Four-Year Undergraduate Programme

Bachelor of Medical Laboratory Technology

Parul Institute of Paramedical & Health Sciences

Faculty of Medicine

Parul University

Vadodara, Gujarat, India

1. Vision of the Department

V1	To establish a develop world class self-reliant institute for imparting Medical and other Health Science education at under-graduate, post-graduate & doctoral levels of the global competence.
V2	To be a centre of excellence to sprout great researchers, technologists in health care system.

2. Mission of the Department

M1	To develop & Train quality health care personnel.
M2	To inculcate high moral, ethical & professional standards of working amongst students.
M3	To ensure skill-based learning for all Students.

3. Program Educational Objectives (PEOs)

PEOs 1	**Excellence in Medical Sciences**	Graduates will develop a strong foundation in medical sciences, integrating disciplinary knowledge, clinical expertise, and problem-solving skills to provide quality healthcare.
PEOs 2	**Professionalism & Ethical Practice**	Graduates will uphold ethical responsibilities, demonstrate effective communication, and work collaboratively in multidisciplinary healthcare teams while ensuring patient-centered care.
PEOs 3	**Lifelong Learning & Research Contribution**	Graduates will continuously advance their skills through professional development, engage in research, and apply evidence-based practices to improve healthcare outcomes.

4. Program Learning Outcomes (PLOs)

PLOs 1	**Disciplinary Knowledge**	Demonstrate comprehensive knowledge of medical sciences, applying theoretical and practical skills to diagnose, treat, and manage conditions within the chosen specialization.
PLOs 2	**Clinical & Technical Skills**	Perform clinical and technical procedures with precision, utilizing medical equipment and diagnostic tools while ensuring safety, emergency preparedness, and patient monitoring.
PLOs 3	**Critical Thinking & Problem-Solving**	Analyze clinical scenarios, evaluate medical data, and apply logical reasoning to develop effective diagnostic, therapeutic, and healthcare solutions.
PLOs 4	**Communication Skills**	Communicate effectively with patients, families, and healthcare teams using verbal, non-verbal, and written methods while maintaining empathy, professionalism, and accurate documentation.
PLOs 5	**Ethics &**	Uphold ethical responsibility, adhere to legal and

	Professionalism	institutional guidelines, and demonstrate integrity, respect, and cultural sensitivity in healthcare settings.
PLOs 6	**Teamwork & Leadership**	Collaborate within multidisciplinary teams, exhibit leadership in crisis management and decision-making, and mentor peers in clinical and technical roles.
PLOs 7	**Digital Literacy**	Utilize healthcare information systems, integrate medical technologies, and stay updated with advancements in digital tools relevant to the specialization.
PLOs 8	**Research & Evidence-Based Practice (EBP)**	Apply research methodologies, utilize evidence-based practices to enhance patient care, and contribute to scientific knowledge through scholarly activities.
PLOs 9	**Lifelong Learning & Professional Development**	Engage in continuous learning, adapt to advancements in medical sciences, and enhance clinical competencies through reflective practice.

5. Program Specific Learning Outcomes (PSLOs)

PSLOs 1	**Clinical Competence & Technological Proficiency**	Graduates will perform precise clinical procedures using advanced medical equipment, diagnostic tools, and healthcare technologies to ensure patient safety and effective treatment.
PSLOs 2	**Critical Thinking & Ethical Decision-Making**	Graduates will analyze complex clinical scenarios, apply logical reasoning, and make informed decisions while adhering to ethical and legal guidelines in healthcare practice.
PSLOs 3	**Leadership, Teamwork & Research Application**	Graduates will collaborate in multidisciplinary teams, exhibit leadership in crisis management, and contribute to healthcare advancements through research and evidence-based practices.

6. Credit Framework

Semester wise Credit distribution of the programme	
Semester-1	24
Semester-2	24
Semester-3	22
Semester-4	24
Semester-5	24
Semester-6	22
Semester-7	22
Semester-8	22
Total Credits:	**184**

Category wise Credit distribution of the programme	
Category	**Credit**
Major Core	96
Minor Stream	32
Multidisciplinary	12
Ability Enhancement Course	10
Skill Enhancement Courses	10
Value added Courses	8
Summer Internship	4
Research Project/Dissertation	12
Total Credits:	**184**

7. Program Curriculum

Semester 1						
Sr. No.	Subject Code	Subject Name	Credit	Lect	Lab	Tut
1	-	MIL-1	2	2	-	-
2	-	University Elective – 1	4	3	2	-
3	19010001SE01	SEC-1: Management of Lifestyle Disorders	2	2	-	-
4	11011401VA01	VAC-1 (Climate change & sustainable environment)	2	2	-	-
5	-	Minor sub – 1(T)	3	3	-	-
6	-	Minor sub – 1(P)	1	-	2	-
7	19010001DS01	Anatomy & Physiology – I(T)	4	4	-	-
8	19010001DS02	Anatomy & Physiology – I (P)	2	-	4	
9	19010601DS05	Foundation Of Medical Laboratory Science (T)	3	3	-	-
10	19010601DS06	Foundation Of Medical Laboratory Science (P)	1	-	2	-
Total			24	19	10	-
MIL-1						
Sr. No.	Subject Code	Subject Name	Credit	Lect	Lab	Tut
1	00019301AE01	Basic English-I	2	2	-	-
2	00019301AE02	Basic Hindi-I	2	2	-	-
3	00019301AE03	Basic Gujarati-I	2	2	-	-
UE-01						
Sr. No.	Subject Code	Subject Name	Credit	Lect	Lab	Tut
1	19010201UE01	Health Informatics	4	3	2	-
2	06010101UE03	Health care management	4	4	-	-
3	17010101UE01	Medical Law	4	4	-	-
4	09010101UE01	First aid & life support	4	4	-	-
Minor Course-1						
1	19011301AC01	Introduction Of Anaesthesia and Critical Care Technology (T)	3	3	-	-
2	19011301AC02	Introduction Of Anaesthesia and Critical Care	1	-	2	-

		Technology (P)				
3	19010901OT01	Introduction To Operation Theatre Technology (T)	3	3	-	-
4	19010901OT02	Introduction To Operation Theatre Technology (P)	1	-	2	-
5	03010501AM01	Programming in Python (T)	3	3	-	-
6	03010501AM02	Programming in Python (P)	1	-	2	-
7	03011301NT01	Introduction to Nanotechnology and its Applications in Healthcare	4	3	-	1
Semester 2						
Sr. No.	Subject Code	Subject Name	Credit	Lect	Lab	Tut
11	-	MIL-2	2	2	-	-
12	-	University Elective – 2	4	4	-	-
13	00019102SE01	SEC-2: Mathematical Aptitude	2	2	-	-
14	00019302VA01	VAC-2 (IPDC including history and culture of India and IKS-I)	2	2	-	-
15	-	Minor sub – 2 (T)	3	3	-	-
16	-	Minor sub – 2 (P)	1	-	2	-
17	19010002DS01	Anatomy & Physiology-II (T)	4	4	-	-
18	19010002DS02	Anatomy & Physiology -II (P)	2	-	4	-
19	19010602DS01	Biochemical Metabolism-1 (T)	3	3	-	-
20	19010602DS02	Biochemical Metabolism-1 (P)	1	-	2	-
Total			24	20	8	-
MIL-2						
Sr. No.	Subject Code	Subject Name	Credit	Lect	Lab	Tut
1	00019302AE04	Basic English-II	2	2	-	-
2	00019302AE05	Basic Hindi-II	2	2	-	-
3	00019302AE06	Basic Gujarati-II	2	2	-	-
UE-02						
Sr. No.	Subject Code	Subject Name	Credit	Lect	Lab	Tut
1	10010102UE01	Introduction to Gender, Health and Rights	4	4	-	-
2	19010202UE01	Public Health Nutrition	4	4	-	-

3	15010402UE01	Human Psychology	4	3	2	-
4	07010102UE01	Biomechanics	4	4	-	-
5	09010102UE01	Life style Diseases & Management	4	4	-	-
Minor Course-2						
Sr. No.	Subject Code	Subject Name	Credit	Lect	Lab	Tut
1	19011302AC01	Basic Techniques of Anaesthesia (T)	3	3	-	-
2	19011302AC02	Basic Techniques of Anaesthesia (P)	1	-	2	-
3	19010902OT01	Basics of Surgical Procedures (T)	3	3	-	-
4	19010902OT02	Basics of Surgical Procedures (P)	1	-	2	-
5	03010502AM01	Artificial Intelligence (T)	3	3	-	-
6	03010502AM02	Artificial Intelligence (P)	1	-	2	-
7	03011302NT01	Nanomaterials in Biomedical Applications	4	3	-	1
Semester 3						
Sr. No.	Subject Code	Subject Name	Credit	Lect	Lab	Tut
21	-	MEL-1	2	2	-	-
22	-	University Elective 3	4	4	-	-
23	03010503SE01	SEC-3 Artificial intelligence	2	2	-	-
24	00019303VA01	VAC-3 (IPDC including history and culture of India and IKS - 2)	2	2	-	-
25	19010003DS01	Microbiology & Pathology – I (T)	3	3	-	-
26	19010003DS02	Microbiology & Pathology – I (P)	1	-	2	-
27	19010603DS01	Basic Hematology And Hematological Diseases (T)	3	3	-	-
28	19010603DS02	Basic Hematology And Hematological Diseases (P)	1	-	2	-
29	19010603DS03	Medical Microbiology-I (Bacteriology and Mycology) (T)	3	3	-	-
30	19010603DS04	Medical Microbiology-I (Bacteriology and Mycology) (P)	1	-	2	-
Total			22	19	6	-
MEL-1						
Sr. No.	Subject Code	Subject Name	Credit	Lect	Lab	Tut
1	00019303AE01	Advanced English-I	2	2	-	-
2	00019303AE02	German-I	2	2	-	-

3	00019303AE03	French-I	2	2	-	-
UE-03						
Sr. No.	Subject Code	Subject Name	Credit	Lect	Lab	Tut
1	19010203UE01	Health Research Fundamentals	4	4	-	-
2	17010103UE01	Intellectual Property	4	4	-	-
3	07010103UE01	Occupational Health and ergonomics	4	4	-	-
4	02010103UE01	Yoga and Positive Psychology for Managing Carrier and Life	4	4	-	-
Semester 4						
Sr. No.	Subject Code	Subject Name	Credit	Lect	Lab	Tut
31	-	MEL-2	2	2	-	-
32	19010004SE01	SEC-4: Health Informatics & Personalised Medicine	2	2	-	-
33	-	VAC - 4: Physical Education	2	2	-	-
34	19010604DS01	Histopathology and Cytology (T)	3	3	-	-
35	19010604DS02	Histopathology and Cytology (P)	1	-	2	-
36	19010004DS01	Microbiology & Pathology-II(T)	3	3	-	-
37	19010004DS02	Microbiology & Pathology-II(P)	1	-	2	-
38	19010004DS03	Applied Medicine & Pharmacology-I(T)	4	4	-	-
39	19010004DS04	Applied Medicine & Pharmacology-I(P)	2	-	4	-
40	-	Minor sub - 3(T)	3	3	-	-
41	-	Minor sub - 3(P)	1	-	2	-
Total			24	19	10	-
MEL-2						
Sr. No.	Subject Code	Subject Name	Credit	Lect	Lab	Tut
1	00019304AE04	Advanced English-II	2	2	-	-
2	00019304AE05	German-II	2	2	-	-
3	00019304AE06	French-II	2	2	-	-
VAC - 4						
1	00019404VA01	Foundations of Yoga	2	1	2	-
2	00019404VA02	Physical Education and Sports	2	1	2	-
3	00019404VA03	National Cadet Corps (NCC)	2	1	2	-

4	15M10504VA01	Psychology of Stress, Health and Well-being	2	2	-	-
Minor Course - 3						
1	19011304AC01	Essentials of Anesthesia (T)	3	3	-	-
2	19011304AC02	Essentials of Anesthesia I(P)	1	-	2	-
3	19010904OT01	Patient, Staff Safety and Quality Care (T)	3	3	-	-
4	19010904OT02	Patient, Staff Safety and Quality Care (P)	1	-	2	-
5	03010504AM01	Data Science for AI (T)	3	3	-	-
6	03010504AM02	Data Science for AI (P)	1	-	2	-
7	03011304NT01	Nanofabrication Techniques	4	3	-	1
Semester 5						
Sr. No.	Subject Code	Subject Name	Credit	Lect	Lab	Tut
42	19010005DS01	Applied Medicine & Pharmacology-II(T)	4	4	-	-
43	19010005DS02	Applied Medicine & Pharmacology-II(P)	2	-	4	-
44	19010605DS01	Metabolism and Molecular Biology (T)	3	3	-	-
45	19010605DS02	Metabolism and Molecular Biology (P)	1	-	2	-
46	19010605DS03	Medical Microbiology - II (Immunology & Virology) (T)	3	3	-	-
47	19010605DS04	Medical Microbiology - II (Immunology & Virology) (P)	1	-	2	-
48	-	Minor sub - 4 (T)	3	3	-	-
49	-	Minor sub – 4 (P)	1	-	2	-
50	-	Minor Sub – 5 (T)	3	3	-	-
51	-	Minor Sub - 5(P)	1	-	2	-
52	-	SEC – 5	2	2	-	-
Total			24	18	12	-
Minor Course - 4						
Sr. No.	Subject Code	Subject Name	Credit	Lect	Lab	Tut
1	19011305AC01	Advanced Anaesthesia Technology	3	3	-	-
2	19011305AC02	Advanced Anaesthesia Technology	1	-	2	-
3	19010905OT01	Principles Of Operation Theatre Management	3	3	-	-
4	19010905OT02	Principles Of Operation Theatre Management	1	-	2	-
5	03010505AM01	Machine Learning	3	3	-	-

6	03010505AM02	Machine Learning	1	-	2	-
7	03011305NT01	Nanofabrication Techniques	4	3	-	1
Minor Course - 5						
Sr. No.	Subject Code	Subject Name	Credit	Lect	Lab	Tut
1	19011305AC03	Advanced Critical Care Technology	3	3	-	-
2	19011305AC04	Advanced Critical Care Technology	1	-	2	-
3	19010905OT03	Operation Theatre Technology -I	3	3	-	-
4	19010905OT04	Operation Theatre Technology -I	1	-	2	-
5	03010505AM03	Deep Learning	3	3	-	-
6	03010505AM04	Deep Learning	1	-	2	-
7	03011305NT03	Nanotoxicology and Safety Assessment	4	3	-	1
SEC – 5						
Sr. No.	Subject Code	Subject Name	Credit	Lect	Lab	Tut
1	06010105SE01	Digital Literacy	2	2	-	-
2	06010105SE02	Finance for everyone	2	2	-	-
Semester 6						
Sr. No.	Subject Code	Subject Name	Credit	Lect	Lab	Tut
53	00019306AE01	Professional Ethics and Communication	2	2	-	-
54	19010606DS01	Advanced Hematology And Transfusion Medicine (T)	3	3	-	-
55	19010606DS02	Advanced Hematology And Transfusion Medicine (P)	1	-	2	-
56	19010606DS03	Medical Microbiology-III (Parasitology and Industrial Microbiology) (T)	3	3	-	-
57	19010606DS04	Medical Microbiology-III (Parasitology and Industrial Microbiology) (P)	1	-	2	-
58	19010606DS05	Phlebotomy Techniques (P)	4	-	8	-
59	19010606IN01	Internship/Mini Project	4	-	8	
60	-	Minor sub - 6	4	3	2	
Total			22	11	22	
Minor Course - 6						

Sr. No.	Subject Code	Subject Name	Credit	Lect	Lab	Tut
1	19011306AC01	Basic And Advanced Anaesthesia and Critical Care	4	-	8	-
2	19010906OT01	Operation Theatre Technology-II	4	-	8	-
3	03010506AM01	Natural Language Processing (T)	3	3	-	-
4	03010506AM02	Natural Language Processing (P)	1	-	2	-
5	03011306NT01	Nanocomposites	4	3	-	1
Semester 7 (Hons. / Hons. With Research)						
Sr. No.	Subject Code	Subject Name	Credit	Lect	Lab	Tut
61	19010607DS01	Medical Laboratory Technology- I	4	-	8	-
62	19010607DS02	Medical Laboratory Technology- II	4	-	8	-
63	19010607DS03	Medical Laboratory Technology- III	4	-	8	-
64	-	Minor Sub 7: Clinical Posting in Minor / Minor Project (Practical)	4	3	2	-
65	19010607OJ01	On Job Training (Practical)	6	-	12	-
66	19010907RP01	Research Project		-		-
		Total	22	3	38	-
Minor Course -7						
Sr. No.	Subject Code	Subject Name	Credit	Lect	Lab	Tut
1	19011307AC01	Advanced Physical Assessment & Critical Care Technology - I	4	-	8	-
2	19010907OT01	Clinics General and Advanced Operation Theatre	4	-	8	-
3	03010507AM01	AI and Machine Learning in Healthcare (T)	3	3	-	-
4	03010507AM02	AI and Machine Learning in Healthcare (P)	1	-	2	-
5	03011307NT01	Nano sensors	4	3	-	1
Semester 8 (Hons. / Hons. With Research)						
Sr. No.	Subject Code	Subject Name	Credit	Lect	Lab	Tut
67	19010608DS01	Advanced Diagnostic Techniques	4	-	8	-
68	19010608DS02	Medical Laboratory Science Management	4	-	8	-
69	19010608DS03	Introduction to Quality and Patient Safety	4	-	8	-
70	-	Minor Sub 8: Clinical Posting in Minor /	4	-	8	-

		Minor Project (Practical)				
71	19010608OJ01	On Job Training (Practical)	6	-	12	-
72	19010908RP01	Research Project		-		-
		Total	22	-	44	-

Minor Course - 8						
Sr. No.	Subject Code	Subject Name	Credit	Lect	Lab	Tut
1	19011308AC01	Clinics: Pre-Intra-Post-Operative Preparation, Complication and Management	4	-	8	-
2	19010908OT01	Clinics Hospital Operation Management	4	-	8	-
3	03010508AM01	AI and Machine Learning Projects	4	-	8	-
4	03011308NT01	Nanotechnology Project	4	-	8	-

Semester 01

a. Course Name: Basic English-1

b. Course Code: 00019301AE01

c. Prerequisite: Basic Knowledge of LSRW. To provide students with soft skills that complement their skills, making them more marketable when entering the workforce.

d. Rationale: Knowledge of LSRW is essential for Students

e. Course Learning Objective:

CLOBJ 1	Develop basic proficiency in English language skills including reading, writing, speaking, and listening, with an emphasis on comprehension and fluency.
CLOBJ 2	Expand vocabulary through the acquisition of common words and phrases used in everyday communication, including greetings, introductions, and expressions for daily activities.
CLOBJ 3	Gain a solid understanding of basic grammar rules, including sentence structure, verb tenses, parts of speech, and word order, to construct grammatically correct sentences and communicate effectively.
CLOBJ 4	Improve pronunciation and intonation to enhance clarity and intelligibility in spoken English, focusing on accurate articulation of sounds, stress patterns, and rhythm.
CLOBJ 5	Develop confidence and proficiency in engaging in everyday conversations in English, including asking and answering questions, expressing opinions, making requests, and participating in discussions on familiar topics.

f. Course Learning Outcomes:

CLOBJ 1	Understand the importance of creative and critical thinking.
CLOBJ 2	Develop four basic skills (LSRW)
CLOBJ 3	Expand vocabulary with proper pronunciation.
CLOBJ 4	Comprehend the basics of English grammar.
CLOBJ 5	Read & write effectively for a variety of contexts. Develop confidence in speaking skills.

g. Teaching & Examination Scheme:

Teaching Scheme				**Evaluation Scheme**					
L	**T**	**P**	**C**	**Internal Evaluation**			**ESE**		**Total**
				TE	**CE**	**P**	**Theory**	**P**	
2	**-**	**-**	**2**	**-**	**100**	**-**	**-**	**-**	**100**

L- Lectures; T- Tutorial; P- Practical; C- Credit; MSE- Mid-Semester Evaluation, CE- Continuous Evaluation, ESE- End Semester Examination

h. Course Content:

Sr. No.	**Content**	**Weightage**	**Teaching Hours**

1	Listening Skills and Hearing Listening Vs Hearing • Types of listening • Traits of good listener • Barriers of listening	7%	2
2	Listening Practice Listening Practice (Audio & Video)	10%	3
3	Presentation Skills • Defining the purpose of presentation • Presentation strategies • How to make an effective presentation? • Knowing /Analyzing audience • Organizing content and preparing an outline • Traits of a good speaker	3%	1
4	Activity Crazy Scientist	7%	2
5	Speaking Practice Speaking practice (Elocution)	24%	7
6	Reading Skills • Define reading • Reading Strategies • Techniques of reading • Techniques to read faster	3%	1
7	Reading Practice Reading Practice (Reading Comprehension)	13%	4
8	Writing Skills • Develop Writing Skills • 7cs of communication • Techniques of writing better • Identifying common errors in writing	10%	3
9	Paragraph Writing • Introduction of Paragraph Writing • Central components of paragraph development • Techniques for paragraph development	3%	1
10	Writing Practice Writing Practice: • Note making • Picture Description	20%	6
	Total teaching hours for the academic year	**100%**	**30**

i. Text Book and Reference Book:

1.	Understanding and Using English Grammar by Betty Azar & Stacy Hagen | Pearson Education
2.	Business Correspondence and Report Writing by SHARMA, R. AND MOHAN, K.
3.	Communication Skills by Kumar S And Lata P | New Delhi Oxford University Press
4.	Technical Communication: Principles And Practice by Sangeetha Sharma, Meenakshi Raman | Oxford University Press
5.	Practical English Usage by MICHAEL SWAN
6.	A Remedial English Grammar for Foreign Student by F.T. WOOD

7.	On Writing Well by William Zinsser | Harper Paperbacks,2006 | 30th anniversary edition
8.	Oxford Practice Grammar, By John Eastwood | Oxford University Press

Semester 01

a. Course Name: Basic Hindi-I

b. Course Code: 00019301AE02

c. Prerequisite: Basic communication skills in Hindi

d. Rationale: Basic comprehensive skills Hindi

e. Course Learning Objective:

CLOBJ 1	Learn to recognize and write Devanagari script. Understand the basics of Gujarati pronunciation, including consonants, vowels, and pronunciation rules.
CLOBJ 2	Build a foundation of commonly used Gujarati vocabulary for everyday communication.
CLOBJ 3	Develop the ability to engage in simple conversations in Gujarati, including greetings, introductions, and expressing basic needs and preferences.
CLOBJ 4	Learn to read and understand simple texts in Gujarati, including signs, labels, short passages, and basic literature.
CLOBJ 5	Practice writing in Gujarati through exercises such as dictation, composition, and letter/email writing.

f. Course Learning Outcomes:

CLO 1	Read and write Hindi alphabets.
CLO 2	Understand the different sounds on Hindi Phonetics.
CLO 3	To make two to three letter words in Hindi.
CLO 4	To make short/basic sentences in Hindi.
CLO 5	To understand and use daily words in Hindi.

g. Teaching & Examination Scheme:

Teaching Scheme				**Evaluation Scheme**					
L	**T**	**P**	**C**	**Internal Evaluation**			**ESE**		**TOTAL**
				T	**CE**	**P**	**Theory**	**P**	
2	**-**	**-**	**2**	**-**	**100**	**-**	**-**	**-**	**100**

L- Lectures; T- Tutorial; P- Practical; C- Credit; MSE- Mid-Semester Evaluation, CE- Continuous Evaluation, ESE- End Semester Examination

h. Course Content:

Sr. No.	**Content**	**Weightage**	**Teaching Hours**
1	• हिंदी वर्णमाला (Hindi Alphabets) Relate with English Alphabets • स्वर (vowel) • व्यंजन (consonant)	13%	4
2	• हिंदी बाररखड़ी (Hindi Phonetics) • संयुक्त शब्द (Joint words) kha, sva etc.	13%	4
3	दो/तीन अक्षर का शब्द िनमार् (two/three letter word formation)	13%	4
4	हिंदी व्याकरर् (Hindi Grammar) • संज्ञा (Noun) • सवर्नाम (Pronoun) • हिया (Verb) • हिया िवशेषर् (Adverb) • िवशेषर् (Adjective)	34%	10

5	हिंदी शब्दावली (Hindi Vocabulary) • संख्या (Numbers) (1 to 50) • सहतता के िदन (Days of the week) • रंग (Colors)	27%	8
	Total	**100%**	**30**

i. Text Book and Reference Book:

1	All in One (English-Gujarati), Manoj Publications
2	Gujarati Barakhadi by Sonika Agrawal, Published by Notion Press
3	Varna Lekhan by Gujarati Books
4	My first Gujarati alphabets by Priyal J., Published by My first Picture Book Inc.

Semester 01

a. Course Name: Basic Gujarati - 1
b. Course Code: 00019301AE03
c. Prerequisite: Basic communication skills in Gujarati
d. Rationale: Basic comprehensive skills Gujarati
e. Course Learning Objective:

CLOBJ 1	Learn to recognize and write Devanagari script. Understand the basics of Gujarati pronunciation, including consonants, vowels, and pronunciation rules.
CLOBJ 2	Build a foundation of commonly used Gujarati vocabulary for everyday communication.
CLOBJ 3	Develop the ability to engage in simple conversations in Gujarati, including greetings, introductions, and expressing basic needs and preferences.
CLOBJ 4	Learn to read and understand simple texts in Gujarati, including signs, labels, short passages, and basic literature.
CLOBJ 5	Practice writing in Gujarati through exercises such as dictation, composition, and letter/email writing.

f. Course Learning Outcomes:

CLO 1	Read and write Gujarati alphabets
CLO 2	Understand the different sounds on Gujarati Phonetics
CLO 3	To make two to three letter words in Gujarati
CLO 4	To make short/basic sentences in Gujarati.
CLO 5	To understand and use daily words in Gujarati

g. Teaching & Examination Scheme:

Teaching Scheme				**Evaluation Scheme**					
L	**T**	**P**	**C**	**Internal Evaluation**			**ESE**		**TOTAL**
				T	**CE**	**P**	**Theory**	**P**	
2	**-**	**-**	**2**	**-**	**100**	**-**	**-**	**-**	**100**

L- Lectures; T- Tutorial; P- Practical; C- Credit; MSE- Mid-Semester Evaluation, CE- Continuous Evaluation, ESE- End Semester Examination

h. Course Content:

Sr. No.	**Content**	**Weightage**	**Teaching Hours**
1	• ગુજરાતી મૂળાક્ષર (Gujarati Alphabets) Relate with English Alphabets • સ્વર (vowel) • વ્યંજન (consonant)	13%	4
2	• બારાક્ષરો (Gujarati Phonetics) • સંયુGત શબ્દો (Joint words) kha, sva etc.	13%	4
3	બે/ત્રણ અક્ષરની શબ્દ રચના (two/three letter word formation)	13%	4
4	ગુજરાતી વ્યાકરણ (Gujarati Grammar) • સંજ્ઞા (Noun) • સવવનામ (Pronoun) • ક્રિયાપદ (Verb) • ક્રિયાક્રિશેષણ (adverb) • વવશેષણ (adjective)	34%	10

5	ગુજરાતી શબ્દભંડોળ (Gujarati Vocabulary) • સંખ્યાઓ (Numbers) (1 to 50) • અઠવાડયાના દદસો (Days of the week) • રંગો (Colors)	27%	8
	Total	**100%**	**30**

i. Text Book and Reference Book:

1	All in One (English-Gujarati), Manoj Publications
2	Gujarati Barakhadi by Sonika Agrawal, Published by Notion Press
3	Varna Lekhan by Gujarati Books
4	My first Gujarati alphabets by Priyal J., Published by My first Picture Book Inc.

Semester 01

a. Course Name: First Aid and Life Support
b. Course Code: 09010101UE01
c. Prerequisite: Knowledge of Biological Sciences up to 12th science level
d. Rationale: Knowledge about different organs and organ Systems of the body, Basic knowledge about functions of body
e. Course Learning Objective:

CLOBJ 1	Understand the importance of first aid in emergency situations.
CLOBJ 2	Demonstrate the ability to assess the scene of an emergency.
CLOBJ 3	Identify and prioritize different types of injuries and illnesses.
CLOBJ 4	Learn and practice CPR techniques for adults, children, and infants and use of automated external defibrillators (AEDs) and how to use them.
CLOBJ 5	Understand the importance of infection control in wound care.

f. Course Learning Outcomes:

CLO 1	Explain the aims of first aid and the role of a first aider. Discuss the legal aspects of providing first aid, including consent and privacy. Identify the steps involved in dealing with emergencies and conducting a top-to-toe assessment.
CLO 2	Evaluate and provide first aid for fractures and injuries to various body parts. Demonstrate knowledge of dislocations, strains, and sprains. Apply appropriate first aid techniques for different types of injuries.
CLO 3	Recognize respiratory distress and provide appropriate assistance. Identify situations requiring referral to healthcare facilities. Demonstrate skills in managing choking, drowning, and other respiratory issues.
CLO 4	Classify and treat different degrees of burns. Manage burns caused by various sources, including chemicals and heat. Implement first aid measures for burns and related conditions like heat exhaustion and frostbites.
CLO 5	Understand the basics of blood circulation, heart function, and blood pressure. Apply first aid for bleeding and perform CPR effectively. Demonstrate knowledge of responding to shock and chest discomfort.

g. Teaching & Examination Scheme:

Teaching Scheme				**Evaluation Scheme**					
L	**T**	**P**	**C**	**Internal Evaluation**			**ESE**		**TOTAL**
				T	**CE**	**P**	**Theory**	**P**	
4	**-**		**4**	**20**	**20**	**-**	**60**	**-**	**100**

L- Lectures; T- Tutorial; P- Practical; C- Credit; MSE- Mid-Semester Evaluation, CE- Continuous Evaluation, ESE- End Semester Examination

h. Course Content:

Sr. No.	**Content**	**Weightage**	**Teaching Hours**

1	**Introduction to first aid** • Aims of first aid • The first aider • First aid and the law • Indian good Samaritan protection guidelines • Duty of giving care • Consent of the person in need • Privacy • Negligence • Dealing with an emergency • Top-to-toe assessment • Hygiene and handwashing • First aid overview flowchart	7%	4
2	**Assessment of patients with fractures, wounds, and bleeding** • Brief Anatomy of the skeletal system • Fractures (injuries to bones) • Injuries and fractures to the head, neck and spine • Injuries and fractures to the cheekbone, nose and lower jaw • Fracture of the cheek bone or nose • Fractures of the lower jaw • Injuries to the shoulder, ribs or breastbone • Injuries or fractures of the shoulder • Injuries and fractures of the collarbone • Rib injuries and fractures • Fractures of the breastbone • Injuries to the arm, elbow, wrist, hand or • Injuries and fractures of the arm (upper arm, forearm, wrist) • Injuries and fractures of hand or fingers • Injuries to the pelvis, lower limbs, knee, ankle or feet • Injuries and fractures of the pelvis • Injuries and fractures of the leg (thigh or lower leg) or ankle • Fracture of the knee cap(patella) • Injuries and fractures of foot or toes • Dislocations (injuries to joints) • Strains and sprains (injuries to ligaments, muscles and tendons)	10%	6

3	**Respiratory emergencies** • Respiration • The respiratory system • No breathing or difficult breathing • When to refer the casualty to a healthcare facility • Drowning • Remove the victim out of the water • Strangulation and hanging • Choking • Swelling within the throat • Suffocation by smoke or gases Asthma	10%	6
4	**Care of burns** • The skin • Burn wounds • First, second and third-degree burns • Type of burns by origin • Danger of burns • Dry burns and scalds (burns from flames, hot surfaces, steam, • Care of minor burns (small first and second-degree burns) • Specific burn locations • Electrical burns and electrocution by electricity or Lightning • Chemical burns • Sunburns, snow/welders' eyes, heat exhaustion and heatstroke • Heat exhaustion • Heatstroke • Frostbites • Prevention of burns • Fever • Hypothermia	8%	5
5	**Lifesaving procedures in emergency &shock** • The heart and the blood circulation • Heart and blood circulation • Blood pressure • Pulse • The blood • Chest discomfort • Bleeding • First aid for bleeding (in general) • Resuscitation (basic CPR) • Resuscitation of a person who is not breathing or not breathing normally • Resuscitation of baby/child (less than one year old)	8%	5

6	**Head trauma &stroke** • The nervous system • The central nervous system • The peripheral nervous system (PNS) • Unconsciousness • Head injuries • Concussion • Cerebral compression • Skull fractures • Stroke • Fits–convulsions –seizures	10%	6
7	**Gastro-intestinal tract, diarrhea, food poisoning and diabetes** • Review of anatomy and physiology of gastro-intestinal tract • Diarrhea • Prevent dehydration • Food poisoning • Diabetes • Type1diabetes • Type2diabetes • Gestational diabetes (diabetes during pregnancy) • Diagnosis • Hyperglycemia • Symptoms of hyperglycemic coma or diabetic coma • Hypoglycemia	10%	6
8	**Senses, foreign bodies in eye, ear, nose or skin and swallowed foreign Objects** • Review of anatomy and physiology of the special senses • Foreign body in the eye • Foreign body in the ear • Foreign body in the nose • Foreign body in the skin • Swallowed foreign objects	10%	6

9	**Urinary system, reproductive system and emergency childbirth** • Review of anatomy and physiology of Urinary & Reproductive system • Male reproductive system • Female reproductive system • Pregnancy • Stages of Labour and giving birth • After care of the mother • Medical conditions and pregnancy • Diabetes • High blood pressure • Infections • Prevention of sexually transmitted diseases (STD) • Sexually transmitted infections • Reducing the risk of STDS/STIS • Emergency childbirth	10%	6
10	**Psychological first aid** • Definition of psychological first aid • Traumatic crisis (psychological) shock phase • Reaction phase • Processing phase • Reorientation phase • Behave calmly • Listening to the affected person • Physical contact • Providing psychological first aid to all	7%	4
11	**Specific emergency situations and disaster management** Emergencies at school Emergencies at work Road and traffic accidents Emergencies in rural area Disasters and multiple casualty accidents Emergency triage	10%	6
	Total teaching hours for the academic year	**100%**	**60**

i. T**ext Book and Reference Book:**

1	Manual of FIRST AID: Management of General injuries, Sports injuries and Common Ailments, by Rai P v
2	Textbook on First Aid & Emergency Nursing, by I Clement
3	First Aid Manual, by British Red Cross Society, St. Andrew's Ambulance Assoc and St. John's Ambulance
4	LC Gupta's Manual of First Aid: Management of General Injuries, Sports Injuries and Common Ailments, by Abhitabh Gupta Jitika Royal
5	Essentials of First Aid and CPR, by National Safety Council and Safety Council Natl

Semester 01

a. Course Name: Medical Law
b. Course Code: 17010101UE01
c. Prerequisite: Medical law is a form of law that deals with the medical field. It talk about the responsibilities and duties of medical professionals or students.
d. Rationale: The subject "Medical Law" provides students with a foundational understanding of the legal systems and regulations that govern medical practice in India. By exploring medico-legal frameworks, ethical considerations, and patient management laws, it empowers future professionals to navigate complex legal environments while upholding ethical standards.
e. Course Learning Objective:

CLOBJ 1	Understand the structure and principles of the legal system, including constitutional and judicial frameworks.
CLOBJ 2	Analyze medico-legal aspects such as medical negligence, consumer protection, and the Indian Penal Code's relevant sections.
CLOBJ 3	Evaluate laws governing medical ethics, drug safety, storage, pricing, and regulation.
CLOBJ 4	Interpret patient management laws, including those related to prenatal diagnostics, organ transplantation, mental health, and HIV/AIDS.
CLOBJ 5	Apply legal knowledge to resolve ethical dilemmas and ensure compliance in healthcare operations.

f. Course Learning Outcomes:

CLO 1	The student will have a comprehensive understanding of basic legal framework
CLO 2	The students will have comprehensive understanding and knowledge of various medical laws
CLO 3	The students will have knowledge about the various regulatory laws with regard to the field of health laws
CLO 4	The students will have knowledge about ethics related to medical profession

g. Teaching & Examination Scheme:

Teaching Scheme				**Evaluation Scheme**					
L	**T**	**P**	**C**	**Internal Evaluation**			**ESE**		**TOTAL**
				T	**CE**	**P**	**Theory**	**P**	
4	**-**		**4**	**20**	**20**	**-**	**60**	**-**	**100**

L- Lectures; T- Tutorial; P- Practical; C- Credit; MSE- Mid-Semester Evaluation, CE- Continuous Evaluation, ESE- End Semester Examination

h. Course Content:

Sr. No.	**Content**	**Weightage**	**Teaching Hours**
1	Introduction to the Legal System • Law and Legal System • General overview of Constitutional Provisions • Overview of Judicial System • Overview of Civil Procedure Code • Overview of Criminal Procedure Code • Overview of Evidence Law • Overview of Indian Penal Code	25%	15

2	Law Governing Medico Legal Aspects IPC • Indian Evidence act (disclosure of privileged / confidential patient related information before a court of law – under • protest) • Medical Negligence • Consumer Protection Act, 2019 • IPC section 52,80,89,92,93,269 • Adulteration of drugs (IPC Sec 274) • Sales of adulterated drugs (IPC Sec 275) • Sales of drug as different drug or preparation (IPC Sec 276) • Negligent conduct with regard to poisonous substances (IPC Sec 284)	25%	15
3	Laws relating to Medical Profession and Ethics • Indian Medical Council Act • Law Governing Storage / Sale of Drugs and Safe Medication • Laws regulating safety and standard of drugs (Drugs and Cosmetic Act 1940) • Law regulating pricing of Drugs (The Drugs Control Act 1950) • Laws regulating the control of operations relating to narcotic drugs and psychotropic substances (Narcotics and • psychotropic substances Act 1985) • Laws regulating advertising of drugs claiming to have magical properties. (Drugs and magic remedies (objectionable advertisements Act 1954)	25%	15
4	Law Governing to Management of Patients • Laws regulating pre conception and prenatal diagnostic techniques and prohibition of sex selection (PNDT Act 1994 and MTP Act, 1997) • Laws regulating transplantation of organs (Transplantation of Human Organ Act 1994) • Laws relating to STDs (National guidelines for clinical management of HIV / AIDS, NACO, Govt of India.) • The Mental Health Act 1987	25%	15
	Total teaching hours for the academic year	**100%**	**60**

i. T**ext Book and Reference Book:**

1	Law and Medicine By Dr Nandita Adhikari
2	Mulla's Indian Contract Act By Mulla | lexis nexis | 15th, Pub. Year 2015
3	Medical Jurisprudence and Toxicology By Modi

4	The principles of Medical Jurisprudence, Medical and Forensic science and Toxicology By Dr. Parikh and Dr. Mishra
5 **6**	Constitution of India By M.P.Jain Constitution of India By Dr. J.N. Pandey
7	Medical Negligence and compensation By R.K.Bangia

Semester 01

a. Course Name: Health Informatics
b. Course Code: 19010201UE01
c. Prerequisite: Basic knowledge of Digital Health.
d. Rationale: This course is designed to equip novice public health students with the knowledge and skills necessary to deliver efficient informatics-led health care services.
e. Course Learning Objective:

CLOBJ 1	Define health informatics and explain its objectives, uses, and limitations in healthcare systems.
CLOBJ 2	Analyze challenges and advancements in electronic health records and global healthcare standards.
CLOBJ 3	Evaluate and present healthcare data for improved decision-making in healthcare management.
CLOBJ 4	Apply information and communication technologies to enhance public and personal healthcare.
CLOBJ 5	Examine legal, ethical, and governance issues in managing healthcare information.

f. Course Learning Outcomes:

CLO 1	Develop a basic understanding of computer application in patient care and nursing practice.
CLO 2	Apply the knowledge of computer and information technology in public health and healthcare education, practice, administration and research.
CLO 3	Describe the principles of health informatics and its use in developing efficient healthcare.
CLO 4	Demonstrate the use of information system in healthcare settings.

g. Teaching & Examination Scheme:

Teaching Scheme				**Evaluation Scheme**					
L	**T**	**P**	**C**	**Internal Evaluation**			**ESE**		**TOTAL**
				T	**CE**	**P**	**Theory**	**P**	
3	**-**	**2**	**4**	**20**	**20**	**20**	**60**	**30**	**150**

L- Lectures; T- Tutorial; P- Practical; C- Credit; MSE- Mid-Semester Evaluation, CE- Continuous Evaluation, ESE- End Semester Examination

h. Course Content:

Sr. No.	Content	Weightage	Teaching Hours
1	**Introduction to Health Informatics and Principles** • Introduction to Health Informatics and Principles • Health Informatics-Definition • Health informatics – Needs, objectives and limitations • Use of data, information and knowledge for more effective healthcare and better health • Use of computers in public health • Internet, Literature search • Hospital Management Information System (HMIS) Shared Care	25%	13

2	**Shared Care & Electronic Health Records** • Challenges of capturing rich patient histories in a computable form • Latest global developments and standards to enable lifelong electronic health records to be integrated from disparate systems	25%	10
3	Using Information in Healthcare Management • Components of health Information system • Evaluation, analysis and presentation of healthcare data to inform decisions in the management of health-care • organizations • Use of information and communication technology to improve or enable personal and public healthcare • Introduction to public health informatics and role of public health professionals	25%	12
4	Healthcare Quality & Evidence Based Practice • Information Law & Governance • Use of scientific evidence in improving the quality of healthcare and technical and professional informatics • standards • Ethical-legal issues pertaining to healthcare information in contemporary public health practice	25%	10
	Total teaching hours for the academic year	**100%**	**45**

i. List of Practical

1	1. Introduction to Health Informatics and Principles 1. Use of computers in public health & Internet, Literature search - It describe the application of computer in public health. 2. Hospital Management Information System - Helps to understand the hospital information system.
2	Shared Care & Electronic Health Records 1. Visit of Hospital to rule out the challenges and experience of informatics system.
3	Using Information in Healthcare Management 1. Demonstration of Healthcare management tools - Demonstrate the skills of using data in management of health care
4	Healthcare Quality & Evidence Based Practice 1. Information Law & Governance - Apply the knowledge of the principles of digital ethical and legal issues in public health practice.

j. T**ext Book and Reference Book:**

1	Healthcare Digital Transformation- How Consumerism, Technology and Pandemic are Accelerating the Future Edward W. Marx, Paddy Padmanabhan|2020. (Textbook)
2	Thesaurus of Health Informatics, M.C. Sievert (Textbook)
3	Health Informatics Practical Guide, 8th Edition William Hersh|2022
4	Informatics for Health Professionals Kathleen Mastrian, Dee McGonigle|2019 (Textbook)
5	Evidence-Based Health Informatics E. Ammenwerth, M. Rigby|2016 (Textbook)

Semester 01

a. Course Name: Health Care Management
b. Course Code: 06010101UE03
c. Prerequisite: Student having knowledge about principles of management and general Activities of Hospital
d. Rationale: This subject equips students with essential knowledge of the Indian healthcare system, addressing its structure, challenges, marketing strategies, and recent innovations. By blending theory with practical insights, it prepares learners to navigate and lead effectively in the evolving healthcare industry
e. Course Learning Objective:

CLOBJ 1	Understand the structure, challenges, and growth of India's healthcare sector.
CLOBJ 2	Evaluate healthcare delivery models, insurance systems, and applicable medical laws.
CLOBJ 3	Apply modern marketing strategies, including digital and social media, in healthcare promotion.
CLOBJ 4	Analyze recent trends and technological innovations shaping healthcare operations.
CLOBJ 5	Conduct practical assessments of healthcare institutions through visits and surveys.

f. Course Learning Outcomes:

CLO 1	Define the healthcare sector and its significance in the Indian context.
CLO 2	Analyze the current state of healthcare in India, including growth trends in the industry.
CLO 3	Describe the structure of the healthcare system in India.
CLO 4	Identify and analyze the major issues and challenges faced by the healthcare industry in India.
CLO 5	Understand the concept of public healthcare insurance in India.
CLO 6	Understand the modern era of healthcare marketing, including web-based marketing and social media.
CLO 7	Conduct a patient satisfaction survey and analyze the results.

g. Teaching & Examination Scheme:

Teaching Scheme				**Evaluation Scheme**					
L	**T**	**P**	**C**	**Internal Evaluation**			**ESE**		**TOTAL**
				T	**CE**	**P**	**Theory**	**P**	
4	**-**		**4**	**20**	**20**	**-**	**60**	**-**	**100**

L- Lectures; T- Tutorial; P- Practical; C- Credit; MSE- Mid-Semester Evaluation, CE- Continuous Evaluation, ESE- End Semester Examination

h. Course Content:

Sr. No.	**Content**	**Weightage**	**Teaching Hours**

1	**Introduction to Healthcare sector** • Historical Background of Healthcare Management in India • Current State of Healthcare in India and Growth in Healthcare Industry • Structure of the Healthcare System • Characteristics of the Health System in India • Issues and Challenges to Healthcare Industry in India Classification of Hospitals • Developments in Public and Private Healthcare • Role of NGOs in health care of India	20%	12
2	**Various models in health care** • Various models in health care delivery in India and abroad • Public Healthcare Insurance in India • Medical Laws applicable to healthcare sector • Healthcare Infrastructure • Role of Hospitals in Healthcare	20%	12
3	**Healthcare Promotion** • Healthcare Promotion • The Marketing Communication Mix • Marketing of Hospitals in the Modern Era • Role of Marketing and PR • Knowledge-based Marketing: Modern Way of Healthcare Marketing – web-based marketing, social media	20%	12
4	**Recent Trends in Healthcare Sector** • Recent Trends in Healthcare Sector • Re-engineering, Tele-medicine, Artificial Intelligence, Euthanasia, Medical Tourism, Outsourcing, Medical • Transcription, Preventive and Social Medicine, Epidemiology. Robotics, integrated health care delivery, PPP models, home care	20%	12
5	**Practical: 1** • Students can visit a hospital (general/specialty) and prepare a report on the department and operations • of the hospital. 2. Students can compare the government hospital with the private hospital and prepare a report on • comparison. 3. Students can carry out patient satisfaction survey.	20%	12
	Total teaching hours for the academic year	**100%**	**60**

i. T**ext Book and Reference Book:**

1	Health Care Management & Administration (English) 01 Edition By S. L. Goel | Deep & Deep Publications Pvt. Ltd, 2004 | 01
2	Information System For Health Care Management, Health Administration Press. By Austin, Charles J. And Stuart B. Boxerman, | Latest Edition

