THE APOLLO UNIVERSITY

DIVISION OF ALLIED HEALTH SCIENCES

SCHOOL OF HEALTH SCIENCES

COURSE STRUCTURE & SYLLABI

(B.Sc. CRITICAL CARE TECHNOLOGY)

FOR 2026 ADMITTED BATCH

The Apollo University

A DIVISION OF AHERF

VISION

The Apollo University aspires to create knowledge, thought leadership, and global leaders for the future, preparing them for a constantly evolving world and empowering them to build a healthier and more equitable society.

MISSION

The Mission is to achieve this vision through transformative education, developed at the intersection of healthcare, science, technology, and management, having roots in innovation & research, in an inclusive culture that fosters practical oriented knowledge, stimulates critical thinking and sustains our legacy of pioneering and excellence, for the benefit of humanity.

PROGRAM OUTCOMES (PO)

PO 1: Engage in continuous professional development by updating knowledge on new technologies and clinical practices in critical care

PO 2: Operate, calibrate, and troubleshoot critical care equipment such as ventilators, cardiac monitors, infusion pumps, and defibrillators with precision and safety.

PO 3: Assist physicians in managing critically ill patients by monitoring vital parameters and responding appropriately to emergencies.

PO 4: Apply clinical reasoning and decision-making skills in identifying and managing life-threatening conditions.

PO 5: Implement infection control, safety, and ethical standards in all aspects of patient care.

PO 6: Communicate effectively with patients, relatives, and healthcare professionals in high-pressure and multidisciplinary environments

PO 7: Demonstrate competency in evidence-based practice by integrating current research, clinical guidelines, and protocols into critical care management.

PO 8: Collaborate effectively as a member of the multidisciplinary healthcare team, contributing to patient-centered care, clinical decision-making, and quality improvement initiatives.

PO 9: Utilize health informatics and digital technologies, including electronic medical records (EMR) and ICU data systems, for accurate documentation, data interpretation, and continuity of care.

PROGRAM EDUCATIONAL OBJECTIVES (PEO):

PEO1: Foundational Knowledge: Students will gain a solid understanding of critical care principles, including patient monitoring, respiratory and cardiovascular care, and emergency medicine.

PEO 2: Technical Proficiency: The program focuses on developing proficiency in using advanced medical equipment essential for patient monitoring and care in critical environmentsy.

PEO 3: Emergency Response Skills: Students will learn trauma management, life support techniques, and infection control protocols, ensuring they are prepared for real-world emergencies.

PEO 4: Clinical Experience: The curriculum includes Hands-on clinical training, allowing students to apply theoretical knowledge in practical settings, enhancing their readiness for critical care roles.

PEO 5: Research and Collaboration: The program encourages participation in clinical research and collaboration with healthcare teams, fostering a comprehensive approach to patient care.

PROGRAM SPECIFIC OUTCOMES (PSO):

After successful completion of the program the graduates will be able to:

PSO 1: Operate, maintain, and troubleshoot critical care equipment such as ventilators, monitors, and defibrillators safely and effectively.

PSO 2: Monitor critically ill patients, recognize clinical deterioration, and assist in timely interventions.

PSO 3: Apply emergency care skills including BLS, ACLS, trauma management, and airway support.

PSO 4: Follow infection control practices, safety protocols, and ethical standards in patient care.

PSO 5: Demonstrate clinical reasoning, teamwork, and effective communication in critical care settings.

PSO 6: Engage in research, evidence-based practice, and continuous professional development.

THE APOLLO UNIVERSITY
ACADEMIC REGULATIONS

SCOPE:

This Academic regulation provide a framework for the regulatory guidelines of all programs offered by The Apollo University. It includes procedures and practices that are to be followed to ensure academic standards in the University. The regulations are approved by the Academic Council. These regulations may be amended from time to time with the approval of the Academic council for the benefit of students or some times to reflect the changes suggested by the statutory bodies.

Information regarding amendments (if any) to the regulations will be communicated to the students by publishing in the University website. Students must follow the amended regulations as they might impact the process for the award of degree. The decision of the Vice Chancellor shall be the final in case of any discrepancy. These regulations apply to all students, despite the program of study.

1. ADMISSION INTO THE PROGRAM

The University admits the students in two modes. One through the convenor quota as per the Andhra Pradesh Private Universities Act, for which the admissions will be carried out through the convener quota by the Govt of Andhra Pradesh. The other is through University quota for which the following procedure will be followed:

A. The applicant shall satisfy the entrance requirements specified by The Apollo University and in accordance with guidelines of statutory councils for Under-graduation.
B. The Applicant shall be qualified in the qualifying examination for a particular program.
C. The Applicant secures a rank in national level entrance exam or suitable such test conducted by The Apollo University / professional body.
D. The Applicant qualifies in the specified state or national level examinations prescribed by The Apollo University.

The Apollo University will widely notify the counselling schedule for admissions into the academic programs in the media. The provisional admission will be given to the eligible students during the counselling scheduled by Apollo University. The selected candidates will be provisionally admitted into the program of his/her choice if the candidate meets the program specific requirements in addition to academic performance qualifying exam. Admission is purely based on merit and so merely meeting the requirements will not ensure admission. The University does not discriminate based on gender, race, region, religion, disability or nationality. The University reserves the right to make admissions based on various criteria which is specified in the admission brochure.

2. ELIGIBILITY CRITERIA

Undergraduate programs

The qualifying exam eligibility for each program is given Annexure 1. The student should have passed the qualifying exam either in the year the student is seeking admission or the previous year.

