogenesis and Pathology of viral infection (HIV, Hepatitis, Polio, Measles, Congenital viral infections, Rubella, CMV, Herpes) Immunity and Prophylaxis of viral Diseases, Principles of viral diseases List of commonly used antiviral agents
VII	5	Parasitology: Amoebiasis, Malaria, Filariasis, Toxoplasmosis, cysticercosis, Roundworm, Hookworm, & Echinococcus.
VIII	5	Mycology: General Properties of Fungi, Classification based on fungal infection Candidiasis, Cryptococcosis, Dermatophytosis, Mycetoma, Aspergillosis.

Practical's:

- Introduction & visit to microbiology lab + Morphology of bacteria + Identification of bacteria (Culture plates & Basic biochemical reactions)
- Gram stain, Acid fast Stain
- Spotters, Instruments, Culture media inoculated & uninoculated
- Applied Immunology (Bacterial) Serological tests – CRP, ASO, RPR, Widal Applied Immunology (Virology) Serological tests: HIV, HBsAg (Rapid Tests)
- Stool Examination for eggs + Parasitology specimens

Reference Books:

1. Ananthanarayanan (R), Textbook of Microbiology, Orient Longman Ltd., 10th Edn, 2017.
2. Mackie and McCartney Practical Medical Microbiology, Relx India Pvt Ltd, 14th Edn, 2018.
3. Baveja CP, Textbook of Microbiology, APC, 6th edn, 2021.
4. Sriram Kumar (S), Textbook of Microbiology, All win Publication, 1st Edn, 2019

Examination Pattern

Theory exam:	75 marks
Internal assessment (Theory)	25 marks

	100 marks

Duration

3 hours

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 75 marks.
 2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.
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Pattern of Question Paper:

Long answer question	-	2 X 10 = 20 marks
Short answer question	-	7 X 5 = 35 marks
Very Short answer	-	10 X 2 = 20 marks

C 2. Computer Application

Placement: I Year (II Semester)

Time: Theory: 30 Hours
Practical: 30 Hours (Lab)

Course Description: The course is designed for student to acquire the knowledge, develop basic understanding, use of computer and its applications in clinical field.

Course Outline

Unit	Time (Hrs)	Content
I	7	Introduction to Computer <ul style="list-style-type: none">• Concepts of computers• Hardware and Software• Trends and Technology• Application of Computer
II	8	Introduction to Disk Operating System <ul style="list-style-type: none">• DOS• Windows (all version)• MS Word• MS Excel with Pictorial Presentation• MS - Access• MS-Power Point
III	7	Statistical packages <ul style="list-style-type: none">• Types and their features
IV	8	Hospital Management System <ul style="list-style-type: none">• Types and uses• Electronic patient records

Reference Books:

1. Bansal Surabhi, Computer Applications for Allied Health Sciences, AITBS, 1st Edi, 2022.
2. Priyanka Randhir, Computer for Paramedical, CBS, 1st Edi, 2020
3. Pooja Jain & Neelam Kumari, Introduction to Computer, S.Vikas & Co, 5th edi, 2019
4. Shah Y.I, Paradkar A.R et.al, Introduction to Biostatistics and Computer Science, Nirali Prakashan Pub, 16th Edi, 2019.

C 3. First-Aid

Placement: I Year (II Semester)

Time: Theory – 30 Hrs
Practical - 30 Hrs (Lab)

Course description:

This course is designed to help students to understand the basics of first aid to render first aid services as and when need arises.

Course Outline

Unit	Time (Hrs)	Content
I	3	Introduction <ul style="list-style-type: none">• Definition of first aid, importance of first aid,• Golden rules of the first aid• Scope and concept of emergency
II	7	First aid in Skeletal injuries <ul style="list-style-type: none">• Definition, types of fractures of various parts of the body, causes, signs and symptoms, rules of treatment, transport of patients with fracture.• First aid measures in dislocation of joints, treatment of muscle injuries
III	3	Respiratory emergencies <ul style="list-style-type: none">• Asphyxia – Etiology, signs and symptoms, rules of treatment• Drowning – definition and management• Artificial respiration – types and techniques
IV	4	Shock and Unconsciousness <ul style="list-style-type: none">• Definition• Types of shock• Common causes of shock• Signs and symptoms of shock (assessment of established shock)• General and special treatment of established shock
V	3	Transportation of the injured <ul style="list-style-type: none">• Methods of transportation – single helper, hand seat, stretcher, wheeled transport (ambulance)• Precautions taken – blanket lift, air and sea travel
VI	2	Community emergencies <ul style="list-style-type: none">• Role of first aider (immediate and later) in<ul style="list-style-type: none">- Fires- Explosions- Floods- Earthquakes- Famine
VII	8	Bandages <ul style="list-style-type: none">• Bandaging• Basic turns• Bandaging extremities• Triangular bandages and their application

Reference Books:

1. Sanju Sira , First Aid Manual for Nurses, CBS, 1st Edi, 2017.
2. Gupta L.C. Manual of First Aid, Jaypee, 2nd Edi, 2017.
3. Indian Red Cross Society (RRC), Indian First Aid Manual, St. John Ambulance Association, 7th Edi, 2016.

6. General Medicine and Geriatrics

Placement: II Year (III Semester)

Time: Theory: 60 Hrs

Clinical: 200 Hours

Course description:

Focuses on the identification and treatment of medical conditions, syndromes and diseases encountered in the integumentary, respiratory, cardiovascular, endocrine, gastrointestinal, genitourinary, neurologic, musculo skeletal, renal, biliary and hematopoietic systems. A case-based approach is used to familiarize the physician assistant student with the variety of presentations seen and the treatment options available

Course Outline

Unit	Hours	Content
I	10	Pathogenesis, causes, epidemiology, clinical presentation, investigations and management of diseases of the following systems: - Introduction to medical terminology- roots, prefixes, and suffixes, Skeletal system Disorders– (Fracture & metabolic bone diseases, Arthritis (rheumatoid arthritis and Osteoarthritis) Muscular system Disorders – (SLE, Fibromyalgia, muscular dystrophy, cardio myopathy)
II	13	Pathogenesis, causes, epidemiology, clinical presentation, investigations and management of diseases of the following systems: - Nervous system Disorders – (cerebro vascular accident, seizures, meningitis, spine disorders, Parkinson's disease) Endocrine system Disorders– (diabetes mellitus, disorders of thyroid, adrenal, growth hormone)
III	18	Pathogenesis, causes, epidemiology, clinical presentation, investigations and management of diseases of the following systems: - Cardiovascular system Disorders– (hypertension, coronary artery disease, congenital heart disease, rheumatic fever, heart failure) Respiratory system Disorders – (bronchial Asthma, COPD, tuberculosis, pleural effusion, pneumothorax, respiratory failure) Integumentary system - skin, hair and nails - disorders.
IV	12	Pathogenesis, causes, epidemiology, clinical presentation, investigations and management of diseases of the following systems: - Digestive system Disorders– (hepatitis, cholecystitis, pancreatitis, inflammatory bowel disease) Urinary system Disorders – (renal calculi, renal failure) Reproductive system – male and female-disorders.
V	7	Geriatrics Physiological and psychological fundamentals of aging process. Diet for the aged and management of nutritional disorders. Disorders of major geriatric ailments and management – Medical – infections, dehydration, acute confusional state, osteoporosis, Degenerative joint diseases, effects of immobility – prevention of contracture and bedsores. Economic and psychosocial needs of the aged. Role of various health care provider's including family.