Semester 01

a. Course Name: Management Of Lifestyle Disorders

b. Course Code: 19010001SE01

c. Prerequisite: Knowledge of Basic Biology and Behavioural Science, up to 12th science level.

d. Rationale: A course on lifestyle disorders for students is immensely essential in this today's era of modern life style. This course will inculcate value of health and wellbeing by adopting healthy lifestyle choices, offering doable preventative and management techniques. This course will also provide access to a range of professional opportunities

e. Course Learning Objective:

CLOBJ 1	**Explain the concept of lifestyle diseases and describe the role of modifiable lifestyle factors**—including diet, physical activity, smoking, alcohol consumption, and stress—in the development and prevention of these conditions.
CLOBJ 2	**Identify the causes, risk factors, signs, symptoms, and prevention strategies** for major lifestyle-related diseases such as obesity, hypertension, coronary heart disease, diabetes mellitus, stroke, cancer, PCOS, and drug addiction.
CLOBJ 3	**Analyze the interrelationship between various lifestyle diseases** and their impact on individual and public health, with a focus on comorbid conditions and long-term complications.
CLOBJ 4	**Evaluate evidence-based approaches and public health strategies** for the control and prevention of lifestyle diseases, including health education, behavioral interventions, and policy measures.
CLOBJ 5	**Demonstrate knowledge of stress management techniques and their significance** in promoting mental and physical well-being as part of an integrated lifestyle disease prevention strategy.

f. Course Learning Outcomes:

CLO 1	**Describe** the concept of lifestyle diseases and **list** the major modifiable risk factors contributing to their development.
CLO 2	**Explain** the etiology, risk factors, signs and symptoms, and preventive measures for common lifestyle diseases such as obesity, hypertension, diabetes, and coronary heart disease.
CLO 3	**Apply** knowledge of lifestyle modification strategies to **suggest** preventive measures for managing conditions like PCOS, stroke, and drug addiction.
CLO 4	**Analyze** the relationship between stress and disease development, and **differentiate** between healthy and unhealthy coping mechanisms.
CLO 5	**Evaluate** public health strategies and individual interventions aimed at reducing the burden of lifestyle diseases and **propose** comprehensive management plans.

g. Teaching & Examination Scheme:

Teaching Scheme				**Evaluation Scheme**					
L	**T**	**P**	**C**	**Internal Evaluation**			**ESE**		**TOTAL**
				T	**CE**	**P**	**Theory**	**P**	
2	**-**	**-**	**2**	**20**	**20**	**-**	**60**	**-**	**100**

L- Lectures; T- Tutorial; P- Practical; C- Credit; MSE- Mid-Semester Evaluation, CE- Continuous Evaluation, ESE- End Semester Examination

h. Course Content:

Sr. No.	**Content**	**Weightage**	**Teaching Hours**

1	• Concept of lifestyle diseases- importance of lifestyle factors in preventing disease development: diet, exercise, smoking, alcohol etc • Causes, risk factors, signs & symptoms, prevention and control • Obesity • Hypertension • Coronary heart disease • Diabetes mellitus	50%	15
2	• Causes, risk factors, signs & symptoms, prevention and control • Drug addiction • Stroke • Cancer • PCOS • Stress Management	50%	15
	Total teaching hours for the academic year	**100%**	**30**

i. Text Book and Reference Book:

1	Lifestyle Diseases: Lifestyle Disease Management, by cliff nyambichu, jeff Lumiri, 2018
2	Lifestyle Medicine for Health and Disease Management by Ziya Altug
3	Lifestyle Medicine by James Rippe, Professor of Medicine, University of Massachusetts Medical School
4	Textbook of Medical Physiology, by Arthur C Guyton, John E Hall Prism Saunders 9th Edion ISBN: 81-7286-034-X.
5	Guide to Prevention of Lifestyle Diseases by R. Kumar, M. Kumar, 2004, Publisher: Deep & Deep Publications

Semester 01

a. Course Name: Climate Change and Sustainable Environment

b. Course Code: 11011401VA01

c. Prerequisite: Shall have the basic knowledge about environmental studies

d. Rationale: Will understand the basic interface between climate change and sustainability.

e. Course Learning Objective:

CLOBJ 1	Understand the scientific principles underlying climate change, including greenhouse gas emissions, global warming potential, and the role of natural and anthropogenic factors.
CLOBJ 2	Analyze the socio-economic impacts of climate change on local and global scales, including effects on communities, economies, ecosystems, and public health.
CLOBJ 3	Evaluate the effectiveness of existing policies, technologies, and initiatives aimed at mitigating climate change and promoting sustainability, considering factors such as feasibility, scalability, and equity.
CLOBJ 4	Apply interdisciplinary approaches to address complex environmental challenges, integrating knowledge from fields such as environmental science, economics, policy analysis, and social justice.
CLOBJ 5	Develop and communicate evidence-based solutions and strategies for advancing sustainability goals, considering the needs and perspectives of diverse stakeholders and fostering collaboration across sectors and disciplines.

f. Course Learning Outcomes:

CLO 1	Identify the complexity and operations of governance systems and processes on international, national, and local levels.
CLO 2	Explain the differences between government and governance and the various ideas and meanings attached to the goal of sustainable development.
CLO 3	Critically analyze policy-making processes in regard to sustainability issues.
CLO 4	Apply high-quality written and verbal communication skills
CLO 5	Work effectively in a team and in tutorial or workshop situations

g. Teaching & Examination Scheme:

Teaching Scheme				**Evaluation Scheme**					
L	**T**	**P**	**C**	**Internal Evaluation**			**ESE**		**TOTAL**
				T	**CE**	**P**	**Theory**	**P**	
2	**-**	**-**	**2**	**20**	**20**	**-**	**60**	**-**	**100**

L- Lectures; T- Tutorial; P- Practical; C- Credit; MSE- Mid-Semester Evaluation, CE- Continuous Evaluation, ESE- End Semester Examination

h. Course Content:

Sr. No.	**Content**	**Weightage**	**Teaching Hours**
1	Unit 1: Introduction to Climate Change Global Climate System Climate Change: Causes and Consequences: Global warming, ozone layer depletion, acid rain, and greenhouse effect case studies: nuclear accidents, chemical disasters, and climatic episodes	33%	10

2	Unit 2: Sustainable Development: Sustainable Development Goals: An overview Climate Change and Sustainable Development: National and State Policies Achieving Sustainable Development Goals: Role of Various Stakeholders Building Partnership for Climate Change and Sustainable Development	34%	10
3	Unit 3: Sustainable Approach to Climate Change: Energy Conservation: Use of Renewable energies: Water, Solar, Wind, Tidal, Geothermal Water conservation techniques: Rain Water Harvesting. Environmental Ethics & Public Awareness: Role of various religions and cultural practices in environmental conservation Sustainable Human Development.	33%	10
	Total teaching hours for the academic year	**100%**	**30**

i. Text Book and Reference Book:

1	Climate Change and Sustainable Development: Prospects for Developing Countries by Anil Markandya, Kirsten Halsnæs
2	Climate Change and Sustainable Development Global Prospective by R. K. Mishra, P. s. Janki Krishna & CH. Lakshmi Kumar
3	This Changes Everything: Capitalism vs The Climate by Naomi Klein

Semester 01

a. Course Name: Introduction of Anesthesia and Critical Care Technology (Theory)
b. Course Code: 19011301AC01
c. Prerequisite: Knowledge of Anatomy and Physiology up to 12th science level
d. Rationale: To address the increasing demand for specialized healthcare professionals capable of administering anesthesia, managing critical care settings, and ensuring patient safety and quality of care in surgical and intensive care settings.
e. Course Learning Objective:

CLOBJ 1	Recognize the significance of the first successful clinical demonstration in the development of anesthesia techniques.
CLOBJ 2	Identify and describe the characteristics, indications, and limitations of inhalational, regional, intravenous, and modern anesthesia techniques.
CLOBJ 3	Perform thorough clinical assessments, including airway, thoracic, abdominal, and neurological assessments, to evaluate patient status in critical care settings.
CLOBJ 4	Demonstrate proficiency in monitoring vital signs such as temperature, SpO2, heart rate, blood pressure, respiratory rate, and urine output to assess patient stability and detect changes in condition.
CLOBJ 5	Demonstrate the ability to perform CPR for adults, children, and infants according to current guidelines, including one- and two-rescuer techniques and apply knowledge of basic life support components and AED use to effectively respond to cardiac arrest and choking incidents

f. Course Learning Outcomes:

CLO 1	Upon completion of the course, students will demonstrate a comprehensive understanding of the historical evolution of anesthesia, including key milestones and the development of different anesthesia techniques.
CLO 2	Graduates will be able to perform thorough clinical assessments in critical care settings, including airway, thoracic, abdominal, and neurological assessments, to accurately evaluate and prioritize patient care.
CLO 3	Students will be proficient in monitoring vital signs such as temperature, SpO2, heart rate, blood pressure, respiratory rate, and urine output, enabling them to detect changes in patient condition and intervene appropriately.
CLO 4	Graduates will possess the knowledge and skills to execute life-saving interventions in emergency situations, including performing CPR for adults, children, and infants, relieving foreign-body airway obstruction, and using an AED effectively.
CLO 5	Upon completion of the course, students will demonstrate the ability to integrate ethical principles and professional standards into their practice, ensuring patient safety, confidentiality, and dignity in anesthesia and critical care settings.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**		**Total**
Lecture Hrs/	**Tutorial Hrs/**	**Lab Hrs/**	**Total Hrs/**	**Credit**	**Internal Marks**	**External Marks**	

Week	Week	Week			T	CE	P	T	P	
3	-	-	3	3	20	20	-	60	-	100

Lect- Lecture, Lab.- Lab, Tut - Tutorial, T - Theory, P - Practical, CE - CE, T - Theory, P – Practical

h. Contents

UNIT	CONTENTS	WEIGHTAGE	HOURS
1.	**INTRODUCTION TO ANESTHESIA** • History of anesthesia • First successful clinical demonstration • Pre-Historic (ether) Era • Inhalational Anaesthetic Era • Regional Anaesthetic Era • Intravenous anaesthetic era • Modern anaesthetic era • Types of Anesthesia	15%	10
2.	**BASIC OF CRITICAL CARE** • What is critical care • Levels of critical care • Clinical Assessment • Airway • Thoracic • Abdominal • Neurological	30%	10
3.	**Vital Signs** • Temperature • SpO2 • Heart Rate • Blood Pressure • Respiratory Rate • Urine Output	15%	10
4.	**BASICS LIFE SUPPORT** • CPR for adults, children, and infants • BLS components • One- and Two Rescuer CPR • AED • Relief of foreign-body airway obstruction (choking) for adults and infants.	40%	15
	Total teaching hours for the academic year	**100%**	**45**

i. Reference Books

1.	Anaesthesia Manual-A. A Pillai
2.	Lee synopsis (Handbook of Anaesthesia)
3.	Clinical Anesthesiology by Morgan
4.	Text Book of anesthesia by Ajay Yadav
5.	Anesthesia equipments and Drugs by AK Paul

Semester 01

a. **Course Name:** Introduction of Anesthesia and Critical Care Technology (Practical)

b. Course Code: 19011301AC02

c. Prerequisite: Knowledge of Anatomy and Physiology up to 12th science level

d. Rationale: To address the increasing demand for specialized healthcare professionals capable of administering anesthesia, managing critical care settings, and ensuring patient safety and quality of care in surgical and intensive care settings.

e. Course Learning Objective:

CLOBJ 1	Recognize the significance of the first successful clinical demonstration in the development of anesthesia techniques.
CLOBJ 2	Identify and describe the characteristics, indications, and limitations of inhalational, regional, intravenous, and modern anesthesia techniques.
CLOBJ 3	Perform thorough clinical assessments, including airway, thoracic, abdominal, and neurological assessments, to evaluate patient status in critical care settings.
CLOBJ 4	Demonstrate proficiency in monitoring vital signs such as temperature, SpO2, heart rate, blood pressure, respiratory rate, and urine output to assess patient stability and detect changes in condition.
CLOBJ 5	Demonstrate the ability to perform CPR for adults, children, and infants according to current guidelines, including one- and two-rescuer techniques and apply knowledge of basic life support components and AED use to effectively respond to cardiac arrest and choking incidents

f. Course Learning Outcomes:

CLO 1	Upon completion of the course, students will demonstrate a comprehensive understanding of the historical evolution of anesthesia, including key milestones and the development of different anesthesia techniques.
CLO 2	Graduates will be able to perform thorough clinical assessments in critical care settings, including airway, thoracic, abdominal, and neurological assessments, to accurately evaluate and prioritize patient care.
CLO 3	Students will be proficient in monitoring vital signs such as temperature, SpO2, heart rate, blood pressure, respiratory rate, and urine output, enabling them to detect changes in patient condition and intervene appropriately.
CLO 4	Graduates will possess the knowledge and skills to execute life-saving interventions in emergency situations, including performing CPR for adults, children, and infants, relieving foreign-body airway obstruction, and using an AED effectively.
CLO 5	Upon completion of the course, students will demonstrate the ability to integrate ethical principles and professional standards into their practice, ensuring patient safety, confidentiality, and dignity in anesthesia and critical care settings.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**		**Total**
Lecture Hrs/	**Tutorial Hrs/**	**Lab Hrs/**	**Total Hrs**	**Credit**	**Internal Marks**	**External Marks**	

Week	Week	Week			T	CE	P	T	P	
-	-	2	2	1	-	-	20	-	30	50

Lect- Lecture, Lab.- Lab, Tut - Tutorial, T - Theory, P - Practical, CE - CE, T - Theory, P – Practical

h. Practical Content

SR.NO	COMPETENCIES	WEIGHTAGE	HOURS
1.	Identification of anesthesia techniques	20%	5
2.	**Patient Identification** • examination • Percussion • Auscultation • Inspection • Palpation	30%	10
3.	Vital signs Monitoring	20%	5
4.	• BLS • CPR • AED	30%	10
	Total Practical hours for the academic year	**100%**	**30**

i. Reference Books

1.	Anaesthesia Manual-A. A Pillai
2.	Lee synopsis (Handbook of Anaesthesia)
3.	Clinical Anesthesiology by Morgan
4.	Textbook of anesthesia by Ajay Yadav
5.	Anesthesia equipments and Drugs by AK Paul

Semester 01

a. Course Name: Introduction To Operation Theatre Technology (T)
b. Course Code: 19010901OT01
c. Prerequisite: Knowledge of up to 12th science level and must Passed
d. Rationale: Basic Operation theatre knowledge is fundamental as it provides a strong foundation for various Healthcare disciplines, promotes problem-solving skills, supports innovation, and opens doors to diverse career opportunities.
e. Course Learning Objective:

CLOBJ 1	To develop skills like how to manage Pre-Operative & Post-operative.
CLOBJ 2	To understand various procedures like bed making, Lifting and Transporting Patients, Bed Side Management.
CLOBJ 3	To know the determinants of Health, Health Indicators of India, Health Team Concept.
CLOBJ 4	To understand the population of India and Family welfare programme in India
CLOBJ 5	To understand the different types, use, care and management of biomedical waste.

f. Course Learning Outcomes:

CLO 1	Know the responsibility of health care personals and hazards faced in the operation theatre & casualty
CLO 2	Understand the different types, use, care and methods of cleaning, composition of dust.
CLO 3	Understand the different types, use, care and management of biomedical waste.
CLO 4	Perform in proper manner all the general surgical procedures like suturing, dressing, related techniques
CLO 5	Helps in various techniques used in operation theatres & casualty

g. Teaching & Examination Scheme:

Teaching Scheme				**Evaluation Scheme**					
L	**T**	**P**	**C**	**MSE**			**ESE**		**Total**
				T	**CE**	**P**	**T**	**P**	
3	**-**	**-**	**3**	**20**	**20**	**-**	**60**	**-**	**100**

L- Lectures; T- Tutorial; P- Practical; C- Credit; MSE- Mid-Semester Evaluation, CE- Continuous Evaluation, ESE- End Semester Examination

h. Course Content:

Sr. No.	**CONTENTS**	**Weightage**	**Teaching Hours**
1	**INTRODUCTION TO HEALTH** • Definition of Health, Determinants of Health, Health Indicators of India, Health Team Concept. • National Health Policy • National Health Programmes (Briefly Objectives and scope) • Population of India and Family welfare programme in India.	20%	9

2	**MEDICINE OUTLINE** • Personnel relationships. Bandaging: Basic turns; • Bandaging extremities; Triangular Bandages and their application. • Position, Bed making, prone, lateral, dorsal, dorsal re-cumbent, Fowler's positions, Comfort measures, Aids and rest and sleep. • Lifting and Transporting Patients: Lifting patients up in the bed. Transferring from bed to wheel • Chair. Transferring from bed to stretcher. • Bed Side Management: Giving and taking Bed pan, Urinal: Observation of stools, urine. • Observation of sputum, understand use and care of catheters, enema giving. • Methods of Giving Nourishment: Feeding, Tube feeding, drips, transfusion • Care of Rubber Goods • Recording of body temperature, respiration and pulse, Simple aseptic technique, sterilization and disinfection. • Surgical Dressing: Observation of dressing procedures.	10%	9
3	**BASICS OF FIRST AID** • Burns • Cuts • Abrasions • Stings • Splinters • Sprains • Strains And others	10%	9
4	**PARAMEDICAL TRAINING IN OPERATION THEATRE** • Introduction to Allied Healthcare Professions • Introduction to Basic Biology • Basic Understanding of Various Zone Of Operation Theater • Undestanding Of Staffing Pattern • Monitoring in the Operation Theatre • Positioning of Pratient • Instrument planning for various surgical procedure and Auxiliary instrumentation. • Operation Theatre Techniques & Procedures • O.T. environment, control of infection scrubbing, theatre cloths including lead apron and goggles • History, pre-operative., Intra operative & post-operative care • Anaesthesia Service.	30%	9

5	**CSSD PROCEDURE** • Cleaning and dusting - methods of cleaning, composition of dust. • General care and testing of instruments- haemostatic forceps, needle, holders, Knife, blade, scissor, use/ abuse, care during surgery. • Disinfectants of instruments and Sterilization- Definition, Methods cleaning agents • Detergents, Mechanical washing, ultrasonic cleaner, lubrication inspection and pitfalls • Various methods of chemical treatment- formalin, glutaraldehyde etc, thermal. • Hot Air oven- dry heat, Autoclaving, steam Sterilization water etc,. UV treatment. • Instrument's Etching, care of micro surgical and titanium instruments Sterilization of equipment - Arthroscopy, Gastro scope, imago Lamp, Apparatus, suction • Apparatus Anaesthetic equipment including endotracheal tubes - • OT Sterilization including Laminar Air flow	30%	9
	Total teaching hours for the academic year	100%	45

i. Text Book and Reference Book:

1	OPERATION THEATER TECHNIQUE ANESTHESIA AND EMERGENCY CARE FOR TECHNICIANS, NURSES & PARAMEDICSBy Vaishali Mohod
2	Textbook of Operation Theatre Technology By MP Sharma
3	Operation Theatre: Assistant Recruitment Exam Guide By Pankaj Singhal
4	Handbook of Operation Theatre Technique Details By Kilpadi / Jaypee Brothers
5	TEXTBOOK OF OPERATION THEATRE TECHNOLOGY By Manjushree Ray

Semester 01

a. Course Name: Introduction To Operation Theatre Technology – I (P)
b. Course Code: 19010901OT02
c. Prerequisite: Knowledge of up to 12th science level and must Passed
d. Rationale: Basic Operation theatre knowledge is fundamental as it provides a strong foundation for various Healthcare disciplines, promotes problem-solving skills, supports innovation, and opens doors to diverse career opportunities.
e. Course Learning Objective:

CLOBJ 1	To develop skill like how to manage Preoperative & Post-operative.
CLOBJ 2	To understand various procedure like bed making, Lifting and Transporting Patients, Bed Side Management.
CLOBJ 3	To know the determinants of Health, Health Indicators of India, Health Team Concept.
CLOBJ 4	To understand the population of India and Family welfare programme in India
CLOBJ 5	To understand the different types, use, care and management of biomedical waste.

f. Course Learning Outcomes:

CLO 1	Know the responsibility of health care personals and hazards faced in the operation theatre & casualty
CLO 2	Understand the different types, use, care and methods of cleaning, composition of dust.
CLO 3	Understand the different types, use, care and management of biomedical waste.
CLO 4	Perform in proper manner all the general surgical procedures like suturing, dressing, related techniques
CLO 5	Helps in various techniques used in operation theatres & casualty

g. Teaching & Examination Scheme:

Teaching Scheme				**Evaluation Scheme**					
L	**T**	**P**	**C**	**MSE**			**ESE**		**Total**
				T	**CE**	**P**	**T**	**P**	
-	**-**	**2**	**1**	**-**	**-**	**20**	**-**	**30**	**50**

L- Lectures; T- Tutorial; P- Practical; C- Credit; MSE- Mid-Semester Evaluation, CE- Continuous Evaluation, ESE- End Semester Examination

h. Course Content:

Sr. No.	**Content**	**Weightage**	**Teaching Hours**
1.	• Students will observe the basic operations of the operation theatre while interacting with the multidisciplinary team members involved in providing optimal care to the patients. • Bandaging • Positioning	50%	10

2.	• Lifting and Transporting Patients • Bed Side Management • Methods of Giving Nourishment • Care of Rubber Goods • Vital Sign	25%	10
3.	• Surgical Dressing • O.T Sterilization • Cleaning and Dusting of Instruments • OT Sterilization	25%	10
	Total teaching hours for the academic year	**100%**	**30**

i. Text Book and Reference Book:

1	OPERATION THEATER TECHNIQUE ANESTHESIA AND EMERGENCY CARE FOR TECHNICIANS, NURSES & PARAMEDICSBy Vaishali Mohod
2	Textbook of Operation Theatre Technology By MP Sharma
3	Operation Theatre: Assistant Recruitment Exam Guide By Pankaj Singhal
4	Handbook of Operation Theatre Technique Details By Kilpadi / Jaypee Brothers
5	TEXTBOOK OF OPERATION THEATRE TECHNOLOGY By Manjushree Ray

Semester 01

a. Course Name: Introduction to Nanotechnology and its Applications in Healthcare
b. Course Code: 03011301NT01
c. Prerequisite: This course will equip the students with the knowledge and skills needed to understand and harness the groundbreaking potential of nanotechnology in revolutionizing healthcare, addressing critical global health challenges, and fostering innovation in the field.
d. Rationale: Nanotechnology is used to conduct sensitive medical procedures. Nanotechnology is showing successful and beneficial uses in the fields of diagnostics, disease treatment, regenerative medicine, gene therapy, dentistry, oncology, the aesthetics industry, drug delivery, and therapeutics.
e. Course Learning Objective:

CLOBJ 1	To Understand the foundational principles of nanotechnology and its application in healthcare, including the manipulation of materials at the nanoscale and the utilization of nanomaterials in various medical contexts such as diagnostics, drug delivery, and regenerative medicine.
CLOBJ 2	To Analyze the role of nanotechnology in addressing critical global health challenges, including infectious diseases, cancer, and degenerative conditions, by exploring case studies and current research advancements in the field.
CLOBJ 3	To Develop critical thinking skills to evaluate the ethical, societal, and environmental implications of nanotechnology in healthcare, considering factors such as safety, accessibility, and equity, and propose strategies for responsible implementation and innovation in this rapidly evolving field.

f. Course Learning Outcomes:

CLO 1	Students will understand the characteristics of, and manipulation of nanoscale materials and how they can be exploited for new applications.
CLO 2	Students will learn about exciting applications of nanotechnology at the leading edge of scientific research.
CLO 3	Students will apply their knowledge of nanotechnology to a topic of personal interest in the use of diagnostic and Nano-medicine purpose.
CLO 4	This is an interdisciplinary and emerging area. This course introduces the students to the new and novel applications to solve biomedical problems through nanotechnology.

g. Teaching & Examination Scheme:

Teaching Scheme				**Evaluation Scheme**					
L	**T**	**P**	**C**	**Internal Evaluation**			**ESE**		**Total**
				T	**CE**	**P**	**Theory**	**P**	
3	**1**	**-**	**4**	**20**	**20**	**-**	**60**	**-**	**100**

L- Lectures; T- Tutorial; P- Practical; C- Credit; MSE- Mid-Semester Evaluation, CE- Continuous Evaluation, ESE- End Semester Examination

h. Course Content:

Sr. No.	**Content**	**Weightage**	**Teaching Hours**

1	**Introduction of Nanotechnology:** • Nanoscience, Nanomaterials, differentiate between nano and bulk materials, Classification of Nanostructured materials; Zero-dimension, one dimension, two dimension and three-dimension nanomaterials. • Characteristic properties of materials at the nanoscale; Physical, chemical, optical, mechanical properties of nanomaterials (e.g. carbon nanotube, polymers, Metals and Metal-oxide nanomaterial).	35%	12
2	**Nanomaterials for Healthcare:** • Properties of nanomaterials requirement for healthcare, Types of nanomaterials (organic and inorganic), Interaction of nanomaterials with biological systems, Biocompatibility and toxicity considerations. • Antimicrobial nanoparticles	25%	10
3	**Application of Nanotechnology in healthcare:** • Nanotechnology in drug delivery, Nanoparticles and Nano carriers for drug delivery. • Targeted drug delivery and controlled release systems. • Nano carriers and their advantages, Nano-probes and contrast agents' requirement for medical field, Nanoparticle for cancer therapy.	25%	11
4	**Nanotechnology use for diagnostic:** • Nanotechnology for diagnostic purpose, Point-of-care diagnostics, Nanoparticle for cancer therapy, Hyperthermia and photothermal therapy, Nanoparticle-based imaging agents. • Environmental and safety concerns of nanomaterials. • Regulatory aspects of nanotechnology in healthcare.	15%	12
	Total teaching hours for the academic year	**100%**	**45**

i. Text Book and Reference Book:

1.	Nano: The Essential, Understanding the nanoscience and nanotechnology By T. Pradeep
2.	Application of Nanotechnology in Biomedical Application By Faheem A. Sheikh
3.	Application of Nanomaterials in Human Health By Firdos Alam Khan

Semester 01

a. Course Name: **Programming in Python**
b. Course Code: **03010501AM01**
c. Prerequisite: Basic Programming concepts.
d. Rationale: This subject will help the students to learn various aspects of Python programming

e. Course Learning Objective:

CLO1	Grasp the core concepts of Python programming, including its applications, environment setup, and basic syntax.
CLO2	Develop skills in using conditional statements and loops to create logical program flows
CLO3	Gain proficiency in reading and writing files, and working with structured data formats like CSV and JSON
CLO4	Learn how to write reusable functions, work with Python's built-in data structures
CLO5	Explore advanced data manipulation techniques, numerical computing with NumPy, and dataset handling using Pandas.

f. Course Outcomes:

CO1	Write and execute python code in command line.
CO2	Debug errors in Python Programming.
CO3	Apply concept of object oriented programming to the real life applications.

g. Teaching and Examination Scheme

Teaching Scheme					Examination Scheme					Total
					Internal Marks			External Marks		
Lecture Hrs /Week	Tutorial Hrs/ Week	Lab Hrs /Week	Hrs /Week	Credit	T	CE	P	T	P	
3	-	-	3	3	20	20	-	60	-	100

h. Course Content

Sr.	Topics	Weightage	Hours
1	Introduction to Python: Overview of Python and its applications, Setting up the Python environment, Variables, data types, and basic operations, Control structures: if-else statements and loops	25%	11
2	Functions and Modules and Data Structures in Python: Writing and using functions in Python, Introduction to modules and packages, Creating and importing custom modules, Lists, tuples, sets, and dictionaries, List comprehensions and other data manipulation techniques, Working with strings	30%	13
3	File Handling:Reading and writing files in Python, Working with CSV and JSON data formats	15%	09
4	NumPy for Numerical Computing and Data Manipulation with Pandas: Introduction to NumPy arrays and operations, Array slicing and reshaping, NumPy for mathematical computations, Introduction to Pandas DataFrames and Series, Data cleaning, filtering, and aggregation, Merging and joining datasets	30	12
	Total teaching hours for the academic year	**100%**	**45**

i. Text Book and Reference Book:

1.	Fluent Python, 2nd Edition by Luciano Ramalho (TextBook)
2.	Learn Python3 the Hard Way By Zed Shaw
3.	Introducing Python by Lubanovic Bill, O' ReILLY
4.	Beginning Python: Using Python 2.6 and Python 3.1 By James Payne | Wrox Publication

Semester 01

a. Course Name: **Programming in Python Lab**
b. Course Code: **03010501AM02**
c. Prerequisite: Basic Programming concepts.
d. Rationale: This subject will help the students to learn various aspects of Python programming

e. Course Learning Objective:

CLO1	Apply Python syntax and programming concepts through practical exercises to solve real-world problems.
CLO2	Write reusable functions and explore Python modules to optimize code efficiency and organization.
CLO3	Work with file handling techniques for reading, writing, and managing structured data formats like CSV and JSON.
CLO4	Utilize NumPy arrays for mathematical operations, data transformations, and efficient computation handling.
CLO5	Perform data cleaning, filtering, aggregation, and visualization using Pandas to extract meaningful insights.

f. Course Outcomes:

CO1	Write and execute python code in command line
CO2	Debug errors in Python Programming.
CO3	Apply concept of object oriented programming to the real life applications

g. Teaching and Examination Scheme

Teaching Scheme					Examination Scheme					Total
					Internal Marks			External Marks		
Lecture Hrs /Week	Tutorial Hrs/ Week	Lab Hrs /Week	Hrs /Week	Credit	T	CE	P	T	P	
-	-	2	2	1	-	-	20	-	30	50

h. Course Content

Sr.	Topics	Weightage	Hours
1	WAP to read and display the following information. Name, Address, Phone no	10%	3
2	WAP to read two numbers from the keyboard and display the larger one on the screen.	05%	3
3	WAP to find, a given number is PRIME or NOT.	10%	3
4	Write a Function to swap values of a pair of integers	10%	3
5	WAP to find N! Using function.	05%	3
6	WAP to print Fibonacci series of ‘n’ numbers, where n is given by the programmer	10%	1
7	WAP to read a set of numbers in an array & to find the largest of them	05%	3
8	WAP to sort a list of names in ascending order	10%	3
9	WAP to read a set of numbers from keyboard & to find the sum of all elements of the given array using a function.	05%	1
10	Calculate area of different geometrical figures (circle, rectangle, square, and triangle).	10%	2
11	WAP to increment the employee salaries on the basis of their designation (Manager-5000, General Manager-10000, CEO20000, worker-2000). Use employee name, id, designation and salary as data member and inc_sal as member function	10%	2
12	Create two classes namely Employee and Qualification. Using multiple inheritance derive two classes Scientist and Manager. Take suitable attributes & operations. WAP to implement this class hierarchy.	05%	1
13	WAP to read data from keyboard & write it to the file. After writing is completed, the file is closed. The program again opens the same file and	05%	2

	reads it.		
	Total teaching hours for the academic year	**100%**	**30**

i. Text Book and Reference Book:

1.	Fluent Python, 2nd Edition by Luciano Ramalho (TextBook)
2.	Learn Python3 the Hard Way By Zed Shaw
3.	Introducing Python by Lubanovic Bill, O' ReILLY
4.	Beginning Python: Using Python 2.6 and Python 3.1 By James Payne | Wrox Publication

Semester 01

a. Course Name: Anatomy & Physiology-I (T)

b. Course Code: 19010001DS01

c. Prerequisite: Knowledge of Anatomy and Physiology up to 12th science level

d. Rationale: Basic Operation theatre knowledge is fundamental as it provides a strong foundation for various Healthcare disciplines, promotes problem-solving skills, supports innovation, and opens doors to diverse career opportunities.

e. Course Learning Objective:

CLOBJ 1	Explain contributions of organs and systems to the maintenance of homeostasis
CLOBJ 2	Use anatomical terminology to identify and describe locations of major organs of each system covered
CLOBJ 3	Explain interrelationships among molecular, cellular, tissue, and organ functions in each system.
CLOBJ 4	Identify causes and effects of homeostatic imbalances.
CLOBJ 5	Describe the interdependency and interactions of the systems

f. Course Learning Outcomes:

CLO 1	Be able to accurately and confidently use anatomical and physiological terms to describe the human body.
CLO 2	Gain a basic understanding of the major body systems and their roles in maintaining homeostasis.
CLO 3	Gain an understanding of how the structure of different body parts is directly related to their function.
CLO 4	Be able to use your understanding of anatomy and physiology to explain common health phenomena and make informed decisions about your own health.
CLO 5	Improve your ability to think critically, analyse information, and solve problems related to anatomy and physiology.

g. Teaching & Examination Scheme:

Teaching Scheme				**Evaluation Scheme**					
L	**T**	**P**	**C**	**MSE**			**ESE**		**Total**
				T	**CE**	**P**	**T**	**P**	
4	**-**	**-**	**4**	**20**	**20**	**-**	**60**	**-**	**100**

L- Lectures; T- Tutorial; P- Practical; C- Credit; MSE- Mid-Semester Evaluation, CE- Continuous Evaluation, ESE- End Semester Examination

h. Course Content:

Sr. No.	**PART-A (ANATOMY) Content**	**Weightage**	**Teaching Hours**

1	**Introduction, Terminology and Skeletal System.** • Define anatomical position; anatomical planes & its directional terms; positions; movements. • Enumerate different sub-branches in Anatomy. • Overview of human skeleton; types of bones with examples; types of cartilage with examples; structure and parts of a typical long bone; identify individual bones of the skeleton & their main structural features.	30%	10
2	**Outline of Tissues and Muscular System:** • Differentiate between the various types of tissues. • Classify the muscles based on different criteria, with examples. • Identify major muscles of different regions of the body.	30%	10
3	**Identify and draw the organs of Respiratory tract:** • Know the basic structural features of the organs of respiratory tract. • Structures of heart; identify the major blood vessels.	40%	10
	Total teaching hours for the academic year	**100%**	**30**

	PART-B (Physiology) Content		
4	**Outline of General physiology, Cell physiology, Blood and Immunity:** • Structure of cell • Cell organelles and functions • Biomolecules of the cell • Cellular transport mechanism • Membrane Potentials	30%	10
5	**Unit-2: Outline of Blood:** • Composition of blood. • Functions of blood. • Body fluids and types of fluids compartments. • Coagulation, Platelets and its functions, Anemia, • Blood indices, Anti coagulation. • ESR, WBC and its functions. • Immunity.	30%	10
6	**Outline of Cardiovascular System:** • Structural organization of Cardiovascular System. • Functions of Cardiovascular System. • Cardiac Cycle, ECG, Blood Pressure, Cardiovascular Soak.	40%	10
	Total teaching hours for the academic year	**100%**	**30**

i. Text Book and Reference Book:

1	Garg K, B.D.Chaurasia's Human Anatomy Regional & Applied, Dissection & Clinical. Upper limb & Thorax
2	ANATOMY & PHYSIOLOGY By ROSS AND WILSON
3	General Anatomy by B.D. Chaurasia
4	Principles of anatomy and physiology by Tortora
5	Human anatomy and Physiology with Health Education by Padma B Sanghani

Semester 01

a. Course Name: Foundation of Medical Laboratory Science (MLS) (T)
b. Course Code: 19010601DS05
c. Prerequisite: Knowledge of Medical Laboratory Sciences up to 12th science level
d. Rationale: Understanding the fundamentals of medical laboratories is essential since it gives a solid basis for many medical specialties, fosters creativity, encourages problem -solving abilities, and opens doors to a variety of career options.

e. Course Learning Objective:

CLOBJ 1	The students will be studying about fundamentals of Medical Laboratory sciences.
CLOBJ 2	The students will be studying about introduction of healthcare system.
CLOBJ 3	The students will be studying about Ethical Principles and Standards of Laboratory.
CLOBJ 4	The students will be studying about demonstration of various instruments.
CLOBJ 5	The students will be studying about collection and processing of samples.

f. Course Outcomes:

CLO 1	After Learning the Course, the students shall be able to learn overview of different working setup of Diagnostic Laboratory.
CLO 2	After Learning the Course, the students shall be able to learn collection and process of sample.
CLO 3	After Learning the Course, the students shall be able to Remember various instrumentation in the laboratory.
CLO 4	After Learning the Course, the students shall be able to understand Ethics and standards.
CLO 5	After Learning the Course, the students shall be able to understand Good Laboratory Practice.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					
					Internal Marks			**External Marks**		**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**T**	**CE**	**P**	**T**	**P**	
3	-	-	3	3	20	20	-	60	-	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	**Introduction to healthcare delivery system** ● Healthcare delivery system in India at primary, secondary and tertiary care ● National Health Mission National ● Health Policy E.g., Issues in Health Care Delivery System in India	30%	15
2	**Common laboratory associated hazards and biosafety measures including radiation hazards.** Subject specific role of a medical lab. professional: **a. Microbiology** ● Role of microbes in human health ● Overview of the role of Medical Laboratory Professionals in	30%	15

	Medical Microbiology ● Bio-safety in Microbiology ● Bio medical waste management **b. Haematology** ● Introduction to Haematological diseases ● Overview of the role of medical lab. professional in Haematology Bio-safety in Haematology **c. Histopathology** ● Introduction to Tumour pathology ● Overview of the role of medical lab. professional in Histopathology ● Biosafety in Histopathology **d. Biochemistry** ● Introduction to metabolic disorders ● Overview of the role of the medical lab. professional in Clinical Biochemistry ● Bio-safety in Clinical Biochemistry		
3	**Ethical Principles and standards for a clinical laboratory professional** ● Duty to the patient ● Duty to colleagues and other professionals ● Duty to the society **Good Laboratory Practice (GLP) Regulations and Accreditation** ● Introduction to Basics of GLP and Accreditation ● Aims of GLP and Accreditation ● Advantages of Accreditation ● Brief knowledge about National and International Agencies for clinical laboratory accreditation **Awareness / Safety in a clinical laboratory** ● General safety precautions ● HIV: pre- and post-exposure guidelines ● Hepatitis B & C: pre- and post-exposure guidelines ● Drug Resistant Tuberculosis **Patient management for clinical samples collection, transportation and preservation, sample accountability** ● Purpose of accountability ● Methods of accountability ● Sample analysis ● Introduction ● Factors affecting sample analysis	40%	15
	Total teaching hours for the academic year	**100%**	**45**

i. Text Book and Reference Book:

1.	Clinical Laboratory Science Review by Robert R. Harr MS MLS (ASCP)
2.	A.N. Tripathy, 2003, Human Values, New Age International Publishers
3.	R. R. Gaur, R Sangal, GP Bagaria, 2009, a Foundation Course in Value Education
4.	E.F. Schumacher, 1973, Small is Beautiful: A study of Economics as if people mattered, Blond & Briggs, Britain.
5.	A. Nagraj, 1998, Jeevan Vidyaek Parichay, Divya Path Sansthan, Amarkantak.
6.	P.L. Dhar, R.R.Gaur, 1990, Science and Humanism, Commonwealth Publishers.

Semester 01

a. Course Name: Foundation of Medical Laboratory Science (MLS) (P)
b. Course Code: 19010601DS06
c. Prerequisite: Knowledge of Medical Laboratory Sciences up to 12th science level
d. Rationale: Understanding the fundamentals of medical laboratories is essential since it gives a solid basis for many medical specialties, fosters creativity, encourages problem -solving abilities, and opens doors to a variety of career options.

e. Course Learning Objective:

CLOBJ 1	The students will be studying about fundamentals of Medical Laboratory sciences.
CLOBJ 2	The students will be studying about introduction of healthcare system.
CLOBJ 3	The students will be studying about Ethical Principles and Standards of Laboratory.
CLOBJ 4	The students will be studying about demonstration of various instruments.
CLOBJ 5	The students will be studying about collection and processing of samples.

f. Course Outcomes:

CLO 1	After Learning the Course, the students shall be able to learn overview of different working setup of Diagnostic Laboratory.
CLO 2	After Learning the Course, the students shall be able to learn collection and process of sample.
CLO 3	After Learning the Course, the students shall be able to Remember various instrumentation in the laboratory.
CLO 4	After Learning the Course, the students shall be able to understand Ethics and standards.
CLO 5	After Learning the Course, the students shall be able to understand Good Laboratory Practice.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		
					T	**CE**	**P**	**T**	**P**	
-	-	2	2	1	-	-	20	-	30	50

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	Introduction and visit to the Hospital. Demonstration and visit to the Central Diagnosis laboratory.	25%	10
2	Introduction and demonstration of bio-safety instruments of all labs. Performance and Demonstration of Biomedical Waste Management. Demonstration of all instrumentation and glassware used in the laboratory.	50%	10
3	Performance and Demonstration of general Safety Precautions. Performance of various Sample collection Techniques. Performance of all sample processing techniques	25%	10
	Total teaching hours for the academic year	**100%**	**30**

i. Text Book and Reference Book:

1.	Clinical Laboratory Science Review by Robert R. Harr MS MLS (ASCP)
2.	A.N. Tripathy, 2003, Human Values, New Age International Publishers
3.	R. R. Gaur, R Sangal, GP Bagaria, 2009, a Foundation Course in Value Education
4.	E.F. Schumacher, 1973, Small is Beautiful: A study of Economics as if people mattered, Blond & Briggs, Britain.
5.	A. Nagraj, 1998, Jeevan Vidyaek Parichay, Divya Path Sansthan, Amarkantak.
6.	P.L. Dhar, R.R.Gaur, 1990, Science and Humanism, Commonwealth Publishers.