Convener Quota: The student seeking admission to any program under convener quota shall qualify in the relevant entrance exam conducted by the Government of Andhra Pradesh.

University Quota: For getting admission under University quota, percentage of marks obtained in the qualifying exam, the rank obtained in TAU entrance exam or any recognized national level examination in the year of admission will be considered.

Counselling

All the eligible students need to apply for admission and have to attend counselling conducted by TAU as per the schedule for the university quota.

3. PROGRAMS

The Apollo University offers variety of programs which includes certificate, undergraduate, postgraduate, and Research. The list of programs on offer for the academic year 2023-24 are annexed in Annexure 2.

Minimum duration of the program

The minimum duration of each program depends on the type of program, viz., undergraduate, postgraduate, integrated programs, etc., and the faculty which offers the program. The maximum duration of the program is N+2 years, where N stands for the minimum duration of the program as mentioned in Annexure 2 and 3. If the student has not obtained the minimum number of credits within the stipulated time, the Vice-Chancellor may extend the maximum duration in extenuating circumstances upon receiving a request along with reasons from the student for not completing the program on time.

4. CHOICE BASED CREDIT SYSTEM

The choice-based credit system (CBCS) facilitates the education student-centric. It provides the opportunity for the learner to choose the courses from a basket of core, elective, and skill enhanced courses. All programs of study are designed to meet the specified number of credit requirements. The courses taken by the student in each semester as part of program are allotted some credit points based on the number of hours assigned. Upon successful completion of the

course, the student secures the number of credits allotted for that course. Once the minimum number of credits of the program is achieved, the degree can be awarded, subject to fulfilment of all other relevant conditions.

5. STRUCTURE OF THE PROGRAM

The Program structure Consists of

i) University Courses
   A. University Core
   B. University Electives

ii) Faculty Courses
   A. Faculty Core
   B. Faculty Electives

iii) Program Courses
   A. Program Core
   B. Program electives

Each course* is assigned a certain number of credits depending upon the number of contact hours (lectures/tutorials/practical) per week. (*one course means one subject)

Core Courses = 3 Credits /4 Credits **Elective =3 Credits**

In general, credits are assigned to the courses as detailed below:

- **A classroom lecture/ tutorial of 60 min (1 hr) duration per week, spread over the entire semester, shall be considered as one credit.**
- **A laboratory session of minimum of 120 min (2 hr) per week shall be considered as one credit.**
- **A project work/ Internship session of 60 minutes (1 hr) carried out per week shall be considered as one credit.**

6. MEDIUM OF INSTRUCTION

The medium of instruction (including examinations and project reports) shall be English.

7. REGISTRATION

Any of the following student must register for the courses opted in a particular semester during the scheduled registration period.

i. a new student who enrols into any program
ii. an existing student who is continuing on rolls from the preceding regular semester
iii. a former student, i.e., who has not enrolled in the preceding regular semester or who has availed academic break or detained and got readmission

Each newly admitted student shall attend an induction/ orientation program prior to commencement of the first semester. During this program academic advisors assist the students in choosing the courses. Existing student may register online by using their registration number and mail ID through the Apollo ERP portal. Class schedules are available approximately two weeks before the beginning of every semester for each program. The concerned head of the department must approve class schedule.

8. ATTENDANCE REQUIREMENTS

- Students should earn a minimum of 80% attendance in the current semester to become eligible to write the Semester End Examinations.
- The monthly statement of attendance will be displayed on the Department Notice Board/ Apollo ERP by the respective departments within the first five working days of the following month.
- Candidates who are falling short of 80% attendance will be detained on the recommendation of the HoD and are not eligible to appear for the current semester examinations. The students who are detained in the current semester will not be allowed to register for the next semester and they have to repeat the same semester by paying the tuition fee prescribed. However, they can write arrear subjects, if any.

9. EVALUATION

The assessment of the student's performance in a Theory course shall be based on two components: Continuous Evaluation (40 marks) and Semester-end examination (60 marks). A student has to secure an aggregate of 40% in the course in the two components put together to be declared to have passed the course, subject to the condition that the candidate must have secured a minimum of 24 marks (i.e. 40%) in the theory component at the semester-end examination. Clinical Skill/Practical/ Project Work/ Industrial Training/ Viva voce/ Seminar etc. are completely assessed as Continuous Evaluation (80 marks) and Semester-end examination (20 marks) put together a maximum of 100 marks, and a student has to obtain a minimum of 50% to secure Pass Grade. For courses having both theory and practical components, 60% of the weightage will be given for theory component and 40% weightage for

practical component. The student must secure 40% (Theory + Practical) with 24 marks minimum in theory to attain pass grade.

Details of Assessment Procedure are furnished below in Table 1.

Table 1: Assessment Procedure

S. No.	Component of Assessment	Marks Allotted	Type of Assessment	Scheme of Evaluation
1	Theory	40	Continuous Evaluation	i) Twenty (20) marks for mid examinations. Three mid examinations shall be conducted for 20 marks each; average of the best two performances shall be taken into consideration. ii) Ten (10) marks for Quizzes, Assignments and Presentations. iii) Ten (10) marks for periodic evaluation, case studies and projects
		60	Semester-end Examination	iv) Sixty (60) marks for Semester-end examinations
	Total	**100**		
2	Laboratory	100	Continuous Evaluation	1)80 marks with equal weightage to all experiments subject to conduct of minimum of 10 experiments 2)20 marks for the end exam (with one of our university teachers as external other than course teacher)
3	Internship	100	Continuous Evaluation	i) (80) marks for periodic evaluation of Internship report by the Project Supervisor. ii) Twenty (20) marks for final Report presentation and Viva-voce, by a panel of internal examiners. iii) Students shall undergo TWO internships during the course of time and

				the evaluation shall be done during final semester.
4	Project work	100	Continuous Evaluation	iv) (80) marks for periodic evaluation and technical report writing by the Project Supervisor. ii) Twenty (20) marks for final Report presentation and Viva-voce, by a panel of internal examiners

GRADING SYSTEM

Based on the student performance during a given semester, a final letter grade will be awarded at the end of the semester in each course. The letter grades and the corresponding grade points are as given inTable2.