Practical's:

- History collection
- General examination
- Recording vitals
- Phlebotomy, collection of blood sample and storage
- Urine normal and abnormal values significance
- Biochemical parameters and their normal and abnormal values /significance
- CSF / Pleural fluid /Ascitic fluid analysis and their significance
- Mantoux test and its significance
- Normal ECG recording & Interpretation
- Chest X ray interpretation
- IV Cannula
- Ryle's tube
- Foley's catheter
- Viral markers and their significance
Culture methods / techniques / swab etc.

Reference Book:

1. Davidson's, Principle and Practice of medicine, Elsevier Publication, 24th edition, 2022.
2. Alagappan. R, Manual of practical medicine, Jaypee Brothers Publication, 6th edition, 2018.

Examination Pattern

Theory exam: (one paper)	80 marks
Practical exam	50 marks
Oral exam	20 marks
Internal assessment (Theory)	25 marks
Internal assessment (Practical)	25 marks

	200 marks

Duration

3 hours
3 hours

The practical examination will have the following components

Practical Major	20 marks
Practical Minor	10 marks
Spotters	20 marks

	50 marks

Guidelines for setting Question Paper for Theory Examination:**Distribution of Course Content**

1. Prepare the question papers for 80 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	-	2 X 10 = 20 marks
Short answer question	-	8 X 5 = 40 marks
Very Short answer	-	10 X 2 = 20 marks

7. Gastroenterology & Orthopedics

Placement: III Year (VI Semester)

Time: Theory: 60 Hours

Clinical: 130 Hours

Course description:

Focuses on the identification and treatment of medical conditions, syndromes and diseases encountered in the Gastroenterology and orthopedics, A case based approach is used to familiarize student with the variety of diseases and their treatment options as well as trauma patient care, emergency procedures, gaining knowledge on patient preparation for endoscopy and assisting the procedure.

Course Outline

Unit	Hours	Contents
I	10	Basics- functions and physiology of defecation Preventive gastroenterology- obesity, GI disorders (IBS, IBD), constipation, diarrhea and dysentery Surgical asepsis and hygienic endoscopy room - preparation of sterile field - preparation of tables, Equipments, instruments for the procedure, giving oral anaesthetic agent, transfer and positioning of the patient, care of the room before , during and after the endoscopy procedure, special precautions in handling patients with sepsis, blood borne infection - Hepatitis B, HCV, HIV etc., cleaning and disinfection, terminal disinfection.
II	15	Basics- ossification of bones of the limbs for age determination, X-rays of bones Infections - osteomyelitis, tuberculosis, mycetoma. Metabolic diseases - rickets /osteomalacia, osteoporosis, hyperparathyroidism Tumours- Primary (Osteosarcoma, Osteoclastoma, Ewing's sarcoma, chondrosarcoma) and Secondary tumors Arthritis - Rheumatoid, osteo arthritis/ ankylosing spondylitis.
III	20	Fracture - definition, classification, management, fracture healing, delayed union, open fractures, Management of fracture clavicle, shaft of Humerus and dislocation of shoulder. Classification of injuries around the elbow and management of supracondylar fracture and 86 dislocation of elbow, Monteggia fracture dislocation and fracture of both bones of forearm, Volkmann's ischemic contracture, fracture lower end of radius, scaphoid and metacarpal fracture. Fracture of pelvis and dislocation of hip, fracture neck of femur, trochanter, and shaft of femur tibia, fibula and metatarsal.
IV	15	Internal derangements of knee, injuries of ankle and foot, amputations, Congenital malformations - CTEV, torticollis, CDH, Pseudarthrosis Disorders of hip- Coxa vara, Perthes disease. Deformities and disorders of the spine Blood transfusion

Practical's:

- History collection
- Case sheet writing
- Discharge summary
- Endoscopy
- Colonoscopy
- POP cast
- Instruments used in orthopedics
- Splints
- Traction
- Prosthesis
- Physiotherapy
- X ray, MRI, CT
- Wound care / trauma patient care
- Blood transfusions
- Fracture reduction

Reference Books

1. Natarajan's, Text Book of Orthopedics & Traumatology, Wolters Kluwer, 8th Edi, 2018.
2. Maheshwari & M.Bhaskar, Essential Orthopedics, Elsevier, 7th Edition, 2022.
3. Davidson's, Principle and Practice of medicine, Elsevier Publication, 24th edition, 2022.
4. Alagappan. R, Manual of Practical Medicine, Jaypee, 6th edition, 2018.

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Examination Pattern

Theory exam: 75 marks
Internal assessment (Theory) 25 marks

Duration

3 hours

100 marks

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 75 marks.
 2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.
-

Pattern of Question Paper:

Long answer question	-	2 X 10 = 20 marks
Short answer question	-	7 X 5 = 35 marks
Very Short answer	-	10 X 2 = 20 marks

8. Pharmacology

Placement: II Year (III Semester)

Time: Theory: 60 Hours

Practical: 30 Hours (Lab)

Course Description: The course is designed to acquire knowledge about the general pharmacology and to ensure that the students understand the medicines used in various systems.

Course Outline

Unit	Hours	Content
I	5	General Pharmacology <ul style="list-style-type: none"> Absorption, distribution, metabolism and elimination of drugs, routes of drug administration. Basic principles of drug action. Adverse reactions to drugs. Factors modifying drug response.
II	10	Autonomic nervous system & Peripheral nervous system <ul style="list-style-type: none"> Neurohumoral transmission Sympathetic nervous system - sympathomimetics, sympatholytics Parasympathetic - Cholinergics, Anticholinergics, Ganglionstimulants and blockers Skeletal muscle relaxants Local anesthetics
III	10	Central nervous system <ul style="list-style-type: none"> General principles - neurotransmitters, definition and common transmitters Drug therapy of various CNS disorders like epilepsy, depression, Parkinson's disease, schizophrenia, neuro-degeneration etc. Pharmacotherapy of pain General anesthetics Drugs for arthritis & gout
IV	5	Autacoids <ul style="list-style-type: none"> Histamine and antihistaminics Prostaglandins, leukotrienes, thromboxane and PAF Substance P, bradykinin
V	10	Cardiovascular system <ul style="list-style-type: none"> Drug therapy of hypertension, shock, angina, cardiac arrhythmias Renin angiotensin system Diuretics Coagulants and anticoagulants, antiplatelet drugs Hypo-lipidemics
VI	5	Gastrointestinal and respiratory system <ul style="list-style-type: none"> Emetics and antiemetics Drugs for constipation and diarrhoea Drug treatment of peptic ulcer Drug therapy of bronchial asthma Pharmacotherapy of cough