Semester 02

a. Course Name: **Basic English - II**
b. Course Code: 00019302AE04
c. Prerequisite: Knowledge of Basic English-I
d. Rationale: Knowledge of Communication is essential for students

e. Course Learning Objective:

CLOBJ 1	Develop basic proficiency in English language skills including reading, writing, speaking, and listening, with an emphasis on comprehension and fluency.
CLOBJ 2	Expand vocabulary through the acquisition of common words and phrases used in everyday communication, including greetings, introductions, and expressions for daily activities.
CLOBJ 3	Gain a solid understanding of basic grammar rules, including sentence structure, verb tenses, parts of speech, and word order, to construct grammatically correct sentences and communicate effectively.
CLOBJ 4	Improve pronunciation and intonation to enhance clarity and intelligibility in spoken English, focusing on accurate articulation of sounds, stress patterns, and rhythm.
CLOBJ 5	Develop confidence and proficiency in engaging in everyday conversations in English, including asking and answering questions, expressing opinions, making requests, and participating in discussions on familiar topics.

f. Course Outcomes:

CLO 1	Construct grammatically correct sentences.
CLO 2	Develop and deliver professional presentation skills
CLO 3	Develop confidence in speaking skills.
CLO 4	Develop the skills of critical thinking.
CLO 5	Compose different types of written communication.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs/Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		**Total**
					T	**CE**	**P**	**T**	**P**	
2	-	-	2	2		100	-	-	-	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	**Definition, Importance and Process of Communication** Definition of Communication & Importance of Communication Definition and process of communication	7%	2
2	**Levels and Flow of Communication** Levels of Communication Flow of Communication	7%	2
3	**Barriers and features of Effective Communication** Barriers to effective Communication Features of effective Communication	7%	2
4	**Non-verbal Communication and Kinesics** Define non-verbal communication Kinesics	3%	1
5	**Proxemics, Paralinguistic and Chronemics**	3%	1

	Proxemics Paralinguistic Chronemics		
6	**Error Analysis (**Tenses, voices & Reported speech**)**	7%	2
7	**Reading Practice (**Reading Comprehension)	3%	1
8	**Vocabulary Building** Idioms Phrases Synonyms Antonyms	7%	2
9	**Theatrics (Role Play)**	16%	5
10	**Extempore**	16%	5
11	**Application writing**	10%	3
12	**Letter Writing (**Elements, Layouts, Inquiry, Complaint, & Adjustment)	14%	4
	Total	**100%**	**30**

i. Text Book and Reference Book:

1.	Business Correspondence and Report Writing By SHARMA, R. AND MOHAN, K
2.	Practical English Usage by MICHAEL SWAN
3.	A Remedial English Grammar for Foreign Student by F.T. WOOD
4.	On Writing Well by William Zinsser | Harper Paperbacks,2006 | 30th anniversary edition
5.	Oxford Practice Grammar, By John Eastwood | Oxford University Press
6.	Sanjay Kumar, Pushp Lata, Communication Skills, Oxford University Press
7.	Technical Communication: Principles And Practice by Sangeetha Sharma, Meenakshi Raman | Oxford University Press

Semester 02

a. Course Name: **Basic Hindi - II**
b. Course Code: **00019302AE05**
c. Prerequisite: Basic communication skills in Hindi
d. Rationale: Basic comprehensive skills Hindi

e. Course Learning Objective:

CLOBJ 1	Learn to recognize and write Devanagari script. Understand the basics of Hindi pronunciation, including consonants, vowels, and pronunciation rules.
CLOBJ 2	Build a foundation of commonly used Hindi vocabulary for everyday communication.
CLOBJ 3	Develop the ability to engage in simple conversations in Hindi, including greetings, introductions, and expressing basic needs and preferences.
CLOBJ 4	Learn to read and understand simple texts in Hindi, including signs, labels, short passages, and basic literature.
CLOBJ 5	Practice writing in Hindi through exercises such as dictation, composition, and letter/email writing.

f. Course Outcomes:

CLO 1	Read and write Hindi alphabets
CLO 2	Comprehend Hindi language through listening
CLO 3	Introduce self in Hindi language.
CLO 4	Communicate at elementary level in Hindi.
CLO 5	To understand and use daily words in Hindi

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					
					Internal Marks			**External Marks**		
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**T**	**CE**	**P**	**T**	**P**	**Total**
2	-	-	-	2	-	100	-	-	-	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	उUत शब्दावली (Advanced vocabulary) संख्या (Numbers) (51 onwards) समय (Telling Time) अहिवादन (Greetings)	13%	4
2	श्रवर् कौशल (Listening skills) • लघु कथा ((Short Story) छोटी बातचीत ((Short Conversation)	20%	6

3	बोलने की कुशलताएं (Speaking Skills) • आत्म पररचय (Self Introduction) • ि दन हप ि दन बातचीत (Day to day conversation) वाि ममता (Elocution)	27%	8
4	पढ़ने के कौशल (Reading Skills)	20%	6
	• समझबझू हक पढ़ना (Reading Comprehension) • लघु कथा (Short Story) अखहबा का लेख (Newspaper article)		
5	लेखन कौशल (Writing skills) • आत्म पररचय (Self Introduction) लघु सन्देश (Short message)	20%	6
	Total	**100%**	**30**

i. Text Book and Reference Book:

1.	Hindi for Beginners published by UpToSchoolWorksheets
2.	Hindi Abhyaas Pustika by Seema Verma, Published by Trishala Learning System pvt.
3.	NCERT Workbook of Hindi for Grade-2
4.	Rachnatmak Vyakaran by Suresh Pant and Himani Joshi, Published by Pearson.
5.	Matra Gyan, Published by Wonder House Books
6.	Amoli Hindi Vyakaran by Dr. Nirmal Dalal

Semester 02

a. Course Name: Basic Gujarati-II
b. Course Code: 00019302AE06
c. Prerequisite: Basic communication skills in Hindi
d. Rationale: Basic comprehensive skills Hindi

e. Course Learning Objective:

CLOBJ 1	Learn to recognize and write Devanagari script. Understand the basics of Gujarati pronunciation, including consonants, vowels, and pronunciation rules.
CLOBJ 2	Build a foundation of commonly used Gujarati vocabulary for everyday communication.
CLOBJ 3	Develop the ability to engage in simple conversations in Gujarati, including greetings, introductions, and expressing basic needs and preferences.
CLOBJ 4	Learn to read and understand simple texts in Gujarati, including signs, labels, short passages, and basic literature.
CLOBJ 5	Practice writing in Gujarati through exercises such as dictation, composition, and letter/email writing.

f. Course Outcomes:

CLO 1	Read and write Gujarati alphabets
CLO 2	Comprehend Gujarati language through listening
CLO 3	Introduce self in Gujarati language.
CLO 4	Communicate at elementary level in Gujarati.
CLO 5	To understand and use daily words in Gujarati

g. Teaching and Examination Scheme

Teaching Scheme					Examination Scheme					Total
					Internal Marks			External Marks		
Lecture Hrs /Week	Tutorial Hrs/ Week	Lab Hrs /Week	Hrs /Week	Credit	T	CE	P	T	P	
2	-	-	-	2	-	100	-	-	-	100

h. Course Content

Sr.	Topics	Weightage	Hours
1	અઘરા શબ્દો (Advanced vocabulary) • સંખ્યાઓ (Numbers) (51 onwards) • સમય (Telling time) શુભેચ્છાઓ (Greetings)	13%	4
2	શ્રવણ કૌશલ્ય (Listening Skills) • ટૂંકી વાા્ (Short Story) ટૂંકી વાર્ીા્ (Short Conversation)	20%	6
3	બોલવાની કુશળતા (Speaking Skills) • પોા્નો પરરચય (Self Introduction) • રોરરંદી વાર્ીા્ (Day to day conversation) વG્ૃત્વ (Elocution)	27%	8

4	વાંચન કુશળતા (Reading Skills) • વાંચન સરમ (reading comprehension) • ટૂંકી વાા્ (Short Story) અખબાર નો લેખ (Newspaper article)	20%	6
5	લેખન કૌશલ્ય (Writing skills)	20%	6
	• પો્નો પરરચય (Self Introduction) ટૂંકો સંદેશ (Short message)		
	Total	**100%**	**30**

i. Text Book and Reference Book:

1.	All in One (English-Gujarati), Manoj Publications
2.	Gujarati Barakhadi by Sonika Agrawal, Published by Notion Press
3.	Varna Lekhan by Gujarati Books
4.	My first Gujarati alphabets by Priyal J., Published by My first Picture Book Inc.

Semester 02

a. Course Name: Introduction to Gender, Health and Rights

b. Course Code: 10010102UE01

c. Prerequisite: Basic understanding of social sciences and a commitment to engaging with issues related to gender and equality.

d. Rationale: The students will be able to learn skills necessary to understand, critique, and contribute to discussions on gender in diverse societal contexts. Provides a comprehensive and in-depth examination of gender-related issues, encompassing theoretical foundations, historical perspectives, and contemporary challenges

e. Course Learning Objective:

CLOBJ 1	Understand the foundational concepts of gender, including the distinction between gender and sex, the dynamics of gender roles, and the influence of patriarchy on societal structures.
CLOBJ 2	Analyze and critique the phenomenon of gender stereotyping, examining its impact on individuals and society, while also exploring feminist perspectives and strategies for challenging stereotypes.
CLOBJ 3	Evaluate the intersectionality of gender and health, considering both biological and social determinants, and recognize the implications for mental health issues within different gender contexts.
CLOBJ 4	Investigate gender disparities in access to healthcare and health outcomes, including the examination of gender-based inequalities, male-female sex ratios, and the impact of societal structures on health provision.
CLOBJ 5	Assess the concept and implementation of gender mainstreaming, tracing its origins, understanding its significance as a paradigm shift in policy-making, and examining the processes involved in integrating gender perspectives into various sectors of society.

f. Course Outcome:

CLO 1	Determine when sex and/or gender are and are not relevant to a health issue
CLO 2	Identify the importance of both sex and gender in health and healthcare.
CLO 3	Recognize the value of bringing multiple disciplines to bear on a given health question.
CLO 4	Imagine how sex/gender can provide innovative approaches to health.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		
					T	**CE**	**P**	**T**	**P**	
4	**-**	**-**	**4**	**4**	**20**	**20**	**-**	**60**	**-**	**100**

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	**Understanding Gender** Definitions and Concepts: gender and sex Gender roles Masculinity & Femineity Public and Private Distinction Patriarchy	20%	10

2	**Gender Stereotyping -** Stereotyping Feminism Gender Based Violence Case Study	20%	10
3	**Gender and Health** Biological Factors in Health Social Factors in Health Mental Health Issues	20%	10
4	**Gender approaches to health** Gender inequality and health Male Female Sex Ratio Access to Health care	20%	10
5	**Gender Mainstreaming** Concept and Origin Paradigm Shift Process of gender mainstreaming	10%	10
6	**Gender and rights** Origin and concept of rights Constitution and legislative safeguards, Women and rights	10%	10
	Total	**100%**	**60**

i. Text Book and Reference Book:

1.	Handbook on Gender and Health, Edited by Jasmine Gideon, Professor of Global Health and Development, School of Social Sciences, Birkbeck, University of London, UK
2.	Gender Equality and Human Rights, by Dr. Tanmoy Rudra
3.	Gender and Health: The Effects of Constrained Choices and Social Policies, by Chloe E. Bird and Patricia P. Rieker
4.	Gender, health communications and reproductive health in international development, by Dr. Carolina Matos
5.	Women, Gender, And Human Rights: A Global Perspective by Marjorie Agosin

Semester 02

a. Course Name: Life style Diseases & Management
b. Course Code: 09010102UE01Y
c. Prerequisite: Shall have the basic knowledge about lifestyle disease conditions.
d. Rationale: Will gain knowledge regarding lifestyle disease and its management

e. Course Learning Objective:

CLOBJ 1	Define and classify lifestyle diseases, analyze their risk factors, and evaluate their global health impact.
CLOBJ 2	Study cardiovascular diseases, Type 2 diabetes, obesity, and respiratory conditions, focusing on prevention, lifestyle interventions, and pharmacological management.
CLOBJ 3	Develop strategies for healthy dietary patterns, physical activity regimens, smoking cessation, and stress management techniques to prevent and manage lifestyle diseases.
CLOBJ 4	Evaluate the role of medications, adherence factors, emerging technologies, and digital tools in managing lifestyle diseases.
CLOBJ 5	Tailor interventions to cultural sensitivities, promote health equity, and explore government policies and community engagement strategies for lifestyle disease prevention.

f. Course Outcomes:

CLO 1	Obtain knowledge and understanding of health, nutrition, lifestyle and associated diseases
CLO 2	Identify the various causes and danger signs of lifestyle-associated disease such atherosclerosis, hypertension, stroke, diabetes, obesity, and Lung conditions.
CLO 3	Describe the techniques for diagnosing the illnesses and learn the fundamentals of how to interpret test results.
CLO 4	Clearly state the approaches to illness management, prevention, and treatment.
CLO 5	Identify healthy & unhealthy Lifestyle habits. Adopts Healthy Lifestyle for daily living.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		
					T	**CE**	**P**	**T**	**P**	
4	-	-	4	4	20	20	-	60	-	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	**Unit 1: Introduction to Lifestyle Diseases** Definition and classification of lifestyle diseases Common risk factors: diet, physical inactivity, tobacco use, alcohol consumption, stress Impact of lifestyle diseases on global health	7%	4
2	**Unit 2: Major Lifestyle Diseases Cardiovascular disease** Atherosclerosis and coronary artery disease Hypertension: causes, consequences, and management Heart failure and its prevention. Type 2 Diabetes Mellitus Pathophysiology and risk factors Blood glucose monitoring and glycemic control Lifestyle interventions and pharmacological management Obesity Causes and mechanisms of obesity Health consequences and comorbidities Weight management	16%	10

	strategies: diet, exercise, behavioral modifications. Respiratory Diseases (e.g., COPD) Relationship between smoking and lung health Breathing exercises and pulmonary rehabilitation Preventive measures and symptom management		
3	**Unit 3: Lifestyle Modifications for Disease Prevention and Management** Healthy dietary patterns and nutrient intake Physical activity guidelines and exercise regimens Smoking cessation and substance abuse interventions Stress management techniques and mindfulness practices	13%	8
4	**Unit 4: Pharmacological Interventions** Role of medications in lifestyle disease management Medication adherence and potential side effects Interaction between lifestyle modifications and drug therapy	12%	7
5	**Unit 5: Monitoring and Assessment** Regular health check-ups and screenings Tracking progress using biomarkers and health metrics Identifying early warning signs and red flags	10%	6
6	**Unit 6: Lifestyle Disease Prevention in Different Age Groups** Pediatric obesity and diabetes prevention adult health promotion: midlife and beyond Geriatric care and addressing age-related health challenges	12%	7
7	**Unit 7: Cultural Sensitivity and Diversity** Tailoring interventions to diverse populations Cultural factors influencing lifestyle choices Addressing disparities in lifestyle disease management	12%	7
8	**Unit 8: Public Health Strategies and Policies** Government initiatives for lifestyle disease prevention Promoting healthy environments and community engagement Advocacy for policy changes and health education campaigns	12%	7
9	**Unit 9: Emerging Technologies and Future Trends** Digital health tools for monitoring and tracking Telemedicine, mHealth and remote patient management	6%	4
	Total	**100%**	**60**

i. Text Book and Reference Book:

1.	Park Textbook of Preventive and Social Medicine, K Park, 21 st Edition, 2011, ISBN-14: 9788190128285, BANARSIDAS BHANOT PUBLISHERS (TextBook)
2.	LIFESTYLE DISEASES
3.	Guide To Prevention of Lifestyle Diseases
4.	Brunner & Suddarth's textbook of medical-surgical nursing (TextBook)

Semester 02

a. Course Name: Human Psychology
b. Course Code: 15010402UE01
c. Prerequisite: Shall have the basic knowledge of human biology and English language
d. Rationale: Students will have basic understanding of different concepts of Psychology and various mental processes.

e. Course Learning Objective:

CLOBJ 1	Define and differentiate growth, development, maturation, and evolution, and analyze factors and stages influencing human development
CLOBJ 2	Examine sensory processes, types of attention, and perceptual mechanisms, including depth perception and common visual illusions.
CLOBJ 3	Analyze cognitive processes such as reasoning, decision-making, and strategies for enhancing creative thinking while overcoming barriers.
CLOBJ 4	Investigate key theories like Multiple Intelligence and Emotional Intelligence, alongside major personality approaches and assessment techniques.
CLOBJ 5	Understand gender theories, human sexual behavior, and psychological and physical aspects of sexuality, including challenges such as dysfunctions.

f. Course Outcomes:

CLO 1	Differentiate between scientific and non-scientific information about human behaviour and mental processes.
CLO 2	Describe the role of nature and nurture in the development of human beings.
CLO 3	Explain psychological processes involved in sensation, perception and thinking.
CLO 4	Describe models of personality and its approaches.
CLO 5	Analyze the factors affecting psychological concepts pertaining to sexuality and gender.
CLO 6	Apply the principles of psychology for the modification of their personality.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		
					T	**CE**	**P**	**T**	**P**	
4	-	-	4	4	20	20	-	60	-	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	**Unit I Human Development** Meaning, Difference between Growth, Development, Maturation and Evolution Factors Influencing Development Overview of Developmental stages Prenatal stage Infancy Childhood Challenges of Adolescence Adulthood Old Age	17%	10

2	**Unit II Sensation, Attention & Perception** Sensation: Definition, types Attention: Definition, Types	17%	10
	Perception: Figure-Ground perception, perceptual constancies: shape, size, brightness; Depth perception: monocular and binocular cues; illusions		
3	**Unit III Thinking** Nature and Processes Problem Solving Reasoning Decision Making Developing Creative Thinking Barriers to Creative Thinking Strategies for Creative Thinking	17%	10
4	**Unit IV Intelligence** Theories of Intelligence Multiple Intelligence theory Triarchic Theory of Intelligence PASS Model of Intelligence Individual Differences in Intelligence Emotional Intelligence	17%	10
5	**Unit V Personality** Concept of Self and Personality Major Approaches of Personality Trait & Type Approaches Five-Factor Model Psychodynamic Approach Behavioural Approach Humanistic Approach Assessment of Personality Self-report Measures Projective Techniques	16%	10
6	**Unit VI Sexuality and Gender** Physical and psychological side of psychology Gender theories Human sexual behavior Sexual dysfunction and problems	16%	10
	Total	**100%**	**60**

i. Text Book and Reference Book:

1.	Introduction to psychology By Baron R | McGraw Hill Publishing House, New Delhi
2.	Psychology By Ciccarelli, S. K. & Meyer, G. E. (2008), | Pearson Education
3.	Introduction to Psychology By Clifford.T Morgan | Tata Mcgraw Hill
4.	Social Psychology By Baron. R.A., Byrne, D & Bhardwaj. | New Delhi: Pearson

Semester 02

a. Course Name: Biomechanics
b. Course Code: 07010102UE01
c. Prerequisite: There is no Prerequisite to opt this Course
d. Rationale: This course provides an introduction to the fundamental concepts Biomechanics and Kinesiology, focusing on the normal human body and joint mechanics. Students will explore biomechanical principles, identify abnormal biomechanics, learn techniques to analyze biomechanical faults and restore normal biomechanics.

e. Course Learning Objective:

CLOBJ 1	Define key concepts in kinematics and kinetics, including motion, forces, and their translatory and rotational effects
CLOBJ 2	Evaluate the design, properties, and changes in human joints due to disease, injury, exercise, and overuse.
CLOBJ 3	Study muscle structure, tension, classification, and factors affecting function, including immobilization, injury, and aging.
CLOBJ 4	Investigate static and dynamic postures and gait characteristics, focusing on kinetic and kinematic analysis for optimal movement.
CLOBJ 5	Analyze biomechanical principles of the upper and lower limbs, spine, and dysfunctions caused by abnormal biomechanics.

f. Course Outcomes:

CLO 1	Understand key concepts of Kinesiology & Biomechanics
CLO 2	Identify common pathologies and abnormal biomechanics.
CLO 3	Apply principles of biomechanics to sports and rehabilitation
CLO 4	Develop awareness of Biomechanical disorders.
CLO 5	Learn techniques to analyze biomechanical faults and restore normal biomechanics.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					
					Internal Marks			**External Marks**		**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**T**	**CE**	**P**	**T**	**P**	
4	-	-	4	4	20	20	-	60	-	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	**Basic concepts of biomechanics** Introduction - Kinematics and Kinetics Kinematics: Description of motion, Introduction to forces, Introduction to Statics & Dynamics, Translatory motion in linear & concurrent force systems, Additional linear force considerations Kinetics: Moment of force, Muscle forces, Torque resisted, Lever systems, Force components, Translatory effects of force components, Total rotation produced by a force	10%	6

2	**Joint structure and function:** Joint design, materials found in human joints, general properties of connective tissue, complexity of human joint design, kinematic chains and joint motion, general changes with disease, injury, immobilization, exercise, and overuse	10%	6
3	**Muscle structure and function:** Elements of muscle structure, muscle tension, classification of muscles, factors affecting muscle function, effects of immobilization, injury, and aging	10%	6
4	**Biomechanics of the posture** Static and dynamic postures, kinetics and kinematics of posture, optimal posture, analysis of standing, sitting and lying posture	10%	6
5	**Biomechanics and gait** Introduction to normal gait (major task of gait & phases of gait cycle), gait terminology, characteristics of normal gait, kinetic and kinematics of gait	10%	6
6	**Overview of biomechanics of upper limb** Biomechanics of Shoulder complex, elbow and hand & wrist	15%	9
7	**Overview of biomechanics of lower limb** Biomechanics of Hip, Knee, ankle & foot	15%	9
8	**Overview of biomechanics of spine** Biomechanics of Cervical, Thorax & lumbar spine	15%	9
9	**Overview of abnormal Biomechanics** Disfunction Produced due to abnormal Biomechanics	5%	3
	Total	**100%**	**60**

i. Text Book and Reference Book:

1.	Joint Structure & Function: comprehensive analysis By P.K.Levangie | Jaypee Brothers Medical Publishers (P) Ltd
2.	Kinesiology: The Mechanics & Patho mechanics of Human Movement By Carol A.Oatis | Lippincott Williams & Wilkins
3.	Brunnstrom's Clinical Kinesiology By Laura K.Smith | Jaypee Brothers Medical Publishers (P) Ltd
4.	Biomechanical Basis of Human Movement By Joseph Hamill | Lippincott Williams & Wilkins
5.	A Text Book of BIOMECHANICS (TextBook) By Arunjit Singh , Pritpal Singh
6.	INTRODUCTORY BIOMECHANICS By Andy Kerr

Semester 02

a. Course Name: **Public Health Nutrition**
b. Course Code: **19010202UE01**
c. Prerequisite: Basic knowledge of Nutrition and Public Health.
Public health nutrition is the field of study that is concerned with promotion. of good health through prevention of nutrition–related illnesses or deficiencies in the population, and the government
d. Rationale: Policies and programmes that are aimed at solving these problems. This course aims to provide an overview of public health nutrition, nutritional problems of public health significance and programmes to tackle nutritional problems.

a. Course Learning Objective:

CLOBJ 1	Explore the history, role of nutrients, nutritional adequacy across life stages, and nutritional status assessment techniques.
CLOBJ 2	Identify the etiology, prevalence, and management of macro- and micronutrient deficiencies, along with the relationship between nutrition and non-communicable diseases.
CLOBJ 3	Examine national and global initiatives, including the UN Decade of Action on Nutrition and Sustainable Development Goals, to promote nutrition-centric development.
CLOBJ 4	Assess factors influencing food security, dietary patterns, and their implications for health and nutrition at individual and societal levels.
CLOBJ 5	Formulate programmatic and community-based approaches, focusing on interventions like food fortification, supplementary feeding, and behavior-change education.

b. Course Outcomes:

CLO 1	Understand the global and national burden of nutritional deficiencies
CLO 2	Identify the determinants for dietary habits and relate these to individual, social, cultural and economic factors
CLO 3	Describe the most important public health nutrition problems in high-income and low-income countries respectively, and discuss long term and short-term countermeasures
CLO 4	Identify and discuss the role and impact of different policy documents, international agreements and regulations of importance for public health nutrition activities on a national and international level
CLO 5	Search and compile scientific material in the field of public health nutrition

c. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		
					T	**CE**	**P**	**T**	**P**	
3	-	2	5	4	20	20	20	60	30	150

d. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	**Introduction to public health nutrition** History of the development of nutrition science Understanding the role of food and nutrients for health Nutrition Transition:	30%	12

	Demographic, economic transition, poverty alleviation, food consumption patterns Determinants of nutritional status of individual & populations The need and adequacy of nutrients including the nutritional adequacy of various physiological groups according to the life cycle (from preconception to the elderly) Nutritional status assessment –MUAC, Weight for age, Height for age, Weight for height, BMI Definitions of various nutrition and health indicators		
2	**Major nutrition deficiencies as public health challenge** 2.1 Undernutrition: global and Indian prevalence of undernutrition, risk factors consequences 2.2. Major nutritional Problems – etiology, prevalence, clinical manifestations, preventive and therapeutic measures for: Macro and micro nutrient deficiencies. 2.3. Other nutritional problems- etiology, prevalence, clinical manifestations, preventive and therapeutic measures for: lathyrism, dropsy, aflatoxicosis, alcoholism and fluorosis. 2.4. Nutrition and non-communicable diseases – Overweight, obesity and chronic degenerative diseases	30%	12
3	**National nutrition programmes and policies** 3.1. Programmes and policies on nutrition and health (National and Global) 3.2. United Nations (UN) Decade of Action on Nutrition (2016 - 2025) 3.3. Overview of Sustainable Development Goals (SDGs) - keeping Nutrition at centre stage	10%	05
4	**Food and nutrition security** 4.1. Factors affecting food security, indicators and systems (Global & national) 4.2. Identification and measurement of food insecurity (FIA, ISMAP) 4.3. Food production, access, distribution, availability, losses and consumption 4.4. Socio-cultural aspects of dietary patterns and their implications for nutrition and health	10%	05
5	**Approaches and Strategies for improving nutritional status and health** 5.1. Programmatic approaches, their advantages and demerits, feasibility, and available resources 5.2. Health-based interventions, food-based interventions including: Fortification and genetic improvement of foods, supplementary feeding, nutrition education for behaviour change 5.3. Case studies: Community-based preventive and management programmes; screening approaches, etc.	20%	11
	Total	**100%**	**45**

e. List of Practical

Sr.	Topics
1	Public health nutrition Nutritional status assessment –MUAC, Weight for age, Height for age, Weight for height, BMI

2	Nutrition deficiencies as public health challenge 1. Global and Indian prevalence of undernutrition, risk factors consequences. 2. Nutritional problems- aetiology, prevalence, clinical manifestations, preventive and therapeutic measures for: lathyrism, dropsy, aflatoxicosis, alcoholism and fluorosis. 3. Nutrition and non-communicable diseases – Overweight, obesity and chronic degenerative diseases
3	Nutrition programmes and policies 1. Sustainable Development Goals (SDGs) - keeping Nutrition at centre stage 2. Programmes and policies on nutrition and health
4	Food and nutrition security 1. Visit to Public Health Lab, VMC.
5	Approaches and Strategies for improving nutritional status and health 1. Health-based interventions, food-based interventions 2. Case studies: Community-based preventive and management programmes; screening approaches

f. Text Book and Reference Book:

1.	Sharda Gupta, Santosh Jain Passi, Rama Seth, Ranjana Mahna & Seema Puri Kumud Khanna, Nutrition and Dietetics, 2014 (Textbook)
2.	Michael J. Gibney, Barrie M. Margetts, John M. Kearney, Lenore Arab, Public Health Nutrition, Wiley India Pvt. Ltd (Textbook)
3.	Park Textbook of Preventive and Social Medicine, K Park, 21 st Edition, 2011, ISBN-14: 9788190128285, banarsidas bhanot publishers (Textbook)

Semester 02

a. Course Name: Mathematical Aptitude
b. Course Code: 00019102SE01
c. Prerequisite: Basic numeracy skill
d. Rationale: Mathematical aptitude refers to the ability to reason, think critically, and apply mathematical principles to solve problems and make sense of the world around us.

e. Course Learning Objective:

CLOBJ 1	Master core concepts like HCF, LCM, square/cube roots, ratios, and proportions, along with efficient shortcut methods for percentages, averages, and partnerships.
CLOBJ 2	Solve problems involving time and work, distance, boats and streams, mixtures, and logarithms, demonstrating real-world application of mathematical concepts.
CLOBJ 3	Understand progressions (AM, GM, HM), series, interest calculations (simple and compound), profit-loss, quadratic and linear equations, and probability.
CLOBJ 4	Evaluate problems involving mensuration (area, perimeter, volume, surface area) and analyze grouped and ungrouped data using metrics like mean and standard deviation.
CLOBJ 5	Utilize tools like tabulation, bar graphs, pie charts, and line charts for precise data representation and decision-making.

f. Course Outcomes:

CLO 1	Analyse and interpret mathematical problems, devise appropriate strategies, and apply relevant mathematical concepts and techniques to find solutions.
CLO 2	Comprehend and manipulate numerical information effectively, make accurate calculations, and interpret numerical data in various contexts.
CLO 3	Think critically and logically, recognize patterns and relationships, and construct logical arguments using mathematical principles.
CLO 4	Apply these concepts and techniques to solve real-world situations

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		**Total**
					T	**CE**	**P**	**T**	**P**	
2	-	-	-	2	20	20	-	60	-	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	Unit-1Numbers, HCF & LCM, Square Root & Cube Root, Ratio & Proportion, Permutations & Combinations, Percentage, Average-Shortcut averages, Partnership, Time -work & distance, Boats & streams, Mixtures, Logarithms	40%	12
2	Unit-2Progression (AM, GM, HM), Series, Interest (S.I. & C.I.) and depreciation rate, Profit-Loss & Discount, Equations (Linear & Quadratic), Probability.	40%	12
3	Unit-3Mensuration I (Area & Perimeter), Mensuration II(Volume & Surface area), Grouped Data, Ungrouped Data (Mean and Standard Deviation) Data interpretation: (Tabulation, Bar Graph, Pie Chart, Line Chart).	20%	6
	Total	**100%**	**30**

i. Text Book and Reference Book:

1.	Quantitative Aptitude for Competitive Examinations (TextBook) By D. Khattar |
	Person Indian Education Service
2.	Verbal Reasoning and Non - Verbal Reasoning (TextBook) By B. S. Sijwali and Indu Sijwali | New Delhi: Arihant
3.	Quantitative Aptitude for Competitive Examinations By R. S. Aggarwal | S. Chand Publishing,

Semester 02

a. Course Name: **IPDC including history and culture of India and IKS-I(T)**

b. Course Code: 00019302VA01

c. Prerequisite: Knowledge of up to 12th science level and must Passed

d. Rationale: IPDC aims to prepare students for the modern challenges they face in their daily lives. Promoting fortitude in the face of failures, Unity amongst family discord, Self-discipline amidst Distractions... and many more priceless lessons.

e. Course Learning Objective:

CLOBJ 1	The course aims to familiarize participants with the foundational principles, major schools of thought, and key figures in Indian philosophy and culture.
CLOBJ 2	Participants will delve into the core concepts, methodologies, and practices of Indian Knowledge Systems (IKS-I).
CLOBJ 3	The course provides insights into the historical context in which Indian philosophy and culture evolved, including the influences of various empires, kingdoms, invasions, and socio-cultural movements.
CLOBJ 4	Participants will explore the role of cultural diplomacy in international relations and its significance in fostering mutual understanding, cooperation, and peaceful coexistence among nations.
CLOBJ 5	In addition to academic knowledge, the course seeks to enhance participants' diplomatic skills, including communication, negotiation, and intercultural competence.

f. Course Outcomes:

CLO 1	To provide students with a holistic value-based education that will enable them to be
CLO 2	successful in their academic, professional, and social lives.
CLO 3	To give the students the tools to develop effective habits, promote personal growth, and
CLO 4	improve their well-being, stability, and productivity.
CLO 5	To allow students to establish a stronger connection with their family through critical

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		**Total**
					T	**CE**	**P**	**T**	**P**	
2	-	-	2	2	20	20	-	60	-	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	**Introduction and Remaking Yourself** Restructuring Yourself: Students learn how self-improvement enables them to secure a bright future for themselves. They will learn 6 powerful thought-processes that can develop their intellectual, physical, emotional, and spiritual quotients	7%	2
2	**Remaking Yourself** Power of Habit: Students will undergo a study of how habits work, the habits of successful professionals, and the practical techniques that can be used to develop good habits in their life.	7%	2
3	**Learning from Legends**	7%	2

	Tendulkar & Tata: Students will learn from the inspirational lives of India's two legends, Sachin Tendulkar and Ratan Tata. They will implement these lessons through relatable case studies.		
4	**From House to Home** Listening & Understanding: Active listening is an essential part of academic progress and communications. Students will learn to listen with their eyes, ears, mind, and heart.	7%	2
5	**Facing Failures** Welcoming Challenges: This lecture enables students to revisit the way in which they approach challenges. Through the study of successful figures such as Disney, Lincoln and Bachchan, students will learn to face difficulties through a positive perspective.	7%	2
6	**Facing Failures** Significance of Failures: Failure is a student's daily source of fear, negativity, and depression. Students will be given the constructive skills to understand failure as formative learning experiences.	7%	2
7	**My India My Pride** Glorious Past - Part 1: India's ancient Rishis, scholars, and intellectuals have made tremendous. contributions to the world, they developed an advanced, sophisticated culture and civilization which began. thousands of years ago. Students will learn the importance of studying India's glorious past so that they could develop a strong passion and pride for our nation.	7%	2
8	**My India My Pride** Glorious Past - Part 2: Our ancient concepts can be used to seek revolutionary ideas and to generate inspiration. Students will develop a deeper interest in India's Glorious Past – by appreciating the need to read about it, research it, write about it, and share it.	7%	2
9	**Learning from Legends** A.P.J. Abdul Kalam: Dr Kalam's inspirational life displayed legendary qualities which apply to students (1) Dare to Dream (2) Work Hard (3) Get Good Guidance (4) Humility (5) Use Your Talents for the Benefit of Others	7%	2
10	**Soft Skills** Networking & Leadership: Students are taught the means of building a professional network and developing a leadership attitude.	7%	2
11	**Soft Skills** Project Management: Students will learn the secrets of project management through the Akshardham case study. They will then practice these skills through an activity relevant to student life.	6%	2
12	**Remaking Yourself** Handling Social Media: Students will learn how social media	6%	2

	can become addictive and they will imbibe simple methods to take back control.		
13	**Facing Failures** Power of Faith: Students will learn about the power and necessity of faith in our daily lives.	6%	2
14	**From House to Home** Bonding the Family: Students will understand the importance of strong family relationships. They will learn how to overcome the generation gap and connect with their family more.	6%	2
15	**Selfless Service Seva:** Students will learn that performing seva is beneficial to one's health, wellbeing, and happiness. It also benefits and inspires others.	6%	2
	Total	**100%**	**30**

i. Text Book and Reference Book:

1.	**Integrated Personality Development Course (Textbook)** By Bochasanwasi Akshar Purushottam Swaminarayan Sanstha

Semester 02

a. Course Name: **Basic Techniques of Anaesthesia (T)**

b. Course Code: 19011302AC01

c. Prerequisite: Knowledge of Anatomy and Physiology up to 12th science level and must Passed with semester 1

d. Rationale: To address the increasing demand for specialized healthcare professionals capable of administering anesthesia, managing critical care settings, and ensuring patient safety and quality of care in surgical and intensive care settings.

e. Course Learning Objective:

CLOBJ 1	To get an understanding of different techniques of anesthesia
CLOBJ 2	Students understand the Basic anaesthetic equipment
CLOBJ 3	To explain the rational selection of regional anesthesia techniques and the choice of local anaesthesia.
CLOBJ 4	To understand the depth of general anesthesia and its mechanism
CLOBJ 5	To learn about different drugs commonly used in OT

f. Course Outcomes:

CLO 1	Execute theoretical knowledge and practical skills to administer various anesthesia techniques in simulated and clinical settings.
CLO 2	Critically assess patient histories to make informed decisions regarding the choice of anesthesia, considering indications, contraindications, and potential complications
CLO 3	Evaluate and prioritize patient safety throughout the anesthesia process, from pre-assessment to post-operative care.
CLO 4	Create integrated plans for anesthesia administration considering patient-specific factors, procedural requirements, and safety measures.
CLO 5	Collaborate with other healthcare professionals to address interdisciplinary aspects of anesthesia, fostering effective communication and teamwork in the healthcare setting.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		
					T	**CE**	**P**	**T**	**P**	
3	-	-	3	3	20	20	-	60	-	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	**Local Anesthesia** • Introduction and overview • Indication • Local Anesthesia Techniques • Drugs Used In L.A • Contraindication • Complications	15%	09

2	**General Anesthesia** • Introduction about General anesthesia • Indication • Positioning • Phases of G.A	25%	09
	• Contraindication • Complications		
3	**Regional Anesthesia** Spinal Anesthesia • Introduction of Spinal Anesthesia • Indication • Positioning • Technique • Contraindication • Complications	20%	09
4	Epidural Anesthesia • Introduction of Epidural Anesthesia • Indication • Positioning • Technique • Contraindication	20%	09
5	Nerve Blocks • Introduction of Nerve Blocks • Types of Nerve Block • Indication • Positioning • Technique • Contraindication • Complications	20%	09
	Total	**100%**	**45**

i. Text Book and Reference Book:

1.	Anaesthesia Manual-A. A Pillai
2.	Lee synopsis (Handbook of Anaesthesia)
3.	Clinical Anesthesiology by Morgan
4.	Text Book of anesthesia by Ajay Yadav
5.	Anesthesia equipment's and Drugs by AK Paul

Semester 02

a. Course Name: **Basic Techniques of Anaesthesia (P)**
b. Course Code: **19011302AC02**
c. Prerequisite: Knowledge of Anatomy and Physiology up to 12th science level and must Passed with semester 1
d. Rationale: To address the increasing demand for specialized healthcare professionals capable of administering anesthesia, managing critical care settings, and ensuring patient safety and quality of care in surgical and intensive care settings.

e. Course Learning Objective:

CLOBJ 1	Understand the fundamental principles and concepts of local anesthesia, including its purpose, indications, techniques, and the drugs commonly used.
CLOBJ 2	Demonstrate proficiency in administering local anesthesia through various techniques while ensuring patient safety and comfort.
CLOBJ 3	Identify contraindications and potential complications associated with the use of local anesthesia and develop strategies for their prevention and management.
CLOBJ 4	Gain comprehensive knowledge of general anesthesia, its indications, phases, and the essential considerations in patient positioning during administration.
CLOBJ 5	Develop skills in recognizing and managing complications arising from general anesthesia, thereby ensuring optimal patient outcomes and safety.

f. Course Outcomes:

CLO 1	Students will be able to proficiently administer local anesthesia using appropriate techniques and drugs, ensuring effective pain management during dental procedures.
CLO 2	Students will demonstrate an understanding of the indications, contraindications, and potential complications associated with local anesthesia, enabling them to make informed clinical decisions.
CLO 3	Upon completion of the course, students will exhibit competency in administering general anesthesia, including proper patient positioning and monitoring throughout the anesthesia process.
CLO 4	Students will recognize and appropriately manage complications that may arise during or after general anesthesia, thereby ensuring patient safety and well-being.
CLO 5	Upon completion of the course, students will be able to apply regional anesthesia techniques such as spinal anesthesia, epidural anesthesia, and nerve blocks, understanding their indications, techniques, and potential complications.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		
					T	**CE**	**P**	**T**	**P**	
-	-	2	2	1	-	-	20	-	30	50

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	• Local anesthesia techniques • Identification of drugs • Routes of administrations	50%	06

2	• Laryngoscope • ETT • O.T Table	25%	12
	• Bougie • Stylet • Airway Examination • Nerve Stimulator		
3	• Equipment's • Positioning • Spinal needles • Part Preparation • Inspection of the site • Catheter Removal • Epidural Set	25%	12
4	**Nerve Block** • Introduction of Nerve Blocks • Types of Nerve Block • Indication • Positioning • Technique • Contraindication • Complications	20%	10
	Total	**100%**	**40**

i. Text Book and Reference Book:

1.	Anaesthesia Manual-A. A Pillai
2.	Lee synopsis (Handbook of Anaesthesia)
3.	Clinical Anesthesiology by Morgan
4.	Text Book of anesthesia by Ajay Yadav
5.	Anesthesia equipment's and Drugs by AK Paul

Semester 02

a. Course Name: **Basics of Surgical Procedures (T)**

b. Course Code: 19010902OT01

c. Prerequisite: Knowledge of up to 12th science level and must Passed

d. Rationale: Basic Operation theatre knowledge is fundamental as it provides a strong foundation for various Healthcare disciplines, promotes problem-solving skills, supports innovation, and opens doors to diverse career opportunities.

e. Course Learning Objective:

CLOBJ 1	To develop skill like how to manage Preoperative & Post-operative.
CLOBJ 2	To understand various procedure like bed making, Lifting and Transporting Patients, Bed Side Management.
CLOBJ 3	To know the determinants of Health, Health Indicators of India, Health Team Concept.
CLOBJ 4	To understand the population of India and Family welfare programme in India
CLOBJ 5	To understand the different types, use, care and management of biomedical waste.

f. Course Outcomes:

CLO 1	Define the responsibility of health care personals and hazards faced in the operation theatre& casualty
CLO 2	Discuss and explain the different types, use, care and maintenance of the surgical procedures and instruments
CLO 3	Demonstrate the different types, use, care and maintenance of the management of biomedical waste
CLO 4	Analyze the responsibility of health care personals and hazards faced in the operation theatre& casualty
CLO 5	Evaluate the various techniques used in operation theatres& casualty

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		
					T	**CE**	**P**	**T**	**P**	
3	-	-	3	3	20	20	-	60	-	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**

1	**BLOOD TRANSFUSION** • History of discovery of blood groups and genetics of blood groups. • Types of blood groups and Rh factor. • Coombs test. • Collection of blood, its preservation and standardization. • Various types of blood and blood products (Packed cells, PRP, FFP) • Pre-transfusion checks. • Transfusion reactions. • Fluids and electrolytes • Body fluid compartments and the effect of fluid administration on them. • Types of fluids (crystalloids and colloids) and their	33%	15
	chemical composition. Indications of specific fluids and their complications.		
2	**GENERAL SURGICAL PROCEDURE AND PARA-SURGICAL EQUIPMENT** • Operating tables: structure, material used, maintenance, control, Hydraulic system and Electrical system. • Different types of diathermy machine. Monopole, Bipolar, Ligasure, Harmonic Scalpel, CUSA- Principle, hazards, • prevention, functioning and maintenance. • Types of operation lights and light sources: Features, Care, cleaning, sterilization and maintenance. • Operation Theatre sterilization- Different recent advances. • LAR/APR--Positioning of patient, care-Prevention of hazards. • Total thyroidectomy—with emphasis on proper positioning. • Transthoracic esophagectomy—Different approaches. • Venesection and Tracheostomy. • Laparoscopic Cholecystectomy – Pneumoperitoneum - Creation and removing, principles. • Breast surgery. • Positioning of patient for different operations: Problems and hazards. Hypothermia and hyperthermia.	45%	15
3	**COMMON INFECTIONS** • Cellulitis, abscess, carbuncle, gangrene, cold abscess • Wound and wound healing • Wound infection and management • Ulcers and Management • Common neoplastic disorders benign and malignant • Antiseptic Solutions • Dressing material Bandage application	22%	15
	Total	**100%**	**45**

i. Text Book and Reference Book:

1.	Operation theatre technique anaesthesia and emergency care for technicians, nurses & paramedics

2.	By Vaishali Mohod
3.	Textbook of Operation Theatre Technology

Semester 02

a. Course Name: **Basics of Surgical Procedures (P)**

b. Course Code: 19010902OT01

c. Prerequisite: Knowledge of up to 12th science level and must Passed

d. Rationale: Basic Operation theatre knowledge is fundamental as it provides a strong foundation for various Healthcare disciplines, promotes problem-solving skills, supports innovation, and opens doors to diverse career opportunities.

e. Course Learning Objective:

CLOB J 1	To develop skill like how to manage Preoperative & Post-operative.
CLOB J 2	To understand various procedure like bed making, Lifting and Transporting Patients, Bed Side Management.
CLOB J 3	To know the determinants of Health, Health Indicators of India, Health Team Concept.
CLOB J 4	To understand the population of India and Family welfare programme in India
CLOB J 5	To understand the different types, use, care and management of biomedical waste.

f. Course Outcomes:

CLO 1	Define the responsibility of health care personals and hazards faced in the operation theatre& casualty
CLO 2	Discuss and explain the different types, use, care and maintenance of the surgical procedures and instruments
CLO 3	Demonstrate the different types, use, care and maintenance of the management of biomedical waste
CLO 4	Analyze the responsibility of health care personals and hazards faced in the operation theatre& casualty
CLO 5	Evaluate the various techniques used in operation theatres & casualty

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		
					T	**CE**	**P**	**T**	**P**	
-	-	2	2	1	-	-	20	-	30	50

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	Blood Transfusion	7%	1
2	Suturing	8%	2
3	Wound infection and management	7%	1
4	Ulcers and Management	8%	1
5	Common neoplastic disorders benign and malignant	7%	1
6	Antiseptic Solutions	8%	1
7	Dressing material Bandage application	8%	1
8	General instruments and equipment	7%	1
9	Urology instruments and equipment's maintenance	6%	1

10	Laparotomy instruments and equipment's maintenance	7%	1
11	Sterilization	7%	1
12	OT Fumigation and OT maintenance	7%	1
13	Stock & record maintenance of OT & Recovery	6%	1
14	Record Management: Maintenance of Anaesthesia cards as per	7%	1
	National guidelines.		
	Total teaching hours for the academic year	**100%**	**15**

i. Text Book and Reference Book:

1.	Operation theatre technique anaesthesia and emergency care for technicians, nurses & paramedics
2.	By Vaishali Mohod
3.	Textbook of Operation Theatre Technology

Semester 02

a. Course Name: **Artificial Intelligence (T)**
b. Course Code: 03010502AM01
c. Prerequisite: Basic knowledge of computer
d. Rationale: This subject with help students to understand fundamental concepts of Artificial Intelligence domain

e. Course Learning Objective:

CLOBJ 1	Understand the fundamentals of artificial intelligence, including its definition, history, and various subfields.
CLOBJ 2	Gain proficiency in machine learning techniques, including supervised, unsupervised, and reinforcement learning.
CLOBJ 3	Develop skills in natural language processing (NLP), including text processing, sentiment analysis, and language generation.
CLOBJ 4	Understand the ethical implications of AI technologies, including bias, fairness, and accountability.
CLOBJ 5	Analyze real-world AI applications across various domains, including healthcare, finance, and autonomous systems.

f. Course Outcomes:

CLO 1	Understand AI Problems and Apply Various Techniques for Problem Solving.
CLO 2	Solve Game Playing Problems.
CLO 3	Design Artificial Neural Network.
CLO 4	Understand how Expert System is designed and how Knowledge Engineering works.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					
					Internal Marks			**External Marks**		
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**T**	**CE**	**P**	**T**	**P**	**Total**
3	-	-	3	3	20	20	-	60	-	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	**Introduction:** Overview and Historical Perspective, • Artificial Intelligence (AI) definition, Goals of AI, History of AI, Applications of AI, Agents, Difference between human intelligence vs. artificial intelligence	10%	7
2	**Agents and Environments:** Agent Terminology, Types of Agents &minuses; Simple Reflex Agents, Model Based Reflex Agents, Goal Based Agents, Nature of Environments, Properties of Environments	25%	10
3	**Search Algorithms:** Terminology, Brute Force Search Strategies − Breadth First Search, Depth First Search. Heuristic Search Strategies, Local Search Algorithms.	25%	10
4	**Fuzzy Logic Systems:** Introduction to Fuzzy Logic and Fuzzy systems, Membership functions, Fuzzification, Defuzzification	20%	9

5	**Neural Networks:** Basic structure of Neural Networks, Neural Network Elements,	20%	9
	Perceptron, Back-propagation, Application of neural network		
	Total teaching hours for the academic year	**100%**	**45**

i. Text Book and Reference Book:

1.	Artificial intelligence: a new synthesis, harcourt publishers by n. J. Nilsson | harcourt publishers clinical ophthalmology: a systematic approach" by jack j. Kanski and brad bowling
2.	Artificial intelligence (textbook)by elaine rich and kevin knight | tata mcgraw-hill
3.	Artificial intelligence: a modern approach by stuart j. Russell and peter norvig | pearson education limited

Semester 02

a. Course Name: **Artificial Intelligence (P)**
b. Course Code: 03010502AM02
c. Prerequisite: Basic knowledge of computer
d. Rationale: This subject with help students to understand fundamental concepts of Artificial Intelligence domain

e. Course Learning Objective:

CLOBJ 1	Understand the fundamentals of artificial intelligence, including its definition, history, and various subfields.
CLOBJ 2	Gain proficiency in machine learning techniques, including supervised, unsupervised, and reinforcement learning.
CLOBJ 3	Develop skills in natural language processing (NLP), including text processing, sentiment analysis, and language generation.
CLOBJ 4	Understand the ethical implications of AI technologies, including bias, fairness, and accountability.
CLOBJ 5	Analyze real-world AI applications across various domains, including healthcare, finance, and autonomous systems.

f. Course Outcomes:

CLO 1	Understand AI Problems and Apply Various Techniques for Problem Solving.
CLO 2	Solve Game Playing Problems.
CLO 3	Design Artificial Neural Network.
CLO 4	Understand how Expert System is designed and how Knowledge Engineering works.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					
					Internal Marks			**External Marks**		**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Total Hrs /Week**	**Credit**	**T**	**CE**	**P**	**T**	**P**	
-	-	2	2	1	-	-	20	-	30	50