Table 2: Grades & Grade Points

Sl. No.	Grade	Grade Points	Absolute Marks
1	O(Outstanding)	10	90 and above
2	A+(Excellent)	9	80 to 89
3	A (Very Good)	8	70 to 79
4	B+(Good)	7	60 to 69
5	B (Above Average)	6	50 to 59
6	C(Average)	5	45 to 49
7	P(Pass)	4	40 to 44
8	F(Fail)	0	Less than 40
9	Ab. (Absent)	0	-

SEMESTER GRADEPOINTAVERAGE (SGPA)

A Semester Grade Point Average (SGPA) for the semester will be calculated according to the formula:

$$SGPA \frac{\sum [C \; X \; G]}{\sum C}$$

Where

C = Number of credits for the course,

G = Grade points obtained by the student in the course.

A student who earns a minimum of 4 grade points (P grade) in a course is declared to have successfully completed the course, and is deemed to have earned the credits assigned to that course.

CUMULATIVE GRADE POINT AVEARGE (CGPA)

A similar formula is used to arrive at Cumulative Grade Point Average (CGPA), considering the student's performance in all the courses taken in all the semesters up to the particular point of time.

Table 3 shows the CGPA required for the award of class after the successful completion of the program.

Table3: CGPA required for award of Class

Class	**CGPA Required**
First Class with Distinction	≥8.0*
First Class	≥6.5
Second Class	≥5.5
Pass Class	≥5.0

*In addition to the required CGPA of 8.0 or more, the student must have necessarily passed all the courses of every semester in first attempt.

11. REAPPEARANCE

a. A student who has secured 'F' grade in a Theory course shall have to reappear at the subsequent Semester end examination held for that course.
b. A student who has secured 'F' grade in a Practical course shall have to attend Special Instruction Classes scheduled by the Department for securing pass.
c. A student who has secured 'F' Grade in Internship /Project work / Industrial Training etc shall have to reappear for Viva – voce scheduled by the department.
d. A student who is declared fail (F) in a course/s can apply for revaluation within one week from the date of publication of results with a fee prescribed by the university. The marks /grade awarded in the revaluation is final.

11.1 PROCEDURE FOR REVALUATION

- The students who have not satisfied with the marks awarded by the examiner can apply for revaluation of his/her answer script/s
- The students have to apply through proper channel for revaluation and to pay the revaluation fee per paper to the university towards revaluation fee.
- Students have to apply for revaluation within 7 days from the date publication of result.
- The scripts will get valued by second examiner and if the difference is more than 15 marks, they will get valued by the third examiner. The average of the nearest two marks will be declared as the final marks.

11.2 ASSESSMENT MECHANISM

The Apollo University offers a student the benefits of Choice Based Credit System. Every paper is allotted a certain number of credits as per the UGC norms. A student is awarded the specified credits on obtaining a pass in the respective paper.

The Choice Based Credit System (CBCS) has been adopted for UG Course from the year 2021-22 onwards as per the recommendations of the A.P. State Council for Higher Education (APSCHE). The structure of undergraduate programmes provides a wide range of choice for students to opt for courses based on their eligibility, aptitude and career goals.

11.3 SEMESTER END EXAMINATION

The End semester examination will be a comprehensive examination of 3 hours duration. Two End Semester examinations are conducted in a year-

Odd semester examinations in November/ December and

Even semester examination in May/June

Practical examination / Project viva will be held 2 weeks prior to the theory semester end examinations.

Under-Graduation Programs

Course	Continuous Assessment	End semester	Aggregate in End semester Examinations
All UG Courses	No passing minimum	40%	40%

11.4 POST EVALUATION PROGRAMME:

Under the Post Evaluation Programme there are three menus:

- Provision for improvement
- Re-totalling and Revaluation of answer scripts
- Restrictions to appear for the examinations

11.5 PROVISION FOR IMPROVEMENT:

A student who passes a paper in the first attempt can reappear for the same paper in the succeeding End-of-Semester examination only, for improving his/her marks. Re-appearance for improvement is allowed for theory and practical subjects of all semesters, except for the final semester subjects. Revised mark statement will be issued after withdrawing the previous one, if the marks obtained in improvement are higher than the marks awarded earlier. When there is no improvement, there shall not be any change in the original marks already awarded. The improved marks shall be considered for classification but not for ranking.

Provision for Re-totalling and Revaluation of valued answer scripts

- UG candidates may apply for re-totalling / revaluation of valued answer scripts, to the Controller of Examinations through the Heads of Departments and Principal / Dean, in the prescribed forms, remitting the prescribed fee within 7 days from the date of publication of results. Revaluation of answer scripts is permissible only for the current semester papers and not for any arrear paper.