Unit	Hours	Content
VII	5	Hormones <ul style="list-style-type: none"> • Drug therapy of Diabetes • Thyroid hormones • Pituitary-hypothalamic axis • Corticosteroids • Oxytocin and drugs acting on uterus • Drugs affecting calcium balance
VIII	7	Chemotherapy <ul style="list-style-type: none"> • General principles of antimicrobial chemotherapy, rational use of antibiotics • Chemotherapeutic agents - b- Lactam Antibiotics, fluoroquinolones, macrolides, • aminoglycoside, tetracyclines, chloramphenicol and polypeptide antibiotics. • Chemotherapy of tuberculosis, • Cancer Chemotherapy
IX	3	Miscellaneous <ul style="list-style-type: none"> • Immunomodulators • Drug therapy of glaucoma and cataract • Treatment of poisoning

Reference Books:

1. Padmaja Udaykumar, Text book of Medical Pharmacology, CBS , 7th Edition, 2022.
2. Sharma.H.L & Sharma.K.K, Principles of Pharmacology, Paras Medical, 3rd Edi, 2017.
3. Tripathi.KD, Essentials of Medical Pharmacology, Jaypee Brothers, 8th Edition, 2018.

Examination Pattern

Theory exam: 75 marks
Internal assessment (Theory) 25 marks

Duration

3 hours

100 marks

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 75 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	-	2 X 10 = 20 marks
Short answer question	-	7 X 5 = 35 marks
Very Short answer	-	10 X 2 = 20 marks

C 4. Sociology

Placement: II Year (III Semester)

Time: Theory: 30 Hours

Course Description: This course 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.

Course Outline

Unit	Time (Hrs)	Content
I	10	Introduction: <ul style="list-style-type: none"> • Meaning - Definition and scope of sociology. Its relation to Anthropology, Psychology, Social Psychology • Methods of Sociological investigations - Case study, social survey, questionnaire, interview and opinion poll methods. • Importance of its study with special reference to health care professionals Social Factors in Health and Disease: <ul style="list-style-type: none"> • Meaning of social factors • Role of social factors in health and disease Socialization: <ul style="list-style-type: none"> • Meaning and nature of socialization • Primary, Secondary and Anticipatory socialization Agencies of socialization
II	5	Social Groups: <ul style="list-style-type: none"> • Concepts of social groups influence of formal and informal groups on health and sickness. The role of primary groups and secondary groups in the hospital and rehabilitation setup. Family: <ul style="list-style-type: none"> • The family, meaning and definitions Functions of types of family • Changing family patterns • Influence of family on individual's health, family and nutrition, the effects of sickness in the family and psychosomatic disease and their importance to physiotherapy Community: <ul style="list-style-type: none"> • Rural community: Meaning and features - Health hazards to rural communities, health hazards to tribal community. • Urban community - Meaning and features - Health hazards of urbanities
III	5	Culture and Health: <ul style="list-style-type: none"> • Concept of Health • Concept of culture • Culture and Health • Culture and Health Disorders Social Change: <ul style="list-style-type: none"> • Meaning of social changes

Unit	Time (Hrs)	Content
		<ul style="list-style-type: none"> • Factors of social changes • Human adaptation and social change Social change and stress • Social change and deviance • Social change and health program • The role of social planning in the improvement of health and rehabilitation
IV	10	<p>Social Problems of disabled:</p> <ul style="list-style-type: none"> • Consequences of the following social problems in relation to sickness and disability remedies to prevent these problems Population explosion • Poverty and unemployment • Beggary • Juvenile delinquency • Prostitution Alcoholism • Problems of women in employment <p>Social Security:</p> <ul style="list-style-type: none"> • Social Security and social legislation in relation to the disabled <p>Social Work:</p> <ul style="list-style-type: none"> • Meaning of Social Work • The role of a Medical Social Worker

Reference Books:

1. Anthony Giddens: Sociology, Atlantic Publications & Distributors Pvt Ltd, 8th Edi, 2022.
2. Vidya Bhushan & Sachdeva, An Introduction to Sociology, Kitab Mahal, 1st Edi, 2017.
3. Ralhan.S, introduction to Sociology, Common Wealth publications, 1st Edition, 2018.
4. Shanker Rao, Sociology, S.Chand Publications, 7th edition, 2017.

9. Surgery and Anesthesiology

Placement: II Year (III Semester)

Time: Theory: 60 Hours

Clinical: 230 Hours

Course Description: The course is designed to assist the students to acquire knowledge about the fundamentals of care of surgical patients. It will introduce students to the role of the PA in the surgical environment and surgical patient management. This is a practical, case based course focusing on common general surgery topics and skills needed to succeed in a surgery clinical rotation. Students will draw on the medical knowledge gained throughout didactic training and apply it in various case scenarios and simulated patient encounters. The skill set and knowledge gained will assist the transition from didactic training to becoming a productive part of a surgical inpatient team during clinical rotations.

Course Outline

Unit	Hours	Content
I	10	History of surgery, role of surgeon, importance of team work, stresses arising during operative procedure, surgical terminology, types of incision and their indications, internal & external hemorrhage - signs and symptoms, management, Tourniquets - use and duration of application and dangers of use. Sutures and surgical instruments.
II	20	Pathogenesis, causes, epidemiology, clinical presentation, investigations and management of diseases of the following systems:- Skin – ulcers & wounds, burns, skin infections (boil, carbuncle, abscess) Cysts (epidermoid, dermoid), tumors (basal cell, squamous cell carcinoma and melanoma). Head and neck region: congenital anomalies (cleft lip, cleft palate, branchial cyst and fistula, thyroglossal cyst), parotid and submandibular glands, oral ulcers, Leukoplakia, jaw tumors, squamous carcinoma of oral cavity. Thyroid and lymph nodes swelling. Arteries- limb ischemia, Raynaud's syndrome. Veins - Varicose veins, deep vein thrombosis and pulmonary embolism.
III	15	Breast - mastalgia, fibroadenoma, carcinoma breast Esophagus - dysphagia, reflux, hiatal hernia. Stomach and duodenum - peptic ulcer, carcinoma, pyloric stenosis Small intestine - small bowel obstruction. Colon and rectum - ulcerative colitis, Appendix - acute appendicitis, acute abdomen Anus - Hemorrhoids, fissure and fistula-in-ano, anorectal abscesses Liver - trauma, abscess, cancer. Biliary tract - gall stone disease, Pancreas-pancreatitis, carcinoma Hernias of abdominal wall- Inguinal, femoral, umbilical Urology- urinary calculi, urinary infection, prostatic hyperplasia, Epididymo-orchitis, hydrocele.