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	a. Write a program to implement Tic Tac Toe game. b. Write a program to implement 8 Puzzle problem. c. Write a program to implement Water Jug Problem. d. Write a program to implement Travelling Salesman Problem	50%	10
2	a. Write a program to implement N Queens Problem. b. Write a prolog program to Calculate Factorial.	25%	10
3	a. Write a prolog program to Create Fibonacci Series. b. Write a prolog program for Temperature Conversion. c. Write a prolog program to Calculate Palindrome. d. Write a prolog program to Create a text file.	25%	10
	Total	**100%**	**30**

i. Text Book and Reference Book:

1.	Artificial intelligence: a new synthesis, harcourt publishers by n. J. Nilsson | harcourt publishers clinical ophthalmology: a systematic approach" by jack j. Kanski and brad bowling
2.	Artificial intelligence (textbook)by elaine rich and kevin knight | tata mcgraw-hill
3.	Artificial intelligence: a modern approach by stuart j. Russell and peter norvig | pearson education limited

Semester 02

a. Course Name: **Nanomaterials for Biomedical applications**

b. Course Code: 03011302NT01

c. Prerequisite: Knowledge of basic principles in chemistry and biology to comprehend the interdisciplinary nature of nanomaterials' interaction with biological systems.

d. Rationale: This course will equip the students with the knowledge and skills needed to understand and harness the ground breaking potential of nanomaterials in revolutionizing the biomedical industry, fostering innovation in the biomedical field.

e. Course Learning Objective:

CLOBJ 1	Understand nanomaterial synthesis, characterization, and manipulation for healthcare applications.
CLOBJ 2	Evaluate nanomaterial strengths, limitations, and uses in healthcare contexts.
CLOBJ 3	Analyze nanomaterial mechanisms in biological systems for optimized biomedical applications.
CLOBJ 4	Anticipate long-term impacts of advanced nanomaterials on healthcare and biology.
CLOBJ 5	Design innovative healthcare solutions using nanomaterial technology

f. Course Outcomes:

CLO 1	Familiarity with working principles, tools and techniques in the field of nanomaterials.
CLO 2	Understand the strengths, limitations and potential uses of nanomaterials in healthcare.
CLO 3	Understand the mechanisms and principles of advanced nanomaterials for different biomedical applications.
CLO 4	Anticipate the long-term impact of the advanced materials on biomedical applications.
CLO 5	Design a solution based on nanomaterial technology for a given need in the field of healthcare and biology.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		
					T	**CE**	**P**	**T**	**P**	
3	1	-	4	4	20	20	-	60	-	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	**Nano biomaterials And Biocompatibility:** Surface and Bulk Properties of Bio materials – Nano biomaterials –Nanoceramics – Nano polymers – Nano Silica – Hydroxy apatite – Carbon Based nanomaterials, Surface modification – Textured and Porous Materials – Surface immobilized biomolecules – Cell-biomaterial interactions – immune response – In Vitro and In Vivo assessment of tissue compatibility	34%	15

2	**Structural & Functional Principles of Bio nanotechnology:** Lipid Bilayers – Liposomes – Endosomes - Phytosomes, Polysaccharides – Peptides –Nucleic acids – DNA scaffolds –Enzymes- Biomolecular motors, Immunotoxins – Membrane	26%	12
	transporters and pumps – Antibodies – monoclonal Antibodies – immunoconjugates – limitations of natural biomolecules		
3	**Nano bio-Analytics:** Luminescent Quantum Dots for Biological Labeling – Nanoparticle Molecular Labels – Surface Biology: Analysis of Biomolecular Structure by Atomic Force Microscopy and Molecular Pulling – Force Spectroscopy – Biofunctionalized Nanoparticles for Surface – Enhanced Raman Scattering and Surface Plasmon Resonance – Bio conjugated Silica Nanoparticles for Bioanalytical Applications	24%	11
4	**Nanomaterials in Tissue Engineering:** Scaffold design and fabrication - Cellular interactions with nanomaterials - Nanomaterials for enhanced tissue regeneration	16%	7
	Total	**100%**	**45**

i. Text Book and Reference Book:

1.	**Nanobiotechnology: Concepts, applications and perspectives** By C.M. Niemeyer, C.A. Mirkin | Wiley India limited., Pub. Year 2004
2.	**Bio nanotechnology: Lessons from Nature** By David S. Goodsell | Wiley-Liss, 2004
3.	**Bio-Nanotechnology: A Revolution in Food, Biomedical and Health Sciences** By Debasis Bagchi, Manashi Bagchi, Hiroyoshi Moriyama, Fereidoon Shahidi | Wiley-Blackwell, Pub. Year 2013
4.	**Biomaterials Science: An Introduction to Materials in Medicine** By Buddy D. Ratner, Allan S. Hoffman, Frederick J. Schoen, Jack E. Lemons | Academic Press, Pub. Year 2012

Semester 02

a. Course Name: **Anatomy & Physiology-II (T)**

b. Course Code: 19010002DS01

c. Prerequisite: Knowledge of Anatomy and Physiology up to 12th science level and must Passed with **Semester I**

d. Rationale: Basic Operation theatre knowledge is fundamental as it provides a strong foundation for various Healthcare disciplines, promotes problem-solving skills, supports innovation, and opens doors to diverse career opportunities.

e. Course Learning Objective:

CLOBJ 1	Identify and locate major organs, tissues, and cells using correct terminology.
CLOBJ 2	Learn the major prefixes, suffixes, and root words used in anatomical and physiological terminology
CLOBJ 3	Understand the basic principles of common diseases and medical interventions
CLOBJ 4	Analyze the effects of exercise, nutrition, and lifestyle choices on different body systems.
CLOBJ 5	Formulate and test hypotheses about how the body works

f. Course Outcomes:

CLO 1	Be able to accurately and confidently use anatomical and physiological terms to describe the human body.
CLO 2	Gain a basic understanding of the major body systems and their roles in maintaining homeostasis.
CLO 3	Gain an understanding of how the structure of different body parts is directly related to their function.
CLO 4	Be able to use your understanding of anatomy and physiology to explain common health phenomena and make informed decisions about your own health.
CLO 5	Improve your ability to think critically, Analysis's information, and solve problems related to anatomy and physiology.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		
					T	**CE**	**P**	**T**	**P**	
4	-	-	4	4	20	20	-	60	-	100

h. Course Content

Sr.	**PART-A (ANATOMY) Content**	**Weightage**	**Hours**
1	**Outline of Gastrointestinal tract and Urinary System:** a. Identify and draw the organs of the gastrointestinal tract. b. Know the basic structural features of the organs of gastrointestinal tract. c. Identify and draw the organs of the urinary tract. d. Know the basic structural features of the organs of urinary tract.	30%	10
2	**Outline of Male Genital tract, Female Genital tract and Endocrine glands:** a. Identify and draw the organs of the male genital tract.	30%	10

	b. Know the basic structural features of the organs of male genital tract. c. Identify and draw the organs of the female genital tract. d. Know the basic structural features of the organs of female genital tract. e. Enumerate different endocrine glands. f. Identify location and basic function of different endocrine glands. g. Know the basic structural features of the organs of urinary tract		
3	**Outline of Nervous System, Special senses and Instruments used in Anatomy:** a. Describe the organization and identify major components of the nervous system. b. Enumerate the cranial nerves. c. Enumerate the special senses. d. Identify and draw the parts of eye and ear. e. Identify the main instruments and functions. f. Understand the principles and technique of x-rays. g. Identify the main x-rays of the human body.	40%	10
	Total teaching hours for the academic year	**100%**	**30**

Sr. No.	PART-B (Physiology) Content	Weightage	Teaching Hours
1	Outline of Respiratory system. a. Structural organization of Respiratory System. b. Transport of Gases. c. Normal Breathing, Abnormal Breathing. d. Structural organization of digestive system. e. Functions of digestive system. f. Movement of digestive system. g. Applied physiology (Diarrhea and Vomiting).	30%	10
2	Outline of Digestive System. a. Structural organization of digestive system. b. Functions of digestive system. c. Movement of digestive system. d. Applied physiology (Diarrhea and Vomiting).	30%	10
3	Outline of Excretory and Endocrine System. a. Gross structural organization of excretory system. b. Functions of Excretory system. c. Regulation of body fluids. d. Applied physiology (Dialysis). e. Functions of Endocrine gland (pituitary, thyroid, parathyroid, adrenal, ovary, testicles).	40%	10
	Total teaching hours for the academic year	**100%**	**30**

i. Text Book and Reference Book:

1.	Ross & Wilson Anatomy and Physiology in Health and Illness by Anne Waugh and Allison Gran
2.	Human Anatomy & Physiology by Elaine N. Marieb and Katja Hoehn
3.	The Anatomy Coloring Book by Wynn Kapit and Lawrence M. Elson
4.	Essential Human Anatomy & Physiology by Elaine N. Marieb and Lori A. Smith
5.	Anatomy & Physiology for Dummies by Erin Odgen

Semester 02

a. Course Name: **Anatomy & Physiology-II (P)**

b. Course Code: 19010002DS02

c. Prerequisite: Knowledge of Anatomy and Physiology up to 12th science level and must Passed with **Semester I**

d. Rationale: Basic Operation theatre knowledge is fundamental as it provides a strong foundation for various Healthcare disciplines, promotes problem-solving skills, supports innovation, and opens doors to diverse career opportunities

e. Course Learning Objective:

CLOBJ 1	Identify and locate major organs, tissues, and cells using correct terminology.
CLOBJ 2	Learn the major prefixes, suffixes, and root words used in anatomical and physiological terminology
CLOBJ 3	Understand the basic principles of common diseases and medical interventions
CLOBJ 4	Analyze the effects of exercise, nutrition, and lifestyle choices on different body systems.
CLOBJ 5	Formulate and test hypotheses about how the body works

f. Course Outcomes:

CLO 1	Be able to accurately and confidently use anatomical and physiological terms to describe the human body.
CLO 2	Gain a basic understanding of the major body systems and their roles in maintaining homeostasis.
CLO 3	Gain an understanding of how the structure of different body parts is directly related to their function.
CLO 4	Be able to use your understanding of anatomy and physiology to explain common health phenomena and make informed decisions about your own health.
CLO 5	Improve your ability to think critically, Analysis's information, and solve problems related to anatomy and physiology.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		
					T	**CE**	**P**	**T**	**P**	
-	-	4	4	2	-	-	20	-	30	50

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	Digestive & Endocrine system.	50%	10
2	Male & Female Genital system.	25%	10
3	X rays & bones.	25%	10
4	**Total teaching hours for the academic year**	**100%**	**30**

Sr. No.	**PART-B (Physiology) Content**	**Weightage**	**Teaching Hours**
1	Determination of Blood Group.	50%	10
2	Determination of Bleeding Time, Clotting Time.	25%	10
3	Determination of ESR, PCV.	25%	10
	Total teaching hours for the academic year	**100%**	**30**

i. Text Book and Reference Book:

1.	Ross & Wilson Anatomy and Physiology in Health and Illness by Anne Waugh and Allison Gran
2.	Human Anatomy & Physiology by Elaine N. Marieb and Katja Hoehn
3.	The Anatomy Coloring Book by Wynn Kapit and Lawrence M. Elson
4.	Essential Human Anatomy & Physiology by Elaine N. Marieb and Lori A. Smith
5.	Anatomy & Physiology for Dummies by Erin Odgen

Semester 02

a. Course Name: Biochemical Metabolism – I (T)
b. Course Code: 19010602DS01
c. Prerequisite: Basic concept of biomolecules
d. Rationale: This paper focuses on the digestion and absorption of biomolecules. The students will learn the details about metabolism of carbohydrates, proteins, lipids, nucleic acids, enzymes & the deficiency diseases related to them.

e. Course Learning Objective:

CLOBJ 1	Digestion absorption, utilization and storage of macromolecules
CLOBJ 2	Disorders related to metabolism of these macromolecules
CLOBJ 3	To gain basic concept about biochemistry and its diagnostic application
CLOBJ 4	Estimation of glucose by various methods
CLOBJ 5	To learn the estimation of cholesterol and proteins
CLOBJ 6	Digestion absorption, utilization and storage of macromolecules

f. Course Outcomes:

CLO 1	Use the concepts of digestion, absorption and related disorders for further studies or research
CLO 2	Construct or propose solutions to present problems
CLO 3	Apply the acquired knowledge of different concepts for entrepreneurship development
CLO 4	Students will be able to interpret abnormal and normal disturbance in diagnosis.
CLO 5	Students will be able to understand the basics of diagnosis in a Biochemistry laboratory.
CLO 6	Use the concepts of digestion, absorption and related disorders for further studies or research

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		
					T	**CE**	**P**	**T**	**P**	
3	-	-	3	3	20	20	-	60	-	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	**Carbohydrates** ● Introduction, Importance and Classification ● Digestion and Absorption ● Abnormalities related to carbohydrate digestion	20%	9
2	**Protein** ● Introduction, Importance and classification ● Important properties of proteins ● Digestion & absorption of Proteins	20%	9
3	**Lipid** ● Introduction & Classification ● Digestion & absorption of fats	20%	9
4	**Nucleic Acid**	10%	9

	● Introduction ● Functions of Nucleic acid ● Functions of energy carriers		
5	**Enzymes** ● Introductions, Importance & Classification ● Properties of enzymes ● Mechanism of enzyme action ● Factors affecting enzyme action ● Enzyme kinetics & inhibitors	30%	9
	Total teaching hours for the academic year	**100%**	**45**

i. Text Book and Reference Book:

1.	Practical Clinical Biochemistry by Harold Varley
2.	Textbook of Medical Laboratory Technology by P. B. Godker
3.	Medical Laboratory Technology by Mukherjee
4.	Principal of Biochemistry by M. A. Siddiqi
5.	Medical Biochemistry by D M Vasudevan

Semester 02

a. Course Name: Biochemical Metabolism – I (P)
b. Course Code: 19010602DS02
c. Prerequisite: Basic concept of biomolecules
d. Rationale: This paper focuses on the digestion and absorption of biomolecules. The students will learn the details about metabolism of carbohydrates, proteins, lipids, nucleic acids, enzymes & the deficiency diseases related to them.

e. Course Learning Objective:

CLOBJ 1	Digestion absorption, utilization and storage of macromolecules
CLOBJ 2	Disorders related to metabolism of these macromolecules
CLOBJ 3	To gain basic concept about biochemistry and its diagnostic application
CLOBJ 4	Estimation of glucose by various methods
CLOBJ 5	To learn the estimation of cholesterol and proteins
CLOBJ 6	Digestion absorption, utilization and storage of macromolecules

f. Course Outcomes:

CLO 1	Use the concepts of digestion, absorption and related disorders for further studies or research.
CLO 2	Construct or propose solutions to present problems.
CLO 3	Apply the acquired knowledge of different concepts for entrepreneurship development.
CLO 4	Students will be able to interpret abnormal and normal disturbance in diagnosis.
CLO 5	Students will be able to understand the basics of diagnosis in a Biochemistry laboratory.
CLO 6	Use the concepts of digestion, absorption and related disorders for further studies or research.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		
					T	**CE**	**P**	**T**	**P**	
-	-	2	2	1	-	-	20	-	30	50

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	Identification of unknown solution of carbohydrates Estimation of glucose by various methods	50%	8
2	Identification of Unknown solution of Protein Estimation of albumin and A/G ratio	20%	8
3	Identification of Unknown solution of Lipids Estimation of cholesterol	20%	7
4	Identification and Analysis of basic metabolites from various body fluids eg. Urine, CSF, Semen	10%	7
	Total teaching hours for the academic year	**100%**	**30**

i. Text Book and Reference Book:

1.	Practical Clinical Biochemistry by Harold Varley.
2.	Textbook of Medical Laboratory Technology by P. B. Godker.

3.	Medical Laboratory Technology by Mukherjee.
4.	Principal of Biochemistry by M. A. Siddiqi.
5.	Medical Biochemistry by D M Vasudevan.

Semester 03

a. Course Name: **Advanced and Higher English**

b. Course Code: **00019303AE01**

c. Prerequisite: Students should have a strong command of the English language, including grammar, vocabulary, reading comprehension, and writing skills. Students should be able to understand and analyse complex texts, including literary works, academic articles, and other forms of written communication.

d. Rationale: To provide a challenging academic environment where students can deepen their understanding of the English language through the study of complex literary texts, rigorous writing assignments, and in-depth analysis of various forms of written communication.

e. Course Learning Objective:

CLOBJ 1	Develop basic proficiency in English language skills including reading, writing, speaking, and listening, with an emphasis on comprehension and fluency.
CLOBJ 2	Expand vocabulary through the acquisition of common words and phrases used in everyday communication, including greetings, introductions, and expressions for daily activities.
CLOBJ 3	Gain a solid understanding of basic grammar rules, including sentence structure, verb tenses, parts of speech, and word order, to construct grammatically correct sentences and communicate effectively.
CLOBJ 4	Improve pronunciation and intonation to enhance clarity and intelligibility in spoken English, focusing on accurate articulation of sounds, stress patterns, and rhythm.
CLOBJ 5	Develop confidence and proficiency in engaging in everyday conversations in English, including asking and answering questions, expressing opinions, making requests, and participating in discussions on familiar topics.

f. Course Outcomes:

CLO 1	Develop advanced communication skills
CLO 2	Become more proficient in formal writing.
CLO 3	Apply interpersonal communication skills to be more productive at the workplace.
CLO 4	Identify, set and achieve the goals with the help of public speaking.
CLO 5	Use wide range of vocabulary to communicate effectively.

g. Teaching and Examination Scheme

Teaching Scheme				**Evaluation Scheme**					
L	**T**	**P**	**C**	**Internal Evaluation**			**ESE**		TOTAL
				T	**CE**	**P**	**Theory**	**P**	
2	-	-	2	-	100	-	-	-	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	Define Public Speaking Importance of Public speaking Types of Public speaking Techniques to master public speaking	5%	2
2	World's best public speakers (activity based)	10%	5
3	Define Debate vs GD Importance of debate Techniques to master debate	5%	1
4	Debate activity	10%	5
5	Advanced vocabulary building	10%	2

	Homophones Homonyms Analogies		
6	Reading comprehension	10%	2
7	Error Analysis: Para- jumble/sentence completion, confusable sentences, incorrectly spelt words, One word substitute, Cloze Passages	10%	5
8	Report writing	10%	2
9	Memo writing	10%	2
10	Narrative Story Writing	10%	2
11	Tourism Pitch	10%	2
	Total teaching hours for the academic year	**100%**	**30**

i. Text Book and Reference Book:

1.	Business Correspondence and Report Writing SHARMA, R. AND MOHAN, K
2.	Communication Skills, Kumar S And Lata P; New Delhi Oxford University Press
3.	Practical English Usage MICHAEL SWAN
4.	A Remedial English Grammar for Foreign Student F.T. WOOD
5.	On Writing Well William Zinsser; Harper Paperbacks,2006; 30th anniversary edition
	Oxford Practice Grammar, John Eastwood; Oxford University Press
	Quantitative Aptitude for Competitive Examinations Dr. R.S. Aggarwal

Semester 03

a. Course Name: **German - 1**

b. Course Code: **00019303AE02**

c. Prerequisite: Knowledge of Basic Knowledge of English language

d. Rationale: German is the second most commonly used scientific language. Germany is the third largest contributor to research and development and offers research fellowships to scientists from abroad. Developments in media, information and communication technology require multilingual communicators. A wide range of important websites are in German and worldwide, Germany is ranked number 5 in terms of annual publication of new books. Knowledge of German therefore offers you extended access to information. Learning German provides you with an insight into the way of life, and the hopes and dreams of people in German speaking countries, broadening your horizon.

e. Course Learning Objective:

CLOBJ 1	Develop proficiency in basic German vocabulary and grammar to facilitate everyday communication.
CLOBJ 2	Gain cultural understanding and appreciation of German-speaking countries through language immersion activities, such as reading authentic texts and watching German media.
CLOBJ 3	Enhance listening, speaking, reading, and writing skills in German through interactive exercises and assignments.
CLOBJ 4	Acquire the ability to engage in simple conversations, express opinions, and ask questions in German on various topics.
CLOBJ 5	Prepare for real-life situations such as traveling, studying abroad, or interacting with German-speaking individuals in professional contexts.

f. Course Outcomes:

CLO 1	Understand the importance of learning German language
CLO 2	Understand the basic communication in German, can greet someone in German
CLO 3	Can tell and understand the date & time in German
CLO 4	Can introduce oneself and third person also frame basic sentences in German language

g. Teaching and Examination Scheme

Teaching Scheme				**Evaluation Scheme**					
L	**T**	**P**	**C**	**Internal Evaluation**			**ESE**		TOTAL
				T	**CE**	**P**	**Theory**	**P**	
2	-	-	2	-	100	-	-	-	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	**Overview of German Language:** History of German language Importance of German Language Why one should Learn German Language?	10%	4

2	**Basics of German: (LSRW)** s Alphabets e Nummeren (Null bis Hundert) e Artikel (Indefinite und Definite) e Grußen	40%	15
	ular und Plural Nomen e Wochetage & Die Monate		
3	**Vocabulary: (LSRW)** Ordinal Nummeren (1 bis 31) Datum Zeit (Offiziel Zeit) äpositionen mit der Zeit Personal Pronomenen (Nominative Case)	20%	5
4	**Simple Communication: (LSRW)** Verben Konjugation, (Hilfs Verben, Regelmaßige und Unregelmaßige verben) Self-Introduction W- Frage und Ja/Nein Frage	30%	6
	Total teaching hours for the academic year	**100%**	**30**

i. Text Book and Reference Book:

1.	Netzwerk A1 Deutsch als Fremdsprache Kursbuch by Stefanie Dengler, Paul Rusch Klett- Langenscheidt
2.	So geht das -1 By Ujjwal Malhotra| Educational Publishers
3.	German in 30 Days by Goyal Saab | Langenscheidt

Semester 03

a. Course Name: **French - 1**
b. Course Code: **00019303AE03**
c. Prerequisite: Knowledge of English Language
d. Rationale: Basic Communication Skills of French Language

e. Course Learning Objective:

CLOBJ 1	Develop proficiency in French pronunciation, vocabulary, and grammar to enable effective communication in everyday situations.
CLOBJ 2	Cultivate an understanding and appreciation of French-speaking cultures through exposure to authentic materials such as literature, films, and music.
CLOBJ 3	Enhance proficiency in listening, speaking, reading, and writing French through a variety of interactive activities and assignments.
CLOBJ 4	Acquire the ability to engage in conversations, express ideas, and communicate effectively in French on a range of topics, both orally and in writing.
CLOBJ 5	Prepare for practical applications of French language skills, such as traveling, studying abroad, or pursuing professional opportunities in French-speaking regions.

f. Course Outcomes:

CLO 1	Introduce self in French.
CLO 2	Greet someone in French.
CLO 3	Tell time in French.
CLO 4	Talk about family (their professions, nationalities, age etc.

g. Teaching and Examination Scheme

Teaching Scheme				**Evaluation Scheme**					
L	**T**	**P**	**C**	**Internal Evaluation**			**ESE**		TOTAL
				T	**CE**	**P**	**Theory**	**P**	
2	-	-	2	-	100	-	-	-	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	**Grammar:** Alphabets Numbers Telling time Personal Pronouns Nouns (masculine & feminine nouns, singular and plural nouns) Verbe conjugaisons (être, avoir, s'appeler and "er ending") Adjective possessive (mon, ma, ton, ta, etc.)	33%	10
2	**Listening Skills:** Sounds French Songs Basic Vocabulary (months of the year, days of the week, family members' names, Countries and nationalities, colours, Professions)	17%	5

3	**Speaking Skills:** How to Introduce self? Greetings How to ask and tell time? How to talk about Family?	17%	5
4	**Reading Skills:**		
	a. Samples of: **b.** Self-Introduction My family	33%	10
	Total teaching hours for the academic year	**100%**	**30**

i. Text Book and Reference Book:

1.	Saison 1 Didier
2.	Enchanté 0
3.	Larrouse Dictionnaire de Poche
4.	Larousse French Grammar (Mini) by Paperback
5.	Plaisir D'ecrire by Viral Thakkar, Saraswati House Pvt. Ltd

Semester 03

a. Course Name: **Health Research Fundamentals**

b. Course Code: **19010203UE01**

c. Prerequisite: Basic knowledge of Health and Research.

d. Rationale: The "Health Research Fundamentals" course is designed to provide students with a foundational understanding of the principles and methods of health research. This course is essential for students who plan to pursue careers in public health or related fields, as it equips them with the necessary skills to critically evaluate research findings, design research studies, and contribute to evidence-based practice.

e. Course Learning Objective:

CLOBJ 1	Develop an understanding of the definition, characteristics, and types of health research, and critically assess the role of research in advancing healthcare outcomes.
CLOBJ 2	Formulate research questions and hypotheses, conduct thorough literature reviews, and demonstrate proficiency in navigating and utilizing databases for health research.
CLOBJ 3	Select appropriate research designs, sampling methods, and calculate sample sizes. Measure study variables accurately to ensure the validity and reliability of findings
CLOBJ 4	Create and evaluate tools for data collection, ensuring validity and reliability. Strategically plan and manage research studies to optimize data integrity and study outcomes.
CLOBJ 5	Apply ethical considerations to research studies and demonstrate the ability to prepare concept papers that align with professional and academic standards.

f. Course Outcomes:

CLO 1	Develop an understanding of the definition, characteristics, and types of health research, recognizing its role in advancing knowledge and informing health practice
CLO 2	Formulate clear research questions and hypotheses, conduct comprehensive literature reviews, and select appropriate research designs, sampling techniques, and measurement methods to address research objectives effectively.
CLO 3	Establish an ethical foundation for health research, adhering to principles of research integrity, confidentiality, and participant rights, and demonstrating ethical decision-making in all aspects of research conduct
CLO 4	Communicate research findings effectively to diverse stakeholders through written and oral formats, and prepare concept papers for research projects, demonstrating the ability to articulate research objectives, methodology, and anticipated outcomes clearly

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					
					Internal Marks			**External Marks**		
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**T**	**CE**	**P**	**T**	**P**	**Total**
3	-	2	5	4	20	20	20	60	30	150

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**

1	**Introduction to Health Research** Definition, characteristics & types of health research. Understanding and Formulating the Research Process. The role	15%	6
	of research in health		
2	**Planning Your Research: From Idea to Study** Formulating research questions and hypotheses. Conducting Literature review. Understanding the Databases	30%	14
3	**Incorporating Epidemiology into Research Study Design** Research Designs Sampling and types of sampling Sample size calculations for different study design. Measurement of study variables	25%	12
4	**Fundamentals of Data Collection** Design & Types of Data collection Tool. Validity, Reliability Study plan and management	15%	9
5	**Conducting & writing a research Study** Ethical consideration for Health Research. Preparing a concept paper for research projects	15%	4
	Total teaching hours for the academic year	**100%**	**45**

i. List of Practical

1	**Planning Your Research: From Idea to Study** • Choosing research topics and formulating research questions • Conducting review of literature - Data extraction sheet. • Hypothesis formation: Null & Alternative
2	**Incorporating Epidemiology into Research Study Design** • Sample size calculation.
3	**Fundamentals of Data Collection** • Developing tools using digital platforms: Google Survey, Kobo (Practical) • Preparing a study Plan
4	**Conducting & writing a research Study** • Preparing a concept paper for research projects

j. Text Book and Reference Book:

1.	RESERACH METHODOLOGY (TextBook) By R.Paneerselvam | PHI | 8
2.	Research Methodology: Methods and Techniques (TextBook) By C.R. Kothari | New Age Publishers
3.	Kenneth S. Bordens & Bruce B. Abbitt, "Research Design & Methods, A process approach" McGraw Hill, 8th edition
4.	ABC of Research Methodology and Applied Biostatistics: A Primer for Clinicians and Researchers. By Parikh, M.N. And Gogtay, N

Semester 03

a. Course Name: **Intellectual Property**

b. Course Code: **17010103UE01**

c. Prerequisite: Students should have a basic understanding of creative and innovative processes, familiarity with different types of intellectual property (such as copyrights, trademarks, and patents), and awareness of the significance of IP rights in promoting innovation and protecting creators.

d. Rationale: Studying Intellectual Property (IP) is crucial for students as it helps them understand how IP rights incentivize creativity and innovation, equips them with knowledge to protect their own intellectual contributions, and fosters an appreciation for the legal and economic impacts of IP in various industries.

e. Course Learning Objective:

CLOBJ 1	Analyze the meaning of patents, copyright, trademarks, and other intellectual property rights, and their significance in safeguarding innovation and creativity
CLOBJ 2	Demonstrate proficiency in identifying patentable inventions, navigating the process of obtaining patents, and understanding the rights and remedies available to patent holders in cases of infringement.
CLOBJ 3	Examine the characteristics, rights, and remedies related to copyright and trademarks, including the registration procedures and legal frameworks for protection against infringement.
CLOBJ 4	Develop a comprehensive understanding of specialized intellectual property rights, including geographical indications, designs, integrated circuits layout, and plant varieties, through an overview of relevant legislative acts.
CLOBJ 5	Evaluate real-world scenarios to apply intellectual property laws ethically and effectively, ensuring compliance with global standards and fostering innovation responsibly.

f. Course Outcomes:

CLO 1	Identify the different forms of intellectual property and describe the importance of protection of IP.
CLO 2	List out the criteria/essential requirements of IP protection, duration, rights conferred and remedies provided.
CLO 3	Demonstrate a solid understanding of the key concepts, principles, and categories of intellectual property rights, as well as the legal frameworks that govern them.
CLO 4	Demonstrate ethical awareness and professional responsibility in dealing with intellectual property issues, recognizing the balance between promoting innovation and creativity while respecting the rights of creators, innovators, and the public interest.
CLO 5	Evaluate as against other the international legal framework related to IP protection and articulate the problem areas for the deficiency.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		
					T	**CE**	**P**	**T**	**P**	
4	-	-	4	4	20	20	-	60	-	100

h. Course Content

Sr.	Topics	Weightage	Hours
1	**PATENT** Introduction to Intellectual Property Law (IPR) Meaning of patent Patentable inventions Procedure for obtaining patent Rights of patent holder Infringement and remedies of patent	25%	15
2	**COPYRIGHT** Introduction, meaning and characteristics of copyright Rights of copyright owner Infringement and remedies of copyright	25%	15
3	**TRADEMARK** Introduction and meaning of trademark Types of trademarks Procedure for registering trademark Infringement and remedies of trademark	25%	15
4	**OTHER IPRGeographical Indications:** Overview on Geographical Indication Act Designs: Overview on Design Act, 2000 Semiconductor Integrated Circuits Layout: Overview on Semiconductor Integrated Circuits Layout Design Act, 2000 Plant Varieties and Farmers' Rights: Overview on Protection of Plant Varieties and Farmers' Rights Act, 2001	25%	15
	Total teaching hours for the academic year	**100%**	**60**

i. Text Book and Reference Book:

1.	Law Relating to Intellectual Property Rights By V K Ahuja | Lexis Nexis
2.	Intellectual Property Rights By P. Narayanan | , Eastern Law House Private Ltd, Pub. Year 2001
3.	The Global Regime for the Enforcement of Intellectual Property Rights By X. Seuba | Cambridge University Press, Pub. Year 2017
4.	Globalizing Intellectual Property Rights By D. Matthews | Routledge, Pub. Year 2003

Semester 03

a. Course Name: **Occupational Health and Ergonomics**

b. Course Code: **07010103UE01**

c. Prerequisite: There is no Prerequisite to opt this Course

d. Rationale: This course provides an introduction to the fundamental concepts of occupational health and ergonomics, focusing on creating safe and healthy work environments. Students will explore ergonomic principles, identify workplace hazards, learn strategies to prevent injuries and enhance employee well-being.

e. Course Learning Objective:

CLOBJ 1	Develop an understanding of the importance and historical evolution of occupational health and ergonomics, recognizing their critical role in improving workplace safety and employee well-being.
CLOBJ 2	Apply knowledge of the musculoskeletal system, biomechanics, and physiological factors to optimize ergonomic designs and workplace interventions.
CLOBJ 3	Evaluate physical, chemical, and biological hazards in the workplace using basic principles of risk assessment and management, ensuring proactive hazard identification and mitigation strategies
CLOBJ 4	Utilize ergonomic principles, including anthropometry, posture, and movement analysis, to assess and redesign workspace layouts, tools, and activities for improved efficiency and health outcomes
CLOBJ 5	Develop and implement occupational health programs and wellness initiatives, including strategies for addressing psychosocial factors and fostering a positive and healthy work environment.

f. Course Outcomes:

CLO 1	Understand key concepts of occupational health and ergonomics and their significance in the workplace.
CLO 2	Identify common workplace hazards and propose basic control measures.
CLO 3	Apply ergonomic principles to evaluate and suggest improvements for basic workspaces.
CLO 4	Develop awareness of musculoskeletal disorders and basic strategies for prevention.
CLO 5	Recognize psychosocial factors affecting employee well-being and suggest simple interventions.
C06	Demonstrate knowledge of occupational health programs and their importance.
C07	Apply basic ergonomic principles to simple case studies.
C08	Conduct basic ergonomic assessments using tools such as the RULA test.
C09	Recognize and address ergonomic issues specific to industrial settings.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		
					T	**CE**	**P**	**T**	**P**	
4	-	-	4	4	20	20	-	60	-	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**

1	**Introduction to Occupational Health and Ergonomics** Definition and importance of occupational health and ergonomics.	10%	6
	Historical development and evolution of occupational health and ergonomics.		
2	**Human Anatomy and Physiology for Ergonomics** Basics of human musculoskeletal system and its functions. Brief overview of biomechanics and physiological factors.	10%	6
3	**Workplace Hazards and Risk Assessment** Introduction to common workplace hazards (physical, chemical, biological). Basic principles of risk assessment and management. **Demonstration:** Identifying and assessing workplace hazards.	15%	9
4	**Ergonomic Principles and Design** Basics of ergonomic design: anthropometry, posture, movement. Introduction to workspace design and tools. Ergonomic evaluation of different activities and tasks	15%	9
5	**Industrial Ergonomics and Musculoskeletal Disorders** Ergonomic challenges and solutions specific to industrial settings. Common musculoskeletal disorders in industrial environments. REBA & RULA demonstration.	15%	9
6	**Psychosocial Factors and Mental Health in the Workplace** Introduction to psychosocial factors affecting well-being. Basic strategies for promoting a positive work environment.	10%	6
7	**Occupational Health Programs and Wellness** Basics of designing and implementing occupational health programs. Introduction to health promotion and wellness initiatives.	10%	6
8	**Case Studies and Modification methods** Analysis of simple ergonomic challenges and solutions. Group discussions: basic ergonomic assessment and solutions for case studies.	15%	9
	Total teaching hours for the academic year	**100%**	**60**

i. Text Book and Reference Book:

1.	Ergonomics in design: methods and techniques handbook 3rd edition By Barry Tillman
2.	Human factors and ergonomics design handbook, third edition By Gavriel salvendy
3.	Introduction to Health and Safety at Work Third edition By Phil Hughes
4.	OCCUPATIONAL THERAPY AND ERGONOMICS By FRANKLIN STEIN, INGRID SODERBACK, SUSAN CUTLER, BARBARA LARSON
5.	Occupational Ergonomics - Theory and Applications By Amit Bhattacharya, James D McGlothin | second
6.	Industrial Therapy (Textbook) By Key PT, Glenda L.

Semester 03

a. Course Name: **Yoga and Positive Psychology for Managing Career and Life**
b. Course Code: **02010103UE01**
c. Prerequisite: shall have the basic knowledge of human biology and English language.
d. Rationale: Students will have basic understanding of different concepts of psychology in Ayurveda for career and life management.

e. Course Learning Objective:

CLOBJ 1	Understand Ayurvedic principles of holistic wellness, including Prakriti (constitution), diet, lifestyle, and self-care practices, to promote physical and mental well-being.
CLOBJ 2	Master yoga techniques such as asanas, pranayama, dhyana, yoga nidra, and Sankalpa setting to achieve balance, stress reduction, and personal growth.
CLOBJ 3	Cultivate gratitude, optimism, and resilience while utilizing mindfulness practices and a strengths-based approach for emotional regulation and personal growth.
CLOBJ 4	Develop personalized self-care plans, Ayurvedic yoga sequences, and actionable goals to seamlessly incorporate wellness practices into everyday routines.
CLOBJ 5	Utilize reflective practices to analyze personal growth and continuously enhance well-being by integrating Ayurvedic principles, yoga, and positive psychology strategies.

f. Course Outcomes:

CLO 1	After Learning the Course, the students shall be able to: Understand the Ayurvedic principles of holistic wellness and their relevance to career and life management.
CLO 2	Utilize yoga practices to enhance mental clarity, emotional balance, and physical vitality.
CLO 3	Apply positive psychology techniques to cultivate resilience, optimism, and personal growth.
CLO 4	Integrate Ayurvedic wisdom, yoga practices, and positive psychology techniques to develop personalized strategies for career success and life satisfaction.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		
					T	**CE**	**P**	**T**	**P**	
4	-	-	4	4	20	20	-	30	-	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	**Ayurvedic Foundations of Wellness** Introduction to Ayurveda Ayurvedic Principles of Holistic Wellness Understanding Prakriti (Constitution) Ayurvedic Diet and Lifestyle for Wellbeing Ayurvedic Self-Care Practices	25%	15
2	**Knowledge on Yoga practices for mind, body and balance** **Asana:** Postures for Balance and Vitality Pranayama: Breathwork for Mental Clarity Dhyana: Meditation for Emotional Balance Yoga Nidra: Deep relaxation for stress reduction Sankalpa setting: Intentions for personal growth	25%	15
3	**positive psychology for personal growth**	25%	15

	Introduction to positive psychology Cultivating Gratitude and Optimism Building resilience in the face of challenges Mindfulness practices for emotional regulation Strengths – Based approach to personal development		
4	**Integration and application** Ayurvedic yoga sequences for specific goals Creating a personalized self- care plan Goal setting and action planning Integrating Ayurvedic principles into daily life Reflective practices for continuous growth	25%	15
	Total teaching hours for the academic year	**100%**	**60**

i. Text Book and Reference Book:

1.	After Learning the Course, the students shall be able to: Understand the Ayurvedic principles of holistic wellness and their relevance to career and life management.
2.	Utilize yoga practices to enhance mental clarity, emotional balance, and physical vitality.
3.	Apply positive psychology techniques to cultivate resilience, optimism, and personal growth.
4.	Integrate Ayurvedic wisdom, yoga practices, and positive psychology techniques to develop personalized strategies for career success and life satisfaction.

Semester 03

a. Course Name: **AI/ Web Development and Designing**

b. Course Code: **03010503SE01**

c. Prerequisite: Data structure, Probability and Statistics, Linear Algebra, Mathematics.

d. Rationale: This course provides a broad introduction to Artificial Intelligence. AI techniques for search and knowledge representation also apply knowledge of AI planning and machine learning techniques to real-world problems.

e. Course Learning Objective:

CLOBJ 1	To understand the foundational principles and algorithms of AI and ML. Students will delve into the core principles underpinning Artificial Intelligence (AI) and Machine Learning (ML), gaining insight into various algorithms and methodologies used in these fields.
CLOBJ 2	To gain proficiency in programming using Python for AI and ML applications. This objective focuses on equipping students with practical programming skills using Python, a widely-used language in AI and ML development.
CLOBJ 3	To learn data pre-processing, exploration, and visualization techniques. They will also learn data exploration methods to uncover patterns and insights, and visualization techniques to present findings effectively using libraries like Pandas, NumPy, Matplotlib, and Seaborn.
CLOBJ 4	To understand model evaluation and selection methods. Evaluating the performance of AI and ML models using appropriate metrics for classification and regression tasks. Students will also learn model selection methods, including train-test splitting and cross-validation, to choose the most suitable model for a given problem.
CLOBJ 5	To apply AI and ML techniques to real-world datasets and understand their ethical implications.

f. Course Outcomes:

CLO 1	Gain foundational knowledge of AI and ML, applicable to various fields
CLO 2	Develop practical programming and data analysis skills
CLO 3	Enhance critical thinking and problem-solving abilities
CLO 4	Understand the potential and limitations of AI and ML technologies
CLO 5	Prepare for a future where AI and ML are increasingly integrated across disciplines

g. Teaching and Examination Scheme

Teaching Scheme					Examination Scheme					Total
					Internal Marks			External Marks		
Lecture Hrs /Week	Tutorial Hrs/ Week	Lab Hrs /Week	Hrs /Week	Credit	T	CE	P	T	P	
2	-	-	2	2	20	20	-	60	-	100

h. Course Content

Sr.	Topics	Weightage	Hours

1	**UNIT-1 Introduction to AI and ML concepts** Machine Learning algorithms Supervised - Linear Regression, Logistic Regression, Decision Trees, Random Forest, Support Vector Machines (SVM), Naive Bayes, k-Nearest Neighbors (k-NN) Unsupervised - K-Means Clustering, Hierarchical Clustering, Density Based Clustering, Anomaly Detection Techniques,	20%	7
	Reinforcement Learning		
2	**UNIT-2 Programming fundamentals in Python** Syntax, Variables and Data Types, Operators, Control Structures, Functions, Data Structures, Input and Output, Modules and Packages	20%	6
3	**UNIT-3** Data preprocessing and Data analysis Using Python Library (Pandas, NumPy). Data exploration and Visualization Using Python Library (Matplotlib, Seaborn)	20%	7
4	**UNIT-4** Model Evaluation- Classification Metrics, Regression Metrics Model Selection - Train-Test Split, Cross-Validation Methods (K-Fold, Random Sampling, Leave-one out, Hold-Out) Ethical considerations in AI and ML	20%	5
5	**UNIT-5** Training and evaluating models on real-world datasets (e.g., image classification, text analysis)	20%	5
	Total teaching hours for the academic year	**100%**	30

i. Text Book and Reference Book:

1.	"Artificial Intelligence: A Modern Approach" Author: Stuart Russell and Peter Norvig |Publisher: Pearson (Textbook)
2.	"Python Machine Learning" Author: Sebastian Raschka and Vahid Mirjalili | Publisher: Packt
3.	“Machine Learning Yearning" Author: Andrew Ng | Publisher: Deeplearning.ai
4.	“Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow" Author: Aurélien Géron | Publisher: O'Reilly Media
5.	“Machine Learning: A Probabilistic Perspective" Author: Kevin P. Murphy | Publisher: The MIT Press

Semester 03

a. Course Name: **VAC-3: IPDC including history and culture of India and IKS - 2**

b. Course Code: **00019303VA01**

c. Prerequisite: IPDC including history and culture of India and IKS-I

d. Rationale: IPDC aims to prepare students for the modern challenges they face in their daily lives. Promoting fortitude in the face of failures, Unity amongst family discord, Self-discipline amidst Distractions... and many more priceless lessons. The course focuses on morality and character development at the core of student growth, to enable students to become self-aware, sincere, and successful in their many roles - as an ambitious student, reliable employee, caring family member, and considerate citizen.

e. Course Learning Objective:

CLOBJ 1	To guide students in setting and achieving future goals through effective visualization, SMART goals, and fostering value-based citizenship for contributing to India's transformation into a developed nation.
CLOBJ 2	To educate students on the detrimental effects of addictions and to promote addiction-free living, enhancing overall health, stress management, and personal well-being through regular exercise, healthy eating habits, and sufficient sleep.
CLOBJ 3	To develop an understanding of selfless service through the analysis of real-world case studies, such as disaster relief efforts.
CLOBJ 4	To cultivate essential teamwork, harmony, and financial planning skills that are crucial for both professional and daily life.
CLOBJ 5	To introduce students to leadership through humility by studying legendary figures who lead without leading and to instill fundamental values of responsibility, integrity, loyalty, sincerity, and punctuality, creating ideal citizens.
CL06	To apply ancient wisdom and practical knowledge to face and overcome modern-day challenges and failures, emphasizing the importance of forgiveness in personal and professional life.
CL07	To provide opportunities for students to seek advice from experienced mentors, helping them navigate daily challenges with wisdom and understanding the impact of social circles on personal development

f. Course Outcomes:

CLO 1	To provide students with a holistic value-based education that will enable them to be successful in their academic, professional, and social lives.
CLO 2	To give the students the tools to develop effective habits, promote personal growth, and improve their well-being, stability, and productivity.
CLO 3	To allow students to establish a stronger connection with their family through critical thinking and development of qualities such as unity, forgiveness, empathy, and effective communication.
CLO 4	To provide students with soft skills that complement their hard skills, making them more marketable when entering the workforce.
CLO 5	To enhance awareness of India’s glory and global values, and to create considerate citizens who strive for the betterment of their family, college, workforce, and nation
CLO 6	To inspire students to strive for a higher sense of character by learning from role models who have lived principled, disciplined, and value-based lives.