- Those wish to apply for revaluation of final semester papers can do so within five days from the date of publication of results. In re-valuation, the answer papers will be valued by an external examiner and if there is a difference of 15 marks between the two evaluations then the script will be sent for third valuation which is final and the mark awarded by the third examiner will be taken into the account.
- Revised mark statement will be issued after withdrawing the previous one, if the marks obtained in revaluation / retotalling are higher than the marks obtained earlier. In other cases, the original marks obtained earlier will be retained and the matter will be intimated to the student concerned as 'No change'.
- A candidate who applies for revaluation should not apply for retotalling.

RESTRICTIONS TO APPEAR FOR THE EXAMINATIONS

Candidates who fail in any of the papers in the UG End semester examinations shall complete the paper concerned within N+2 years from the date of admission to the particular course. If they fail to do so, they shall re-register their names and take the examination in the texts/revised regulations/syllabus of the paper prescribed for the subsequent batch of candidates, in force at the time of their reappearance. In the event of removal of that paper consequent to change of regulation and/or curriculum after N+2 years period, the candidate shall have to take up an equivalent paper in the revised syllabus as suggested by the Chairman, Board of Studies concerned.

12. BETTERMENT OF GRADES

A student who has secured only a Pass or Second class and desires to improve his/her Class can appear for Betterment Examinations only in Theory courses of any Semester of his/her choice, conducted in Summer Vacation along with the Special Examinations. Betterment of Grades is permitted 'only once' immediately after completion of the program of study.

13. DETENTION AND RE-ADMISSION

If a student fails to meet the minimum attendance requirement or minimum standards for academic progression, the concerned academic head will recommend for detention and it will be notified by the concerned Dean of the School. The students who are detained in the current semester will not be allowed to register for the next semester and they have to repeat the same semester.

The candidates who are detained or availed academic break or suspended in the previous semester/academic year and want to continue their study shall apply for re-admission to the university. The candidates shall request for re-admission to the respective Head of the Department, with details viz., Full Name, Registration Number, Department, School, Fee payment particulars with proofs and reasons for discontinuations. The concerned academic head will forward it to the Registrar with specific comments. The Registrar will notify the decision of re-admission which shall include the prescribed fee particulars, semester/ year into which readmission is granted and additional courses to be completed by the student (if any). The candidates should apply for re-admission in advance, that is before the commencement of the semester.

14. GROOMING AND ATTIRE FOR STUDENTS

Grooming and Etiquette is of great significance in the dynamic of shaping one's Personality. The Apollo University stands by a *Code of Grooming, Attire and Etiquette* that promotes a professional standard: Academic Day; Campus Placements and Non-Academic Hours on Campus.

The Dress Code to be in compliance on academic premises while attending: Formal Functions of the Institution / Lectures / Practicals / Dining Area / Library / Labs / Office Areas.

Students shall follow appropriate attire during Academic and Non-Academic hours on the campus. Students shall wear clean, neat, pressed and presentable clothing, and command respect by dressing in accordance with responsible personal norms. Students shall always wear The Apollo University ID Card with the Lanyard.

Grooming and Formal Wear - Boys:

Formal Shirts / T-Shirts with a Collar should preferably be tucked in with a Formal pair of Pants Shoes and Socks to complete the Formal Attire. Personal Hygiene should be followed and Hair should be well groomed.

Smart Casuals for Boys:

Long Kurtas / Formals / Semi-Formal Shirts with Jeans.

Grooming and Formal Wear - Girls: Sarees / Salwar Suits / Leggings or Jeggings with Long Kurtis / Long Frocks / Long Skirts / Palazzos. Complement the outfit with proper footwear. Personal Hygiene should be followed and Hair should be well groomed.

Smart Casuals for Girls:

Jeans with long Kurtis / Long Skirts / Long Frocks.

Attire for Non-Academic Hours On Campus:

The students should be neatly attired during Non-Academic Hours on Campus.

Dress Code for Boys:

Jeans / Track Suits / T-Shirts / Trousers / Shirts.

Dress Code for Girls:

Jeans / T-Shirts or Blouses / Salwar Suits / Palazzos / Leggings or Jeggings with Long Tops / Sarees / Long Skirts / Track Suits.

DO'S AND DO'NTS FOR BOYS AND GIRL STUDENTS OF THE UNIVERSITY:

- To wear modest clothing that reflects the essence of good personal grooming standards.
- To refrain from wearing Sleeveless Clothing; Shorts; Short Tops, etc.,

PLEASE NOTE: The decision as to what constitutes Appropriate Attire vests with the Authorities of The Apollo University.

15. ELIGIBILITY FOR AWARD OF THE DEGREE

The undergraduate degree will be of 4-years/ 3-years(Lateral Entry) of duration. A student shall be declared as eligible for the award of the degree if the candidate has successfully secured the minimum number of required credits as specified in the curriculum corresponding to the branch of his/her study within the stipulated time.

After successful completion of the program, a provisional certificate cum memorandum of grades (PCMG) will be issued to the students. The PCMG includes the secured grades and class achieved in chosen program and specialization if any, along with grades and CGPA secured by the student. The original degree will be presented in the subsequent convocation.

16. DISCRETION POWER

Not with-standing anything contained in the above sections, the Vice Chancellor may review all exceptional cases, and give his decision, which will be final and binding.

ANNEXURE 1

ELIGIBILTY FOR QUALIFYING EXAM FOR UNDER GRADUATE PROGRAMS

Program Type	Program Name	Eligibility
Bachelor's	Critical Care Technology	Passed with at least 50% (40% in case the candidates belong to reserved category) marks with Botany, Zoology, Physics and Chemistry or Inter vocational with Bridge course of Biological and Physical Sciences (or) APOSS with Biological Sciences and Physical Sciences from a recognized board or other equivalent board or Intermediate and attain 17 Years as on 31st December of Calendar Year.