Unit	Hours	Content
IV	15	Common Equipments /anesthesiology Personal cleanliness and aseptic techniques / dressing techniques / wound care Pre-operative and post-operative care of the surgical patient. Emergency procedure - endotracheal intubation, tracheotomy, Central line placement, IVcannulation, Ambu bag ventilation, CPR, Basic Life Support.

Practical's:

- History Collection
- Case Sheet Writing
- General & Local examination
- Personal protective Equipments
- Hand wash technique
- Identification of surgical instruments
- Identification of suture materials
- Dressing techniques
- Drugs used in general, spinal and local anesthesia
- Spotters (ET tube ,Tracheostomy tube ,Laryngoscope, Ambubag)
- Pre-op & Post op care
- Emergency drugs
- Sterilization techniques
- Antibiotics & Anti septics

Reference Books:

1. Rajagopal Shenoy.K, Manipal Manual of Surgery,CBS Publication, 5th Edition, 2020.
2. Sabiston, Textbook of Surgery, Elsevier Publication ,21st Edition, 2021.
3. Ajay Yadav,Short Textbook of Anesthesia, Jaypee, 6th Edition 2018.

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Examination Pattern

Theory exam: (one paper)	80 marks
Practical exam	50 marks
Oral exam	20 marks
Internal assessment (Theory)	25 marks
Internal assessment (Practical)	25 marks

200 marks

Duration

3 hours
3 hours

The practical examination will have the following components

Practical Major	20 marks
Practical Minor	10 marks
Spotters	20 marks

50 marks

Guidelines for setting Question Paper for Theory Examination:**Distribution of Course Content**

1. Prepare the question papers for 80 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	-	2 X 10 = 20 marks
Short answer question	-	8 X 5 = 40 marks
Very Short answer	-	10 X 2 = 20 marks

10.Paediatrics

Placement: II Year (IV semester)

Time: Theory:60 hours

Clinical: 160 Hours

Course Description: This course uses a case-based learning format to aid the students in understanding the physical and psychosocial fundamentals of normal growth and development. In addition, it focuses on the presentation of major paediatric disorders and conditions, their signs and symptoms, diagnosis and management.

Course outline

Units	Hours	Contents
I	10	<p>Definition, population, morbidity and mortality in children ,maternal , perinatal , neonatal , infant and preschool mortality rates, current National Programmes like ICDS, RCH, Vitamin A prophylaxis, UIP,IMCI, Pulse Polio, AFP,ARI. Diarrhoea control programmes.</p> <p>Growth and development - anthropometry - Measurement and interpretation of weight length/height, head circumference, mid-arm circumference. Use of weighing machines, infant meter, interpretation of Growth.</p> <p>Charts: Road to health card and percentile growth curves, abnormal growth patterns- failure to thrive, short stature, growth pattern of different organ systems like lymphoid, brain and sex organs, normal pattern of teeth eruption.</p> <p>Important milestones in infancy and early childhood in areas of gross motor, fine motor, language and personal - social development, psychological and behavioral problems</p> <p>Measurement and interpretation of sitting height, US: LS ratio and arm span Age- independent anthropometric measurement - principles and application.</p>
II	20	<p>Nutrition - normal requirements of carbohydrates, protein, fats, minerals and vitamins for newborn, children, pregnant and lactating mother. Common food sources.</p> <p>Breast feeding - colostrum and composition of breast milk, initiation and technique of feeding, hazards and demerits of prelacteal feed, top milk and bottle - feeding. Feeding of LBW babies. Infant feeding /weaning foods, methods of weaning. Assessment of nutritional status of child based on history and physical examination.</p> <p>Protein energy malnutrition-definition, classification, features, causes and management.</p> <p>Vitamins -etio-pathogenesis, clinical feature, biochemical and radiological findings, differential diagnosis and management of nutritional disorders.</p> <p>Definition, causes and management of obesity</p> <p>Immunization: - National immunization programme, vaccine preservation and cold-chain.</p> <p>Vaccination types, contents, efficacy, storage, dose, site, route, contraindications and adverse reactions BCG, DPT, OPV, Measles, MMR</p>

Units	Hours	Contents
		and Typhoid. Pulse Polio Immunization, AFP (Acute flaccid paralysis) surveillance Special vaccines - Hepatitis B, H influenza B, Pneumococcal, Hepatitis A, Chicken Pox, Meningococcal and Rabies.
III	20	Disorders of respiratory system- bronchopneumonia, CROUP, tuberculosis Gastro intestinal tract disorders - diarrhea, hepatitis, giardiasis, amoebiasis, intestinal helminthiasis Cardiovascular system disorder - congenital heart diseases, rheumatic fever Hematological disorder- Anemia Nervous system disorder - meningitis, seizures Infectious disease - epidemiology, basic pathology, symptoms, signs, complications, investigations, differential diagnosis , management and prevention of common bacterial(typhoid) , viral(dengue) and parasitic(malaria) infections, fever of unknown origin, chicken pox Pediatric emergencies- status epilepticus, status asthmatics/ acute severe asthma, shock, burns, hypertensive emergencies, gastrointestinal bleed, comatose child, congestive cardiac failure, acute renal failure Genetics- principles of inheritance and diagnosis of genetic disorders - Down's syndrome

Practical's:

- History Collection
- Case sheet writing
- Discharge summary
- APGAR Score
- Primitive reflexes
- Anthropometry measurement
- Nebulization
- Fontanelles
- Incubator
- Phototherapy
- Identification of vaccines
- Normal nutritional requirements
- Developmental milestone assessment
- BLS (demonstration of basic life support)

Reference Books:

1. Ghai, Essentials pediatrics, CBS Publications, 9th edition, 2019.
2. Gupte Suraj, The Short Textbook of Pediatrics, Jaypee, 12th Edi, 2016

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Examination Pattern

Theory exam: 75 marks
Internal assessment (Theory) 25 marks

Duration

3 hours

100 marks

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 75 marks in such a way that the question paper shall contain
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	-	2 X 10 = 20 marks
Short answer question	-	7 X 5 = 35 marks
Very Short answer	-	10 X 2 = 20 marks

C 5. Community Medicine & EVS

Placement: II Year (IV semester)

Time: Theory: 30 hours

Course Description: This course explores the relationship people have with their environment, the risk management choices made, and the resulting associations that affect health and physical well-being for the individual, communities and susceptible populations.