g. Teaching and Examination Scheme

Teaching Scheme					Examination Scheme					
Lectur	Tutori	Lab			Internal			External		Total
e Hrs /Week	al Hrs/ Week	Hrs /We ek	Hrs /Week	Credit	Marks			Marks		
					T	CE	P	T	P	
2	-	-	2	2	20	20	-	60	-	100

h. Course Content

Sr.	Topics	Weightage	Hours
1	**Remaking Yourself: Begin with the End in mind** Students will learn to visualize their future goals and will structure their lives through smart goals to give themselves direction and ultimately take them to where they want to go.	6%	2
2	**Remaking Yourself: Being Addiction-Free** Students will explore the detrimental effects of addictions on one's health, personal life, and family life. They will learn how to take control of their life by becoming addiction free.	6%	2
3	**Selfless Service: Case Study: Disaster Relief** Students will apply previous lessons of seva, to analyse the case study of the Bhuj earthquake relief work.	6%	2
4	**Soft Skills: Teamwork & Harmony** Students will learn the six steps of teamwork and harmony that are essential for students' professional and daily life	6%	2
5	**My India My Pride: Present Scenario** To implement the transformation of India from a developing country into a developed country it is necessary to have a value-based citizen. Students will see how the transformation to a greater India relies on the vision and efforts of themselves as a youth.	6%	2
6	**Learning from Legends: Leading Without Leading** Students will explore a new approach to leadership, through humility.	7%	2
7	**My India My Pride: An Ideal Citizen – 1** Students will learn that to become value-based citizens, they must first develop good values in their lives. They start by exploring the values of responsibility and integrity	7%	2
8	**My India My Pride: An Ideal Citizen – 2** Students will learn that by developing the values of loyalty, sincerity, and punctuality; they become indispensable and can leave a strong impression. They will start developing these values by trying to keep perfection in every small task and by looking at the bigger picture	7%	2
9	**Facing Failures: Timeless Wisdom for Daily Life** Students will learn the role wisdom plays in finding long-term stability. They will use ancient wisdom to solve their modern-day challenges	7%	2
10	**From House to Home: Forgive & Forget** Students will understand the importance and benefits that forgiveness plays in their personal and professional life. They will learn to apply this knowledge in realistic situations.	7%	2

11	**Remaking Yourself: Stress Management** Students will learn to cope with current and future causes of	7%	2
	stress.		
12	**Remaking Yourself: Better Health Better Future** A healthy body prevents disease and stress; increases positivity, productivity, and brainpower. Students will learn to maintain good health through regular exercise, healthy eating habits, and regular and sufficient sleep.	7%	2
13	**Learning from Legends: Words of Wisdom** A panel of learned and experienced mentors will personally answer practical questions that students face in their daily life.	7%	2
14	**Soft Skills: Financial Planning** Students will develop a variety of practical financial skills that prepare them to become financially stable throughout their future careers.	7%	2
15	**Remaking Yourself: Impact of Company and Life After IPDC** Students will understand that the type of company that we keep, has a crucial role in determining who we are and who we will become. They will develop the ability to create a positive environment around them. This concluding lecture encourages students to keep practising these priceless lessons and prepares them for the next steps in their lives.	7%	2
	Total teaching hours for the academic year	**100%**	**30**

i. Text Book and Reference Book:

1.	**Integrated Personality Development Course (Textbook)** By Bochasanwasi Akshar Purushottam Swaminarayan Sanstha

Semester 03

a. Course Name: **Microbiology & Pathology - I**
b. Course Code: 19010003DS01
c. Prerequisite: Knowledge of up to 12th science level and must Passed with Semester II.
d. Rationale: Basic Operation theatre knowledge is fundamental as it provides a strong foundation for various Healthcare disciplines, promotes problem-solving skills, supports innovation, and opens doors to diverse career opportunities.

e. Course Learning Objective:

CLOBJ 1	It helps students with thorough knowledge of diseases and techniques used in disease diagnosis.
CLOBJ 2	It helps in explanation of pathologic processes that apply to patients
CLOBJ 3	Also helps in analysis of laboratory and clinical data.
CLOBJ 4	It helps in interpretation of laboratory data for clinical pathologic correlation
CLOBJ 5	The morphology, physiology and pathogenicity of microorganisms and their pathogenic potential that cause disease in man.

f. Course Outcomes:

CLO 1	Be able to accurately and confidently use anatomical and physiological terms to describe the human body.
CLO 2	Gain a basic understanding of the major body systems and their roles in maintaining homeostasis.
CLO 3	Gain an understanding of how the structure of different body parts is directly related to their function.
CLO 4	Be able to use your understanding of anatomy and physiology to explain common health phenomena and make informed decisions about your own health.
CLO 5	Improve your ability to think critically, Analysis's information, and solve problems related to anatomy and physiology.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		
					T	**CE**	**P**	**T**	**P**	
3	-	-	3	3	20	20	-	60	-	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	**Unit-1: Introduction of pathology:** Definition Types of pathology - histopathology, haematology, chemical etc.	20%	9
2	**Unit-2: Molecular Cell Biology in health &Ageing:** Human Genome Bio membranes- Molecular organization and functions Cellular communications Overview of cell cycle Stem cells & regenerative medicine	10%	9

3	**Unit-3: Outline of Cell injury and pathology:** Normal cell Cell adaptation	10%	9
	Aetiology of cell injury Pathogenesis of cell injury Necrosis and types Gangrene		
4	**Unit-4: Outline of General Bacteriology:** Introduction and Historical background Differences between Prokaryotes and Eukaryotes Morphology and fine structure of Bacteria and Fungi Function and structure of Cell wall, Cell membrane, Flagella and Capsule in bacteria Morphology and Cultivation of Animal viruses Morphology and Replication of Bacteriophage	30%	9
5	**Unit-5: Outline of Microbial Physiology:** Microbial Nutrition: Requirements for growth, Physical requirements, Chemical requirements. Culture media: Aerobic, Anaerobic, Selective, Differential, Enrichment. Microbial growth, Bacterial growth curve, Factors affecting growth Antimicrobial Techniques- Antimicrobial agents (Physical, chemical, radiation).	30%	9
	Total teaching hours for the academic year	**100%**	**45**

i. Text Book and Reference Book:

1.	Microbiology By M.J. Pelczar
2.	Kuby Immunology By Jenni Punt, Sharon Stranford, Patricia Jones, Judy Owen
3.	Prescott's Microbiology By Joanne M. Willey

Semester 03

a. Course Name: **Microbiology & Pathology – I (P)**

b. Course Code: 19010003DS01

c. Prerequisite: Knowledge of up to 12th science level and must Passed with Semester II

d. Rationale: Basic Operation theatre knowledge is fundamental as it provides a strong foundation for various Healthcare disciplines, promotes problem-solving skills, supports innovation, and opens doors to diverse career opportunities.

e. Course Learning Objective:

CLOBJ 1	It helps students with thorough knowledge of diseases and techniques used in disease diagnosis.
CLOBJ 2	It helps in explanation of pathologic processes that apply to patients
CLOBJ 3	Also helps in analysis of laboratory and clinical data.
CLOBJ 4	It helps in interpretation of laboratory data for clinical pathologic correlation
CLOBJ 5	The morphology, physiology and pathogenicity of microorganisms and their pathogenic potential that cause disease in man.

f. Course Outcomes:

CLO 1	Be able to accurately and confidently use anatomical and physiological terms to describe the human body.
CLO 2	Gain a basic understanding of the major body systems and their roles in maintaining homeostasis.
CLO 3	Gain an understanding of how the structure of different body parts is directly related to their function.
CLO 4	Be able to use your understanding of anatomy and physiology to explain common health phenomena and make informed decisions about your own health.
CLO 5	Improve your ability to think critically, Analysis's information, and solve problems related to anatomy and physiology.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		
					T	**CE**	**P**	**T**	**P**	
-	-	2	2	1	-	-	20	-	30	50

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	Simple staining techniques	10%	4
2	Gram staining	10%	4
3	ZN staining	10%	2
4	Preparation of culture media	10%	4
5	Methods of isolation	10%	4
6	Instruments used in microbiology including sterilization equipment	10%	2
7	Microscopic examinations	10%	4
8	Haematological staining	10%	2
9	Cytology staining	10%	2
10	Total cell count	10%	2
	Total teaching hours for the academic year	**100%**	**30**

i. Text Book and Reference Book:

1.	Microbiology By M.J. Pelczar
2.	Kuby Immunology By Jenni Punt, Sharon Stranford, Patricia Jones, Judy Owen
3.	Prescott's Microbiology By Joanne M. Willey

Semester 03

a. Course Name: Basic Hematology and Hematological Diseases (T)
b. Course Code: 19010603DS01
c. Prerequisite: Foundational understanding of basic pathology and haematology concepts.
d. Rationale: Haematology and Pathology are pivotal in understanding pathological roles in health, disease, and environmental processes, informing medical practices and ecological management.

e. Course Learning Objective:

CLOBJ 1	To learn a working principle of various instruments.
CLOBJ 2	To learn various blood morphology and its identification.
CLOBJ 3	To learn a basics of haematological estimations.
CLOBJ 4	To learn more about basic body fluid examination like Urine analysis.
CLOBJ 5	To learn manual methodology of blood count.

f. Course Outcomes:

CLO 1	Students able to understand basic of haematology.
CLO 2	Students can able to perform basic procedure of haematological diagnosis.
CLO 3	Students can Identify various blood morphology.
CLO 4	Students can learn the principle of automation.
CLO 5	Course will help student to enhance clinical skills.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		
					T	**CE**	**P**	**T**	**P**	
3	-	-	3	4	20	20	-	60	-	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	**Introduction to Haematology** ● Definition ● Importance ● Important equipment used ● Laboratory organization and safety measures in Haematology Laboratory. ● Introduction to blood, its composition, function and normal cellular components Formation of cellular components of blood (Haemopoiesis) ● Erythropoiesis ● Leucopoiesis ● Thrombopoiesis. ● Haemoglobin: definition, types, structure, synthesis and degradation	30%	15
2	**Morphology of normal blood cells** ● Normal Haemostasis & physiological properties of coagulation factors ● Radioactivity: definition, half-life, physical decay and units	30%	15

	● Anticoagulants: types, mode of action and preference of anticoagulants for different haematological studies ● Collection and preservation of blood sample for various haematological investigations ● Urine analysis		
3	**Anaemia** ● Introduction ● Classification ● Microcytic hypochromic anaemia ● Macrocytic anaemia ● Normocytic normochromic anaemia Quantitative disorders of Leukocytes Cause and significance ● Granulocytic and Monocytic Disorders ● Lymphocytic Disorders Thrombosis Introduction ● Causes of thrombosis **Bleeding disorders** ● Introduction Causes of bleeding disorders ● Vascular defect ● Platelet defect ● Factor deficiency ● Inhibitors ● Hyperfibrinolysis ● Types of bleeding disorders ● Inherited bleeding disorders ● Acquired bleeding disorders ● Types of bleeding disorders ● Inherited bleeding disorders ● Acquired bleeding disorders	40%	15
	Total teaching hours for the academic year	**100%**	**45**

i. Text Book and Reference Book:

1.	An introduction to Med. Lab. Technology by F.J. Baker & R.E. Silverton, Pb. London, Butterworth and Co. Ltd
2.	Handbook of Histopathological & Histochemical Techniques by CFA Culling
3.	Theory & Practice of Histological Techniques by Johan D Bancroft & Gamble
4.	Medical Lab. Technology by Lynch
5.	Handbook of Histopathological Techniques by C.F.A Culling

Semester 02

a. Course Name: Basic Hematology and Hematological Disease (P)
b. Course Code: 19010603DSS02
c. Prerequisite: Knowledge of up to 12th science level and must Passed
d. Rationale: Basic Operation theatre knowledge is fundamental as it provides a strong foundation for various Healthcare disciplines, promotes problem-solving skills, supports innovation, and opens doors to diverse career opportunities.

e. Course Learning Objective:

CLOBJ 1	It helps students with thorough knowledge of diseases and techniques used in disease diagnosis.
CLOBJ 2	It helps in explanation of pathologic processes that apply to patients
CLOBJ 3	Also helps in analysis of laboratory and clinical data.
CLOBJ 4	It helps in interpretation of laboratory data for clinical pathologic correlation
CLOBJ 5	The morphology, physiology and pathogenicity of microorganisms and their pathogenic potential that cause disease in man.

f. Course Outcomes:

CLO 1	Be able to accurately and confidently use anatomical and physiological terms to describe the human body.
CLO 2	Gain a basic understanding of the major body systems and their roles in maintaining homeostasis.
CLO 3	Gain an understanding of how the structure of different body parts is directly related to their function.
CLO 4	Be able to use your understanding of anatomy and physiology to explain common health phenomena and make informed decisions about your own health.
CLO 5	Improve your ability to think critically, analyse information, and solve problems related to anatomy and physiology.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		
					T	**CE**	**P**	**T**	**P**	
-	-	2	2	1	-	-	20	-	30	50

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	Simple staining techniques	10%	4
2	Gram staining	10%	4
3	ZN staining	10%	2
4	Preparation of culture media	10%	4
5	Methods of isolation	10%	3
6	Instruments used in microbiology including sterilization equipment	10%	2
7	Microscopic examinations	10%	4
8	Hematological staining	10%	2
9	Cytology staining	10%	2
10	Total cell count	10%	3

	Total teaching hours for the academic year	**100%**	**30**

i. Text Book and Reference Book:

1.	Microbiology By M.J. Pelczar
2.	Kuby Immunology By Jenni Punt, Sharon Stranford, Patricia Jones, Judy Owen
3.	Prescott's Microbiology By Joanne M. Willey

Semester 03

a. Course Name: Medical Microbiology-I (Bacteriology and Mycology) (T)
b. Course Code: 19010603DS03
c. Prerequisite: Foundational understanding of basic biology and microbiology concepts.
d. Rationale: Bacteriology and mycology are pivotal in understanding microbial roles in health, disease, and environmental processes, informing medical practices and ecological management.

e. Course Learning Objective:

CLOBJ 1	To complement the students with the basic knowledge about microbial growth and microscopy.
CLOBJ 2	To complement the students with the cultivation and control of microbes with a physical and chemical approach.
CLOBJ 3	To instil practical skills about methods of isolation, characterization, and control of Microbes and familiarize with fundamental aspects of cellular chemistry.
CLOBJ 4	To acquaint with microbial isolation techniques from various clinical samples Gain knowledge about diagnostic tests for diseases To train to determine the potency of antibiotics using various standard methods.
CLOBJ 5	To learn basic knowledge about the fungal infectious disease and their prevation and Treatment.

f. Course Outcomes:

CLO 1	Students will be able to gain a concept of basic diagnostic microbiology.
CLO 2	Students will be able to cultivate and identify specific microorganisms.
CLO 3	Students can be able to make various culture media to growth microorganisms.
CLO 4	Student can able to identify different types of fungus with their culture properties.
CLO 5	Student can able to perform fungal diagnostic test.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					**Total**
					Internal Marks			**External Marks**		
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**T**	**CE**	**P**	**T**	**P**	
3	-	-	3	3	20	20	-	60	-	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	● To demonstrate the instruments used to seed culture media ● To learn techniques for Inoculation of bacteria on culture media ● To isolate specific bacteria from a mixture of organisms. ● To demonstrate simple staining (Methylene blue) ● To prepare India ink preparation to demonstrate negative staining. ● Bacterial identification: To demonstrate reagent preparation, procedure and interpretation for ● Gram stain ● Albert stain	20%	06

	● Neisser ‘s staining ● Z-N staining ● Capsule staining ● Demonstration of flagella by staining methods ● Spore staining ● To demonstrate spirochetes by Fontana staining procedure		
2	To prepare the reagent and demonstrate the following biochemical tests with positive and negative control bacteria: ● Catalase ● Citrate ● Oxidase ● TSIA ● Nitrate reduction ● Carbohydrate fermentation ● Huge and Leifson ● Bile solubility ● H2S production ● Demonstration and motility ● Decarboxylases ● CAMP ● Nagler ‘s reaction	25%	13
3	To demonstrate various characteristics (morphological, cultural, and biochemical) of bacteria commonly isolated from clinical samples i.e. ● Staphylococcus ● Streptococcus ● Corynebacterium ● Escherichia coli ● Klebsiella ● Citrobacter ● Enterobacter ● Proteus ● Salmonella ● Shigella ● Vibrio cholera ● Mycobacterium tuberculosis ● Pseudomonas	25%	13
4	**General Mycology** ● To demonstrate Hand hygiene and safety precaution ● To demonstrate fungal sample collection, transportation, storage method ● Preparation of culture media use in mycology ● To demonstrate instrument use in mycology laboratory	10%	05
5	**Fungal diagnostic Test** To demonstrate KOH preparation ● To demonstrate gram staining method ● To demonstrate India ink preparation ● To demonstrate Modified kinyoun acid fast stain ● To demonstrate Lpcb mount preparation ● To demonstrate slide culture method	20%	08

	● To demonstrate cellophane tape mount method ● To demonstrate Fungal mount microscopy ● To demonstrate stock maintenance, Revival of fungal stock.		
	Total teaching hours for the academic year	**100%**	**45**

i. Text Book and Reference Book:

1.	An introduction to Med. Lab. Technology by F.J. Baker & R.E. Silverton, Pb. London, Butterworth and Co. Ltd
2.	Handbook of Histopathological & Histochemical Techniques by CFA Culling
3.	Theory & Practice of Histological Techniques by Johan D Bancroft & Gamble
4.	Medical Lab. Technology by Lynch
5.	Handbook of Histopathological Techniques by C.F.A Culling

Semester 03

a. Course Name: Medical Microbiology-I (Bacteriology and Mycology) (P)
b. Course Code: 19010603DS04
c. Prerequisite: Foundational understanding of basic biology and microbiology concepts.
d. Rationale: Bacteriology and mycology are pivotal in understanding microbial roles in health, disease, and environmental processes, informing medical practices and ecological management.

e. Course Learning Objective:

CLOBJ 1	To complement the students with the basic knowledge about microbial growth and microscopy.
CLOBJ 2	To complement the students with the cultivation and control of microbes with a physical and chemical approach.
CLOBJ 3	To instil practical skills about methods of isolation, characterization, and control of Microbes and familiarize with fundamental aspects of cellular chemistry.
CLOBJ 4	To acquaint with microbial isolation techniques from various clinical samples Gain knowledge about diagnostic tests for diseases To train to determine the potency of antibiotics using various standard methods.
CLOBJ 5	To learn basic knowledge about the fungal infectious disease and their prevation and Treatment.

f. Course Outcomes:

CLO 1	Students will be able to gain a concept of basic diagnostic microbiology.
CLO 2	Students will be able to cultivate and identify specific microorganisms.
CLO 3	Students can be able to make various culture media to growth microorganisms.
CLO 4	Student can able to identify different types of fungus with their culture properties.
CLO 5	Student can able to perform fungal diagnostic test.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		
					T	**CE**	**P**	**T**	**P**	
-	-	2	2	1	-	-	20	-	30	50

h. Course Contentp

Sr.	**Topics**	**Weightage**	**Hours**
1	• To demonstrate the instruments used to seed culture media • To learn techniques for Inoculation of bacteria on culture media • To isolate specific bacteria from a mixture of organisms. • To demonstrate simple staining (Methylene blue) • To prepare India ink preparation to demonstrate negative staining. • Bacterial identification: To demonstrate reagent preparation, procedure and interpretation for • Gram stain	20%	06

	• Albert stain • Neisser‘s staining • Z-N staining • Capsule staining • Demonstration of flagella by staining methods • Spore staining • To demonstrate spirochetes by Fontana staining procedure		
2	To prepare the reagent and demonstrate the following biochemical tests with positive and negative control bacteria: • Catalase • Citrate • Oxidase • TSIA • Nitrate reduction • Carbohydrate fermentation • Huge and Leifson • Bile solubility • H2S production • Demonstration and motility • Decarboxylases • CAMP • Nagler ‘s reaction	25%	06
3	To demonstrate various characteristics (morphological, cultural, and biochemical) of bacteria commonly isolated from clinical samples i.e. • Staphylococcus • Streptococcus • Corynebacterium • Escherichia coli • Klebsiella • Citrobacter • Enterobacter • Proteus • Salmonella • Shigella • Vibrio cholera • Mycobacterium tuberculosis • Pseudomonas	25%	06
4	**General Mycology** • To demonstrate Hand hygiene and safety precaution • To demonstrate fungal sample collection, transportation, storage method • Preparation of culture media use in mycology • To demonstrate instrument use in mycology laboratory.	10%	06
5	**Fungal diagnostic Test**	20%	06

	• To demonstrate KOH preparation • To demonstrate gram staining method • To demonstrate india ink preparation • To demonstrate Modified kinyoun acid fast stain • To demonstrate Lpcb mount prepatation • To demonstrate slide culture method • To demonstrate cellophane tape mount method • To demonstrate Fungal mount microscopy • To demonstrate stock maintenance,Reviaval of fungal stock.		
	Total teaching hours for the academic year	**100%**	**30**

i. Text Book and Reference Book:

1.	An introduction to Med. Lab. Technology by F.J. Baker & R.E. Silverton, Pb. London, Butterworth and Co. Ltd
2.	Handbook of Histopathological & Histochemical Techniques by CFA Culling
3.	Theory & Practice of Histological Techniques by Johan D Bancroft & Gamble
4.	Medical Lab. Technology by Lynch
5.	Handbook of Histopathological Techniques by C.F.A Culling

Semester 04

a. Course Name: **Advanced and Higher English - II**

b. Course Code: **00019304AE04**

c. Prerequisite: Knowledge of Advanced English-1

d. Rationale: To provide a challenging academic environment where students can deepen their understanding of the English language through the study of complex literary texts, rigorous writing assignments, and in-depth analysis of various forms of written communication.

e. Course Learning Objective:

CLOBJ 1	Develop basic proficiency in English language skills including reading, writing, speaking, and listening, with an emphasis on comprehension and fluency.
CLOBJ 2	Expand vocabulary through the acquisition of common words and phrases used in everyday communication, including greetings, introductions, and expressions for daily activities.
CLOBJ 3	Gain a solid understanding of basic grammar rules, including sentence structure, verb tenses, parts of speech, and word order, to construct grammatically correct sentences and communicate effectively.
CLOBJ 4	Improve pronunciation and intonation to enhance clarity and intelligibility in spoken English, focusing on accurate articulation of sounds, stress patterns, and rhythm.
CLOBJ 5	Develop confidence and proficiency in engaging in everyday conversations in English, including asking and answering questions, expressing opinions, making requests, and participating in discussions on familiar topics.

f. Course Outcomes:

CLO 1	Identity and develop soft skills required for personal and professional growth.
CLO 2	Develop professional etiquette & desired behavior at the workplace
CLO 3	Speak and participate effectively in oral organizational communication
CLO 4	Improve comprehensive skills for reading.
CLO 5	Know how to be assertive in professional environment

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		
					T	**CE**	**P**	**T**	**P**	
2	-	-	2	2	-	100	-	-	-	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	Corporate Etiquette: Tips and guide to develop personality and gain various etiquettes manners, case studies and activities. Telephone etiquette	3%	1
2	Etiquette for foreign business trips	3%	1
3	Etiquette for small talks	3%	1
4	Respecting privacy Learning to say 'No'	3%	1
5	Presentation	33%	10
6	Email etiquettes & writing	7%	2
7	Article writing	7%	2

8	Poster making	7%	2
9	Advertisement design	7%	2
10	Convincing skills	7%	2
11	Insane inventor	4%	2
12	Picture perception	4%	1
13	Book review	4%	1
14	Movie review	4%	1
15	Critical thinking	4%	1
	Total teaching hours for the academic year	**100%**	**30**

i. Text Book and Reference Book:

1.	Business Correspondence and report Writing, Sharma, R. AND Mohan, k.
2.	Communication Skills, Kumar S and Lata P; New Delhi Oxford University Press
3.	Practical English Usage, Michael Swan
4.	A Remedial English Grammar for Foreign Student, F.T. WOOD
5.	On Writing Well, William Zinsser; Harper Paperbacks,2006; 30th anniversary edition
6.	Oxford Practice Grammar, John Eastwood; Oxford University Press

Semester 04

a. Course Name: **German - II**

b. Course Code: **00019304AE05**

c. Prerequisite: Knowledge of Basic German Language Studied in MEL-1

d. Rationale: German is the second most commonly used scientific language. Germany is the third largest contributor to research and development and offers research fellowships to scientists from abroad. Germany awards a generous number of scholarships and other support to study in Germany. Working holiday visas are available for young people from a range country, and special visas are offered to skilled workers and professionals. There are agreements for student exchange between Germany and many countries of the world. Knowing the language of your German business partners improves your relations and therefore your chances for effective communication and success.

e. Course Learning Objective:

CLOBJ 1	Develop proficiency in basic German vocabulary and grammar to facilitate everyday communication.
CLOBJ 2	Gain cultural understanding and appreciation of German-speaking countries through language immersion activities, such as reading authentic texts and watching German media.
CLOBJ 3	Enhance listening, speaking, reading, and writing skills in German through interactive exercises and assignments.
CLOBJ 4	Acquire the ability to engage in simple conversations, express opinions, and ask questions in German on various topics.
CLOBJ 5	Prepare for real-life situations such as traveling, studying abroad, or interacting with German-speaking individuals in professional contexts.

f. Course Outcomes:

CLO 1	Communicate, understand various City Places, Body Parts, Colours, Professions. Can also able to frame the Sentences with the help of Modal Verbs.
CLO 2	Can communicate in German with Friends and in shopping mall and also able ask and guide Directions in German Language.
CLO 3	Can read basic Passages in German
CLO 4	Write basic topics in German.

g. Teaching and Examination Scheme

Teaching Scheme					Examination Scheme					Total
					Internal Marks			External Marks		
Lecture Hrs /Week	Tutorial Hrs/ Week	Lab Hrs /Week	Hrs /Week	Credit	T	CE	P	T	P	
2	-	-	2	2	-	100	-	-	-	100

h. Course Content

Sr.	Topics	Weightage	Hours

1	**Grammar and Vocabulary: (LSRW)** Family Colors Clothing Body Parts Professions City Vocabulary Conjunctions	30%	10
	Modal Verbs Possessive Artikel		
2	**Conversation: (LSRW)** Dialogue (Suggested Situation) Asking Directions Conversation between two People Conversation in shopping mall/Shop My Family	30%	6
3	**Reading Skills:(LSRW)** My university My friend Berlin- Haupstadt (Detailed) My Family	20%	6
4	**Writing Skills:(LSRW)** Passage Writing (suggested Topics) My university My Family My Friend Advertisement	20%	8
	Total teaching hours for the academic year	**100%**	**30**

i. Text Book and Reference Book:

1.	Netzwerk A1 Deutsch als Fremdsprache Kursbuch by Stefanie Dengler, Paul Rusch Klett- Langenscheidt
2.	So geht das -1 By Ujjwal Malhotra| Educational Publishers
3.	German in 30 Days by Goyal Saab | Langenscheidt

Semester 04

a. Course Name: **French - II**
b. Course Code: **00019304AE06**
c. Prerequisite: Knowledge of MIL – 1 (French)
d. Rationale: Basic Communication Skills of French Language

e. Course Learning Objective:

CLOBJ 1	Develop proficiency in French pronunciation, vocabulary, and grammar to enable effective communication in everyday situations.
CLOBJ 2	Cultivate an understanding and appreciation of French-speaking cultures through exposure to authentic materials such as literature, films, and music.
CLOBJ 3	Enhance proficiency in listening, speaking, reading, and writing French through a variety of interactive activities and assignments.
CLOBJ 4	Acquire the ability to engage in conversations, express ideas, and communicate effectively in French on a range of topics, both orally and in writing.
CLOBJ 5	Prepare for practical applications of French language skills, such as traveling, studying abroad, or pursuing professional opportunities in French-speaking regions.

f. Course Outcomes:

CLO 1	Talk about future activities and plans.
CLO 2	Ask and respond to questions in French.
CLO 3	Describe feelings in French.
CLO 4	Talk about likes and dislikes.
CLO 5	Talk about future activities and plans.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		
					T	**CE**	**P**	**T**	**P**	
2	-	-	2	2	-	100	-	-	-	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	**Grammar:** Articles (definite, indefinite and partitive) Prepositions (à, en, au, aux, à la, à l', chez, du, de la, des, d') Les verbs (Present Tense): ir, re, irregular verbs Le futur Proche Poser et Répondez aux questions (Asking Questions) – Qui, Quand, Où, Pourquoi, Quel, Quelle, Quels, Quelles	33%	10
2	**Listening Skills: Basic Vocabular** **a.** Class room objects **b.** Study Subjects **c.** Common nouns of places **d.** Seasons	17%	5
3	**Speaking Skills:** Talking to a French Speaking Stranger. Talking about hobbies. Talking and writing about hobbies.	17%	5
4	**Reading Skills and Writing Skills:** My family	33%	10

	Les dialogues (Talking to a classmate on the 1st day of school/college. / Talking to a friend about your family or vice versa. / Talking and writing about hobbies. / Talking to a French Speaking Stranger.) My hobbies My Best friend		
	Total teaching hours for the academic year	**100%**	**30**

i. Text Book and Reference Book:

1.	Saison 1 Didier
2.	Enchanté 0
3.	Larrouse Dictionnaire de Poche
4.	Larousse French Grammar (Mini) by Paperback
5.	Plaisir D'ecrire by Viral Thakkar, Saraswati House Pvt. Ltd.

Semester 04

a. Course Name: **Health Informatics and Personalized Medicine**

b. Course Code: **19010004SE01**

c. Prerequisite: Foundational Knowledge in Healthcare Systems, Basic Information Technology Skills, Introduction to Biology and Genetics, Statistics and Data Analysis, Programming Skills.

d. Rationale: Integration of Health Informatics and Personalized Medicine, Emphasis on Data Management and Analytics, Focus on Genomics and Biomarkers.

e. Course Learning Objective:

CLOBJ 1	Grasp the basic concepts, history, and importance of health informatics in modern healthcare.
CLOBJ 2	Learn the various types of health information systems and their functionalities, along with the principles of data management in healthcare settings.
CLOBJ 3	Understand the principles of personalized medicine, including genomics, biomarkers, and pharmacogenomics.
CLOBJ 4	Learn to use bioinformatics tools and data analysis techniques to process and interpret healthcare data.
CLOBJ 5	Understand the strategies for implementing health informatics systems and explore emerging technologies and future trends.

f. Course Outcomes:

CLO 1	Define health informatics, explain its evolution, and describe its impact on healthcare delivery and patient outcomes.
CLO 2	Students will demonstrate the ability to identify and describe different health information systems (EHR, EMR, PHR), understand data collection methods, and ensure data quality and governance.
CLO 3	Explain how genomics and biomarkers are used in personalized medicine, discuss the principles of pharmacogenomics, and describe how these elements contribute to individualized patient care.
CLO 4	Students will acquire skills in using bioinformatics tools, data mining, and machine learning algorithms to analyze healthcare data, develop predictive models, and enhance decision-making in clinical settings.
CLO 5	Describe the system development lifecycle, discuss challenges and solutions in implementing health informatics systems, evaluate their impact on healthcare, and identify future trends and ethical considerations in the field.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					
					Internal Marks			**External Marks**		**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**T**	**CE**	**P**	**T**	**P**	
2	-	-	2	2	20	20	-	60	-	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**

1	**Chapter 1: Introduction to Health Informatics** Definition and scope Importance in modern healthcare Types of health information systems (EHR, EMR, PHR) Key components and functionalities	25%	7
2	**Chapter 2: Foundations of Personalized Medicine**	25%	8
	Definition and principles Comparison with traditional medicine Basics of genomics and genetics Role of genomics in personalized medicine Genetic testing and its applications		
3	**Chapter 3: Data Analysis and Bioinformatics** Introduction to bioinformatics Key bioinformatics tools Applications in health informatics Basics of data mining Machine learning algorithms and their applications	25%	8
4	**Chapter 4: Implementation and Future Trends** System development lifecycle Implementation strategies Future directions in health informatics Ethical, legal, and social implications	25%	7
	Total teaching hours for the academic year	**100%**	**30**

i. Text Book and Reference Book:

1.	"*Health Informatics: An Interprofessional Approach" by Ramona Nelson and Nancy Staggers*
2.	*Biomedical Informatics: Computer Applications in Health Care and Biomedicine" by Edward H. Shortliffe and James J. Cimino*
3.	"*Principles of Biomedical Informatics" by Ira J. Kalet*
4.	"*Genomic and Personalized Medicine: Foundations, Translation, and Implementation" edited by Geoffrey S. Ginsburg and Huntington F. Willard*
5.	"*Data Science for Healthcare: Methodologies and Applications" by Sergio Consoli, Diego Reforgiato Recupero, and Milan Petković*

Semester 04

a. Course Name: Microbiology & Pathology – II (T)

b. Course Code: 19010004DS01

c. Prerequisite: Knowledge of up to 12th science level and must Passed with **Semester III**

d. Rationale: Basic Operation theatre knowledge is fundamental as it provides a strong foundation for various Healthcare disciplines, promotes problem-solving skills, supports innovation, and opens doors to diverse career opportunities.

e. Course Learning Objective:

CLOBJ 1	It helps in explanation of pathologic processes that apply to patients
CLOBJ 2	Demonstrate competency in bacterial sampling and culturing techniques and achieving a pure culture of bacteria
CLOBJ 3	To recognize and diagnose common infectious diseases from the clinical presentation and associated microbiology
CLOBJ 4	Describe the epidemiology of infectious agents including how infectious diseases are transmitted
CLOBJ 5	Understand antimicrobial agents and common mechanisms of antimicrobial action and resistance

f. Course Learning Outcomes:

CLO 1	Be able to accurately and confidently use anatomical and physiological terms to describe the human body.
CLO 2	Gain a basic understanding of the major body systems and their roles in maintaining homeostasis.
CLO 3	Gain an understanding of how the structure of different body parts is directly related to their function.
CLO 4	Be able to use your understanding of anatomy and physiology to explain common health phenomena and make informed decisions about your own health.
CLO 5	Improve your ability to think critically, Analysis's information, and solve problems related to anatomy and physiology.

g. Teaching & Examination Scheme:

Teaching Scheme				**Evaluation Scheme**					
				Internal Evaluation			**ESE**		TOTAL
L	**T**	**P**	**C**	**T**	**CE**	**P**	**Theory**	**P**	
3	-	-	3	20	20	-	60	-	100

L- Lectures; **T-** Tutorial; **P-** Practical; **C-** Credit; **MSE-** Mid-Semester Evaluation, **CE-** Continuous Evaluation, **ESE-** End Semester Examination

h. Course Content:

Sr.	**Topics**	**Weightage**	**Hours**
1	**Unit-1: Immunology:** Introduction to Immunity and Immune system Types of Immunity Innate immunity- Specific features, components of innate immunity, barriers of innate immunity (physical, physiological and biological) Adaptive Immunity- Specific features, types of adaptive immunity, cellular and humoral immunity. Primary and Secondary lymphoid organ. Immunoglobulins- Genes, classes and functions. Hematopoiesis Antigen - Antibody reactions. Different Immunological techniques	20	8
2	**Unit-2: Systemic Bacteriology:** Gram positive cocci: Streptococci, Staphylococci, Pneumococci. Gram negative bacilli: Enterobacteriaceae group	10	7

	Gram positive bacilli: Clostridium Acid fast bacilli: Mycobacterium Bacterial Infection: Types of infection, Etiology, epidemiology, pathogenesis, symptoms and diagnosis of the following- Cholera Typhoid Anthrax Syphilis Tetanus		
3	**Unit-3: Disease and Transmission:** Normal flora of skin, eye, respiratory tract, mouth, intestinal tract, genitourinary tract. Nosocomial Infection: Epidemiology, Mode of transmission and Prevention Viral Infection Hepatitis AIDS, Polio, Foot and Mouth disease Infection by other microorganism: Etiology, epidemiology, pathogenesis, symptoms and diagnosis of the following- Malaria Spirochetes, Candidiasis, Fungal meningitis, Amebiasis	10	8
4	**Unit-4 Outline of Inflammation and wound healing:** Introduction Types of inflammation Regulation of inflammation Regeneration, repair, wound healing, healing in specialized tissues Neoplasia	30	8
5	**Unit-5: Derangement of Homeostasis & Hemodynamic:** Homeostasis Derangements of Body Water- Oedema, effusion, Dehydration, Overhydration Embolism Shock, Thrombosis, Ischemia, Infarction	20	7
6	**Unit-6: Pathological conditions & Diseases:** • Environmental & Nutritional diseases • Genetic & Pediatric diseases • Bleeding disorders • Disorders of Respiratory system, GIT. • Infectious diseases	10	`7
	Total teaching hours for the academic year	**100%**	**45**

i. Text Book and Reference Book:

1	Microbiology By M.J. Pelczar
2	Kuby Immunology By Jenni Punt, Sharon Stranford, Patricia Jones, Judy Owen
3	Prescott's Microbiology By Joanne M. Willey

Semester 04

a. Course Name: Microbiology & Pathology - II (P)

b. Course Code: 19010004DS02

c. Prerequisite: Knowledge of up to 12th science level and must Passed with **Semester III**

d. Rationale: Basic Operation theatre knowledge is fundamental as it provides a strong foundation for various Healthcare disciplines, promotes problem-solving skills, supports innovation, and opens doors to diverse career opportunities

e. Course Learning Objective:

CLOBJ 1	It helps in explanation of pathologic processes that apply to patients
CLOBJ 2	Demonstrate competency in bacterial sampling and culturing techniques and achieving a pure culture of bacteria
CLOBJ 3	To recognize and diagnose common infectious diseases from the clinical presentation and associated microbiology
CLOBJ 4	Describe the epidemiology of infectious agents including how infectious diseases are transmitted
CLOBJ 5	Understand antimicrobial agents and common mechanisms of antimicrobial action and resistance

f. Course Learning Outcomes:

CLO 1	Be able to accurately and confidently use anatomical and physiological terms to describe the human body.
CLO 2	Gain a basic understanding of the major body systems and their roles in maintaining homeostasis.
CLO 3	Gain an understanding of how the structure of different body parts is directly related to their function.
CLO 4	Be able to use your understanding of anatomy and physiology to explain common health phenomena and make informed decisions about your own health.
CLO 5	Improve your ability to think critically, Analysis's information, and solve problems related to anatomy and physiology.

g. Teaching & Examination Scheme:

Teaching Scheme				**Evaluation Scheme**					
L	**T**	**P**	**C**	**Internal Evaluation**			**ESE**		TOTAL
				T	**CE**	**P**	**Theory**	**P**	
-	-	2	1	-	-	20	-	30	50

L- Lectures; **T-** Tutorial; **P-** Practical; **C-** Credit; **MSE-** Mid-Semester Evaluation, **CE-** Continuous Evaluation, **ESE-** End Semester Examination

h. Course Content:

Sr. No.	**Content**	**Weightage**	**Teaching Hours**
1	Hanging drop preparation	10%	4
2	Isolation and identification of fungi on SDA agar media	10%	4
3	Serological testing	10%	2
4	Culture and drug sensitivity of blood, CSF, body fluids, etc.	10%	4
5	Differential blood count - RBC, WBC	10%	4
6	Cell counts of body fluids and biochemistry	10%	2
7	Semen analysis	10%	4
8	Basic histological techniques	10%	2

9	BT, CT, PT, APTT, INR etc.	10%	2
10	Electrophoresis	10%	2
	Total teaching hours for the academic year	**100%**	**30**

i. Text Book and Reference Book:

1	Microbiology By M.J. Pelczar
2	Kuby Immunology By Jenni Punt, Sharon Stranford, Patricia Jones, Judy Owen
3	Prescott's Microbiology By Joanne M. Willey

Semester 04

a. Course Name: **Foundations of Yoga**

b. Course Code: **00019404VA01**

c. Prerequisite: An open mind, basic health, consistency, a quiet space, comfortable clothing, a yoga mat, proper guidance, and a willingness to connect with your body, breath, and mind.

d. Rationale: The foundation of yoga promotes physical flexibility, mental clarity, emotional resilience, and spiritual growth, fostering a holistic approach to well-being that enhances overall health and encourages a deeper connection between mind, body, and spirit.

e. Course Learning Objective:

CLOBJ 1	Learners will master the sequence, alignment, and relaxation techniques of standing, sitting, supine, and prone yoga postures to enhance flexibility, strength, and balance.
CLOBJ 2	Learners will practice and internalize breathing exercises such as Suryabhedana, Ujjayi, Sitkari, and Nadishuddhi to improve respiratory efficiency and mental focus.
CLOBJ 3	Learners will gain competence in cleansing techniques like Jalaneti, Kapalabhati, and Trataka to purify the body and mind.
CLOBJ 4	Learners will be able to apply relaxation methods, including Yoga Nidra and Breath Awareness, to cultivate mindfulness and reduce stress.
CLOBJ 5	Learners will explore the significance and perform mudras and bandhas to channel energy effectively within the body

f. Course Outcomes:

CLO 1	To introduce students to the basic principles and philosophy of yoga.
CLO 2	To provide an understanding of the physical and mental benefits of yoga.
CLO 3	To teach foundational yoga postures, breathing techniques, and meditation practices.
CLO 4	To cultivate a personal yoga practice that promotes well-being and stress management.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		
					T	**CE**	**P**	**T**	**P**	
1	-	2	3	2	40	40	20	60	30	150

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	**Introduction to Yoga:** Definition and History of Yoga Different Paths of Yoga (Hatha, Raja, Karma, Bhakti, Jnana) Importance and relevance of Yoga in modern life	20%	3
2	**Philosophy of Yoga:** The Eight Limbs of Yoga (Ashtanga Yoga) Basic concepts of Patanjali's Yoga Sutras Concept of Mind, Body, and Spirit connection	15%	2

3	**Basic Anatomy and Physiology for Yoga:** Understanding the Musculoskeletal System Respiratory and Circulatory Systems in relation to Yoga	20%	3
	Physiological and Anatomical Effects of Asanas on the Human Body		
4	**Introduction to Pranayama and Meditation:** Basics of Pranayama (Breathing Techniques) Introduction to Meditation: Importance and Benefits Techniques for Developing Concentration and Mindfulness	20%	3
5	**Shat chakras**	5%	1
6	**Yoga and Health:** Physical and Mental Health Benefits of Yoga Yoga for Stress Management Yoga and Lifestyle Diseases (e.g., Hypertension, Diabetes)	20%	3
	Total teaching hours for the academic year	**100%**	**15**

i. List of Practical

1	**Warm-up and Preparation:** • Basic Warm-up Exercises • Joint Mobilization and Stretching
2	**Foundational Yoga Postures:** • Standing Postures: Tadasana, Ardhakatichakrasana, Ardhachakrasana,Padahastasana, Trikonasana and Vrikshasana step by step with Sthiti, main procedure, and vishrama. • Sitting Postures: Vajrasana, Suptavajrasana, Shashankasana, Ushtrasana,Marjarasana,Pashchimottanasana, Bhadrasana, Swasthikasana, Siddhasana,Padmasana, Gomukhasana and Ardhamatsyendrasana step by step with Sthiti, main procedure, and vishrama. • Supine Postures: Shavasana, Pavanamuktasana, Sarvangasana, Matsyasana, Halasana, Chakrasana and Setubandhasana step by step with Sthiti, main procedure and visrama • Prone Postures: Bhujangasana, Shalabhasana, Dhanurasana, and Makarasana step by step with Sthiti, main procedure and vishrama. • Introduction to Sun Salutations (Surya Namaskar).
3	**Pranayama Techniques:** • Perform Kumbhakabhedas namely-Suryabhedana, Ujjayi, Sitkari, Sheetali, Bhastrika and Bhramari. • Perform Nadishuddhi Pranayama with inhalation-retention-exhalation in the ratio of 1:4:2 in a comfortable sitting posture.
4	**Shuddhikriya Techniques:** • Perform Jalaneti, Kapalabhati and Trataka
5	**Meditation and Relaxation Techniques:** • Guided Meditation for Beginners • Techniques for Relaxation: Yoga Nidra • Mindfulness Meditation Practice • Breath Awareness Meditation.
6	Mudras and Bandhas

j. Text Book and Reference Book:

1.	A Text book of Sports and Exercise Physiology By Dey, Swapan Kumar | Jaypee Brothers Medical publishers
2.	Competition Level Book of Sports and Games By Dr. A. Mahaboojan, and etal | Lakshya Publisher and Distributor

3.	Exercise, Physiology, Fitness and sports Nutrition By B. Srilakshmi,V.Suganthi and G. Kalaivani Ashok | New AgeInternational Publisher
4.	Health and Physical Education By Puri & Chandra S S | Surjeet Publications
5.	Rules of Games and Sports, Updated Version 2024 By Shrivastava, Singh and Kumar | KSK Publishers and Distributors, Delhi
6.	Sports Nutrition and Weight Management By Prof. V. Satyanarayana | Sports Publications, Delhi
7.	Swasthya Shiksha By Dixit, Suresh | Sports Publications, Delhi
8.	Principles and History of Physical Education By Kamlesh, M.L | New Delhi: Friends Publication
9.	Light on Yoga (TextBook) By B.K.S. Iyengar
10.	The Yoga Sutras of Patanjali (TextBook) By Swami Satchidananda
11.	The Heart of Yoga (TextBook) By T.K.V. Desikachar
12.	Yoga Anatomy (TextBook) By Leslie Kaminoff and Amy Matthews

Semester 04

a. Course Name: **Physical Education and Sports**
b. Course Code: **00019404VA02**
c. Prerequisite: Basic understanding of physical fitness concepts and a willingness to actively participate in physical activities and team-based sports.
d. Rationale: The objective of this course is promoting physical health, enhancing mental well-being, fostering social skills, and encouraging lifelong habits of fitness and teamwork, ultimately contributing to holistic personal development and community cohesion.

e. Course Learning Objective:

CLOBJ 1	Learners will acquire practical knowledge and skills in marking fields and courts, ensuring accurate dimensions and adherence to standards.
CLOBJ 2	Learners will engage in activities that enhance coordination, communication, and teamwork by participating in group games and relay races.
CLOBJ 3	Learners will practice general warm-up, stretching, and cardio exercises to enhance flexibility, respiratory health, and overall physical fitness
CLOBJ 4	Learners will participate in walking, skipping, and running exercises to build endurance and cardiovascular strength.
CLOBJ 5	Learners will refine their fundamental game skills and participate in match practices to strengthen strategy and performance in sports.

f. Course Outcomes:

CLO 1	Learning of New Skills in Games and Sports.
CLO 2	Develop healthy life style practices.
CLO 3	Acquire Knowledge of well- being and physical fitness.
CLO 4	Maintain physical fitness through sports.
CLO 5	Improve skills of critical thinking, creative-thinking, problem-solving, team-work leadership, cooperative Behaviour and technical competencies.
CLO 6	Acquire information of sports initiatives of the Government.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		
					T	**CE**	**P**	**T**	**P**	
1	-	2	3	2	40	40	20	60	30	150