ANNEXURE 2

PROGRAMS OFFERED BY THE DIVISION OF ALLIED HEALTH SCIENCES

FROM THE ACADEMIC YEAR 2021-22

Sl. No.	Program	Expanded	Level	Minimum Duration in Years (N)
1.	B.Sc. PAT	B.Sc. Physician Assistant	Bachelor's	4
2.	B.Sc. MLT	B.Sc. Medical Lab Technology	Bachelor's	4
3.	B.Sc. IMT	B.Sc. Imaging Technology	Bachelor's	4
4.	B.Sc. AOTT	B.Sc. Anaesthesiology and Operation Technology	Bachelor's	4
5.	B.Sc. RDT	B.Sc. Renal Dialysis Technology	Bachelor's	4
6.	B.Sc. RTT	B.Sc. Respiratory Therapy Technology	Bachelor's	4
7.	B.Sc. EMT	B.Sc. Emergency Medical Technology	Bachelor's	4
8.	BOPT	Bachelors in optometry	Bachelor's	4
9.	B.Sc. CCT	B.Sc. Critical Care Technology	Bachelor's	4

I - Semester

Induction Programme						
Course Code	**Course Name**	**Periods per week**			**Credits**	**Hours per week**
		L	**T**	**P**		
	Anatomy	3	1	2	5	6
	Physiology	3	1	2	5	6
	Biochemistry	3	1	2	5	6
	Medical Terminology	1	0	0	1	1
TAUT1101	University core (Communicative English)	3	0	0	3	3
TAUT1201	University Elective - I	3	0	0	3	3
--	Mentoring	0	0	0	0	2
--	Library	0	0	0	0	1
--	Physical Activity	0	0	0	0	2
--	Extracurricular activities	0	0	0	0	2
--	Co-curricular activities	0	0	0	0	1
--	Self-Learning	0	0	0	0	2
--	Seminar	0	0	0	0	1
TOTAL					**22**	**36**

II – Semester

Course Code	Course Name	Periods per week			Credits	Hours per week
		L	T	P		
	Microbiology	3	1	2	5	6
	Pathology	3	1	2	5	6
	Pharmacology	3	0	0	3	3
	Sociology & Psychology	2	0	0	2	2
TAUT1102	University Core - II (Environmental Studies)	3	0	0	3	3
TAUT1202	University Elective - II	3	0	0	3	3
	Fundamentals of Critical Care technology	3	0	0	3	3
--	Mentoring	0	0	0	0	2
--	Library	0	0	0	0	1
--	Physical Activity	0	0	0	0	2
--	Extra-curricular activities	0	0	0	0	2
--	Self – Learning	0	0	0	0	2
--	Seminar	0	0	0	0	1
TOTAL					**24**	**36**

III – Semester

Course Code	Course Name	Periods per week			Credits	Hours per week
		L	T	P		
	Mechanical Ventilation – I	3	1	0	4	4
	Arterial Blood Gas & Acid–Base Balance	3	1	0	4	4
	Basic ICU Monitoring and Procedures	3	1	0	4	4
	Clinical Skills - I	0	0	12	6	12
TAUT2101	University Core – III (Health and Wellness)	3	0	0	3	3
TAUT2201	University Elective - III	3	0	0	3	3
--	Mentoring	0	0	0	0	1
--	Extra-curricular activities	0	0	0	0	2
--	Library	0	0	0	0	1
--	Seminar	0	0	0	0	1
--	Self-Learning	0	0	0	0	1
TOTAL					**24**	**36**

IV – Semester

Course Code	Course Name	Periods per week			Credits	Hours per week
		L	T	P		
	Mechanical Ventilation – II	3	1	0	4	4
	Hemodynamic Monitoring	3	1	0	4	4
	Infection Control, QA & ICU Safety	3	1	0	4	4
	Clinical Skills - II	0	0	20	10	20
--	Mentoring	0	0	0	0	1
--	Extra-curricular activities	0	0	0	0	2
--	Library	0	0	0	0	1
TOTAL					**22**	**36**

V – Semester

Course Code	Course Name	Periods per week			Credits	Hours per week
		L	T	P		
	Critical Care Cardiology & ECG	3	1	0	4	4
	Neuro-Critical Care	3	1	0	4	4
	ICU Administration & Patient Relations	3	1	0	4	4
	Program Elective -I	3	0	0	3	3
	Clinical skills-III	0	0	16	8	16
--	Mentoring	0	0	0	0	1
--	Extra-curricular activities	0	0	0	0	2
--	Seminar	0	0	0	0	1
--	Library	0	0	0	0	1
TOTAL					**23**	**36**

Program Elective -I	
Course Code	**Course Name**
	Emergency & Trauma Care
	ICU Simulation Skills
	Renal Replacement Therapy (Intro)

VI – Semester

Course Code	Course Name	Periods per week			Credits	Hours per week
		L	T	P		
	Applied Critical Care (Case Seminars)	3	1	0	4	4
	ICU Laws, Ethics & Accreditation	3	1	0	4	4
	Program Elective -II	3	0	0	3	3
	First aid and Emergency care	3	1	0	4	4
	Clinical Skills-IV	0	0	16	8	16
--	Mentoring	0	0	0	0	1
--	Extra-curricular activities	0	0	0	0	2
--	Seminar	0	0	0	0	1
--	Library	0	0	0	0	1
TOTAL					**23**	**36**

Program Elective -II	
Course Code	**Course Name**
	Research Methods & Biostatistics
	Entrepreneurship & Healthcare Innovation
	Public Health & Emergency Care