Course outline

Unit	Hours	Content
I	10	Concept of health & disease: Concept of health, Definition of health, Philosophy of health- Dimension of health - Concept of wellbeing, Spectrum of health, Responsibility of health - Determinates of health & Indicators of health - Concepts of disease & Concepts of cessation - Natural history of disease- Iceberg phenomenon , Concepts of control - Concepts of prevention - Modes of Intervention, Changing pattern of disease
II	10	Epidemiology: Definition & explanation, Aims, Epidemiologic approach, Basic measurements in epidemiology & tools of measurements - Measurements of Mortality & Morbidity, Epidemiologic methods- Descriptive epidemiology - Analytical epidemiology - case control study - Analytical epidemiology – Cohort study - Experimental epidemiology – RCT - Association & Causation Uses of epidemiology (Criteria for judging causality) - Infection disease epidemiology Definitions Dynamic of disease transmission & Modes of transmission -Disinfection – Definition Types Agents used Recommended Disinfection procedures - Investigation of an epidemic.
III	10	Environment & health: Definition & components (environment sanitation environmental sanitation)Water: Safe & Whole some water Requirements Uses source of water supply (sanitary well)-Purification (1).Large scale purification, (2).Small scale purification - Water Quality - Special treatment of water Air: Composition The air of occupied room discomfort. Air pollution & its effects. Prevention & Control of air pollution Ventilation: Definition Standards of ventilation Types of ventilation. Light , Noise & Radiation, Metrological environment, Housing, Disposal of waste Excreta disposal.

Reference Books:

1. Agarwal, R.K, Environmental Science, Krishna Prakashan Publishers, 1st Edition.2020.
2. Bharucha Erach, The Biodiversity of India, Mapin Publication, 1st edition, 2002.

C 6. Psychology

Placement: II Year (IV Semester)

Time: Theory: 30 Hours

Course Description: This course is designed to assist the students to knowledge of fundamentals of psychology and develop an insight into behavior of self and others.

Course outline

Unit	Hours	Contents
I	2	Basic Concepts of Psychology Definition of Psychology, Origin of Psychology - Philosophical roots of psychology, Schools of Psychology –Structuralism – Gestalt – Functionalism – Behaviorism - Psychoanalysis – Humanistic. Fields of Psychology - Work of a psychologist – Applications of psychology.
II	5	Learning principles and methods Definition of learning, Factors In The Process of Learning Classical conditioning - Operant Conditioning – The principle of reinforcement and Punishment. Theory of learning. Cognitive learning- Latent learning, Insight learning, and Imitation.
III	7	Motivation, Emotion, Memory and forgetting Motivation - Definition of motivation – Theories of motivation - Physiological basis of motivation – Motivational factors in aggression –Self-actualization motivation. Emotion – Emotional expression – Theories of emotions. Kinds of remembering – Retrieval processes – The nature of forgetting – Two process theories of memory – Improvingmemory –Language and thought – Symbols and concepts – Structure – Forms of thought - Thinking and reasoning – Concept formation.
IV	6	Development, Sensory Processes and Perception. Erikson's stages of psychosocial development Lawrence Kohlberg's stages of moral development Freud's Stages of Psychosexual Development Physiological basis of behavior – The brain and nervous system –The sensory process , Some general characteristic of senses – Five senses ,Perception: Organization – The role of learning in perception – Perception and attention – Perceptual process.
V	5	Intelligence & Personality Theories of intelligence – Measuring Intelligence – Kinds of intelligence tests – Ability – Formation of aptitude and attitude – Aptitude tests –Creativity and its tests. Personality – 64 Definition of Personality – Theories of Personality – Assessment of Personality. Social Factors Influencing Personality

Unit	Hours	Contents
VI	3	Social Psychology Definition, Nature, Subject Matter and Scope of Social Psychology- Applications and Importance of Social Psychology, Groups: Definition and Type- Primary And Secondary Groups Social Interaction, Social and Inter-Personal Relations. Inter-personal attraction – Love and Companionship. Psychosocial-behavior. Modes of empathy: self – other differentiation and development of empathy. Social influence: attitude and conformity. Definition - Characteristics and Classification of Crowd. Leadership: Definition and characteristics, Defense Mechanisms, frustration and conflict, sources of frustration and conflict, types of conflicts. Aggression and Types of aggression.
VII	2	Health Psychology Definition of Health Psychology -Relating Health Psychology to other fields Clinical Health Psychology, Public Health Psychology, Community Health Psychology, Critical Health Psychology Abnormal Psychology: Concepts of normality and abnormality, causation of mental illness, neuroses, psychoses, psychosomatic disorders, measures to promote mental health. Stress - Definitions- Models of Stress – Theories of Stress - Stress reactions – Coping and Stress Management techniques, Pain and its management - Psychological reactions of a patient to loss – Stages of Acceptance by Kubler-Ross.

Reference Books:

1. Mangal, SK, General Psychology, Sterling Pub, 16th Edi, 2016
2. T. Morgan, et.al—Introduction to Psychology” – 7th Edi. Tata McGraw Hill Book, 2009.
3. Baron, R. A., & Byrne, D (2006), Social psychology”, Prentice hall of India private limited.
4. Elliot Aronson, “Social psychology” 9th edition published by Pearson education, Inc.,2006

11. Cardiology & Cardiac surgery

Placement: III Year (V Semester)

Time: Theory: 60 Hours

Clinical: 230 Hours

Course Description

Focuses on the identification and treatment of medical conditions, syndromes and diseases encountered in the Cardiology, interpretation of ECG, ECHO, TMT, orientation to Cathlab and gaining knowledge on cardio pulmonary bypass, ECMO, as well as various adult and pediatric surgical procedures.

Unit	Hours	Content
I	10	Embryology of the heart Basics –Anatomy of the heart (chambers, valves, great vessels, surface markings, coronary circulation), cardiac cycle, cardiac output, Action Potential
II	15	Cardiovascular diseases - symptoms and signs, pulse, BP, JVP Congenital heart disease –cyanotic (TOF, TGA) and acyanotic (ASD, VSD, PDA) heart diseases Hypertension- essential, malignant, Arterial diseases - atherosclerosis - risk factors, Coronary artery disease, Rheumatic heart disease, heart failure, cardiac arrhythmias, cardiomyopathies, Peripheral vascular disease, pulmonary thromboembolism, infective endocarditis, diseases of aorta. Systemic diseases affecting the heart, pregnancy and heart disease, pericardial diseases, Cardiac trauma, tumors of heart.
III	15	Diagnostic tools - ECG, Chest X-ray, ECHO, TMT, Holter, 24-hour ambulatory BP monitoring, blood analysis. Etc., Cardiac catheterization and coronary angiography- preparation of patient physically and mentally. Pre and post-operative care and rehabilitation programme. PPI Importance of life style modification measures.
IV	20	Cardiac surgery;- Basics - Cardiopulmonary bypass - closed and open heart operation, PDA ligation, closed mitral valvotomy, pulmonary artery banding, block trussing shunt, Pericardiectomy, shunt operations, ASD and VSD closure, Tetralogy of Fallot correction, valvular disease surgeries, surgery for transpositions, other corrective surgeries and coronary surgeries.