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	**History and Basic Concept of Sports and Fitness**: Concept of Sports and Fitness Aims and Objectives,Importance of Sports and Fitness Difference between Games and Sports History of Sports Ancient and Modern Olympics Asian Games and Common Wealth Gamesfunctioning	33%	5
2	**Concepts of Physical Fitness and Rules and Techniques of Games:** Concepts of Physical Fitness Fitness Components Meaning and development of strength, speed and accuracy in different physical activities	34%	5

	Sports Nutrition Importance of a Balanced Diet Rules and Techniques (games like Football, Athletics, Kho Kho, Kabaddi, Hockey etc.) Basic concepts and rules of different sports Fundamental Skills of Games and Sports		
3	**Trends in Sports and Fitness:** Personality Development through Sports Team building through Group games General Sports Policies Role of Khel Mahakumbh in Gujarat to promote Sports Careers in Physical Education and Sports	33%	5
	Total teaching hours for the academic year	**100%**	**15**

i. List of Practical

1	**Fundamental Skill Development Activities:** Marking fields or courts on ground, Group Games or Relay Race, Outdoor Games, Fundamental Skill Development Activities: Practicing general warm-up, stretching Practicing cardio and respiratory fitness Walking, Skipping and Running Participate and match practice in Game and Sports.

j. Text Book and Reference Book:

1.	A Text book of Sports and Exercise Physiology By Dey, Swapan Kumar | Jaypee Brothers Medical publishers
2.	Competition Level Book of Sports and Games By Dr. A. Mahaboojan, and etal | Lakshya Publisher and Distributor
3.	Exercise, Physiology, Fitness and sports Nutrition By B. Srilakshmi,V.Suganthi and G. Kalaivani Ashok | New AgeInternational Publisher
4.	Health and Physical Education By Puri & Chandra S S | Surjeet Publications
5.	Rules of Games and Sports, Updated Version 2024 By Shrivastava, Singh and Kumar | KSK Publishers and Distributors, Delhi
6.	Sports Nutrition and Weight Management By Prof. V. Satyanarayana | Sports Publications, Delhi
7.	Swasthya Shiksha By Dixit, Suresh | Sports Publications, Delhi
8.	Principles and History of Physical Education By Kamlesh, M.L | New Delhi: Friends Publication

Semester 04

a. Course Name: **National Cadet Corps (NCC)**
b. Course Code: **00019404VA03**
c. Prerequisite: Student who opt for this course should be physically fit and free from any major ailment.
d. Rationale: The objective of the NCC as a value-added course is to develop character, comradeship, secular outlook, discipline, leadership, and a spirit of adventure among youth.

e. Course Learning Objective:

CLOBJ 1	Understand the history, significance, organizational structure, and functioning of NCC to appreciate its role in national development.
CLOBJ 2	Explore leadership qualities, communication skills, team-building strategies, and management styles for personality development.
CLOBJ 3	Recognize the importance of national integration by understanding cultural diversity and promoting unity.
CLOBJ 4	Familiarize with basic health and hygiene practices, along with first aid and emergency response techniques for better community health.
CLOBJ 5	Gain insight into conservation, sustainable practices, and the role of NCC in promoting environmental protection.
CLOBJ 6	Examine various types of disasters, their impacts, and effective preparedness and response strategies to enhance resilience.
CL07	Investigate the role of NCC in community service and develop strategies to plan and execute impactful social service activities.

f. Course Outcomes:

CLO 1	Demonstrate the ability to work effectively in teams with mutual respect, fostering camaraderie and teamwork
CLO 2	Exhibit self-discipline and adhere to established rules and regulations in various activities, promoting an organized and disciplined approach.
CLO 3	Develop leadership qualities, including decision-making, problem-solving, and the ability to inspire and motivate others.
CLO 4	Understand and respect diverse cultures and religions, promoting unity, harmony, and a secular outlook in all interactions
CLO 5	Engage in activities that enhance physical fitness, environmental awareness, and resilience, fostering a spirit of adventure and sustainable living
CLO 6	Actively participate in community service initiatives, demonstrating social responsibility, empathy, and a commitment to societal well-being.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		**Total**
					T	**CE**	**P**	**T**	**P**	
1	-	2	2	2	40	40	20	60	30	150

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**

1	**Introduction to NCC:** History and significance of NCC, Organizational structure and functioning	14%	2
2	**Leadership and Personality Development:** Leadership qualities and styles, Communication skills, Team	16%	3
	building and management.		
3	**National Integration and Awareness:** Importance of national integration, Cultural diversity and unity	14%	2
4	**Health and Hygiene:** Basic health and hygiene practices, First aid and emergency response	14%	2
5	**Environmental Awareness:** Conservation and sustainable practices, Role of NCC in environmental protection	14%	2
6	**Disaster Management:** Types of disasters and their impact, Preparedness and response strategies	14%	2
7	**Social Service and Community Development:** Role of NCC in community service, Planning and executing social service activities	14%	2
	Total teaching hours for the academic year	**100%**	**15**

i. List of Practical

1	Drill: Basic drill movements, Marching and parade techniques.
2	Physical Fitness: Physical training exercises, Endurance, strength building, and Yogasana.
3	Community Service Projects: Participation in local community service projects, Planning and execution of social activities.

j. Text Book and Reference Book:

1.	Cadet's Hand Book Common Subject, All Wings (in English DGNCC, New Delhi
2.	Cadet's Hand Book Common Subject, All Wings (in Hindi) DGNCC, New Delhi)
3.	Cadet's Hand Book Specialized Subject, All Wings DGNCC, New Delhi

Semester 04

a. Course Name: **Psychology of Stress, Health and Wellbeing**

b. Course Code: **15M10504VA01**

c. Prerequisite: There is no prerequisite

d. Rationale: Mental distress is pervasive, but psychology is increasingly concerned with the improvement of well-being. This course looks at health, stress, happiness, and adjustment, with both challenges and strengths in human behavior. It provides insights that lead to a richer and more satisfying life.

e. Course Learning Objective:

CLOBJ 1	Comprehend the nature and physiology of stress, its impact on health (infectious, non-infectious, and psychological disorders), and the potential for posttraumatic growth.
CLOBJ 2	Explore various coping strategies, including physical, mental, and social approaches, along with mindfulness and the unconscious mechanisms of defensive coping.
CLOBJ 3	Understand the components of happiness, including genetic set-points, socio-economic factors, positive emotions, and sustainable happiness models with intentional activities.
CLOBJ 4	Engage with advanced concepts of happiness, focusing on eudaimonic well-being, self-determination, meaning in life, and the practice of Logo therapy.
CLOBJ 5	Evaluate the significance of positive mental health and well-being by integrating coping mechanisms and happiness practices into daily life.

f. Course Outcomes:

CLO 1	Explain the physiological and psychological processes of stress and its connection to health, trauma, and well-being, including its role in posttraumatic growth.
CLO 2	Implement effective coping strategies, including mindfulness, social support, and physical and mental methods, to address stress and enhance resilience
CLO 3	Differentiate between maladaptive and constructive coping mechanisms, evaluating their impact on psychological well-being and stress recovery.
CLO 4	Assess the influence of socio-economic factors, genetic predispositions, and intentional activities on happiness and sustainable well-being
CLO 5	Develop personalized strategies to cultivate happiness through activities like gratitude expression, identifying strengths, and achieving flow, while avoiding detrimental behaviors such as overthinking.
CLO 6	Design a comprehensive well-being plan integrating the principles of eudaimonic well-being, self-determination, meaning in life, and long-term life goals.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		**Total**
					T	**CE**	**P**	**T**	**P**	
2	-	-	2	2	40	40	-	60	-	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	Stress, Trauma and Health: Nature and physiology of stress Mind-body connections Stress and diseases: Infectious, Non-infectious and	25%	8

	Psychological disorders Stress, trauma and posttraumatic growth Factors influencing stress		
2	Stress and Coping: Types of coping strategies Unconscious mind and defensive coping Characteristics of constructive coping Physical ways of coping Mind-body strategies Mental ways of coping Coping with social support, meaning in life and Mindfulness Positive mental health and well-being	25%	8
3	Psychology of Happiness-I: What is happines and what makes us happy? Socio-economic factors and happiness Positive emotions Genetic set-point and hedonic adaptation Sustainable happiness model and intentional activities Happiness Activities-I	25%	7
4	Psychology of Happiness-II: Happiness Activities-II Concept of eudaimonic well-being, self-determination and motivation Concept of meaning of life Logo therapy	25%	7
	Total teaching hours for the academic year	**100%**	**30**

i. Text Book and Reference Book:

1.	Explain the physiological and psychological processes of stress and its connection to health, trauma, and well-being, including its role in posttraumatic growth.
2.	Implement effective coping strategies, including mindfulness, social support, and physical and mental methods, to address stress and enhance resilience.
3.	Differentiate between maladaptive and constructive coping mechanisms, evaluating their impact on psychological well-being and stress recovery.
4.	Assess the influence of socio-economic factors, genetic predispositions, and intentional activities on happiness and sustainable well-being
5.	Develop personalized strategies to cultivate happiness through activities like gratitude expression, identifying strengths, and achieving flow, while avoiding detrimental behaviors such as overthinking.
6.	Design a comprehensive well-being plan integrating the principles of eudaimonic well-being, self-determination, meaning in life, and long-term life goals.

Semester 04

a. **Course Name:** Applied Medicine & Pharmacology-I (Theory)
b. **Course Code:** 19010004DS03
c. **Prerequisites:** Students need knowledge of basic biology, microbiology, and biochemistry, along with skills in laboratory techniques, critical analysis, and clinical observations.
d. **Rationale:** Understanding immunology, bacteriology, disease transmission, inflammation, homeostasis, and various pathological conditions is crucial for diagnosing and managing infections, immune responses, and systemic disorders effectively.
e. **Course Learning Objective:**

CLOBJ 1	Students will learn all types of Clinical, Para clinical and Surgical Conditions.
CLOBJ 2	Students will understand exact mechanism of all types of important Disease conditions.
CLOBJ 3	Students will able to bifurcate disease conditions into two types of management: Medical and Surgical
CLOBJ 4	To identify a range of drugs used in medicine and discuss their mechanisms of action.
CLOBJ 5	To explain the mechanisms of action and pathology of ethanol and drugs of abuse

f. **Course Learning Outcomes:**

CLO 1	Know the basic pre-clinical - para clinical - clinical subjects
CLO 2	Applied Medicine Is application of Medical Knowledge in Patients for Diagnosis, Treatment & Prevention of Diseases
CLO 3	Students will be able to understand different types of divisions and disease conditions like GENERAL MEDICINE, GENERAL SURGERY, OBGY, PEDIATRIC, ORTHOPEDICS, ANAESTHESIA
CLO 4	Learn about how to take history & communications with patient common symptoms & sign of disease
CLO 5	Applying knowledge of medicines in patient care, evidence-based prescribing

g. **Teaching And Examination Scheme:**

Teaching Scheme					**Examination Scheme**					**Total**
Lecture Hrs./ Week	**Tutorial Hrs./ Week**	**Lab Hrs./ Week**	**Total Hrs./**	**Credit**	**Internal Marks**			**External Marks**		
					T	**CE**	**P**	**T**	**P**	
4	-	-	4	4	20	20	-	60	-	100

Lect.- Lecture, Lab.- Lab, Tut - Tutorial, T - Theory, P - Practical, CE - CE, T - Theory, P – Practical

h. **Content:**

UNIT	**CONTENTS**	**WEIGHTAGE**	**HOURS**
1	**Unit-1: General Surgery:** History Taking and clinical examination in Surgery (General & local examination) Over view of sign & symptoms of abdominal diseases with figure of abdominal organ and organ wise diseases Visits of OPD, Casualty, OT, wards, laboratory, CSSD etc. Common surgical emergencies like burns,	18%	10

	trauma – abdominal, chest & head, intestinal obstruction & perforation, Appendicitis. Wound, Ulcer, Inflammation, Abscess		
2	**Unit-2: General Medicine:** History taking & clinical examination in Medicine (General & systemic Examination) Overview of Common medical emergencies like poisoning, snake bite, convulsions, MI, status asthmatics, status epileptics, acute LVF, acute pulmonary Embolism, unstable angina, Tension Pneuthorax, Diabetic Ketoacidosis **Overview of** Diabetes, jaundice, Hypertension, Fever, TB, AIDS, Anaemia, RESPIRATORY Diseases	18%	10
3	**Unit-3: OBGY:** History taking & clinical examination in OBGY (General & local examination) Antenatal Care & labour management Bleeding P.V., Leucorrhoea Common emergencies in OBGY Like PPH, APH, Eclampsia.	15%	10
4	**Unit-4: Outline of General Pharmacology:** Introduction Definitions Source of drugs Distribution of drugs	15%	10
5	**Unit-5: Outline of Administration and Fate of Drugs:** ute of drugs administration rm of drugs and dosage sorption and bioavailability of drugs ctors affecting drug metabolism Biotransformation of drugs	17%	10
6	**Unit-6: Outline of Drug Action, Receptors and Excretion:** Methods of prolonging the duration of drug action Site of drug action Mechanism of drug action Adverse drugs reaction in man ±ADR Manifestation of ADR Treatment of drug poisoning Factors modifying the effect of drug Drug receptors Dose response relationship Introduction about excretion of drug Route other than absorption site	17%	10
	Total teaching hours for the academic year	**100%**	**60**

i. Reference Books

1.	**DC Datta' s Textbook of Gynecology** By Hiralal Konar

2.	**Golwalla ' s Medicine for Student** By Aspi F.Golwalla & Sharukh A.Golwalla
3.	**Essentials of Medical Pharmacology** By K.D.Tripathi
4.	**Sharma & Sharma's Principles of Pharmacology** By H. L. Sharma & K.K. Sharma
5.	**Medical Pharmacology** By Padmaja Udaykumar

Semester 04

a. Course Name: Applied Medicine & Pharmacology-I (Practical)
b. Course Code: 19010004DS04
c. Prerequisites: Students need knowledge of basic biology, microbiology, and biochemistry, along with skills in laboratory techniques, critical analysis, and clinical observations.
d. Rationale: Understanding immunology, bacteriology, disease transmission, inflammation, homeostasis, and various pathological conditions is crucial for diagnosing and managing infections, immune responses, and systemic disorders effectively.
e. Course Learning Objective:

CLOBJ 1	Students will learn all types of Clinical, Para clinical and Surgical Conditions.
CLOBJ 2	Students will understand exact mechanism of all types of important Disease conditions.
CLOBJ 3	Students will able to bifurcate disease conditions into two types of management: Medical and Surgical
CLOBJ 4	To identify a range of drugs used in medicine and discuss their mechanisms of action.
CLOBJ 5	To explain the mechanisms of action and pathology of ethanol and drugs of abuse

f. Course Learning Outcomes:

CLO 1	Know the basic pre-clinical - para clinical - clinical subjects
CLO 2	Applied Medicine Is application of Medical Knowledge in Patients for Diagnosis, Treatment & Prevention of Diseases
CLO 3	Students will be able to understand different types of divisions and disease conditions like GENERAL MEDICINE, GENERAL SURGERY, OBGY, PEDIATRIC, ORTHOPEDICS, ANAESTHESIA
CLO 4	Learn about how to take history & communications with patient common symptoms & sign of disease
CLO 5	Applying knowledge of medicines in patient care, evidence-based prescribing

g. Teaching And Examination Scheme:

Teaching Scheme					**Examination Scheme**					**Total**
					Internal Marks			**External Marks**		
Lecture Hrs./ Week	**Tutorial Hrs./ Week**	**Lab Hrs./ Week**	**Total Hrs./**	**Credit**	**T**	**CE**	**P**	**T**	**P**	
-	-	4	4	2	-	-	20	-	30	50

Lect.- Lecture, Lab.- Lab, Tut - Tutorial, T - Theory, P - Practical, CE - CE, T - Theory, P – Practical

h. List Of Skills / List of Practical

Sr. No.	**COMPETENCIES**	**WEIGHTAGE**	**HOURS**
1	Definition, sources of drugs and drug development	10%	10
2	Introduction to Clinical pharmacy	10%	10
3	Solid dosage forms	15%	10
4	Liquid dosage forms – oral	10%	10
5	Liquid dosage forms – parenteral	15%	10
6	Liquid dosage form of topical formulations	15%	03
7	Dosage calculation	15%	02
8	Sources of drug information	10%	05

	Total Practical hours for the academic year	**100%**	**60**

i. Reference Books

1.	**DC Datta' s Textbook of Gynecology** By Hiralal Konar
2.	**Golwalla ' s Medicine for Student** By Aspi F.Golwalla & Sharukh A.Golwalla
3.	**Essentials of Medical Pharmacology** By K.D.Tripathi
4.	**Sharma & Sharma's Principles of Pharmacology** By H. L. Sharma & K.K. Sharma
5.	**Medical Pharmacology** By Padmaja Udaykumar

Semester 04

a. Course Name: **Histopathology and Cytology (T)**
b. Course Code: 19010604DS01
c. Prerequisite: Knowledge of up to 12th science level and must passed with Semester III.
d. Rationale: Histopathology provides knowledge on tissue processing and staining techniques for disease identification, while Cytology focuses on detecting cellular abnormalities, aiding in early diagnosis and preventive healthcare. Both are crucial for training competent laboratory professionals who support pathologists and contribute to accurate patient diagnosis and care.

e. Course Learning Objective:

CLOBJ 1	The students will be studying about basics of Histopathology and cytopathology technique.
CLOBJ 2	The students will be able to learn about sample processing criteria for cytopathology and Histopathology
CLOBJ 3	The students will understand Advance techniques requires to perform cytological methods
CLOBJ 4	The students will be able to create workflow for Histopathology techniques.
CLOBJ 5	The students will be learning about various concepts of museum techniques to preserve rare sample.

f. Course Outcomes:

CLO 1	Student will able to understand basic histopathological procedures.
CLO 2	Student will able to learn about various biopsy and autopsy.
CLO 3	Students will also able to learn about preparation of Various museum specimen.
CLO 4	Students will be able to remember principles of Instrumentation used in Histopathology
CLO 5	Students will also able to learn about preparation of Various museum specimen.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		
					T	**CE**	**P**	**T**	**P**	
3	-	-	3	3	20	20	-	60	-	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	**Unit-1: Fundamentals of Histopatholohgy** Alimentary System: Diseases of mouth, Diseases of Esophagus- Esophageal varices. Digestive System: Gastritis, Peptic ulceration, Appendicitis microbial diseases, food poisoning, hernia, Intestinal obstructions & mal absorption. Accessory Digestive glands: Salivary glands- mumps Liver – hepatitis, liver failure, cirrhosis. Pancreas- pancreatitis. Gall Bladder- Gall stones, jaundice and cardiovascular diseases. Circulatory System:Diseases of Blood vessels- Atheroma,	30%	14

	Arteriosclerosis, heart block. Disorders of Blood Pressure-Hyper & Hypotension. Respiratory System: Upper respiratory tract infection, Bronchi, Asthma, Pneumonia, Lung abscess, Tuberculosis, Lung Collapse. Urinary System: Glomerulonephritis, Nephrotic syndrome, renal failure, renal calculi, Urinary obstruction, Urinary tract infection. Reproductive system: Sexually transmitted diseases, Pelvic inflammatory disease, disorder of cervix (CIN), Disease of ovaries, ectopic pregnancy, prostatitis, Infertility Nervous System: Neuronal damage, ICP, Cerebral Infarction, head injury, Alzheimer ‘s disease, dementia. Endocrine System: Pituitary: Hyper & Hypo secretions Thyroid: Goiter Adrenal: Cushing Syndrome, Addison Disease Pancreas: Diabetes Sense Organs: Ear: Otitis Eye: Cataract		
2	**Unit-2: Introduction to Histotechnology** Introduction, Care, and maintenance of laboratory equipment used in histotechnology. Safety measures in a histopathology laboratory Basic concepts about routine methods of examination of tissues Collection and transportation of specimens for histological examination Basic concepts of fixationVarious types of fixatives used in a routine histopathology laboratory. Simple fixatives Compound fixatives Special fixatives for demonstration of various tissue elements Decalcification Criteria of a good decalcification agent Technique of decalcification followed with selection of tissue, fixation, and decalcification, neutralization of acid and thorough washing. Various types of decalcifying fluids: Organic & Inorganic Acid, chelating agents, Use of Ion-exchange resigns and Electrophoretic decalcification and treatment of hard tissues which are not calcified. Processing of various tissues for histological examination Procedure followed by Dehydration, Clearing, Infiltration and routine timing schedule for manual or automatic tissue processing. Components & principles of various types of automatic tissue Processors Embedding: Definition Various types of embedding media Section Cutting Introduction regarding equipment used for sectioning	40%	18

	Microtome Knives Sharpening of Microtome Knives, Honing, Stropping, various types of microtomes and their applications Freezing Microtome and various types of Cryostats. Faults in paraffin section cutting with reason and remedy, spreading the sections and attachment, or mounting of sections to glass slides. Staining, Impregnation and Mountains Theory of Staining, Classifications of Dyes, Principles of Dye Chemistry Stains and Dyes and their uses. Types of Stains, Chemical Staining Action, Mordants and Accentuators, Metachromasia Use of Controls in Staining Procedures Preparation of Stains, solvents, aniline water, and buffers etc.		
3	**Unit-3: Cytopathology** Enzyme Cytochemistry: Diagnostic applications Demonstration of Phosphatases, Dehydrogenases, Oxidases & Peroxidases Vital staining for Sex Chromatin Aspiration cytology: Principle Indications & utility of the technique with special emphasis on role of cytotechnologist in FNAC clinics Exfoliative cytology (Papanicolaou technique for the staining of cervical smears) Cervical cytology Fluid Cytology Urine CSF Body Fluids (Pleural, Pericardial, Ascitic) Automation in cytology Liquid based cytology: Principles and preparation, Cytocentrifuge, molecular cytology, Cell Block and Immune-cytochemistry	30%	13
	Total teaching hours for the academic year	**100%**	**45**

i. Text Book and Reference Book:

1.	An introduction to Med. Lab. Technology by F.J. Baker & R.E. Silverton, Pb. London, Butterworth and Co. Ltd
2.	Handbook of Histopathological & Histochemical Techniques by CFA Culling
3.	Theory & Practice of Histological Techniques by Johan D Bancroft & Gamble
4.	Medical Lab. Technology by Lynch
5.	Handbook of Histopathological Techniques by C.F.A Culling

Semester 04

a. Course Name: **Histopathology and Cytology (P)**
b. Course Code: 19010604DS02
c. Prerequisite: Knowledge of up to 12th science level and must passed with **Semester III**
d. Rationale: Histopathology provides knowledge on tissue processing and staining techniques for disease identification, while Cytology focuses on detecting cellular abnormalities, aiding in early diagnosis and preventive healthcare. Both are crucial for training competent laboratory professionals who support pathologists and contribute to accurate patient diagnosis and care.

e. Course Learning Objective:

CLOBJ 1	The students will be studying about basics of Histopathology and cytopathology technique.
CLOBJ 2	The students will be able to learn about sample processing criteria for cytopathology and Histopathology
CLOBJ 3	The students will understand Advance techniques requires to perform cytological methods
CLOBJ 4	The students will be able to create workflow for Histopathology techniques.
CLOBJ 5	The students will be learning about various concepts of museum techniques to preserve rare sample.

f. Course Outcomes:

CLO 1	Student will able to understand basic histopathological procedures.
CLO 2	Student will able to learn about various biopsy and autopsy.
CLO 3	Students will also able to learn about preparation of Various Museum specimen.
CLO 4	Students will be able to remember principles of Instrumentation used in Histopathology
CLO 5	Students will also able to learn about preparation of Various Museum specimen.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					
					Internal Marks			**External Marks**		**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**T**	**CE**	**P**	**T**	**P**	
-	-	2	2	1	-	-	20	-	30	50

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	**FUNDAMENTAL OF HISTOLOGY:** To study squamous cell from cheek cells (Buccal mucosa) To study stained slide preparation from organs of digestive system Study of stained slides of liver, pancreas, gall bladder Study of various types of microscopes and draw diagram in practical notebook. To study stained slide preparation from organs of circulatory system To study stained slide preparation from organs of Respiratory	20%	6

	system To study stained slide preparation from organs of Nervous system To study stained slide preparation from organs of Urinary system To study stained slide preparation from organs of Endocrine system		
2	Demonstration of instruments used for dissection. Use of antiseptics, disinfectants, and insecticides in a tissue culture processing laboratory Reception and labeling of histological specimens. Preparation of various fixatives Helly ‘s fluid Zenker ‘s fluid Bouin ‘s fluid Corney‘s fluid 10% Neutral formalin Formal saline Formal acetic acid Pereyn‘s fluid Testing of melting point of paraffin wax and perform embedding of given tissue in paraffin block. To process a bone for decalcification To prepare ascending and descending grades of alcohol from absolute alcohol Processing of tissue by manual and automated processor method To demonstrate various part and types of microtomes To learn sharpening of microtome knife (Honing and stropping technique), and types of disposable blades in use (High and Low Profile). To perform section cutting (Rough and Fine) To practice attachment of tissue sections to glass slides To learn using tissue floatation bath and drying of sections in oven (60-65C) To perform & practice the Haematoxylin and Eosin staining technique. To perform & practice the Mallory ‘s Phospho tungstic Acid Haematoxylin (PTAH)	40%	12
3	To learn mounting of stained smears To perform Papnicolaou ‘s stain on cervical smear To perform Guard ‘s staining for demonstration sex chromatin (Barr bodies on a buccal smear) To perform Shorr ‘s staining for Hormonal assessment To cut frozen sections of Gynaec tissue To perform CSF sample and body fluids by cytospin Should know the various stains used in Cytology lab: ‖ May Grunwald Giemsa, H&E, PAS, Grocott‘s.	40%	12

	Total teaching hours for the academic year	**100%**	**30**

i. Text Book and Reference Book:

1.	An introduction to Med. Lab. Technology by F.J. Baker & R.E. Silverton, Pb. London, Butterworth and Co. Ltd
2.	Handbook of Histopathological & Histochemical Techniques by CFA Culling
3.	Theory & Practice of Histological Techniques by Johan D Bancroft & Gamble
4.	Medical Lab. Technology by Lynch
5.	Handbook of Histopathological Techniques by C.F.A Culling

Semester 05

a. Course Name: **Applied Medicine & Pharmacology-II (Theory)**

b. Course Code: **19010005DS01**

c. Prerequisite: Students need knowledge of basic biology, microbiology, and biochemistry, along with skills in laboratory techniques, critical analysis, and clinical observations.

d. Rationale: Understanding immunology, bacteriology, disease transmission, inflammation, homeostasis, and various pathological conditions is crucial for diagnosing and managing infections, immune responses, and systemic disorders effectively.

e. Course Learning Objective:

CLOBJ 1	Students will learn all types of Clinical, Para clinical and Surgical Conditions.
CLOBJ 2	Students will understand exact mechanism of all types of important Disease conditions.
CLOBJ 3	Students will able to bifurcate disease conditions into two types of management: Medical and Surgical
CLOBJ 4	To identify a range of drugs used in medicine and discuss their mechanisms of action.
CLOBJ 5	To explain the mechanisms of action and pathology of ethanol and drugs of abuse

f. Course Outcomes:

CLO 1	Know the basic pre-clinical - para clinical - clinical subjects
CLO 2	Applied medicine is application of medical knowledge in patients for diagnosis, treatment & prevention of diseases
CLO 3	Students will be able to understand different types of divisions and disease conditions like general medicine, general surgery, obgy, pediatric, orthopedics, anaesthesia .
CLO 4	Learn about how to take history & communications with patient common symptoms & sign of disease
CLO 5	Applying knowledge of medicines in patient care, evidence-based prescribing

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		
					T	**CE**	**P**	**T**	**P**	
4	-	-	4	4	20	20	-	60	-	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	**Unit-1: Orthopaedics:** • History taking, clinical examination in Ortho (General & local examination) • Bone fracture management, arthritis • Plaster & cast application	18%	10

2	**Unit-2: Pediatric:** • History taking, clinical examination in Pediatric (general & systemic) • Overview of Diarrhoea, Fever, Cough, Basic new born care • Common pediatric emergencies with emergency resuscitation	18%	10
3	**Unit-3: Anesthesia:** Overview of Anaesthesia	15%	10
	• Machine & Circuit • Intubation set • CPR		
4	**Unit-4: Outline of drugs acting on different systems:** • Drugs acting on central Nervous System • Drugs acting on Kidney • Drugs acting on GIT • Drugs acting on Respiratory system	15%	10
5	**Unit-5: Outline of CVS, Hormones & antimicrobials:** • Drugs acting on skin & mucous membrane • Hormones & related drugs • Drugs affecting blood & blood formation • Drugs acting on cardiovascular system • Introduction to antimicrobials	17%	10
6	**Unit-6: Outline of Autacoids & miscellaneous:** • Autacoids and related drugs • Antiseptics, Disinfectants, Ecto-parasiticides • Chelating Agents	17%	10
	Total teaching hours for the academic year	**100%**	**60**

i. Text Book and Reference Book:

1.	**DC Datta' s Textbook of Gynecology** By Hiralal Konar
2.	**Golwalla ' s Medicine for Student** By Aspi F.Golwalla & Sharukh A.Golwalla
3.	**Essentials of Medical Pharmacology** By K.D.Tripathi
4.	**Sharma & Sharma's Principles of Pharmacology** By H. L. Sharma & K.K. Sharma
5.	**Medical Pharmacology** By Padmaja Udaykumar

Semester 05

a. Course Name: **Applied Medicine & Pharmacology-II (Practical)**

b. Course Code: **19010005DS02**

c. Prerequisite: Students need knowledge of basic biology, microbiology, and biochemistry, along with skills in laboratory techniques, critical analysis, and clinical observations.

d. Rationale: Understanding immunology, bacteriology, disease transmission, inflammation, homeostasis, and various pathological conditions is crucial for diagnosing and managing infections, immune responses, and systemic disorders effectively.

e. Course Learning Objective:

CLOBJ 1	Students will learn all types of Clinical, Para clinical and Surgical Conditions.
CLOBJ 2	Students will understand exact mechanism of all types of important Disease conditions.
CLOBJ 3	Students will able to bifurcate disease conditions into two types of management: Medical and Surgical
CLOBJ 4	To identify a range of drugs used in medicine and discuss their mechanisms of action.
CLOBJ 5	To explain the mechanisms of action and pathology of ethanol and drugs of abuse

f. Course Outcomes:

CLO 1	Know the basic pre-clinical - para clinical - clinical subjects
CLO 2	Applied medicine is application of medical knowledge in patients for diagnosis, treatment & prevention of diseases
CLO 3	Students will be able to understand different types of divisions and disease conditions like general medicine, general surgery, obgy, pediatric, orthopedics, anaesthesia .
CLO 4	Learn about how to take history & communications with patient common symptoms & sign of disease
CLO 5	Applying knowledge of medicines in patient care, evidence-based prescribing

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		
					T	**CE**	**P**	**T**	**P**	
-	-	4	4	2	-	-	20	-	30	50

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	Introduction to experimental pharmacology	10%	10
2	Adverse drug reaction reporting	10%	10
3	Administer drugs through various routes in stimulated environment using mannequins.	15%	10
4	Introduction to prescription writing	10%	10
5	Prescription: ANS, Autocoids, Respiratory, CVS, Blood, CNS, GIT, Endocrine, Infectious disease.	15%	10

6	Communication with patient- I (on proper use of prescribed medications)	15%	05

7	Communication with patient- II (with empathy and ethics on all aspects of drug use)	15%	02
8	Communication with patient- III (regarding optimal use of	10%	03
	drug therapy, devices and storage of medicines)		
	Total teaching hours for the academic year	**100%**	**60**

i. Text Book and Reference Book:

1.	**DC Datta' s Textbook of Gynecology** By Hiralal Konar
2.	**Golwalla ' s Medicine for Student** By Aspi F.Golwalla & Sharukh A.Golwalla
3.	**Essentials of Medical Pharmacology** By K.D.Tripathi
4.	**Sharma & Sharma's Principles of Pharmacology** By H. L. Sharma & K.K. Sharma
5.	**Medical Pharmacology** By Padmaja Udaykumar

Semester 05

a. Course Name: **Advanced Anaesthesia Technology (T)**

b. Course Code: 19011305AC01

c. Prerequisite: **S**tudents should have a foundational understanding of human anatomy, physiology, and basic pharmacology. Prior exposure to clinical environments and basic medical equipment would be beneficial

d. Rationale: This curriculum is designed to equip medical students and professionals with comprehensive knowledge and practical skills in anesthesia and critical care. Understanding the intricacies of various anesthesia machines, artificial airways, and patient monitoring systems is crucial for ensuring patient safety and effective management during surgical procedures.

e. Course Learning Objective:

CLOBJ 1	Students will learn about the design, operation, and maintenance of anesthesia machines and related equipment.
CLOBJ 2	Students will differentiate among various types of face masks, ET tubes, LMAs, and tracheostomy tubes, understanding their modifications and specific uses.
CLOBJ 3	Students will gain knowledge in TIVA, balanced anesthesia, and the anesthesia triad.
CLOBJ 4	Students will master the use of multi-parameter monitors, interpreting normal values and responding to abnormalities.
CLOBJ 5	Students will learn the types, settings, and modes of operation room ventilators, as well as the complications and general care for patients on ventilators.

f. Course Outcomes:

CLO 1	Graduates will demonstrate a thorough understanding of Boyle's Basic Machine, anesthesia workstations, and AMBU bags, ensuring proper usage and troubleshooting.
CLO 2	Graduates will be able to select and modify face masks, ET tubes, LMAs, and tracheostomy tubes according to patient needs.
CLO 3	Graduates will competently administer TIVA and balanced anesthesia, utilizing the anesthesia triad and nerve stimulators to optimize patient outcomes.
CLO 4	Graduates will accurately monitor and interpret patient vitals using multi-parameter monitors, ensuring timely and appropriate responses to changes.
CLO 5	Graduates will adeptly manage artificial ventilation, adjusting ventilator settings and modes while recognizing and addressing complications.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		**Total**
					T	**CE**	**P**	**T**	**P**	
3	-	-	3	3	3	20	20	-	60	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**

1	Boyle's Basic Machine Anesthesia Workstation Face Masks- Types and modifications Artificial Airways-Types and modifications ET Tube- Types and modifications	30%	15
	LMA- Types and modifications Tracheostomy Tubes- Types and modifications AMBU Bag		
2	TIVA: Definition, Drugs used Balanced anaesthesia Anaesthesia triad Combined Spinal Epidural Nerve Stimulators	15%	8
3	Anaesthesia Monitoring Clinical Monitoring Multi parameter monitor: Normal values Arterial blood pressure, NIBP, IBP, Electrocardiogram monitoring SpO2, EtCLO 2, Temperature, FiO2 Urine output	30%	10
4	Artificial Ventilation Operation room Ventilators: Types, Settings, modes Complication in patients on Ventilators General care of patient on Ventilator Ventilator alarms Disinfection and sterilization of ventilators	25%	12
	Total teaching hours for the academic year	**100%**	**45**

i. Text Book and Reference Book:

1.	Anaesthesia Manual-A. A Pillai
2.	Lee synopsis (Handbook of Anaesthesia)
3.	Clinical Anesthesiology by Morgan
4.	Text Book of anesthesia by Ajay Yadav
5.	Anesthesia equipment's and Drugs by AK Paul

Semester 05

a. Course Name: **Advanced Anaesthesia Technology (P)**

b. Course Code: 19011305AC02

c. Prerequisite: **S**tudents should have a foundational understanding of human anatomy, physiology, and basic pharmacology. Prior exposure to clinical environments and basic medical equipment would be beneficial.

d. Rationale: This curriculum is designed to equip medical students and professionals with comprehensive knowledge and practical skills in anesthesia and critical care. Understanding the intricacies of various anesthesia machines, artificial airways, and patient monitoring systems is crucial for ensuring patient safety and effective management during surgical procedures.

e. Course Learning Objective:

CLOBJ 1	Students will learn about the design, operation, and maintenance of anesthesia machines and related equipment.
CLOBJ 2	Students will differentiate among various types of face masks, ET tubes, LMAs, and tracheostomy tubes, understanding their modifications and specific uses.
CLOBJ 3	Students will gain knowledge in TIVA, balanced anesthesia, and the anesthesia triad.
CLOBJ 4	Students will master the use of multi-parameter monitors, interpreting normal values and responding to abnormalities.
CLOBJ 5	Students will learn the types, settings, and modes of operation room ventilators, as well as the complications and general care for patients on ventilators.

f. Course Outcomes:

CLO 1	Graduates will demonstrate a thorough understanding of Boyle's Basic Machine, anesthesia workstations, and AMBU bags, ensuring proper usage and troubleshooting.
CLO 2	Graduates will be able to select and modify face masks, ET tubes, LMAs, and tracheostomy tubes according to patient needs.
CLO 3	Graduates will competently administer TIVA and balanced anesthesia, utilizing the anesthesia triad and nerve stimulators to optimize patient outcomes.
CLO 4	Graduates will accurately monitor and interpret patient vitals using multi-parameter monitors, ensuring timely and appropriate responses to changes.
CLO 5	Graduates will adeptly manage artificial ventilation, adjusting ventilator settings and modes while recognizing and addressing complications.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		
					T	**CE**	**P**	**T**	**P**	
-	-	2	2	2	-	-	20	-	30	50

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**

1	Boyle's Basic Machine Anesthesia Workstation Face Masks- Types and modifications Artificial Airways-Types and modifications ET Tube- Types and modifications	30%	8
	LMA- Types and modifications Tracheostomy Tubes- Types and modifications AMBU Bag		
2	TIVA: Definition, Drugs used Balanced anaesthesia Anaesthesia triad Combined Spinal Epidural Nerve Stimulators	15%	7
3	Anaesthesia Monitoring Clinical Monitoring Multi parameter monitor: Normal values Arterial blood pressure, NIBP, IBP, Electrocardiogram monitoring SpO2, EtCLO 2, Temperature, FiO2 Urine output	30%	8
4	Artificial Ventilation Operation room Ventilators: Types, Settings, modes Complication in patients on Ventilators General care of patient on Ventilator Ventilator alarms Disinfection and sterilization of ventilators	25%	7
	Total teaching hours for the academic year	**100%**	**30**

i. Text Book and Reference Book:

1.	Anaesthesia Manual-A. A Pillai
2.	Lee synopsis (Handbook of Anaesthesia)
3.	Clinical Anesthesiology by Morgan
4.	Text Book of anesthesia by Ajay Yadav
5.	Anesthesia equipment's and Drugs by AK Paul

Semester 05

a. Course Name: **Principles of Operation Theatre Management (T)**

b. Course Code: **19010905OT01**

c. Prerequisite: Knowledge of up to 12th science level and must passed all previous semesters and Human Anatomy and Physiology, Medical Terminology and Aseptic Technique.

d. Rationale: Basic Operation theatre knowledge is fundamental as it provides students with the fundamental knowledge and skills necessary to function effectively in the operating room setting such as Surgical asepsis and infection control, surgical instrumentation, Anesthesia and patient care and surgical procedures.

e. Course Learning Objective:

CLOBJ 1	Understand the core functions and responsibilities of an operating theatre team.
CLOBJ 2	Grasp the principles of aseptic technique and infection control in the operating room.
CLOBJ 3	Apply scheduling and resource management techniques to optimize operating room efficiency.
CLOBJ 4	Analyze factors impacting surgical case flow and identify strategies to minimize delays.
CLOBJ 5	Develop an understanding of legal and ethical considerations in operating room management.

f. Course Outcomes:

CLO 1	Understand the health care system.
CLO 2	Understand the different types of record and report.
CLO 3	Develop skill like how to manage Inventory control and purchase management
CLO 4	In the future, get a better employment opportunity in Hospital like OT assistant, OT Manager or in charge and other various posts.
CLO 5	The programmed reported an increase in their understanding of innovation and entrepreneurship.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		
					T	**CE**	**P**	**T**	**P**	
3	-	-	3	3	20	20	-	60	-	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**

1	**OPERATION THEATRE MANAGEMENT** a. Development of Management: Definitions of Management – Contributions of F.W. Taylor, Henry Fayol and others. b. Functions of Management: Planning Organizing – Directing – Controlling. c. Motivation: Motivation theories – McGregor's theory X and theory Y – Maslow's and Herzberg's theory d. Communication: Types of communication – Barriers of effective communication– Techniques for improved communication. e. Directing: Principles relating to Direction process – Principles and theories of leadership – Leadership Styles	34%	10
	f. Controlling: Span of control – Factors limiting effective span of control g. Co-ordination: Co-ordination and co-operation – Principles of co-ordination – Techniques of co- ordination charts and records		
2	**PERSONAL MANAGEMENT** a. Objective of Personnel Management b. Role of Personnel Manager in an organization Staffing and work distribution techniques c. Job analysis and description d. Recruitment and selection processes e. Orientation and training f. Coaching and counselling g. Disciplining h. Complaints and grievances i. Termination of employees j. Performance appraisal k. Health and safety of employees l. Consumer Protection Act as applicable to health care services.	22%	10
3	**FINANCIAL MANAGEMENT** a. Definition of financial Management b. Profit maximization c. Return maximization d. Wealth maximization e. short term Financing f. Intermediate Financing g. long term Financing h. Leasing as a source of Finance i. Cash and Security Management j. Inventory Management k. Dividend policies l. Valuations of Shares m. Financial Management in a hospital n. Third party payments on behalf of patients. o. Insurance health schemes and policies.	22%	10

4	**STORE AND INVENTORY CONTROL** a. Instrument set assembly and packaging. b. Sterilization services c. Patient equipment cleaning, distribution, and billing d. Case cart system for surgery and/or the delivery room e. Surgical instrument purchasing f. Acquisition of special-order implants and supplies g. Instrument processing within surgery h. Monitoring operating budgets for other departments within the facility	22%	15
	Total teaching hours for the academic year	**100%**	**45**

i. Text Book and Reference Book:

1.	OPERATION THEATER TECHNIQUE ANESTHESIA AND EMERGENCY CARE FOR TECHNICIANS, NURSES & PARAMEDICS By Vaishali Mohod
2.	Textbook of Operation Theatre Technology By MP Sharma
3.	Operation Theatre: Assistant Recruitment Exam Guide By Pankaj Singhal
4.	Handbook of Operation Theatre Technique Details By Kilpadi / Jaypee Brothers
5.	TEXTBOOK OF OPERATION THEATRE TECHNOLOGY By Manjushree Ray

Semester 05

a. Course Name: **Principles of Operation Theatre Management (P)**

b. Course Code: 19010905OT012

c. Prerequisite: Knowledge of up to 12th science level and must passed all previous semesters and Human Anatomy and Physiology, Medical Terminology and Aseptic Technique.

d. Rationale: Basic Operation theatre knowledge is fundamental as it provides students with the fundamental knowledge and skills necessary to function effectively in the operating room setting such as Surgical asepsis and infection control, surgical instrumentation, Anesthesia and patient care and surgical procedures.

e. Course Learning Objective:

CLOB J 1	Understand the core functions and responsibilities of an operating theatre team.
CLOB J 2	Grasp the principles of aseptic technique and infection control in the operating room.
CLOB J 3	Apply scheduling and resource management techniques to optimize operating room efficiency.
CLOB J 4	Analyze factors impacting surgical case flow and identify strategies to minimize delays.
CLOB J 5	Develop an understanding of legal and ethical considerations in operating room management.

f. Course Outcomes:

CLO 1	Understand the health care system.
CLO 2	Understand the different types of record and report.
CLO 3	Develop skill like how to manage Inventory control and purchase management
CLO 4	In the future, get a better employment opportunity in Hospital like OT assistant, OT Manager or in charge and other various posts.
CLO 5	The programmed reported an increase in their understanding of innovation and entrepreneurship.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		
					T	**CE**	**P**	**T**	**P**	
-	-	2	2	1	-	-	20	-	30	50

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	The student will be introduced to terminologies, equipment, and techniques used for preparation and management of the OT.	50%	10
2	Clinical visit will include visit to the entire chain of healthcare delivery system –Sub centre, PHC, CHC, SDH, DH and Medical College, private hospitals, dispensaries and clinics.	25%	10
3	Clinical visit to their respective professional department within the hospital.	25%	10
	Total teaching hours for the academic year	**100%**	**30**

i. Text Book and Reference Book:

1.	OPERATION THEATER TECHNIQUE ANESTHESIA AND EMERGENCY CARE FOR TECHNICIANS, NURSES & PARAMEDICS By Vaishali Mohod
2.	Textbook of Operation Theatre Technology By MP Sharma
3.	Operation Theatre: Assistant Recruitment Exam Guide By Pankaj Singhal
4.	Handbook of Operation Theatre Technique Details By Kilpadi / Jaypee Brothers
5.	TEXTBOOK OF OPERATION THEATRE TECHNOLOGY By Manjushree Ray

Semester 05

a. Course Name: **Advanced Critical Care Technology (T)**

b. Course Code: 19011305AC03

c. Prerequisite: Proficiency in using monitoring and diagnostic equipment, familiarity with interpreting data from these equipment's and understanding the implications for patient care is essential.

d. Rationale: Mastery of monitoring and diagnostic equipment ensures accurate assessment and early detection of changes in patient condition, crucial for guiding timely interventions and optimizing outcomes in critically ill patients.

e. Course Learning Objective:

CLOB J 1	Understand the principles and techniques involved in comprehensive patient assessment and monitoring, encompassing vital signs, neurological, cardiovascular, respiratory, renal, and metabolic assessments.
CLOB J 2	Develop proficiency in basic and advanced life support techniques, including management of cardiac arrest, arrhythmias, emergency airway management, and rapid response protocols.
CLOB J 3	Acquire in-depth knowledge of critical conditions such as sepsis, shock, acute respiratory distress syndrome (ARDS), acute coronary syndromes, and stroke, along with evidence-based management strategies.
CLOB J 4	Explore special considerations in critical care, including palliative and end-of-life care, pain management, nutrition in critically ill patients, and critical care considerations in special populations like paediatrics and geriatrics.
CLOB J 5	Gain expertise in the technological applications used in critical care settings, including understanding and operating critical care equipment, ventilator management, use of infusion pumps and syringe drivers, interpretation of monitoring systems, and basics of extracorporeal membrane oxygenation (ECMO) along with safety and maintenance protocols.