VII & VIII Semester

Course Code	Course Name	Periods per week			Credits	Hours per Semester
		L	T	P		
	Internship-I			**48**	**25**	**1104**
TOTAL				**48**	**25**	**1104**

Course Code	Course Name	Periods per week			Credits	Hours per Semester
		L	T	P		
	Internship-II			**48**	**25**	**1104**
	Project			**8**	**6**	**180**
TOTAL				**56**	**31**	**1284**

***Internship Evaluation can be submitted at the end of the Year**

I - Semester

AHSJ1301 **ANATOMY** **L T P C**

3 1 2 5

Course Description:

This course will cover anatomy with special emphasis on general anatomy including anatomical position, anatomical planes, cell structure, tissues and upper and lower limbs focusing on important muscles, arteries, veins, and nerves which are of significant clinical importance. This course also covers important and relevant anatomical knowledge of all systems namely nervous, cardiovascular, respiratory, gastrointestinal, reproductive, and excretory systems.This course also covers practical teaching of osteology, gross anatomy of important viscera, radiology and histology.

Course Objectives:

Students undergoing this course are expected to:

1. Understand and describe the **gross anatomy** of the human body with emphasis on normal structure, functional relevance, and applied aspects.
2. Learn and recall the **origin, insertion, action, and nerve supply of clinically significant muscles** of the body.
3. Understand the **origin, course, branches, distribution, and clinical significance** of major blood vessels and peripheral nerves.
4. Explain the **location, external features, relations, blood supply, lymphatic drainage, and innervation** of vital organs of various systems (nervous, cardiovascular, respiratory, gastrointestinal, reproductive, endocrine, and excretory).
5. Describe the **surface landmarks and applied anatomy** relevant for clinical practice and diagnostic procedures

THEORY **Total: 60 Hrs**

UNIT-I **12 Hrs**

INTRODUCTION

- Introduction to anatomy
- Define Anatomy and list its sub-divisions.
- Describe the Anatomical position.

General Histology

- Describe the human cell and its organelle.
- Describe the types of cell division and give examples.
- List out the types of tissues and describe their basic structure.

- Briefly describe the types of connective tissue including specialized connective tissue
- Describe the types and functions of epithelia.

UPPER LIMB

- Name the important bones, muscles, blood vessels & nerves of the upper limb.
- Briefly describe the movements of joints and the nerve supply and actions of the important muscle groups of the upper limb
- Describe the location and course of the major blood vessels & nerves of the upper limb.

UNIT-II **12 Hrs**

LOWER LIMB

- Name the important bones, muscles, blood vessels & nerves of the lower limb
- Briefly describe the movements of joints, nerve supply and actions of the important muscle groups of the lower limb
- Describe the location and course of the major blood vessels & nerves of the lower limb

RESPIRATORY SYSTEM

- Name the parts of the respiratory system.
- Briefly describe the pleura and its disposition
- Describe the external features of the lungs and their relations.
- Name the bronchopulmonary segments in each lung and explain their significance.
- Briefly describe the mechanism of respiration

UNIT-III **12 Hrs**

CARDIOVASCULAR SYSTEM

- Describe the important external and internal features of the heart.
- Briefly describe the blood supply of the heart
- Describe the circulation of blood through the heart and types of circulation.
- Describe the aorta and its branches.
- List out the major veins that join into the superior and inferior vena cavae.
- Briefly describe the lymphatic system and its function

NERVOUS SYSTEM

- Classify nervous system.
- Describe briefly the external and internal features of the spinal cord, its coverings and blood supply.

- Describe briefly the external and internal features of the brainstem and the functional significance of the tracts and nuclei seen in the brainstem.
- Briefly describe the cerebellum and its peduncles
- Describe the cerebrum in brief and its lobes and functional areas of importance.
- Briefly describe the circulation of cerebrospinal fluid

UNIT-IV **12 Hrs**

ENDOCRINE SYSTEM

- Name the endocrine glands and the hormones secreted by each.
- Briefly describe the anatomy and physiology of the pituitary, thyroid, parathyroid, Adrenal, and pancreas.

REPRODUCTIVE SYSTEM

- Describe briefly the male reproductive system.
- Describe briefly the female reproductive system.
- List out the hormones released by the organs in the reproductive system**.**

EXCRETORY SYSTEM

- Describe briefly the excretory system.

UNIT-V **12 Hrs**

GASTROINTESTINAL SYSTEM

- Briefly describe the extent, important anatomical features, and relations of various parts of the gastrointestinal tract.
- Describe the important anatomical features, surface anatomy, relations and functions, and blood supply of the liver.
- Briefly describe the parts, important features and functions of the oesophagus, stomach, duodenum, small intestine, and large intestine.
- Describe briefly the important anatomical features, position and relations and functions of pancreas and spleen.
- Briefly describe the blood supply of the gastrointestinal system.

Course outcomes:

At the end of this course, students should be able to:

1. Explain the origin, insertion, action, nerve supply, and clinical importance of major muscles of the human body.

2. Describe the origin, course, branches, distribution, and clinical relevance of important vessels and nerves.
3. Explain the location, external features, relations, blood supply, and clinical significance of organs belonging to the nervous, cardiovascular, respiratory, gastrointestinal, reproductive, endocrine, and excretory systems.
4. Identify and interpret the osteological and radiological features of bones, joints, and soft tissues with applied clinical correlations.
5. Describe the histological structure of tissues and organs and correlate them with function and pathology.

PRACTICALS **Total: 30 Hrs**

Course Objective: The course will cover Anatomy with special emphasis on osteology, histology, demonstration of viscera, radiology.