Practicals:

- History collection
- Case sheet writing
- Discharge summary preparation
- Cardiovascular examination
- Pulse, JVP, BP, Arterial line, CVP
- Cardiac bio markers

- Loading dose of MI
- ECG- Interpretation, basics, ischemia, infarction, heart block, arrhythmias
- Echo-basics, stress
- TMT, Holter, X-ray
- Cardiac catheterization
- Pacemaker
- Pulmonary artery catheter
- ACT
- CPB basics
- IABP
- Prosthetic valves

Reference Books:

1. Davidson's, Principle and Practice of medicine, Elsevier, 24th edi, 2022.
2. Alagappan. R , Manual of practical medicine, Jaypee, 6th edi, 2018.

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Examination Pattern

Theory exam: (one paper)	80 marks
Practical exam	50 marks
Oral exam	20 marks
Internal assessment (Theory)	25 marks
Internal assessment (Practical)	25 marks

	200 marks

Duration

3 hours
3 hours

The practical examination will have the following components

Identification of Spotters (General)	20 marks
Identification of Basics of ECG	15 marks
Identification of Basics of ECHO	15 marks

50 marks

Guidelines for setting Question Paper for Theory Examination:**Distribution of Course Content**

1. Prepare the question papers for 80 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	-	2 X 10 = 20 marks
Short answer question	-	8 X 5 = 40 marks
Very Short answer	-	10 X 2 = 20 marks

12. Neurology

Placement: III Year (V Semester)

Time: Theory: 60 Hours

Clinical: 160 Hours

Course Description

Focuses on the identification and treatment of medical conditions, syndromes and diseases encountered in the Neurology, gaining basic knowledge on EEG, EMG, CT/MRI A case based approach is used to familiarize student with the variety of rehabilitations like physiotherapy, speech therapy for disability caused by neurological problems.

Course Outline

Unit	Hours	Contents
I	5	<ul style="list-style-type: none">• Nervous system – Review of anatomy and physiology,• Neurotransmitters general principles and common transmitters• Action potential and salutatory conduction, properties of nerve-fibers.• Neuromuscular junction, Excitation- contraction coupling, Reflexes
II	15	<ul style="list-style-type: none">• Sensory system -Functional organization of sensory system, perception of touch, physiology of pain.• Motor System - Functional organization of motor system, proprioception• Basal ganglia and Cerebellum in maintenance of equilibrium and its disturbances• Neurological disorder manifestation and localizing the level of lesion in neurological diseases• Higher cerebral functions - learning, memory and speech.
III	20	<ul style="list-style-type: none">• Neuropathology - Trauma, Cerebrovascular accident• Inflammatory and infectious disorders - Meningitis, Encephalitis, Brain abscess• CSF and its disturbances - cerebral odema, raised intracranial pressure and tension• Sleep and wakefulness – physiology and pathology• Cranial, Spinal Neuropathies — Bell's palsy, trigeminal neuralgia
IV	20	<ul style="list-style-type: none">• Neurological diseases - Clinical examination of nervous system, Investigations• Disorders of movement, coma and brain death,• Headaches - migraine, cluster and Epilepsy• Cranial Neuropathies — Bell's palsy, trigeminal neuralgia• Peripheral Neuropathies; Guillain-Barre Syndrome Myasthenia gravis Multiple sclerosis• Parkinson's disease. Degenerative diseases Delirium - Dementia - Alzheimer's disease• Rehabilitative medicine in neurological diseases

Practical's:

- History collection
- Case sheet writing
- Neurological examination
- Discharge summary preparation
- Use of Glasgow coma scale and attending unconscious patients
- Introduction to diagnostic evaluation (CT, MRI, EEG, Evoked potential, EMG)
- Protocols in meeting with emergency condition (Epilepsy, hemorrhage)
- Stroke protocol
- Introduction to rehabilitative medicine (physiotherapy, speech therapy)

Introduction to sleep medicine

Reference Books:

1. Davidson's, Principle and Practice of medicine, Elsevier, 24th edi, 2022
2. Heinrich Mattle, Marco Mumenthaler, Fundamentals of Neurology Thieme, 2nd Edi, 2016.
3. Alagappan. R, Manual of Practical Medicine, Jaypee Brothers Publication, 6th Edi, 2018.

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Examination Pattern**Duration**

Theory exam: 75 marks

3 hours

Internal assessment (Theory) 25 marks

100 marks

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 75 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question - 2 X 10 = 20 marks

Short answer question - 7 X 5 = 35 marks

Very Short answer - 10 X 2 = 20 marks

C 7. Medical Ethics and Biosafety

Placement: III Year (V Semester)

Time: Theory: 30 Hours

Course Description: The course is designed to understand the basics of medical law and ethics in relation to clinical sciences.

Course Outline

Unit	Hours	Content
I	5	Definition and key Concepts; philosophical considerations; epistemology of science; ethical terms; principles and theories; relevance to health care; ethics and the law issues: genetic engineering, stem cells, cloning, medical techniques, trans- humanism, and bio-weapons.
II	8	Define negligence, malpractice & liability; iatrogenic harm; Influence of ethics in general practice; Describe primary and secondary ethical principles; Hippocrates' oath; Professional codes of ethics; Describe the moral basis of informed consent and advance directives; research ethics – animal rights, ethics of human cloning, and stem cell research; ICMR guidelines.
III	7	Genetic testing, genetic screening, Fertility and birth control, sex determination and sex selection, Reproductive control: assisted reproduction and ethics, pre-natal genetic counseling, pre-implantation genetic diagnosis, Ethical issues in applied medicine; Workers compensation.
IV	5	Euthanasia and physician-assisted dying; end-of-life care; Physicians, patients and other: autonomy, truth telling & confidentiality; emerging issues: impact of medical advances on society; Use of genetic evidence in civil and criminal court cases; Challenges to public policy – to regulate or not to regulate; improving public understanding to correct misconceptions.
V	5	Introduction to Biosafety; biological safety cabinets; containment of biohazard; precautions for medical workers; precautions in patient care; Biosafety levels of microorganisms; mitigation of antibiotic resistance; radiological safety; measurement of radiation; guidelines for limiting radiation exposure; maximum reasonable dose; precautions against contamination; Institutional Biosafety committee.

Reference books:

1. Bonnie F Fremgen, Medical Law and Ethics, Pearson Publications, 5th Edition, 2015.

C 8. Physician's Office Management

Placement: III Year (V Semester)

Time: Theory: 30 Hours

Course Description: The course is designed to enable to student to acquire understanding of management of clinical and community health services, Educational programme. This is also designed to enable students to acquire understanding of the professional responsibilities, prospects and contribution to the growth of the profession.