f. Course Outcomes:

CLO 1	Students will demonstrate proficiency in conducting comprehensive patient assessments, interpreting monitoring data, and identifying abnormalities indicative of changes in patient condition.
CLO 2	Upon completion of the course, students will be able to effectively apply basic and advanced life support techniques in simulated clinical scenarios, demonstrating competence in managing life-threatening emergencies.
CLO 3	Students will exhibit a deep understanding of critical conditions commonly encountered in critical care settings, applying evidence-based management strategies to stabilize patients and prevent complications.
CLO 4	By the end of the course, students will demonstrate sensitivity to special considerations in critical care, including providing compassionate end-of-life care, managing pain and agitation, addressing nutritional needs, and adapting care for diverse patient populations.
CLO 5	Upon successful completion of the course, students will be proficient in utilizing technological applications in critical care, including operating equipment, managing ventilators, administering medications via infusion pumps and syringe drivers, interpreting monitoring data, and ensuring safety and maintenance of critical care equipment.

g. Teaching and Examination Scheme

Teaching Scheme					Examination Scheme					Total
Lectur	Tutori	Lab			Internal			External		
e Hrs /Week	al Hrs/ Week	Hrs /We ek	Hrs /Week	Credit	Marks			Marks		
					T	CE	P	T	P	
3	-	-	3	3	20	20	-	60	-	100

h. Course Content

Sr.	Topics	Weightage	Hours
1	a. Patient Assessment and Monitoring b. Vital signs monitoring c. Neurological assessment d. Cardiovascular assessment e. Respiratory assessment f. Renal and metabolic assessment	20%	9
2	a. Advanced Life Support b. Basic and advanced life support techniques c. Management of cardiac arrest and arrhythmias d. Emergency airway management e. Rapid response and code blue	20%	9
3	a. Management of Critical Conditions b. Management of sepsis and shock c. Management of acute respiratory distress syndrome (ARDS) d. Management of acute coronary syndromes e. Management of stroke	20%	9
4	a. Special Considerations in Critical Care b. Palliative and end-of-life care in the ICU c. Management of pain, agitation, and delirium d. Nutrition in the critically ill patient e. Critical care considerations in special populations (e.g., paediatrics, geriatrics)	20%	9
5	a. Technological Applications in Critical Care b. Understanding and operating critical care equipment c. Ventilator management and settings d. Use of infusion pumps and syringe drivers e. Monitoring systems and their interpretation f. Basics of extracorporeal membrane oxygenation (ECMO) g. Safety and maintenance of critical care equipment	20%	9
	Total teaching hours for the academic year	**100%**	**45**

i. Text Book and Reference Book:

1.	Textbook of Critical Care" by Jean-Louis Vincent and Edward Abraham
2.	Advanced Cardiovascular Life Support (ACLS) Provider Manual" by American Heart Association
3.	Roberts and Hedges' Clinical Procedures in Emergency Medicine" by James R. Roberts and Catherine B. Custalow
4.	Palliative Care Nursing: Quality Care to the End of Life" by Marianne Matzo and Deborah Witt Sherman
5.	Critical Care Nursing: Diagnosis and Management" by Linda D. Urden, Kathleen M. Stacy, and Mary E. Lough

Semester 05

a. Course Name: **Advanced Critical Care Technology (P)**

b. Course Code: 19011305AC04

c. Prerequisite: Proficiency in using monitoring and diagnostic equipment, familiarity with interpreting data from these equipment's and understanding the implications for patient care is essential.

d. Rationale: Mastery of monitoring and diagnostic equipment ensures accurate assessment and early detection of changes in patient condition, crucial for guiding timely interventions and optimizing outcomes in critically ill patients.

e. Course Learning Objective:

CLOBJ 1	Understand the principles and techniques involved in comprehensive patient assessment and monitoring, encompassing vital signs, neurological, cardiovascular, respiratory, renal, and metabolic assessments.
CLOBJ 2	Develop proficiency in basic and advanced life support techniques, including management of cardiac arrest, arrhythmias, emergency airway management, and rapid response protocols.
CLOBJ 3	Acquire in-depth knowledge of critical conditions such as sepsis, shock, acute respiratory distress syndrome (ARDS), acute coronary syndromes, and stroke, along with evidence-based management strategies.
CLOBJ 4	Explore special considerations in critical care, including palliative and end-of-life care, pain management, nutrition in critically ill patients, and critical care considerations in special populations like paediatrics and geriatrics.
CLOBJ 5	Gain expertise in the technological applications used in critical care settings, including understanding and operating critical care equipment, ventilator management, use of infusion pumps and syringe drivers, interpretation of monitoring systems, and basics of extracorporeal membrane oxygenation (ECMO) along with safety and maintenance protocols.

f. Course Outcomes:

CLO 1	Students will demonstrate proficiency in conducting comprehensive patient assessments, interpreting monitoring data, and identifying abnormalities indicative of changes in patient condition.
CLO 2	Upon completion of the course, students will be able to effectively apply basic and advanced life support techniques in simulated clinical scenarios, demonstrating competence in managing life-threatening emergencies.
CLO 3	Students will exhibit a deep understanding of critical conditions commonly encountered in critical care settings, applying evidence-based management strategies to stabilize patients and prevent complications.
CLO 4	By the end of the course, students will demonstrate sensitivity to special considerations in critical care, including providing compassionate end-of-life care, managing pain and agitation, addressing nutritional needs, and adapting care for diverse patient populations.
CLO 5	Upon successful completion of the course, students will be proficient in utilizing technological applications in critical care, including operating equipment, managing ventilators, administering medications via infusion pumps and syringe drivers, interpreting monitoring data, and ensuring safety and maintenance of critical care equipment.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**		**Total**
Lecture	**Tutorial Hrs/**	**Lab Hrs**	**Hrs**	**Credit**	**Internal Marks**	**External Marks**	

Hrs /Week	Week	/Week	/Week		T	CE	P	T	P	
-	-	2	2	1	-	-	20	-	30	50

h. Course Content

Sr.	Topics	Weightage	Hours
1	a. Vital signs monitoring techniques b. Neurological assessment methods c. Cardiovascular assessment skills d. Respiratory assessment procedures e. Renal and metabolic monitoring techniques	20%	6
2	a. Basic life support (BLS) procedures b. Advanced cardiac life support (ACLS) protocols c. Emergency airway management techniques d. Rapid response and code blue scenarios e. Mock code drills for resuscitation	20%	6
3	a. Sepsis management strategies b. Acute respiratory distress syndrome (ARDS) interventions c. Acute coronary syndromes (ACS) care pathways d. Stroke management protocols e. Pediatric and geriatric critical care considerations	20%	6
4	a. Palliative and end-of-life care principles b. Pain management strategies c. Nutritional support practices d. Critical care considerations in special populations e. Ethical dilemmas in critical care	20%	6
5	a. Operating critical care equipment b. Ventilator management and settings c. Use of infusion pumps and syringe drivers d. Monitoring systems interpretation e. Basics of extracorporeal membrane oxygenation (ECMO)	20%	6
	Total teaching hours for the academic year	**100%**	**30**

i. Text Book and Reference Book:

1.	Textbook of Critical Care" by Jean-Louis Vincent and Edward Abraham
2.	Advanced Cardiovascular Life Support (ACLS) Provider Manual" by American Heart Association
3.	Roberts and Hedges' Clinical Procedures in Emergency Medicine" by James R. Roberts and Catherine B. Custalow
4.	Palliative Care Nursing: Quality Care to the End of Life" by Marianne Matzo and Deborah Witt Sherman
5.	Critical Care Nursing: Diagnosis and Management" by Linda D. Urden, Kathleen M. Stacy, and Mary E. Lough

Semester 05

a. Course Name: **Operation Theatre Technology – I (T)**
b. Course Code: 19010905OT03
c. Prerequisite: Knowledge of up to 12th science level and must passed all previous semesters and Human Anatomy and Physiology, Medical Terminology and Aseptic Technique.
d. Rationale: Basic Operation theatre knowledge -1 lays the groundwork for more advanced courses in surgical technology, sterile processing, and surgical assisting. This course equips students with the knowledge and skills they need to begin their careers as surgical technologists or surgical assistants.

e. Course Learning Objective:

CLOBJ 1	Learn to prepare the operating room for different types of surgeries.
CLOBJ 2	Develop skills to assist surgeons and other healthcare professionals during surgical procedures.
CLOBJ 3	Gain proficiency in maintaining sterile fields and ensuring patient safety throughout surgery.
CLOBJ 4	Comprehend and adhere to ethical and legal considerations in the operating room setting.
CLOBJ 5	Appreciate the importance of patient care and demonstrate empathy towards patients undergoing surgery.

f. Course Outcomes:

CLO 1	Demonstrate aseptic technique to prevent the spread of infection in the operating room
CLO 2	Prepare and maintain the operating room including cleaning, sterilizing, and organizing instruments and equipment.
CLO 3	Assist the surgical team during surgery by providing them with instruments and supplies.
CLO 4	Care for patients before, during, and after surgery
CLO 5	Maintain sterile supplies and equipment and Follow safety protocols in the operating room.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		
					T	**CE**	**P**	**T**	**P**	
3	-	-	3	3	20	20	-	60	-	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	Zoning of OT**,** OT disinfection & sterilization: Cleaning, carbonization, fumigation, fogging Theatre clothes, PPE, Lead aprons, goggles Scrubbing, gowning, gloving Handling of sterilized articles in OT OT table, OT lights, image intensifier: Handling and maintenance	20%	9

2	**Medical Gas** Compressed gas cylinders: Types, sizes, parts	10%	9

	Colour coding different gas cylinder and pipe line system Cylinder storage and handling: Things to remember Medical gas pipe line system and outlets. Diameter index safety system (DISS), and PISS Safety devices in pipe line and cylinders Air compressor Oxygen concentrator: working principal their uses and care		
3	**Oxygen Therapy** Hypoxia and hypoxemia. Clinical signs of hypoxemia. Goals of oxygen therapy. Oxygen therapy devices, Types of oxygen masks Evaluation of patients receiving oxygen therapy Hazards of oxygen therapy	10%	9
4	**Gas administration devices** Anaesthesia masks and Oxygen masks Pressure Regulators, pressure gauges Flow meters, Flow restrictors	30%	9
5	**Injection Techniques** Routes of drug administration Intra muscular and Intra Venous techniques Handling of sterilized syringes and needles. labeling of drugs Disposal of sharps, used syringes, needles	30%	9
	Total teaching hours for the academic year	**100%**	**45**

i. Text Book and Reference Book:

1.	OPERATION THEATER TECHNIQUE ANESTHESIA AND EMERGENCY CARE FOR TECHNICIANS, NURSES & PARAMEDICS By Vaishali Mohod
2.	Textbook of Operation Theatre Technology By MP Sharma
3.	Operation Theatre: Assistant Recruitment Exam Guide By Pankaj Singhal
4.	Handbook of Operation Theatre Technique Details By Kilpadi / Jaypee Brothers
5.	TEXTBOOK OF OPERATION THEATRE TECHNOLOGY By Manjushree Ray

Semester 05

a. Course Name: **Operation Theatre Technology – I (P)**

b. Course Code: 19010905OT04

c. Prerequisite: Knowledge of up to 12th science level and must passed all previous semesters and Human Anatomy and Physiology, Medical Terminology and Aseptic Technique.

d. Rationale: Basic Operation theatre knowledge -1 lays the groundwork for more advanced courses in surgical technology, sterile processing, and surgical assisting. This course equips students with the knowledge and skills they need to begin their careers as surgical technologists or surgical assistants.

e. Course Learning Objective:

CLOBJ 1	Learn to prepare the operating room for different types of surgeries.
CLOBJ 2	Develop skills to assist surgeons and other healthcare professionals during surgical procedures.
CLOBJ 3	Gain proficiency in maintaining sterile fields and ensuring patient safety throughout surgery.
CLOBJ 4	Comprehend and adhere to ethical and legal considerations in the operating room setting.
CLOBJ 5	Appreciate the importance of patient care and demonstrate empathy towards patients undergoing surgery.

f. Course Outcomes:

CLO 1	Demonstrate aseptic technique to prevent the spread of infection in the operating room
CLO 2	Prepare and maintain the operating room including cleaning, sterilizing, and organizing instruments and equipment.
CLO 3	Assist the surgical team during surgery by providing them with instruments and supplies.
CLO 4	Care for patients before, during, and after surgery
CLO 5	Maintain sterile supplies and equipment and Follow safety protocols in the operating room

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		
					T	**CE**	**P**	**T**	**P**	
-	-	2	2	1	-	-	20	-	30	50

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	Various Techniques of Injection –Advantages and Disadvantages.	50%	10
2	Crystalloids and colloids, Techniques of insertion of peripheral IV line.	25%	10
3	Medical Gas delivery Devices, DISS, PISS, Oxygen concentrator.	25%	10
	Total teaching hours for the academic year	**100%**	**30**

i. Text Book and Reference Book:

1.	OPERATION THEATER TECHNIQUE ANESTHESIA AND EMERGENCY

	CARE FOR TECHNICIANS, NURSES & PARAMEDICS By Vaishali Mohod
2.	Textbook of Operation Theatre Technology By MP Sharma
3.	Operation Theatre: Assistant Recruitment Exam Guide By Pankaj Singhal
4.	Handbook of Operation Theatre Technique Details By Kilpadi / Jaypee Brothers
5.	TEXTBOOK OF OPERATION THEATRE TECHNOLOGY By Manjushree Ray

Semester 05

a. Course Name: Metabolism and Molecular Biology (T)
b. Course Code: 19010605DS01
c. Prerequisite: Foundational understanding of basic metabolism and molecular biology.
d. Rationale: The study of metabolism and molecular biology is crucial in understanding how living organisms function at the most fundamental level.It lies in their fundamental importance to life processes, their relevance to health and disease, their applications in various fields including biotechnology and medicine, their implications for environmental and agricultural sciences, their insights into evolutionary biology, and their contributions to drug discovery and development.

e. Course Learning Objective:

CLOBJ 1	To develop Understanding of Basic Concepts related to metabolism and molecular biology, such as enzymes, metabolic pathways, gene expression, DNA replication, and protein synthesis.
CLOBJ 2	Describe the major metabolic pathways involved in energy production, such as glycolysis, the citric acid cycle, and oxidative phosphorylation.
CLOBJ 3	Understand the mechanisms of metabolic regulation, including enzyme regulation, allosteric control, and hormonal regulation and to Discuss how feedback mechanisms maintain homeostasis in metabolic pathways.
CLOBJ 4	Describe the processes of DNA replication, transcription, and translation and to Explain the roles of different molecules (DNA, RNA, proteins) and enzymes involved in molecular biology processes.
CLOBJ 5	Familiarize students with laboratory techniques commonly used in molecular biology research, such as polymerase chain reaction (PCR), gel electrophoresis, DNA sequencing, and recombinant DNA technology.
CLOBJ 6	Explore the applications of molecular biology in biotechnology, medicine, agriculture, and environmental sciences.

f. Course Outcomes:

CLO 1	Demonstrate a comprehensive understanding of the fundamental principles, concepts, and terminology related to metabolism and molecular biology. And explain the structures and functions of key biomolecules, metabolic pathways, and molecular biology processes.
CLO 2	Apply knowledge of metabolic pathways and molecular biology processes to analyse and solve complex problems in cellular and molecular biology and critically evaluate experimental data, scientific literature, and research findings related to metabolism and molecular biology.
CLO 3	Perform laboratory techniques commonly used in metabolism and molecular biology research, such as DNA extraction, PCR, gel electrophoresis, and enzyme assays and interpret experimental results accurately and draw appropriate conclusions based on experimental data.
CLO 4	Apply principles of metabolism and molecular biology and explore the applications of molecular biology techniques in biotechnology, medicine, agriculture, and environmental sciences.

g. Teaching and Examination Scheme

Teaching Scheme					Examination Scheme					Total
Lecture Hrs /Week	Tutorial Hrs/ Week	Lab Hrs /Week	Hrs /Week	Credit	Internal Marks			External Marks		
					T	CE	P	T	P	
3	-	-	3	3	20	20	-	60	-	100

h. Course Content

Sr.	Topics	Weightage	Hours
1	**Introduction to Metabolism** Definition of metabolism, anabolism and catabolism	5%	2
2	**Carbohydrate metabolism** ● Glycolysis ● Citric acid cycle ● Gluconeogenesis ● Glycogenolysis ● Glycogenesis ● Disorders related to carbohydrate metabolism	20%	8
3	**Protein metabolism** ● Formation of ammonia, detoxification of ammonia ● Transamination reaction ● Urea cycle and disorders ● Inborn errors of amino acid metabolism ● PKU, MSUD, Homocystinuria, Albinism	20%	9
4	**Lipid metabolism** ● Fatty acid oxidation ● Ketone body metabolism ● Lipoproteins ● Fatty liver	20%	9
5	**Nucleotide metabolism** ● Metabolism of purines ● Metabolism of pyrimidines ● Related disorders	20%	9
6	**Molecular Biology** ● DNA Replication, Transcription and Translation ● Recombinant DNA Technology	15%	8
	Total teaching hours for the academic year	**100%**	**45**

i. Text Book and Reference Book:

1.	Medical Biochemistry by D M Vasudevan
2.	Essentials of Biochemistry, Second Edition, Dr. (Prof) Satyanarayana
3.	Textbook of Medical Laboratory Technology, Volume 1, 3rd edition by Praful Ghodkar
4.	Medical Laboratory Technology by Mukherjee
5.	Practical Clinical Biochemistry by Harold Varley

Semester 05

a. Course Name: Metabolism and molecular biology (P)
b. Course Code: 19010605DS02
c. Prerequisite: Foundational understanding of basic metabolism and molecular biology.
d. Rationale: The study of metabolism and molecular biology is crucial in understanding how living organisms function at the most fundamental level. It lies in their fundamental importance to life processes, their relevance to health and disease, their applications in various fields including biotechnology and medicine, their implications for environmental and agricultural sciences, their insights into evolutionary biology, and their contributions to drug discovery and development.

e. Course Learning Objective:

CLOBJ 1	To develop Understanding of Basic Concepts related to metabolism and molecular biology, such as enzymes, metabolic pathways, gene expression, DNA replication, and protein synthesis.
CLOBJ 2	Describe the major metabolic pathways involved in energy production, such as glycolysis, the citric acid cycle, and oxidative phosphorylation.
CLOBJ 3	Understand the mechanisms of metabolic regulation, including enzyme regulation, allosteric control, and hormonal regulation and to Discuss how feedback mechanisms maintain homeostasis in metabolic pathways.
CLOBJ 4	Describe the processes of DNA replication, transcription, and translation and to Explain the roles of different molecules (DNA, RNA, proteins) and enzymes involved in molecular biology processes.
CLOBJ 5	Familiarize students with laboratory techniques commonly used in molecular biology research, such as polymerase chain reaction (PCR), gel electrophoresis, DNA sequencing, and recombinant DNA technology.
CLOBJ 6	Explore the applications of molecular biology in biotechnology, medicine, agriculture, and environmental sciences.

f. Course Outcomes:

CLO 1	Demonstrate a comprehensive understanding of the fundamental principles, concepts, and terminology related to metabolism and molecular biology. And explain the structures and functions of key biomolecules, metabolic pathways, and molecular biology processes.
CLO 2	Apply knowledge of metabolic pathways and molecular biology processes to analyse and solve complex problems in cellular and molecular biology and critically evaluate experimental data, scientific literature, and research findings related to metabolism and molecular biology.
CLO 3	Perform laboratory techniques commonly used in metabolism and molecular biology research, such as DNA extraction, PCR, gel electrophoresis, and enzyme assays and interpret experimental results accurately and draw appropriate conclusions based on experimental data.
CLO 4	Apply principles of metabolism and molecular biology and explore the applications of molecular biology techniques in biotechnology, medicine, agriculture, and environmental sciences.

g. Teaching and Examination Scheme

Teaching Scheme	**Examination Scheme**	

Lecture Hrs /Week	Tutorial Hrs/ Week	Lab Hrs /Week	Hrs /Week	Credit	Internal Marks			External Marks		Total
					T	CE	P	T	P	
-	-	2	2	1	-	-	20	-	30	50

h. Course Content

Sr.	Topics	Weightage	Hours
1	**Introduction to Metabolism** Definition of metabolism, anabolism and catabolism	5%	2
2	**Carbohydrate metabolism** ● Glycolysis ● Citric acid cycle ● Gluconeogenesis ● Glycogenolysis ● Glycogenesis ● Disorders related to carbohydrate metabolism	20%	6
3	**Protein metabolism** ● Formation of ammonia, detoxification of ammonia ● Transamination reaction ● Urea cycle and disorders ● Inborn errors of amino acid metabolism ● PKU, MSUD, Homocystinuria, Albinism	20%	6
4	**Lipid metabolism** ● Fatty acid oxidation ● Ketone body metabolism ● Lipoproteins ● Fatty liver	20%	6
5	**Nucleotide metabolism** ● Metabolism of purines ● Metabolism of pyrimidines ● Related disorders	20%	6
6	**Molecular Biology** ● DNA Replication, Transcription and Translation ● Recombinant DNA Technology	15%	4
	Total teaching hours for the academic year	**100%**	**30**

i. Text Book and Reference Book:

1.	Medical Biochemistry by D M Vasudevan
2.	Essentials of Biochemistry, Second Edition, Dr. (Prof) Satyanarayana
3.	Textbook of Medical Laboratory Technology, Volume 1, 3rd edition by Praful Ghodkar
4.	Medical Laboratory Technology by Mukherjee
5.	Practical Clinical Biochemistry by Harold Varley

Semester 05

a. Course Name: Medical Microbiology - II (Immunology & Virology) (T)
b. Course Code: 19010605DS03
c. Prerequisite: A foundational understanding of microbiology, including bacterial and viral structures, as well as basic immunological concepts like antigen-antibody interactions.
d. Rationale: This knowledge is essential to comprehend advanced topics such as immune system mechanisms, viral replication, and pathogenesis. It ensures students can connect theoretical concepts to clinical applications.

e. Course Learning Objective:

CLOBJ 1	The students will understand and evaluated compatibility testing.
CLOBJ 2	The students will analyze by various diagnostic techniques for hemoglobinopathies.
CLOBJ 3	To learn about applied Hematological testing and Hematological diseases
CLOBJ 4	To learn basic techniques related to Hematology
CLOBJ 5	The students will learn and create work flow of transfusion medicine and

f. Course Outcomes:

CLO 1	Students able to understand basic of hematology and procedure of hematological diagnosis
CLO 2	Students will learn about transfusion reaction from donor to recipient and techniques of transfusion medicine
CLO 3	Students Can Identify various blood morphology
CLO 4	Students can learn the principle of automation
CLO 5	Course will help student to enhance clinical skills

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		
					T	**CE**	**P**	**T**	**P**	
3	-	-	3	3	20	20	-	60	-	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	**Introduction to Virology** • Introduction of Medical Virology • Introduction of Medically important virus • Collection, transportation, storage of virus sample • General properties of virus • Classification of virus • Morphology of virus	12%	09
2	**Replication & cultivation** • Virus replication • Virus cultivation • Laboratory diagnosis of viral infection • Collection, transportation, storage of virus sample • Immuno-prophylaxis of viral infection	13%	09
3	**Study of virus in detail**	25%	09

	• Virus morphology, classification, etiology, clinical significance, lab diagnosis of virus, Treatment • Dengue virus • Chikungunya virus • Hepatitis virus • Herpes virus • HIV virus • Rabies virus • Influenza virus • Sars-Cov virus • Polio virus		
4	**Immunology and Serology** • Antigen-Antibody reactions • Definition • Classification • General features and mechanisms • Applications of various antigen antibody reactions • mentioned in Medical Microbiology: • Complement fixation test • Immuno- fluorescence • ELISA • SDS-PAGE • Western blotting • Principle, procedure, and interpretation of various • serological tests: • Widal • VDRL • ASO • CRP • Brucella tube agglutination • Rose-Waaler	25%	09
5	**Complement system:** • Definition • Basic concepts about its components • Complement activation pathways • Immune response: • Introduction • Basic concepts of Humoral and Cellular • immune responses • Hypersensitivity: • Definition • Types of hypersensitivity reactions • Basic concepts of autoimmunity and brief knowledge • about autoimmune diseases • Automation in diagnostic serology • Vaccines: • Definition • Types • Vaccination schedule • Brief knowledge about _Extended	25%	09

	• programme of immunization ‘(EPI) in India		
	Total teaching hours for the academic year	**100%**	**45**

i. Text Book and Reference Book:

1.	Practical Medical Microbiology by Mackie & McCartney Volume 1 and 2
2.	Textbook of Microbiology by Ananthanarayanan
3.	Medical Microbiology by Paniker& Satish Gupte
4.	Medical laboratory Technology Vol. I ,II, III by Mukherjee
5.	Medical Laboratory manual for tropical countries Vol II Microbiology by Monica Cheesbrough

Semester 05

a. Course Name: Medical Microbiology - II (Immunology & Virology) (P)
b. Course Code: 19010605DS04
c. Prerequisite: Prior laboratory experience in microbiological techniques, such as staining, culturing, and handling microbial specimens.
d. Rationale: Practical skills are crucial for conducting experiments in immunology and virology, enabling students to apply theoretical knowledge to diagnostic and research settings.

e. Course Learning Objective:

CLOBJ 1	The students will understand and evaluated compatibility testing.
CLOBJ 2	The students will analyze by various diagnostic techniques for hemoglobinopathies.
CLOBJ 3	To learn about applied Hematological testing and Hematological diseases
CLOBJ 4	To learn basic techniques related to Hematology
CLOBJ 5	The students will learn and create work flow of transfusion medicine and

f. Course Outcomes:

CLO 1	Students able to understand basic of hematology and procedure of hematological diagnosis
CLO 2	Students will learn about transfusion reaction from donor to recipient and techniques of transfusion medicine
CLO 3	Students Can Identify various blood morphology
CLO 4	Students can learn the principle of automation
CLO 5	Course will help student to enhance clinical skills

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		
					T	**CE**	**P**	**T**	**P**	
-	-	2	2	1	-	-	20	-	30	50

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	• To demonstrate safety equipment,use, • To demonstrate hand hygine,washing technique • To demonstrate the instruments use in viral diagnosis laboratory • To demonstrate virus sample collection,transport,storage method	20%	06
2	• To learn techniques for Inoculation of virus on culture media • To isolate specific virus from a mixture of clinical sample. • To demonstrate virus cultivation method-egg culture,animal inoculation,tissue culture,cell culture • To demonstrate Electron microscopy • To demonstrate Fluorescence microscopy	20%	06
3	• Demonstration of virus model • To demonstrate Molecular method-Rt-pcr,elisa • To demonstrate rapid method-immunochromatography test	20%	06

4	• Collection of blood sample by vein • puncture, separation and preservation of • serum • Performing Haemolysin titration for Rose- • Waaler test • Preparation of Phosphate buffers, Verinol • buffer, ASO buffer, Richardson‘s buffer, • Buffers of different pH and Molarity, Tris • buffer, Standardization of cell concentration by Spectrophotometer	20%	06
5	• Widal, • Brucella Tube Agglutination, • VDRL (including Antigen • Preparation), • ASO (Anti-Streptolysin _O‘) • C-Reactive Protein (Latex • agglutination) • Rheumatoid factor (RF) Latex • agglutination • Rose Waaler test, • Demonstration of antigen/antibody • determination by Immuno fluorescence (IF), • Immunodiffusion, precipitation in Agarose gel • (Ouchterlony), CCIEP, ELISA, SDS – PAGE and Western blotting.	20%	06
	Total teaching hours for the academic year	**100%**	**30**

i. Text Book and Reference Book:

1.	Practical Medical Microbiology by Mackie & McCartney Volume 1 and 2
2.	Textbook of Microbiology by Ananthanarayanan
3.	Medical Microbiology by Paniker& Satish Gupte
4.	Medical laboratory Technology Vol. I ,II, III by Mukherjee
5.	Medical Laboratory manual for tropical countries Vol II Microbiology by Monica Cheesbrough

Semester 06

a. Course Name: **Basics and Advanced Anaesthesia and Critical Care**
b. Course Code: 19011306AC01
c. Prerequisite: Student must pass with previously and Students should have a strong foundation in patient assessment, medication administration, and sterile technique.
d. Rationale: The study of anesthesia and critical care provides nurses with the knowledge and skills to care for patients in critical situations. These critical situations can occur in the operating room, intensive care unit (ICU), emergency department, and other areas of the hospital.

e. Course Learning Objective:

CLOBJ 1	Explain the principles and techniques of basic and advanced anesthetic procedures, including airway management, regional anesthesia, intravenous access, and cardiovascular monitoring.
CLOBJ 2	Demonstrate proficiency in using anesthesia-related equipment such as ventilators, hemodynamic monitors, and intravenous access devices in simulated clinical settings.
CLOBJ 3	Apply critical care strategies for managing sepsis, shock, trauma, and renal dysfunction, including fluid resuscitation, vasopressor administration, and renal replacement therapy.
CLOBJ 4	Analyze and interpret patient monitoring data, such as ECG, invasive pressure waveforms, pulmonary function tests, and ultrasound findings, to guide clinical decision-making.
CLOBJ 5	Evaluate and optimize anesthesia and critical care interventions based on patient response, complications, and emerging evidence-based practices to improve patient outcomes.

f. Course Outcomes:

CLO 1	Identify and explain the principles, techniques, and clinical applications of anesthetic and critical care procedures.
CLO 2	Perform and demonstrate essential anesthesia skills, including airway management, mechanical ventilation, vascular access, and regional anesthesia techniques.
CLO 3	Apply evidence-based approaches to manage critically ill patients, including those with sepsis, trauma, renal failure, and cardiovascular instability.
CLO 4	Interpret and analyze clinical monitoring data to assess patient conditions and modify anesthetic or critical care plans accordingly.
CLO 5	Synthesize knowledge of anesthesia and critical care interventions to make informed decisions, troubleshoot complications, and optimize patient safety and outcomes.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		**Total**
					T	**CE**	**P**	**T**	**P**	
-	-	8	8	4	-	-	40	-	60	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**

1	**Unit 1: Basic Anesthetic Techniques** • **Airway Management:** o Practicing bag-mask ventilation techniques o Learning laryngoscopy and endotracheal intubation procedures on mannequins o Familiarization with different airway devices (supraglottic airway devices) • **Monitoring:** o Setting up and using basic monitoring equipment (pulse oximetry, ECG, non-invasive blood pressure) o Interpreting vital signs during anesthesia • **Induction and Maintenance of Anesthesia:** o Understanding different types of anesthetic drugs (inhalational, intravenous) o Practicing safe administration of these drugs on mannequins Monitoring depth of anesthesia	25%	30
2	**Unit 2: Advanced Anesthetic Techniques** • **Regional Anesthesia:** o Learning different regional nerve block techniques (peripheral nerve blocks, central neuraxial blocks) on models o Practicing aseptic technique for regional anesthesia procedures • **Intravenous Access:** o Mastering techniques for peripheral and central venous access (cannulation) on mannequins Understanding complications associated with intravenous access	25%	30
3	**Unit 3: Critical Care Procedures** • **Cardiovascular Monitoring:** o Using advanced hemodynamic monitoring devices (invasive arterial pressure monitoring, central venous pressure monitoring) o Interpreting hemodynamic waveforms • **Mechanical Ventilation:** o Setting up and managing mechanical ventilators on mannequins o Understanding different ventilator modes and their applications • **Fluid Management and Electrolyte Balance:** o Principles of fluid resuscitation in critically ill patients	25%	30

	Understanding electrolyte imbalances and their correction		
4	**Unit 4: Sepsis & Shock Management** • Early recognition of sepsis (qSOFA, SIRS criteria). • Fluid resuscitation and vasoactive drug administration. • Point-of-care ultrasound (POCUS) for volume assessment. **Renal Support in Critical Care** • Basics of renal replacement therapy (CRRT, hemodialysis). • Electrolyte management and acid-base correction. **Trauma & Emergency Procedures** • Chest tube insertion (needle thoracostomy, tube thoracostomy). • FAST scan for trauma assessment. Damage control resuscitation principles.	25%	30
	Total teaching hours for the academic year	**100%**	**120**

i. Text Book and Reference Book:

1.	**To Err Is Human: Building a Safer Health System** by Institute of Medicine (US) Committee on Quality of Health Care in America
2.	**Crossing the Quality Chasm: A New Health System for the 21st Century**by Institute of Medicine (US) Committee on Quality of Health Care in America
3.	**The Checklist Manifesto: How to Get Things Right**by Atul Gawande
4.	**Textbook of Patient Safety and Clinical Risk Management**by Peter Lachman, Lucian Leape, and Ronald S. Braithwaite
5.	**Getting to Resilience: How Healthcare Systems Learn to Thrive in Uncertainty** by Kathleen Sutcliffe and Iris B. Schoonover

Semester 06

a. Course Name: **Operation Theatre Technology - II**

b. Course Code: 19010906OT01

c. Prerequisite: Logical to expect that Operation Theatre Technology - II would build upon the knowledge and skills gained from earlier semesters, particularly subjects like Operation Theatre Technology – I, Pharmacology and Anatomy and Physiology

d. Rationale: Operation Theatre Technology - II is likely to be a more advanced course compared to Operation Theatre Technology - I, focusing on in-depth knowledge and practical skills required for working in an operation theatre like Advanced Surgical Procedures, Anesthesia and Surgical Assisting and Communication and Teamwork.

e. Course Learning Objective:

CLOBJ 1	Apply knowledge of surgical procedures to anticipate instrument and medication needs
CLOBJ 2	Describe the proper functioning and care of surgical instruments and equipment
CLOBJ 3	Identify the different types of anesthesia and their applications
CLOBJ 4	Understand the principles of aseptic technique and sterile field maintenance
CLOBJ 5	Grasp the importance of communication and teamwork in ensuring patient safety during surgery

f. Course Outcomes:

CLO 1	Students will gain in-depth knowledge of sterile technique principles and practices used in various surgical procedures.
CLO 2	Students will learn about the specialized instruments used in various surgical procedures and how to handle them properly.
CLO 3	This includes knowledge of surgical case preparation, intraoperative care, and post-operative care.
CLO 4	The course will explore the specific requirements and protocols for different surgical specialties.
CLO 5	The course will emphasize the importance of professionalism, communication, teamwork, and ethical behavior in the operating room setting.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		**Total**
					T	**CE**	**P**	**T**	**P**	
-	-	8	8	4	-	-	40	-	60	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	● Care and maintenance of ventilators, suction machines, monitoring devices. ● Care, maintenance and operational capabilities of beds, lights and other apparatus. ● Care of unconscious adult and pediatric patients.	35%	40
2	● Physiotherapy techniques, feeding, Ryle's tube insertion and hyperalimentation.	35%	40

	● Suctioning and posturing of semiconscious and unconscious patients.		
3	● Oxygen therapy, maintenance of clear Airway. ● Ventilation of patient in crisis: ● Mouth to mouth. ● Mouth to ET Tube. ● Resuscitator/ bag valve mask assembly	30%	40
	Total teaching hours for the academic year	**100%**	**120**

i. Text Book and Reference Book:

1.	Operation theater technique anesthesia and emergency care for technicians, nurses & paramedics by vaishali mohod
2.	Textbook of operation theatre technology By mp sharma
3.	Operation theatre: assistant recruitment exam guide By pankaj singhal
4.	Handbook of operation theatre technique details By kilpadi / jaypee brothers
5.	Textbook of operation theatre technology By manjushree ray

Semester 06

a. Course Name: **Advance Hematology and Transfusion Medicine (T)**
b. Course Code: **19010606DS01**
c. Prerequisite: A solid understanding of basic hematology, including blood cell morphology, coagulation pathways, and blood group systems.
d. Rationale: This foundational knowledge is crucial for exploring advanced topics such as transfusion reactions, blood component therapy, and hemovigilance, ensuring students can apply theoretical concepts to clinical scenarios effectively.

e. Course Learning Objective:

CLOBJ 1	The students will understand and evaluated compatibility testing.
CLOBJ 2	The students will analyze by various diagnostic techniques for hemoglobinopathies.
CLOBJ 3	To learn about applied hematological testing and hematological diseases
CLOBJ 4	To learn basic techniques related to hematology
CLOBJ 5	The students will learn and create work flow of transfusion medicine and Hematology.

f. Course Outcomes:

CLO 1	Students able to understand basic of hematology and procedure of hematological diagnosis
CLO 2	Students will learn about transfusion reaction from donor to recipient and techniques of transfusion medicine
CLO 3	Students Can Identify various blood morphology
CLO 4	Students can learn the principle of automation
CLO 5	Course will help student to enhance clinical skills

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		
					T	**CE**	**P**	**T**	**P**	
3	-	-	3	3	20	20	-	60	-	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	**ADVANCED HEMATOLOGY** **Hemocytometry**: Introduction, Principle, Reagent preparation, procedure, errors involved and means to minimize errors. **Haematocritvalue:** RBC Count, Total leucocytes count (TLC) Platelet Count. Absolute Eosinophil count Principle mechanism and different methods with merit and demerits for the measuring Erythrocyte Sedimentation Rate (ESR) and its significance Different methods with merit and demerits for packedcellvolume/Haematocritvalue **Red cell anomalies:** Morphological changes such as variation	30%	15

	in size shape & staining character. Reticulocytes: Definition, different methods to count, Absolute reticulocyte count and IRF (Immature reticulocyte fraction) and significance of reticulocytes. Lupus Erythematosus (L.E) cell phenomenon. Definition of L.E. cell. Demonstration of L.E. cell by various methods. Clinical significance. **Safety precautions in Haematology** **Basic concepts of automation in Haematology with special reference to:** Blood cell counter Coagulometer **Laboratory diagnosis of bleeding disorders with special emphasize to** • Hemophilia A, B & Von-Willebrand disease • DIC • Platelet disorder (Qualitative and quantitative) • Laboratory approach for investigating thrombosis. **Correction studies for Factor deficiency** **Quantitative assay of coagulation factors** Principle Procedure Screening of inhibitors Inhibitors against coagulation factors APLA Karyotyping: Chromosomal studies in hematological disorders (PBLC and Bone marrow) Cyto-chemical staining: Principles, method and significance Biomedical waste management in Haematology laboratory (Other than Radioactive material)		
2	**Bone marrow examination** Composition and functions Aspiration of bone marrow (Adults and children) Processing of aspirated bone marrow (Preparation & staining of smear) Brief knowledge about examination of aspirated bone marrow (differential cell counts and cellular ratios) Processing and staining of trephine biopsy specimens Laboratory diagnosis of Iron deficiency anemia Laboratory diagnosis of Megaloblastic anemia & Pernicious anemia Classification and Laboratory diagnosis of Haemolytic anaemia Definition, classification and laboratory diagnosis of Leukaemia Chromosomal studies in various Hematological disorders and their significance. Using radioisotopes measurement of: • Blood volume • Determination of Red cell volume and Plasma volume • Red cell life span • Platelet life span	30%	15

	• Radiation hazards and its prevention • Disposal of radioactive material		
3	B**lood Banking** • Introduction to Blood Banking • History and discovery of various blood group systems • ABO blood group system • Rh and other major blood group system • Sources of error in blood grouping and their elimination. • ABO grouping: Forward and reverse grouping. Causes of discrimination between forward and reverse grouping Rh grouping **Compatibility test in blood transfusion** • Collection of blood for cross matching from a blood bag • Major cross matching • Minor cross matching • Use of enzymes in blood bank specially Papain • Complications and hazards of blood transfusion • Laboratory investigations of transfusion reactions and mismatched blood transfusion. • Precautions while procurement and storage of grouping antisera • Various anticoagulants used to collect blood for transfusion purposes • Selection of donor and procedure for collection of blood from a healthy donor • Preparation of various fractions of blood for transfusion and therapeutic purposes such as: • Packed red cells, washed red cells and FROZEN Red cells • Platelet Rich Plasma (PRP), Platelet concentrate and frozen platelets. • Fresh plasma (FP), Fresh Frozen Plasma (FFP) and cryoprecipitate • Brief introduction of blood substitute/artificial blood • Haemophiles: pertaining to Leucocytes, platelets and plasma. • **Quality control in blood bank.**	40%	15
	Total teaching hours for the academic year	**100%**	**45**

i. Text Book and Reference Book:

1.	Textbook of Medical Laboratory Technology by Paraful B. Godkar
2.	Medical laboratory Technology by K.L. Mukherjee Volume-I
3.	De Gruchy's clinical Haematology in medical practice
4.	Clinical Diagnosis & Management by Laboratory methods (20thedition) by John Bernard Henry
5.	Transfusion Science by Overfield, Hamer

Semester 06

a. Course Name: **Advance Hematology and Transfusion Medicine (P)**
b. Course Code: **19010606DS02**
c. Prerequisite: Prior experience in laboratory techniques, such as blood typing, crossmatching, and handling blood specimens.
d. Rationale: Practical skills are essential for conducting advanced procedures like component separation, pathogen reduction, and transfusion safety protocols, enabling students to bridge theory with hands-on applications.

e. Course Learning Objective:

CLOBJ 1	The students will understand and evaluated compatibility testing.
CLOBJ 2	The students will analyze by various diagnostic techniques for hemoglobinopathies.
CLOBJ 3	To learn about applied hematological testing and hematological diseases
CLOBJ 4	To learn basic techniques related to hematology
CLOBJ 5	The students will learn and create work flow of transfusion medicine and Hematology.

f. Course Outcomes:

CLO 1	Students able to understand basic of hematology and procedure of hematological diagnosis
CLO 2	Students will learn about transfusion reaction from donor to recipient and techniques of transfusion medicine
CLO 3	Students Can Identify various blood morphology
CLO 4	Students can learn the principle of automation
CLO 5	Course will help student to enhance clinical skills

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		
					T	**CE**	**P**	**T**	**P**	
-	-	2	2	1	-	-	20	-	30	50

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	Study and interpretation of Histogram of Automated Blood cell counter To estimate serum iron and total iron binding capacity. To estimate Hb-F, Hb-A2 in each blood sample. To estimate plasma and urine Hemoglobin in the given specimens. To demonstrate the presence of Hb-S by Sickling and Solubility tests. Perform Hb electrophoresis (alkaline) Perform osmotic red cell fragility. Total leukocyte count Platelets count Absolute Eosinophil count	50%	10

	Preparation of smearandstaining with Giemsaand Leishmanstain. ESR (Wintrobeand Westergren method) Packed cell volume (Macro & Micro)		
2	Cytological examination of CSF and other body fluids Physical and Microscopic examination of seminal fluid including sperm count Perform normal DLC Preparation of M/40 Calcium chloride Brain thromboplastin and standardization Cephalin Adsorbed plasma Perform BT, CT, Hess test, PT and APTT Review the morphology of Normal and abnormal RBCs Review the morphology of normal and immature WBCs WBCs anomalies Calculating INR and determining the ISI of thromboplastin Quantitative Factor assays: Factor VIII Factor IX Factor VII Factor X Factor V Quantification of inhibitors (Bethesda method) APLA: Lupus Anticoagulant (LA) Anti-cardiolipin antibodies (ACA) Perform Euglobulin clot lysis test (ELT) Urea clot solubility test for factor XIII.	25%	10
3	Screening of blood donor: physical examination including medical history of the donor Collection and preservation of blood for transfusion purpose Screening of blood for Malaria, Microfilaria, HBs Ag, Syphilis and HIV To determine the ABO & Rh grouping Direct or preliminary grouping Indirect or proof grouping Rh grouping and determination of Du in case of Rh negative To perform Direct and Indirect Comb ‘s test To perform cross matching Major cross matching Minor cross matching Preparation of various fractions of blood Demonstration nucleic acid amplification test (NAT)	25%	10
	Total teaching hours for the academic year	**100%**	**30**

i. Text Book and Reference Book:

1.	Textbook of Medical Laboratory Technology by Paraful B. Godkar

2.	Medical laboratory Technology by K.L. Mukherjee Volume-I
3.	De Gruchy's clinical Haematology in medical practice
4.	Clinical Diagnosis & Management by Laboratory methods (20thedition) by John Bernard Henry
5.	Transfusion Science by Overfield, Hamer

Semester 06

a. Course Name: **Clinical Posting: Phlebotomy Techniques**

b. Course Code: **19010606DS05**

c. Prerequisite: **To effectively undertake the Phlebotomy Techniques clinical posting, students should have:**

Basic understanding of human anatomy and physiology, particularly the circulatory system.
Knowledge of infection control practices and biosafety precautions.
Familiarity with medical terminology and laboratory procedures.
Prior exposure to laboratory equipment and basic specimen handling
Foundational communication skills to interact appropriately with patients across age groups**.**

d. Rationale: Phlebotomy is a critical skill in clinical diagnostics as it involves the first and most essential step—sample collection—for a wide range of medical tests. This subject is designed to equip students with the competencies necessary to safely and effectively collect, label, and transport blood samples for laboratory investigations. It bridges theoretical knowledge with practical application, ensuring students.

e. Course Learning Objective:

CLOBJ 1	Recall basic principles and terminologies related to phlebotomy and blood collection procedures.
CLOBJ 2	Explain the anatomical, physiological, and procedural aspects involved in safe venipuncture.
CLOBJ 3	Demonstrate correct techniques for patient preparation, site selection, and blood collection.
CLOBJ 4	Analyze causes of failed venipuncture and propose suitable corrective measures.
CLOBJ 5	Evaluate and follow standard precautions and infection control procedures during phlebotomy.

f. Course Outcomes:

CLO 1	Describe the basic concepts, terminology, and anatomical relevance involved in phlebotomy.
CLO 2	Explain the procedure, precautions, and importance of test requisition forms and blood collection methods.
CLO 3	Demonstrate the correct venipuncture and capillary sampling techniques in diverse clinical scenarios.
CLO 4	Analyze procedural errors and causes of failed venipuncture to determine effective corrective actions.
CLO 5	Adhere to infection control, sample handling, labelling, and transportation standards to ensure diagnostic accuracy/ Develop proper documentation procedures for patient records, inventory, and sample tracking.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		
					T	**CE**	**P**	**T**	**P**	
-	-	8	8	4	-	20	40	-	60	100

h. Course Content

Sr.	Topics	Weightage	Hours
1	**Basic Principles of tests performed in healthcare settings which require collection of blood samples.** a. Anatomical and physiological significance b. Relevance and use according to local area needs and disease profile. **Test Requisition Forms (TRF)** a. Types of TRF b. Significance of recording details on Laboratory TRF c. Important aspects of the TRF d. Filling accurate information in the right location in the TRF e. Interpreting the TRF details. **Blood collection systems –** a. Open b. Closed i. Vacuum extraction systems c. Advantages and disadvantages **Equipment used in venipuncture.** **a. Identification, types and usage of equipment used for venipuncture such as –** i. Tourniquet ii. Gloves iii. Antiseptic and disinfectant iv. Needle • Needle size • Selection of needle based on size, location, and volume of blood to be collected. v. Syringe or needle holder • Size of syringes • Selection of syringe based on patient, volume of blood to be collected, strength of vacuum expected.	20%	30

	vi. Specimen container vii. Gauze – choice of gauge viii. Tape for strapping ix. Sharps disposal container and safety devices **b. Sterilization and sanitization** **c. Troubleshooting and maintenance.** **Inventory management of supplies** Principles of site selection and process for drawing blood Proper site selection for venipuncture **a. Proper site selection** i. For general patients ii. For hospitalized patients iii. For pediatric patients **b. Following standard precautions.** **c. Site selection** i. Attributes of preferred vein ii. Vein selection iii. Palpating the vein. iv. Inappropriate sites for venipuncture.		
2	**Patient preparation** a. Proper patient identification procedures and protocols to follow for different age groups of patients. b. Patient interaction and reassurance c. Patient preparation i. Handling patients in special conditions ii. Patient positioning iii. Cleaning the venipuncture site d. Factors affecting patient preparation i. Therapeutic drug monitoring ii. Effects of exercise iii. Stress iv. Diurnal rhythm	20%	30

	v. Posture vi. Age, gender, pregnancy etc. **Principles of site selection and process for drawing blood** **Proper site selection for venipuncture** a. Proper site selection i. For general patients ii. For hospitalized patients iii. For pediatric patients b. Following standard precautions. c. Site selection i. Attributes of preferred vein ii. Vein selection iii. Palpating the vein iv. Inappropriate sites for venipuncture. **Needle insertion technique** a. Angle of insertion b. Insertion technique c. Areas of caution Order of draw Importance of correct filling order of sample tubes (Order of draw) b. First draw c. Second draw d. Third draw e. Last draw Tube filling Needle removal and sharp disposal Prophylactic treatment in case of emergencies during drawing blood Special casesa.		