The assessment of the students will be undertaken with the help of following exercises.

- Spotters
- Viva

Textbooks:

1. Manipal manual of Human anatomy
2. Human anatomy & Physiology for Nursing – Mahindra Kumar Anand & Meena Verma
3. Understanding Human Anatomy & physiology – Willian Davis (McGraw Hill)
4. Anatomy & physiology – Kaarna Muni Shekhar
5. Textbook of Anatomy – Chaurasia
6. Textbook of Anatomy – TS Ranganathan Human Anatomy – Fattana.

Reference Books:

Textbook of anatomy-Vishram Singh

AHSJ1302 **PHYSIOLOGY** **L T P C**

3 1 2 5

Course Description:

The goal of this course is to help students in understanding functions, regulation, and integration of organ systems of the human body.

Course Objectives:

1. Describe the concept of homeostasis.
2. Interpret the structure of the cell membrane and describe the transport mechanisms for solute and water across the cell membrane. Explain the basis of membrane potential.
3. Describe the structure and functional organization of the human nervous system and its subdivisions. Discuss the role of nervous system in homeostasis.
4. Understand how heart and blood vessels work to maintain a constant delivery of blood flow (oxygenated) to all the tissues and simultaneously how the blood is returned (deoxygenated/ venous blood) to the heart. Explain how cardiovascular system adjust its activity to meet the demands placed by the body during activities of daily life (E.g., exercise)
5. Describe the basic anatomy and functions of the pulmonary system.
6. Explain the role of kidney in blood pressure, electrolyte, and fluid homeostasis.
7. Elaborate on how the structure of gastrointestinal tract suited for digestion and absorption. Discuss the mechanism of digestion and absorption at various levels of gastrointestinal tract.
8. Describe how endocrine organs are involved in regulation of growth, metabolism, fluid and electrolyte balance and reproduction.

THEORY **Total: 60 Hrs**

UNIT-I **10 Hrs**

1. General Physiology (Cell Physiology)

- Homeostasis
- Cell structure and functions of cell with special emphasis on characteristics of cell membranes, Transport mechanisms across cell membrane.
- Body Fluid Compartments (volume, composition, and units to measure solute concentration).

2. Nerve-Muscle Physiology

- Neuron (structure and function), Classification of neurons, Neuroglia, Type of nerve fibers, Resting membrane potential and Action potential.
- Neuromuscular Junction (skeletal muscle) and Neuromuscular blocking drugs
- Classification and functions and structure of muscles, Excitation contraction coupling, Mechanism of muscle contraction
- Differences between skeletal, smooth, and cardiac muscle.
- Applied physiology: Nerve injury, Myasthenia gravis, Neuromuscular junction blockers, Muscular dystrophy.

3. Blood (Hematology)

- Composition of blood, functions of cellular (RBC, WBC, and platelets) and non-cellular (plasma and plasma proteins) components of blood.
- RBC (Erythrocyte): Erythropoiesis and factors affecting it, Normal count, and variations. Hemoglobin: Functions and recycling of hemoglobin, Jaundice, Anemia.
- WBC: Classification, morphology, site of production, functions, normal and differential count, and variations. Immunity.
- Platelets: Origin, normal count, and functions (role in hemostasis).
- Hemostasis: Clotting factors and their role in hemostasis. Disorders of Hemostasis.
- Blood groups: ABO & Rh systems, Erythroblastosis fetalis, Hazards of mismatched blood transfusion
- Reticuloendothelial system

UNIT-II **13 Hrs**

1. Nervous system (Central Nervous system)

- Parts (gross connections)
- **Cerebral hemisphere**: parts, corpus callosum, cerebral cortex, and functions of frontal, parietal, temporal, and occipital lobes of the cerebrum.
- Connections between motor cortex and subcortical structures and spinal cord (descending tracts). Connections between spinal cord and thalamus- somatosensory cortex of parietal lobe (ascending tracts).
- Upper and lower motor neurons
- Descending and ascending tracts (origin, location, course, and termination)
- **Subcortical structures**
  Basal ganglia, Thalamus, Hypothalamus, and Limbic system. Nuclei of subcortical structures, its connections with various parts of the brain and its functions.
- **Brain stem**: (Midbrain, Pons, and Medulla oblongata)
  Nuclei, connections, and its functions
- **Cerebellum**

Physiological anatomy: lobes, cerebella cortex, connections (afferent and efferent), functions and applied aspects.

- Reticular formation and its functions
- Sleep
- **Spinal cord:** parts of gray matter and constituents of white matter. Applied physiology.

Peripheral Nervous System

- Divisions and constituents of the peripheral nervous system
- Functions of cranial and spinal nerves
- Physiological anatomy of somatic nervous system and its functions
- Physiological anatomy of autonomic nervous system (sympathetic and parasympathetic) and its functions

2. Special senses

- **Vision** –Functional anatomy of eye, visual pathway. Applied physiology: lesions along visual pathway and its effect. Refractive errors.
- **Hearing**– Physiological anatomy of ear, Mechanism of hearing, and auditory pathway. Applied physiology: deafness.
- **Olfaction** –receptors and pathway, function, and its applied physiology
- **Gustation**-modalities, receptor, function, taste pathway, and its applied physiology