Course Outline

Unit	Hours	Content
I	8	Outpatient Section Registration of new cases, Registration of repeat cases, Patient record guide, Laboratory X-Ray report & reports filing, Alpha index typing & Filing, O.P. Records coding (disease & indexing), O.P. records retrieval, O.P. Statistics. .
II	5	Inpatient Section Admitting office procedure, Inpatient record removal & forwarding, Ward Census
III	5	Assembling & deficiency checks, I.P. record coding & indexing
IV	7	Discharge Analysis Incomplete record control, Completed record control, Medico legal procedures & issue of Medical certification, Record retention & destruction of O.P. & I.P. records
V	5	Miscellaneous Hospital reception, Secretarial practice, Library (Medical)

Reference Books:

1. Pradeep Agarwal K, Hospital Marketing and Administration, Jaypee, 13th Edi, 2013.
2. Lawrence Wolper P, Physician Practice Management: Population-centered Health Care in the Community, Elsevier, 2nd Edi. 2014.

13. Obstetrics & Gynecology

Placement: II Year (IV Semester)

Time: Theory: 60 Hours

Clinical: 150 Hours

Course description:

Course provides the student with an overview of commonly encountered obstetric and gynecologic conditions in women's health care. Major topics include pregnancy and prenatal care, menopause, lactation, uterine and breast disorders, the menstrual cycle, its hormonal regulation and commonly encountered conditions

Course Outline

Units	Hours	Contents
I	10	Bony pelvis - important land marks of obstetrics significance, fetal skull Physiological changes in pregnancy / menopause Conception, abortions, gestational trophoblastic diseases Infections - STD, genital TB, HIV, TORCH, vertical transmission of HIV
II	15	Obstetrics- Diagnosis of pregnancy, antenatal care and fetal surveillance, first trimester bleeding, normal and abnormal presentations and positions, dystocia due to bony pelvis, soft tissue, high risk pregnancies, IUGR, IUD, preterm labour, premature rupture of membranes, poly and oligohydramnios, postdated delivery, Prolonged labour, obstructed labour, rupture uterus, previous LSCS, third trimester bleeding, preeclampsia and eclampsia , medical disorders complicating pregnancy, surgical emergencies in obstetrics, Rh iso immunization, partogram, ultra sound in obstetrics, fetal monitoring , active management of labour ,neonatal resuscitation, analgesia and anaesthesia in obstetrics, instrumental deliveries, LSCS, third stage complications, normal and abnormal puerperium.
III	15	Gynecology: - Maldevelopment, injuries, infections, cysts, tumors of female genital tract. Vulva - inflammation, ulcers, atrophy, dystrophies, cysts, neoplasm Vagina - leucorrhoea, infections, carcinoma. Cervix - erosion, ulcer, dysplasia, carcinoma Uterus - prolapse, displacements (inversion and retroversion), endometriosis, and adenomyosis Abnormal uterine bleeding / post-menopausal bleeding, endometrial hyperplasia, benign and malignant Tumours. Primary and secondary amenorrhea, infertility, PCOD, assisted reproductive techniques
IV	20	Urinary system - Stress incontinence, pelvic pain, low back ache Cancer screening for genital malignancy and breast / Pap smear Radiotherapy outline and chemotherapy Neonatology: - Neonatal resuscitation, meconium aspiration syndrome, preterm care, RDS, neonatal jaundice, congenital anomalies, birth injuries.

Practical's:

- History Collection
- Case sheet writing
- Normal delivery
- Pregnancy test
- Ultrasound
- Partogram
- Biophysical profile
- Neonatal care and resuscitation
- Obstetrics &Gynaecology instruments/ sterile techniques / instruments
- Obstetrics &Gynaecology Emergencies
- Importance of Pap smear /terminal care
- Preparing the discharge summaries
- Rh ISO Immunization
- Puerperal care
- Infertility Investigations
- Contraceptive methods
- Medical termination of Pregnancy

Reference Books:

- 1.Dutta.D.C, Text book of Obstetrics, Jaypee Brothers Publications, 9th Edition, 2016.
- 2.Mudaliar and Menons, Clinical obstetrics, University Press Pub, 12th Edition 2015.
- 3.Dutta.D.C, Text book Gynecology, Jaypee Brothers Publications, 8th Edition, 2020.

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Examination Pattern

Theory exam: 75 marks
Internal assessment (Theory) 25 marks

Duration

3 hours

100 marks

Guidelines for setting Question Paper for Theory Examination:

1. Prepare the question papers for 75 marks.
 2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.
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Pattern of Question Paper:

Long answer question	-	2 X 10 = 20 marks
Short answer question	-	7 X 5 = 35 marks
Very Short answer	-	10 X 2 = 20 marks

14. Nephrology & Pulmonology

Placement: III Year (VI Semester)

Time: Theory: 60 Hours

Clinical: 260 Hours

Course Description

Focuses on the identification and treatment of medical conditions, syndromes and diseases encountered in the Gastroenterology and orthopedics, A case based approach is used to familiarize student with the variety of diseases and their treatment options as well as trauma patient care, emergency procedures. gaining knowledge on patient preparation for endoscopy and assisting the procedure.

Course Outline

Unit	Hours	Content
I	8	Basics-macroscopic and microscopic structure of the kidney, innervations of urinary bladder in detail, histopathology of kidney, ureters, urinary bladder and urethra. Renal hemodynamics and glomerular filtration, renal function, renal function tests, micturition
II	15	Urinary tract pathology- basis of impaired renal function, urine analysis. Glomerulonephritis - classification - primary (proliferative and non-proliferative) Secondary glomerulonephritis - (SLE, polyarteritis, amyloidosis, diabetes, lupus nephritis, Wegener's granulomatosis) Acute renal failure, progressive renal failure and end stage renal disease Pyelonephritis, reflux nephropathy, interstitial nephritis Tumours - renal cell carcinoma and nephroblastoma Renal vascular disorders, kidney changes in hypertension Urinary bladder - cystitis, carcinoma, urinary tract tuberculosis, urolithiasis and obstructive uropathy. Congenital abnormalities of kidneys and urinary system
III	12	Clinical examination of kidney and genitourinary system- symptoms, signs and investigations. Major manifestations - dysuria, pyuria, urethral symptoms, Disorders of urine volume, hematuria, proteinuria, edema, incontinence, Renal involvement in systemic disorders, Drugs and kidney, renal replacement therapy
IV	25	Pathophysiology of hypoxia and hypercapnia. Respiratory failure -acute, chronic mechanism and management, bronchial asthma, chronic obstructive lung diseases. Restrictive /interstitial lung diseases, pulmonary tuberculosis, occupational lung diseases Lung cancer - Primary and secondary, hemoptysis, pneumonia. Pleural diseases -Pneumothorax, Pleural effusion. Cardiogenic and non-cardiogenic pulmonary edema, Diseases of the Diaphragm and the chest wall.