3	**Arterial blood sampling** Pediatric and neonatal blood sampling Capillary sampling Collecting blood in various case situations: a. Shock b. Hemorrhage c. Road Traffic Accidents d Neonates e. Infants, etc. Post venipuncture process a. Examination of venipuncture site b. Application of adhesive bandage c. Instructions to patient Preparation of blood samples a. Coagulation b. Mixing of samples i. Importance of mixing samples ii. Process of mixing samples Labelling of blood samples a. Identification of samples b. Precautions for labelling specimen c. Bar code labelling Types of sampling for various tests: a. Whole blood b. With coagulant c. Shaking of samples. d. Without shaking samples. Time duration of patient preparation before sampling Blood Glucose sampling Instructions for FB and PP tests	20%	3020
4	**TRANSPORT THE BLOOD SAMPLES TO THE LABORATORY** Process of transporting sample Conditions necessary for transportation of samples a. Temperature b. Pressure, and other necessary conditions b. Packing of samples	20%	30

	a. Ideal conditions of packing of blood samples **Factors that influence the outcome of laboratory results during collection and transportation:** • Knowledge of staff involved in blood collection • Use of the correct gauge of hypodermic needle to prevent haemolysis or abnormal results. • The anatomical insertion site for venipuncture • The use of recommended laboratory collection tubes Patient–sample matching (i.e. Labelling) • Transportation conditions g. Interpretation of results for clinical management. • Causes of failed venipuncture **a. Procedure related such as –** i. Improper positioning of tube ii. Rolling of veins iii. Puncture through veins iv. Collapsed vein. v. Partially inserted needle vi. Accidental arterial puncture **b. Patient related.** i. Excessive bleeding ii. Petechiae iii. Nausea iv. Vomiting v. Fainting vi. Seizures c. Corrective measures for failed venipuncture **Adverse events and post exposure prophylaxis** a. First aid b. Management and follow up		
	Total teaching hours for the academic year	**100%**	**120**

i. Text Book and Reference Book:

1.	Phlebotomy-The Internet Pathology Laboratory for Medical Education
2.	WHO Guidelines on Drawing Blood: Best Practices in Phlebotomy:
3.	Skills for Care & Skills for Health, Code of Conduct for Healthcare Support Workers, and Adult Social Care Workers in England.
4.	National AIDS & STDs STI Control Programme (NASCOP), Ministry of Health

	Kenya. 2013. Safe Phlebotomy Training for Health Care Workers in Kenya: Participant's Manual

Semester 07

a. Course Name: **Advanced Physical Assessment & critical Care Technology - I**

b. Course Code: 19011307AC01

c. Prerequisite: Students should have a solid foundation in medical history taking, physical examination techniques, and basic understanding of human anatomy and physiology, along with skills in conducting diagnostic tests and interpreting laboratory results.

d. Rationale: Mastering the assessment of various body systems, including cardiovascular, respiratory, nervous, renal, gastrointestinal, musculoskeletal, reproductive, and endocrine systems, as well as pediatric and geriatric assessments, is essential for providing comprehensive patient care, diagnosing medical conditions, and developing treatment plans tailored to individual patient needs.

e. Course Learning Objective:

CLOBJ 1	Conduct a systematic history-taking and physical examination across various organ systems to aid in clinical assessment.
CLOBJ 2	Interpret key laboratory and diagnostic studies related to cardiovascular, respiratory, neurological, renal, gastrointestinal, musculoskeletal, reproductive, and endocrine systems.
CLOBJ 3	Assess and monitor critically ill patients using appropriate clinical tools, including biochemical markers, imaging studies, and functional assessments.
CLOBJ 4	Perform age-specific assessments, including pediatric growth and development monitoring and geriatric evaluations.
CLOBJ 5	Apply evidence-based approaches to analyzing clinical findings and formulating patient management strategies.

f. Course Outcomes:

CLO 1	Demonstrate proficiency in conducting history-taking and physical examinations for various organ systems.
CLO 2	Analyze laboratory and diagnostic test results to assist in clinical decision-making and patient care.
CLO 3	Utilize monitoring tools such as ECG, ABG, pulse oximetry, and imaging techniques for comprehensive patient evaluation.
CLO 4	Adapt assessment techniques for different patient populations, including pediatric and geriatric patients, ensuring age-appropriate care.
CLO 5	Synthesize clinical data to contribute to the diagnosis and management of patients with multisystem conditions.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		**Total**
					T	**CE**	**P**	**T**	**P**	
-	-	8	8	4	-	-	40	-	60	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	**Introduction** • History taking • Physical examination	20%	20

	Cardiovascular system • Cardiac history • Physical examination • Cardiac laboratory studies – biochemical markers, hematological studies • Cardiac diagnostic studies – Electrocardiogram, echocardiography, stress testing, radiological imaging		
2	**Respiratory system** • History • Physical examination • Respiratory monitoring – Arterial blood gasses, pulse oximetry, end-tidal carbon dioxide monitoring • Respiratory Diagnostic tests – Chest radiography, ventilation perfusion scanning, pulmonary angiography, bronchoscopy, thoracentesis, sputum culture, pulmonary function test **4. Nervous system** • Neurological history • General physical examination • Assessment of cognitive function • Assessment of cranial nerve function • Motor assessment – muscle strength, power, and reflexes • Sensory assessment – dermatome assessment • Neurodiagnostic studies – CT scan, MRI, PET	20%	20
3	**Renal system** • History • Physical examination • Assessment of renal function • Assessment of electrolytes and acid base balance • Assessment of fluid balance **Gastrointestinal system** • History • Physical examination • Nutritional assessment • Laboratory studies – Liver function studies, blood parameters, stool test • Diagnostic studies – radiological and imaging studies, endoscopic studies	20%	30
4	**Musculoskeletal system** • History • Physical examination – gait assessment, joint assessment, • Laboratory studies – blood parameters (inflammatory enzymes, uric acid)	20%	30

	• Diagnostic studies - Radiological and imaging studies, endoscopic studies **Reproductive system (Male & Female)** • History • Physical examination • Laboratory studies • Diagnostic studies		
5	**Endocrine system** • History, physical examination, laboratory studies, and diagnostic studies of • Hypothalamus and pituitary gland • Thyroid gland • Parathyroid gland • Endocrine gland • Adrenal gland **Assessment of children** • Growth and development • Nutritional assessment • Specific system assessment **Assessment of older adults** • History • Physical assessment • Psychological assessment	20%	20
	Total teaching hours for the academic year	**100%**	**120**

i. Text Book and Reference Book:

1.	Textbook of clinical medicine. Dr. oza
2.	Physical Examination and Health Assessment book, javeri.
3.	Medical-Surgical Nursing: Assessment and Management of Clinical Problems, lewis
4.	Orthopedic Physical Assessment, David Magee
5.	Evidence-Based Physical Examination: Best Practices for Health & Well-Being Assessment, KATE Gwalik

Semester 07

a. Course Name: **General and Advanced operation Theatre**

b. Course Code: **19010907OT01**

c. Prerequisite: Student must pass with previously includes a strong foundation in anatomy, physiology, microbiology, and pharmacology. Understanding these core concepts is essential for safe and effective patient care in the operating room.

d. Rationale: The operating room is a unique and complex environment. Practical experience allows students to develop the skills they need to function effectively in this setting, such as scrubbing, gowning, gloving, instrument handling, and assisting the surgical team.

e. Course Learning Objective:

CLOBJ 1	To learn about the OT lights and laminar air flow to prevent from microorganism
CLOBJ 2	How to maintain sterility in operating room
CLOBJ 3	Have practice in techniques of insertions iv cannula and peripheral line
CLOBJ 4	How to manage trolley and maintain sterility
CLOBJ 5	How to Manage the operation theatre room temperature

f. Course Outcomes:

CLO 1	Prepare trolly for different surgical procedure
CLO 2	Able to manage airflow and infection control in operation room
CLO 3	Able to Manage medical gasses delivery
CLO 4	Easy to insert a cannula or peripheral line
CLO 5	Develop skill in identify suture material and techniques

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		**Total**
					T	**CE**	**P**	**T**	**P**	
-	-	8	8	4	-	-	40	-	60	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	Preparation for different surgical trolley, Positioning, Part preparation, draping	20%	25
2	Layout of OT, OT lights, laminar airflow	10%	20
3	Medical Gas delivery Devices, DISS, PISS, Oxygen concentrator	10%	25
4	Techniques of insertion of peripheral IV line, Various types of suture material, needles and uses**.**	30%	25
5	Maintenance of Temperature, humidity and sterility	30%	25
	Total teaching hours for the academic year	**100%**	**120**

i. Text Book and Reference Book:

1.	Operation Theater Technique Anesthesia and Emergency Care for Technicians, Nurses & Paramedics by Vaishali Mohod
2.	Textbook of Operation Theatre Technology By Mp Sharma

3.	Operation Theatre: Assistant Recruitment Exam Guide By Pankaj Singhal
4.	Handbook of Operation Theatre Technique Details By Kilpadi / Jaypee Brothers
5.	Textbook of Operation Theatre Technology By Manjushree Ray

Semester 07

a. Course Name: **Medical Laboratory Technology - I**

b. Course Code: **19040607DS01**

c. Prerequisite: To successfully undertake this course, students should have: Basic knowledge of Human Physiology and Pathology: To understand the significance of diagnostic tests. Foundational understanding of Biochemistry and Microbiology: To grasp the biochemical and microbial basis of diseases.

d. Rationale: This course is designed to equip students of B.Sc. in Paramedical & Health Sciences (Medical Laboratory Technology) with hands-on experience and essential skills required for clinical laboratory practices.

e. Course Learning Objective:

CLOBJ 1	Recall safety guidelines and standard operating procedures used in clinical microbiology laboratories.
CLOBJ 2	Describe the significance and methodology of culture media preparation and its types.
CLOBJ 3	Operate laboratory equipment including pH meters, analytical balances, and volumetric apparatus.
CLOBJ 4	Analyze laboratory results using statistical tools like standard deviation, coefficient of variation, and assess the precision and accuracy.
CLOBJ 5	Evaluate the effectiveness of various staining techniques based on microbial morphology and diagnosis needs.

f. Course Outcomes:

CLO 1	Recall the names, uses, and handling procedures of laboratory glassware, equipment, and stains used in microbiology and Hematology.
CLO 2	Explain the principles behind pH measurement, staining techniques, and hematological procedures including hemoglobin analysis and urine examination.
CLO 3	Apply correct techniques in the collection, preservation, and labelling of clinical samples and preparation of culture media.
CLO 4	Analyze laboratory findings using statistical tools (e.g., standard deviation, coefficient of variation) to interpret test accuracy and reliability.
CLO 5	Evaluate the quality of culture media, staining results, and instrument calibration as part of routine quality control in laboratory practices/ Design standard procedures for laboratory techniques such as smear preparation, staining, and calibration of lab instruments for diagnostic use.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		
					T	**CE**	**P**	**T**	**P**	
-	-	8	8	4	-	20	40	-	60	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	**Safety measures in Clinical Microbiology** Glassware used in Clinical Microbiology Laboratory:	20%	30

	Introduction Care and handling of glassware Cleaning of glassware Equipment used in clinical Microbiology Laboratory: Introduction, Care and maintenance including calibration. Culture media: Introduction Classification of culture media (Example & Uses) solid media, liquid media, semisolid, Media, routine/synthetic/defined media, basal media, enriched, enrichment, Selective differential media, sugar fermentation media, transport media, preservation media and anaerobic culture media Quality control in culture media Automation in culture media preparation.		
2	**Collection and preservation of blood sample for various hematological investigation** Hemoglobin: definition, types, structure, synthesis and degradation Urine analysis Quality assurance in Haematology Internal and external quality control including reference preparation. Routine quality assurance protocol Statistical analysis i.e. Standard deviation, Co-efficient of variation, accuracy and precision	20%	30
3	**Practical Performance of ISI** Units of Measurement. S.I unit and CGS units Conversion Strength, molecular weight, equivalent weight Normality, Molarity, Molality Numerical Calibration of volumetric apparatus Flask Pipettes Burettes Cylinders Analytical balance Principle Working Maintenance Concept of pH Definition Henderson Hassel batch equation Pka value pH indicator Methods of measurement of pH	20%	30

	pH paper pH meter Principle, working, maintenance and calibration of pH meter		
4	**Bacterial culture** Instruments used to seed culture media. Culture procedures – seeding a plate Staining techniques in bacteriology Significance of staining in bacteriology Principle, Reagent preparation, procedures, and interpretation of the following Simple staining Negative staining Gram stain Albert‘s stain Neisser ‘s stain Ziehl –Neelsen staining. Capsule staining Flagella staining Spore staining Fontana stain for spirochetes	20%	30
	Total teaching hours for the academic year	**100%**	**120**

i. Text Book and Reference Book:

1.	Text book of Medical Laboratory Technology by Praful B. Godkar
2.	Medical laboratory Technology by K.L. Mukherjee Volume-I
3.	Practical Haematology by J.B. Dacie
4.	Clinical Diagnosis &Management by Laboratory methods (20th edition) by John Bernard Henry
5.	Atlas of Haematology (5th edition) by G.A. McDonald

Semester 07

a. Course Name: **Clinical Posting: Medical Laboratory Technology - II**

b. Course Code: **19010607DS02**

c. Prerequisite: To effectively engage with this course content, students are expected to have prior understanding and skills in: Basic Human Anatomy and Physiology – To comprehend tissue structures and interpret histological findings. Introduction to Biochemistry and Pathology – Understanding biomolecules and pathological processes supports cytology and hematology diagnostics.

d. Rationale: This course is designed to provide advanced practical exposure in medical laboratory sciences, focusing on histopathology, cytology, blood banking, and advanced biochemical techniques like chromatography and electrophoresis.

e. Course Learning Objective:

CLOBJ 1	Recall the principles, instruments, and procedures used in chromatography, electrophoresis, and histopathology.
CLOBJ 2	Explain the rationale behind tissue fixation, decalcification, processing, staining, and cytological evaluation.
CLOBJ 3	Apply techniques of chromatography and electrophoresis in clinical diagnostics.
CLOBJ 4	Identify causes of errors in blood grouping and transfusion reactions, and suggest remedies.
CLOBJ 5	Evaluate diagnostic efficiency of advanced cytological methods like liquid-based cytology and enzyme cytochemistry.

f. Course Outcomes:

CLO 1	Recall the principles, components, and instrumentation involved in chromatography and electrophoresis techniques.
CLO 2	Explain histological procedures such as fixation, decalcification, tissue processing, and staining techniques, along with their diagnostic importance.
CLO 3	Apply proper techniques in cytology including exfoliative, aspiration, and fluid cytology; and in blood banking procedures such as grouping, crossmatching, and donor screening.
CLO 4	Analyze different diagnostic techniques used in histopathology, cytology, and transfusion medicine to determine suitability for clinical conditions.
CLO 5	Evaluate the quality and reliability of processed histological and cytological samples and transfusion products through appropriate quality control measures.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					
					Internal Marks			**External Marks**		**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**T**	**CE**	**P**	**T**	**P**	
-	-	8	8	4	-	20	40	-	60	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	**Enzyme Cytochemistry:** Diagnostic applications Demonstration of Phosphatases, Dehydrogenases, Oxidases &	20%	30

	Peroxidases Vital staining for Sex Chromatin Aspiration cytology: Principle Indications & utility of the technique with special emphasis on role of cytotechnologist in FNAC clinics Exfoliative cytology (Papanicolaou technique for the staining of cervical smears) Cervical cytology Fluid Cytology Urine CSF Body Fluids (Pleural, Pericardial, Ascitic) Automation in cytology Liquid based cytology: Principles and preparation, Cytocentrifuge, molecular cytology, Cell Block and Immune-cytochemistry		
2	**Blood Banking** • Introduction to Blood Banking • History and discovery of various blood group systems • ABO blood group system • Rh and other major blood group system • Sources of error in blood grouping and their elimination. • ABO grouping: Forward and reverse grouping. Causes of discrimination between forward and reverse grouping Rh grouping. **Compatibility test in blood transfusion** • Collection of blood for cross matching from a blood bag • Major cross matching • Minor cross matching • Use of enzymes in blood bank specially Papain • Complications and hazards of blood transfusion • Laboratory investigations of transfusion reactions and mismatched blood transfusion. • Precautions while procurement and storage of grouping antisera • Various anticoagulants used to collect blood for transfusion purposes • Selection of donor and procedure for collection of blood from a healthy donor • Preparation of various fractions of blood for transfusion and therapeutic purposes such as: Packed red cells, washed red cells and FROZEN Red cells Platelet Rich Plasma (PRP), Platelet concentrate and frozen platelets.	20%	30

	Fresh plasma (FP), Fresh Frozen Plasma (FFP) and cryoprecipitate • Brief introduction of blood substitute/artificial blood • Haemophiles: pertaining to Leucocytes, platelets and plasma. • **Quality control in blood bank**		
3	**Enzyme Cytochemistry:** Diagnostic applications Demonstration of Phosphatases, Dehydrogenases, Oxidases & Peroxidases Vital staining for Sex Chromatin Aspiration cytology: Principle Indications & utility of the technique with special emphasis on role of cytotechnologist in FNAC clinics Exfoliative cytology (Papanicolaou technique for the staining of cervical smears) Cervical cytology Fluid Cytology Urine CSF Body Fluids (Pleural, Pericardial, Ascitic) Automation in cytology Liquid based cytology: Principles and preparation, Cytocentrifuge, molecular cytology, Cell Block and Immune-cytochemistry	20%	30
4	**Blood Banking** • Introduction to Blood Banking • History and discovery of various blood group systems • ABO blood group system • Rh and other major blood group system • Sources of error in blood grouping and their elimination. • ABO grouping: Forward and reverse grouping. Causes of discrimination between forward and reverse grouping Rh grouping **Compatibility test in blood transfusion** • Collection of blood for cross matching from a blood bag • Major cross matching • Minor cross matching • Use of enzymes in blood bank specially Papain • Complications and hazards of blood transfusion • Laboratory investigations of transfusion reactions and mismatched blood transfusion. • Precautions while procurement and storage of grouping antisera	20%	30

	• Various anticoagulants used to collect blood for transfusion purposes • Selection of donor and procedure for collection of blood from a healthy donor • Preparation of various fractions of blood for transfusion and therapeutic purposes such as: Packed red cells, washed red cells and FROZEN Red cells Platelet Rich Plasma (PRP), Platelet concentrate and frozen platelets. Fresh plasma (FP), Fresh Frozen Plasma (FFP) and cryoprecipitate • Brief introduction of blood substitute/artificial blood • Haemophiles: pertaining to Leucocytes, platelets and plasma. **Quality control in blood bank**		
	Total teaching hours for the academic year	**100%**	**120**

i. Text Book and Reference Book:

1.	Textbook of Medical Laboratory Technology by Paraful B. Godkar
2.	Medical laboratory Technology by K.L. Mukherjee Volume-I
3.	De Gruchy's clinical Haematology in medical practice
4.	Clinical Diagnosis & Management by Laboratory methods (20thedition) by John Bernard Henry
5.	Transfusion Science by Overfield, Hamer

Semester 07

a. Course Name: **Clinical Posting Medical Laboratory Technology - III**

b. Course Code: **19010607DS03**

c. Prerequisite: To engage effectively with this course, students should have completed foundational coursework and practical exposure in: Basic Human Anatomy and Physiology – Essential for understanding blood components and infection mechanisms. Introductory Microbiology and Biochemistry – To grasp microbial structures, metabolism, and biochemical reactions.

d. Rationale: The course "Medical Laboratory Technology - III" is designed to provide advanced hands-on training and theoretical understanding of critical laboratory techniques in clinical microbiology, biochemistry, and hematology.

e. Course Learning Objective:

CLOBJ 1	Recall principles and procedures of biochemical tests, hematological methods, and microbiological identification protocols.
CLOBJ 2	Explain the basis of bacterial classification, pathogenesis, and biochemical reactions used in clinical microbiology.
CLOBJ 3	Apply appropriate techniques for conducting biochemical estimations (e.g., glucose, urea, creatinine) and microbial biochemical identification tests (e.g., catalase, citrate, urease).
CLOBJ 4	Identify possible sources of error in hematological tests and biochemical estimations and implement corrective measures
CLOBJ 5	Assess the effectiveness of staining procedures and biochemical reactions for diagnostic relevance.

f. Course Outcomes:

CLO 1	Recall key biochemical, microbiological, and hematological procedures, reagents, and diagnostic criteria used in laboratory practices.
CLO 2	Understand the principles and diagnostic relevance of tests such as biochemical estimations, bacterial identification, and blood cell morphology evaluation.
CLO 3	Apply correct phlebotomy techniques, biochemical testing methods, and hematology protocols for patient sample analysis.
CLO 4	Analyze laboratory results to distinguish between normal and pathological findings in blood tests and bacterial profiles.
CLO 5	Evaluate sample quality, test performance, and diagnostic accuracy using microbiological, biochemical, and hematological methods.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		**Total**
					T	**CE**	**P**	**T**	**P**	
-	-	8	8	4	-	20	40	-	60	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	**Principle, procedures and interpretation of the following biochemical tests for identification of different bacteria.** Catalase	25%	30

	Coagulase Indole Methyl Red Voges Proskauer Urease Citrate Oxidase TSIA Nitrate reduction Definition, Classification, Various characteristics (morphological, cultural and biochemical), pathogenesis and laboratory diagnosis of the following bacteria Staphylococcus Streptococcus Pneumococcus Neisseria gonorrhea and Neisseria meningitis Haemophilis Corynebacterium Enterobacteriaceae: Escherichia coli, Klebsiella, Citrobacter, Enterobacter, Proteus, Salmonella, Shigella, Yersinia enterocolitica and Yersinia pestis Vibrio, Aeromones and Plesiomonas Clostridia of wound infection Mycobacterium tuberculosis complex, Atypical Mycobacteria and M. leprae Spirochetes – Treponema, Borrellia and leptospira Bordetella and brucella Mycoplasma and Ureaplasma		
2	To determine the presence of carbohydrates by Molisch test. To determine the presence of reducing sugar by Fehling solutions. To determine the presence of reducing sugar by Benedicts method. To determine starch by Iodine test. Determination of Glucose in serum & plasma Estimates of blood Glucose by Folin& Wu method Determination of Urea in serum, plasma & urine. Determination of Creatinine in serum or plasma Determination of serum Albumin Determination of Cholesterol in serum or plasma	25%	30
3	Antibiotic susceptibility testing in bacteriology Definition of antibiotics Culture medium used for Antibiotic susceptibility testing Preparation and standardization of inoculum Control bacterial strains Choice of antibiotics MIC and MBC: Concepts and methods for determination Various methods of Antibiotic susceptibility testing with special reference to Stokes and Kirby-Bauer method Polymerase chain reaction (PCR)	25%	30

	Preservation methods for microbes Basic concepts of preservation of microbes Why do we need to preserve bacteria? Principle and procedures of various short term and long-term preservation methods with special reference to Lyophilization		
4	Hemoglobinometry: Different methods to measure Haemoglobin with merits and demerits Hemocytometer: Introduction, Principle, Reagent preparation, procedure, errors involved and means to minimize errors. RBC Count, Total leukocyte count (TLC) Platelet Count. Absolute Eosinophil count Principle mechanism and different methods with merit and demerits for the measuring Erythrocyte Sedimentation Rate (ESR) and its significance Different methods with merit and demerits for packed cell volume/Haematocrit value Preparation of blood films Types, Methods of preparation (Thick and thin smear/film) and utility Staining techniques in Haematology (Romanowsky's stains): Principle, composition, preparation staining reagent sand procedure of the following Giemsa'sstain Leishman 's stain Wright's stain Field's stain JSBstain Differential leucocytes count (DLC)	25%	30
	Total teaching hours for the academic year	**100%**	**120**

i. Text Book and Reference Book:

1.	Textbook of Medical Laboratory Technology by Paraful B. Godkar
2.	Medical laboratory Technology by K.L. Mukherjee Volume-I
3.	De Gruchy's clinical Haematology in medical practice
4.	Clinical Diagnosis & Management by Laboratory methods (20thedition) by John Bernard Henry
5.	Transfusion Science by Overfield, Hamer

Semester 08

a. Course Name: Clinics: Pre, Intra & Post-operative preparation, complication and management

b. Course Code: 19011308AC01

c. Prerequisite: Students should have a solid foundation in medical history taking, physical examination techniques, and basic understanding of human anatomy and physiology, along with skills in conducting diagnostic tests and interpreting laboratory results.

d. Rationale: Mastering the assessment of various body systems, including cardiovascular, respiratory, nervous, renal, gastrointestinal, musculoskeletal, reproductive, and endocrine systems, as well as pediatric and geriatric assessments, is essential for providing comprehensive patient care, diagnosing medical conditions, and developing treatment plans tailored to individual patient needs.

e. Course Learning Objective:

CLOBJ 1	Demonstrate proficiency in setting up anesthesia trolleys for general and regional anesthesia, ensuring all essential equipment and drugs are readily available.
CLOBJ 2	Explain the components and significance of informed consent for anesthesia, emphasizing ethical and medico-legal considerations.
CLOBJ 3	Apply safe handling techniques for gas cylinders, including identification, pressure checks, and storage protocols.
CLOBJ 4	Describe and perform appropriate patient positioning for various surgical procedures while preventing positioning-related complications.
CLOBJ 5	Implement best practices for post-anesthesia care, including monitoring, pain management, and handling postoperative complications.

f. Course Outcomes:

CLO 1	Organize and prepare anesthesia equipment and medications for different types of anesthesia.
CLO 2	Justify the importance of informed consent and execute proper documentation procedures.
CLO 3	Apply safety measures in handling medical gases, ensuring proper use and maintenance.
CLO 4	Assess and position patients correctly for different surgical procedures, minimizing risks of complications.
CLO 5	Integrate post-anesthesia care principles to ensure safe recovery and manage common postoperative complications effectively.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		**Total**
					T	**CE**	**P**	**T**	**P**	
-	-	8	8	4	-	-	40	-	60	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	**Setting Up the Trolley for Anesthesia** **A. General Anesthesia (GA) Trolley Setup** **Essential Equipment:**	20%	24

	• Laryngoscope (with different blade sizes) • Endotracheal tubes (cuffed and uncuffed) • Supraglottic airway devices (LMA, i-gel) • Magill's forceps • Bougie & stylet • Airway adjuncts (nasopharyngeal and oropharyngeal airways) • Breathing circuits (Bain, Jackson-Rees, circle system) • Ambu bag with mask • Syringes for drug administration **Drugs:** • Induction agents (Propofol, Ketamine, Etomidate) • Muscle relaxants (Succinylcholine, Rocuronium) • Opioids (Fentanyl, Morphine) • Emergency drugs (Atropine, Epinephrine, Ephedrine, Naloxone) • Local anesthetics (Lidocaine, Bupivacaine) **B. Regional Anesthesia (RA) Trolley Setup** • Spinal and epidural needles • Sterile gloves, drapes, antiseptic solution • Local anesthetics (Bupivacaine, Ropivacaine) • Nerve stimulator or Ultrasound for peripheral nerve blocks Catheter for continuous epidural anesthesia		
2	**Consent Form for Anesthesia** • Components of an informed consent form: o Patient details & identification o Type of anesthesia planned (GA, RA, MAC) o Risks and benefits explained o Possible complications and alternatives o Signature of patient, anesthetist, and witness • Importance of verbal and written consent **Gas Cylinders Handling** • Identification of different gas cylinders (O2, N2O, CLO 2, medical air). • Color coding and labeling of cylinders. • Checking cylinder pressure and flow rates. Safe handling, storage, and replacement of cylinders.	20%	24
3	**Positioning of Patients for Surgery** • **Supine:** Most common, used for abdominal and cardiac surgeries. • **Prone:** For spinal and posterior fossa surgeries. • **Lateral:** Used in thoracic and kidney surgeries. • **Lithotomy:** Gynecological and urological surgeries.	20%	24

	• **Trendelenburg & Reverse Trendelenburg:** For laparoscopic and head surgeries. **Precautions:** Pressure point padding, avoiding nerve injuries (ulnar, brachial plexus, peroneal).		
4	**Monitoring in PACU & Alarm Settings** • Monitoring parameters: o Heart rate, blood pressure, SpO2, respiratory rate, ECG. o End-tidal CLO 2 (capnography) for ventilated patients. • Setting alarms for: o Low oxygen saturation o Bradycardia & tachycardia o Hypotension & hypertension Pain assessment (VAS scale), temperature monitoring, nausea control.	20%	24
5	**Rapid Sequence Intubation (RSI)** • **Indications:** Full stomach, trauma, emergency surgeries. • **Steps:** o Pre-oxygenation (100% O2 for 3-5 min). o IV induction with etomidate or ketamine. o Administration of succinylcholine or rocuronium. o Cricoid pressure (Sellick maneuver). o Endotracheal intubation and confirmation (capnography, auscultation). **Postoperative Management in PACU** • **Pain Management:** o IV analgesics (Morphine, Paracetamol, NSAIDs). o Regional techniques (epidural, nerve blocks). o Multimodal analgesia. • **Management of Nausea & Vomiting:** o Antiemetics (Ondansetron, Metoclopramide). o Hydration and electrolyte correction. • **Bladder Distension & Urinary Retention:** o Bladder scanning. Catheterization if needed.	20%	24
	Total teaching hours for the academic year	**100%**	**120**

i. Text Book and Reference Book:

1.	Textbook of Clinical Anesthesiology-Morgan
2.	Drugs & Equipments in anesthesia -Arunkumar Paul,
3.	A practice of Anaesthesia- Wylie & Churchill Davidson's
4.	Short Textbook of Anaesthesia, Ajay Yadav.

5.	Textbook of Anaesthesia Equipments-Dorsch & Dorsch

Semester 08

a. Course Name: **Clinics: Hospital Operation Management**

b. Course Code: 19010908OT01

c. Prerequisite: Successful completion of foundational courses in previous semesters, healthcare systems, and healthcare finance is typically required. These courses provide students with a strong understanding of the healthcare industry's structure, function, and financial operations.

d. Rationale: Students gain hands-on experience with various aspects of hospital operations, such as scheduling, budgeting, staffing, and quality improvement. The clinical setting provides a real-world environment for students to apply the knowledge and skills they have learned in the classroom. Clinical rotations offer opportunities to build relationships with healthcare professionals and potential employers.

e. Course Learning Objective:

CLOBJ 1	This area focuses on understanding the fundamental concepts and key questions related to service management in a hospital setting
CLOBJ 2	the strategies and objectives involved in managing service operations within a hospital
CLOBJ 3	The design aspects of service operations, including the layout, processes, and workflows
CLOBJ 4	Assess the importance of quality management principles in healthcare operations.
CLO5	Analyze the role of information technology in improving healthcare operations.

f. Course Outcomes:

CLO 1	Make strategies for hospital
CLO 2	Able to make decisions for hospital
CLO 3	Work with hospital management staff
CLO 4	Able to make plans for aseptic control
CLO 5	Can design an operation theatre layout

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		**Total**
					T	**CE**	**P**	**T**	**P**	
-	-	8	8	4	-	-	40	-	60	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	Introduction and key questions of service management:	25%	30
2	Strategies and objectives of service operations:	25%	30
3	Design of service operations:	25%	30
4	Planning, scheduling, and control of service operations: l	25%	30
	Total teaching hours for the academic year	**100%**	**120**

i. Text Book and Reference Book:

1.	Operation theater technique anesthesia and emergency care for technicians, nurses & paramedics by vaishali mohod
2.	Textbook of Operation Theatre Technology By MP Sharma

3.	Operation theatre: assistant recruitment exam guide By pankaj singhal
4.	Handbook of Operation Theatre Technique Details By Kilpadi / Jaypee Brothers
5.	Textbook of operation theatre technology By manjushree ray

Semester 08

a. Course Name: **Advance Diagnostic Techniques**

b. Course Code: **19010608DS01**

c. Prerequisite: Students should have prior knowledge of: Basics of cell biology, biochemistry, immunology, and molecular biology, Familiarity with clinical diagnostic procedures

d. Rationale: The course equips students with advanced laboratory diagnostic skills critical for accurate disease detection and research. Techniques like PCR, ELISA, flow cytometry, immunofluorescence, and blotting methods form the foundation of modern diagnostics.

e. Course Learning Objective:

CLOBJ 1	Recall the principles behind advanced diagnostic methods such as ELISA, PCR, and electrophoresis.
CLOBJ 2	Explain the purpose and applications of immunological and molecular diagnostic techniques.
CLOBJ 3	Demonstrate hands-on skills in DNA/RNA isolation, immunoassays, and PBMC separation.
CLOBJ 4	Analyze diagnostic data obtained through methods like FACS, ANA, and electrophoresis.
CLOBJ 5	Evaluate the effectiveness and limitations of different diagnostic tools in various clinical scenarios.

f. Course Outcomes:

CLO 1	Recall the basic principles and terminologies related to advanced diagnostic techniques such as ELISA, PCR, immunofluorescence, and electrophoresis
CLO 2	Explain metabolic disorders and their diagnostic markers to aid clinical decision-making.
CLO 3	Demonstrate advanced diagnostic techniques such as ELISA, PCR, and FACS in laboratory settings.
CLO 4	Construct effective solutions for diagnostic problems using molecular biology tools and innovations.
CLO 5	Evaluate and interpret laboratory findings from immunological and genetic tests.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					
					Internal Marks			**External Marks**		**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**T**	**CE**	**P**	**T**	**P**	
-	-	8	8	4	-	20	40	-	60	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	Peripheral blood mononuclear cell (PBMC) isolation by gradient centrifugation T and B cell separation Immunofluorescence Anti- Nuclear Antibody (ANA) Anti- Neutrophil Cytoplasmic Antibody (ANCA)	100%	120

	AIDS Immunology and Pathogenesis (AIP) Thyroid Microsomal antigen (TMA)- Agglutination reactions Electrophoresis Gel diffusion Nephelometry HLA Typing Serology & Cross match Molecular Typing Nitro blue Tetrazolium Chloride Test (NBT) FACS for CD4 and CD8 ELISA for lab. diagnosis of AIDS Polymerase Chain Reaction and its advanced versions Gel electrophoresis Western blotting Isolation of DNA and RNA Estimation of DNA and RNA Determination of molecular weight and quantification of DNA using agarose gel electrophoresis		
	Total teaching hours for the academic year	**100%**	**120**

i. Text Book and Reference Book:

1.	Text book of Medical Laboratory Technology by Praful B. Godkar
2.	Medical laboratory Technology by K.L. Mukherjee Volume-I
3.	Practical Haematology by J.B. Dacie
4.	Clinical Diagnosis &Management by Laboratory methods (20th edition) by John Bernard Henry
5.	Atlas of Haematology (5th edition) by G.A. McDonald

Semester 08

a. Course Name: **Medical Laboratory Science Management**
b. Course Code: **19010608DS02**
c. Prerequisite: Students should have prior knowledge and practical exposure in: Basic Medical Laboratory Techniques, Clinical Biochemistry, Hematology, and Microbiology
d. Rationale: Medical Laboratory Science Management is essential for ensuring the quality, efficiency, and ethical functioning of clinical laboratories. With advancements in diagnostics, laboratories must meet stringent quality standards, manage sophisticated instruments, handle biomedical waste responsibly, and maintain accurate records.

e. Course Learning Objective:

CLOBJ 1	Recall fundamental ethical responsibilities and safety standards in clinical laboratories.
CLOBJ 2	Explain the components of Good Laboratory Practices (GLP), sample accountability, and test report formatting.
CLOBJ 3	Demonstrate appropriate handling, transportation, and preservation of clinical samples.
CLOBJ 4	Analyze the workflow of quality management systems, calibration, validation, and biomedical waste management.
CLOBJ 5	Evaluate laboratory procedures based on audit findings, inventory data, and compliance standards.

f. Course Outcomes:

CLO 1	Explain GLP regulations, accreditation procedures, and roles of national/international agencies.
CLO 2	Understand and apply ethical standards, safety practices, and responsibilities in laboratory operations.
CLO 3	Manage patient samples effectively from collection to reporting while maintaining accountability.
CLO 4	Operate within a quality management framework including internal/external quality controls.
CLO 5	Utilize Laboratory Information Systems (LIS), manage financial and inventory systems, and perform lab audits.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					
					Internal Marks			**External Marks**		**Total**
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**T**	**CE**	**P**	**T**	**P**	
-	-	8	8	4	-	20	40	-	60	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	Ethical Principles and standards for a clinical laboratory professional Duty to the patient Duty to colleagues and other professionals Duty to the society Good Laboratory Practice (GLP) Regulations and Accreditation	50%	60

	Introduction to Basics of GLP and Accreditation Aims of GLP and Accreditation Advantages of Accreditation Brief knowledge about National and International Agencies for clinical laboratory accreditation Awareness / Safety in a clinical laboratory General safety precautions HIV: pre- and post-exposure guidelines Hepatitis B & C: pre- and post-exposure guidelines Drug Resistant Tuberculosis		
2	Patient management for clinical samples collection, transportation and preservation Sample accountability Purpose of accountability Methods of accountability Sample analysis Introduction Factors affecting sample analysis Basic format of a test report Reported reference range Clinical Alerts Abnormal results Turnaround time Results from referral laboratories Release of examination results Alteration in reports	25%	30
3	Quality Management system Introduction Quality assurance Quality control system Internal and External quality control Biomedical waste management in a clinical laboratory Introduction and importance of calibration and Validation of Clinical Laboratory instruments Laboratory Information system (LIS), Hospital Information system (HIS) and financial Management Introduction Functions of a laboratory management system Standards for laboratory management system Introduction and awareness of financial management in a clinical laboratory	25%	30
4	Ethics in Medical laboratory Practice Understanding the term _Ethics ‘ Ethics in relation to the following: Pre-Examination procedures Examination procedures Reporting of results Preserving medical records Access to Medical laboratory Records Procurement of equipment and Inventory Control Audit in a Medical Laboratory		

	Introduction and Importance Responsibility Planning Horizontal, Vertical and Test audit Frequency of audit Documentation		
	Total teaching hours for the academic year	**100%**	**120**

i. Text Book and Reference Book:

1.	Textbook of Medical Laboratory Technology by Paraful B. Godkar
2.	Medical laboratory Technology by K.L. Mukherjee Volume-I
3.	De Gruchy's clinical Haematology in medical practice
4.	Clinical Diagnosis & Management by Laboratory methods (20thedition) by John Bernard Henry
5.	Transfusion Science by Overfield, Hamer

Semester 08

a. Course Name: **Introduction to Quality &Amp; Patient Safety**

b. Course Code: **19010608DS03**

c. Prerequisite: Students enrolling in this course should have completed foundational coursework in: Basic Human Anatomy and Physiology, Microbiology and Pathology.

d. Rationale: Patient safety and healthcare quality have become central pillars in the delivery of effective medical services. This course introduces students to the principles of quality assurance, infection prevention, emergency care, biomedical waste management, and disaster preparedness.

e. Course Learning Objective:

CLOBJ 1	Recall key concepts of quality assurance, infection control, and patient safety protocols.
CLOBJ 2	Explain the principles of NABH/NABL guidelines, emergency care, and biomedical waste management.
CLOBJ 3	Demonstrate basic life-saving procedures, including CPR, use of AED, and first aid.
CLOBJ 4	Analyze different types of antibiotic resistance and assess their impact on patient outcomes.
CLOBJ 5	Evaluate the effectiveness of quality improvement tools and infection control programs in healthcare.

f. Course Outcomes:

CLO 1	Recall the basic principles of quality assurance, NABH/NABL guidelines, and patient safety.
CLO 2	Explain the processes involved in infection control, biomedical waste management, and first aid.
CLO 3	Implement standard infection prevention measures and waste segregation protocols in simulated environments.
CLO 4	Evaluate the effectiveness of quality improvement tools and infection control practices in a healthcare setting.
CLO 5	Create educational posters/charts on hospital safety, infection control, and waste management practices.

g. Teaching and Examination Scheme

Teaching Scheme					**Examination Scheme**					
Lecture Hrs /Week	**Tutorial Hrs/ Week**	**Lab Hrs /Week**	**Hrs /Week**	**Credit**	**Internal Marks**			**External Marks**		**Total**
					T	**CE**	**P**	**T**	**P**	
-	-	8	8	4	-	20	40	-	60	100

h. Course Content

Sr.	**Topics**	**Weightage**	**Hours**
1	**Quality assurance and management** Concepts of Quality of Care Quality Improvement Approaches Standards and Norms Quality Improvement Tools Introduction to NABH guidelines Basics of emergency care and life support skills:	50%	60

	Vital signs and primary assessment Basic emergency care – first aid and triage Ventilations including use of bag-valve-masks (BVMs) Choking, rescue breathing methods One- and Two-rescuer CPR 6. Using an AED (Automated external defibrillator). Managing an emergency including moving a patient		
2	**Bio medical waste management and environment safety** Visit to Central Sterile Supply Department (CSSD) Visit to incinerator complex Visit to Immunization section Discussion on Biomedical Waste, Demonstration of Types of waste generated from Health Care Facility Discussion on waste minimization Poster presentation of BMW – Segregation, collection, transportation, treatment and disposal (including color coding) Discussion on Liquid BMW, Radioactive waste, Metals / Chemicals / Drug waste Visit to Central Sterile Supply Department for demonstration of BMW Management & methods of disinfection Modern Technology for handling BMW e.g. Incinerator, Shredder etc. Demonstration of proper use of Personal protective equipment (PPE) Demonstration of monitoring & controlling of cross infection (Protective devices) Infection prevention and control: Demonstration of evidence-based infection control principles and practices [such as Sterilization, Disinfection, Effective hand hygiene and use of Personal Protective Equipment (PPE)], Discussion on prevention & control of common healthcare associated infections, Preparing Charts & Posters of Components of an effective infection control program, and Guidelines (NABH and JCI) for Hospital Infection Control	25%	30
3	**Antibiotic Resistance** Discussion on various types of Antibiotics Demonstration of how Resistance Happens and Spreads Discussion on types of resistance- Intrinsic, Acquired, Passive Antibiotic sensitivity testing Display of Consequences of antibiotic resistance Demonstration of Antimicrobial Barriers and opportunities, Tools and models in hospitals Disaster preparedness and management: Discussion on fundamentals of emergency management, Management psychological impact Discussion on; .Resource management, Preparedness and risk reduction.	25%	30
	Total teaching hours for the academic year	**100%**	**120**

i. Text Book and Reference Book:

1.	Textbook of Medical Laboratory Technology by Paraful B. Godkar
2.	Medical laboratory Technology by K.L. Mukherjee Volume-I
3.	De Gruchy's clinical Haematology in medical practice
4.	Clinical Diagnosis & Management by Laboratory methods (20thedition) by John Bernard Henry
5.	Transfusion Science by Overfield, Hamer