Practical's:

- History collection
- Case sheet writing
- Clinical examination of respiratory and urinary system
- Discharge summary preparation
- Renal function test
- 24 hrs. urine protein
- Intravenous pyelogram, ESWL
- Cystoscopy
- Dialysis, AV fistula
- Renal biopsy, plasmapheresis
- Renal transplant
- Chest x ray, CT
- Pulmonary function test
- Oxygen mask – nasal prongs, venture mask, CPAP, BIPAP, nebulization
- Mechanical ventilator
- Pleural tapping
- Bronchoscopy
- Anti-tuberculous treatment
- ABG

Reference Books

1. Davidson's, Principle and Practice of medicine, Elsevier Publication, 24th edition, 2022.
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Examination Pattern

Theory exam: (one paper)	80 marks
Practical exam	50 marks
Oral exam	20 marks
Internal assessment (Theory)	25 marks
Internal assessment (Practical)	25 marks

	200 marks

Duration

3 hours
3 hours

The practical examination will have the following components

Identification of Spotters (General)	20 marks
Case presentation Nephrology	15 marks
Case presentation Pulmonology	15 marks

50 marks

Guidelines for setting Question Paper for Theory Examination:**Distribution of Course Content**

1. Prepare the question papers for 80 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper:

Long answer question	-	2 X 10 = 20 marks
Short answer question	-	8 X 5 = 40 marks
Very Short answer	-	10 X 2 = 20 marks

C 9. Biostatistics & Research Methodology

Placement: III Year (VI Semester)

Time: Theory: 30 Hours

Course Description:

At the end of the course, the students will be able to develop an understanding of the statistical methods and apply them in conducting research studies.

Course Outline

Unit	Time (Hrs)	Content
I	3	Introduction: <ul style="list-style-type: none"> • Concepts, types, significance and scope of statistics, Meaning of data, Sample, parameter • Type and levels of data and their measurement • Organization and presentation of data – Tabulation of data; Frequency distribution – Graphical and tabular presentations
II	2	Measures of central tendency: <ul style="list-style-type: none"> • Mean, Median, Mode Measures of variability: <ul style="list-style-type: none"> • Range, Percentiles, average deviation, quartile deviation, standard deviation
III	2	Normal Distribution: <ul style="list-style-type: none"> • Probability, • Characteristics and application of normal probability curve; • Sampling
IV	4	Measures of relationship: <ul style="list-style-type: none"> • Correlation – need and meaning • Rank order correlation • Scatter diagram method • Product moment correlation • Simple linear regression analysis and prediction.
V	4	Significance of Statistic and Significance of difference between two statistics (Testing hypothesis) <ul style="list-style-type: none"> • Non parametric test – Chi-square test, Sign, median test, Mann Whitney test. • Parametric test – ‘t’ test, ANOVA, MANOVA, ANCOVA
VI	7	Research Methods: <ul style="list-style-type: none"> • Research Meaning- • Scope and Objectives • .Research methods vs. Methodology. Types of research <ul style="list-style-type: none"> • Descriptive vs. Analytical, • Applied vs. Fundamental, • Quantitative vs. Qualitative, • Conceptual vs. Empirical, •

Unit	Time (Hrs)	Content
		Concept of applied and basic research process, <ul style="list-style-type: none"> Defining and formulating the research problem Selecting the problem, necessity of defining the problem, Importance of literature review in defining a problem, criteria of good research. Literature review <ul style="list-style-type: none"> Primary and secondary sources, reviews, monograph, patents, research databases, web as a source, searching the web, critical literature review, identifying gap areas from literature and research database, development of working hypothesis
VII	8	Data Collection And Sampling: <ul style="list-style-type: none"> Data collection Classification of data Class intervals Continuous and discrete measurements Drawing frequency polygon types of frequency polygon Histogram Accepts of method validation, observation and collection of data, methods of data collection Sampling methods, Data processing and analysis strategies and tools, data analysis with statistical package <ul style="list-style-type: none"> Sigma STAT, SPSS for student t-test, ANOVA, etc. hypothesis testing. Correlation <ul style="list-style-type: none"> historical contribution meaning of correlation types: Product, moment, content correlation, variation of product, movement correlation, rank correlation, Regression analysis. <ul style="list-style-type: none"> Tests of significance- need for sampling error significance of the mean significance of differences between means interpretation of probability levels – small samples – large samples.

Research Project Description:

This project study shall be done by individuals or by group of individual students of the same class during internship. The student should identify a problem area of relevance to the theory and / or practice of Physician Assistant to carry out an investigation of one aspect of that problem area, and to present a clear report on the process and result of the project work done.

The students are encouraged to identify problems of special interest to them that fall within the interest areas of Physician Assistant services, and to aim towards knowledge on the topic in the specified problem area.

Desirable:

- A Research study to be done and submit the report before the one year of Internship.
- One or more value added courses (like Swayam) during final year or Internship.

Reference Books:

1. Mahajan B.K., Methods in Biostatistics for Medical Students and Research Workers, Jaypee, 9th Edi, 2018.
2. Sundar Rao, Introduction to Biostatistics & Research Methods, Prentice Hall of India, 5th edi, 2012.
3. Negi K.S., Biostatistics, A.I.I.B.S, 1st Edi, 2013.
4. Rao & Murthy, Applied Statistics in Health Sciences, Jaypee, 2010.
5. Visweswara Rao, Biostatistics & Manual of Statistical Methods for use in Health, Nutrition and Anthropology, Jaypee, 2009.

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VIII. Question Paper Pattern

(Subject with Theory and Practical Exam)

Guidelines for setting a Question Paper for Theory Examination:

1. Prepare the question papers for 80 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper

Time: 3 hours

Max Marks: 80

2x 10 =20 marks

I. Write essay on any TWO

- 1.
- 2.
- 3.

II. Write short notes on any EIGHT

8 x 5 =40 marks

- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.
- 11.
- 12.
- 13.

III. Very Short Answer – Answer all questions:

10 x 2 = 20 marks

- 14.
- 15.
- 16.
- 17.
- 18.
- 19.
- 20.
- 21.
- 22.
- 23.

VIII. Question Paper Pattern

(Subject with Theory Exam and no Practical)

Guidelines for setting a Question Paper for Theory Examination:

1. Prepare the question papers for 75 marks.
2. Set questions within the course syllabus covering entire syllabus with equal distribution from all topics in each section.

Pattern of Question Paper

Time – 3 Hours

Maximum Marks – 75 Marks

2x 10 =20 marks

I. Write essay **any TWO**

- 1.
- 2.
- 3.

II. Write short notes on **any SEVEN**

7 x 5 =35 marks

- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.
- 11.
- 12.

III. Very Short Answer – **Answer all questions:**

10 x 2 = 20 marks

- 13.
- 14.
- 15.
- 16.
- 17.
- 18.
- 19.
- 20.
- 21.
- 22.