UNIT- III **14 Hrs**

1. Cardiovascular system

- Physiological anatomy of the heart, autonomic innervation, and its action on the heart, pulmonary and systemic circulation
- Properties of cardiac muscle
- Conducting system of the heart
- Electrocardiogram
- Cardiac cycle, Heart sounds.
- Vascular system (branching), hemodynamics, factors influencing resistance to the blood flow.
- Cardiac output: definition, factors regulating it and measurement of cardiac output.
- Blood pressure: Definition, components, determinants of blood pressure and factors regulating it.
- Lymphatic system and its functions
- Pulse
- Applied aspects of cardiovascular physiology: myocardial infarction, heart failure, shock, and others
- Cardiovascular changes during exercise

2. Respiratory System

- Physiological anatomy of the respiratory tract, conducting and respiratory zone of the respiratory tract, pleural and pleural cavity, mechanics of respiration, changes in intrapleural and intrapulmonary pressures during respiratory cycle.
- Compliance and factors affecting it (surface tension and surfactant), respiratory distress syndrome.
- Lung volumes and capacities
- Respiratory membrane, partial pressure of gases, transport of O_2 and CO_2, Oxyhemoglobin dissociation curve.
- Regulation of respiration (Chemical and Neural)
- Hypoxia, dyspnea, apnea, asphyxia, and cyanosis
- Artificial respiration

UNIT-IV **13 Hrs**

1.Digestive System

- Introduction to Gastrointestinal system and Physiological anatomy of the wall of Gastrointestinal tract
- **Salivary glands** and its function, mastication, pharynx, and Deglutition
- **Stomach:** physiological anatomy, composition of Gastric juice (HCL secretion), its functions and its regulation.
- Vomiting reflex.
- **Liver and gall bladder**: Bile composition and its functions, and other functions of the liver, functions of the gall bladder. Enterohepatic circulation
- **Pancreas:** Pancreatic juice composition, its functions and regulation of its release.
- **Small intestine:** Succus entericus composition, functions, and regulation of its release. Small intestinal motility and its functions.
- **Large intestine:** function, movements, and Defecation reflex
- Digestion and absorption of carbohydrates, fats, and proteins.

2.Renal System

- Physiological anatomy & functions of the kidney, blood supply and special features of blood flow to the kidney. Structure and types of nephrons
- Histology of the renal corpuscle: Juxtaglomerular apparatus.
- Mechanisms of formation of urine: Glomerular filtration rate (GFR), Tubular reabsorption (Special emphasis on reabsorption of water, Na+, Glucose, HC03- and Ca2+) and tubular secretion (special emphasis on secretion of K+ and H+). Renal handling of urea, Renal threshold, and Tubular maximum.
- GFR: Starling forces acting across the glomerular capillaries and factors affecting GFR

- Concentration of urine: role of counter-current multiplier and counter-current exchanger
- Role of kidney in Regulation of blood pressure and pH
- Diuresis, diuretics, renal clearance. Renal function tests.
- Artificial kidney (Dialysis)
- Skin: Physiological anatomy of the skin and its role in temperature regulation.

UNIT-V **10 Hrs**

1. Endocrine System

- Physiological anatomy & functions of the kidney, blood supply and special features of blood flow to the kidney. Structure and types of nephrons
- Histology of the renal corpuscle: Juxtaglomerular apparatus.
- Mechanisms of formation of urine: Glomerular filtration rate (GFR), Tubular reabsorption (Special emphasis on reabsorption of water, Na+, Glucose, HC03- and Ca2+) and tubular secretion (special emphasis on secretion of K+ and H+). Renal handling of urea, Renal threshold, and Tubular maximum.
- GFR: Starling forces acting across the glomerular capillaries and factors affecting GFR
- Concentration of urine: role of counter-current multiplier and counter-current exchanger
- Role of kidney in Regulation of blood pressure and pH
- Diuresis, diuretics, renal clearance. Renal function tests.
- Artificial kidney (Dialysis)
- Skin: Physiological anatomy of the skin and its role in temperature regulation.

2. Reproductive system

- Introduction to reproductive system, sex differentiation, and Puberty.
- **Male reproductive system**, physiological anatomy of the testis and its functions, functions of testosterone, Spermatogenesis, and its regulation.
- **Female reproductive system**; physiological anatomy of ovaries and uterus.
- Functions of ovaries; Oogenesis and ovarian cycle, functions of Estrogen and Progesterone, and menstrual cycle.
- Physiological changes during pregnancy, pregnancy tests, parturition & lactation.
- Male & Female contraceptive methods

Course Outcome:

At the end of the course, students should

1. Describe the normal functions of cells, tissues, organs, and organ systems in the human body.

2. Explain the mechanisms of regulation and integration of different organ systems in maintaining homeostasis.
3. Discuss the physiological adaptations to altered states such as exercise, fasting, stress, and environmental changes (e.g., high altitude).
4. Demonstrate the ability to perform and interpret physiological experiments and correlate findings with theoretical concepts.
5. Apply physiological knowledge to clinical cases, diagnostic methods, and health sciences practice.

PRACTICALS **Total: 30 Hrs**

HEMATOLOGY

- Microscope
- Estimation of Hemoglobin
- Estimation of bleeding time and clotting time
- Measurement of ESR – demo
- Estimation of PCV – demo
- Perform RBC count of given blood sample.
- Perform WBC count of given blood sample.
- Perform a Differential Leucocyte Count.
- Calculation of blood indices

CLINICALS

A. Cardiovascular system

- Examination of radial pulse
- Measurement of blood pressure
- Recording of ECG- demo
- Measure of weight and height and calculate body mass index
- Demonstrate JVP, apex beat, percussion of cardiac borders, auscultation of heart sounds.

B. Respiratory system

- Measurement of respiratory rate and temperature
- Examination of respiratory system and temperature
- Spirometry demo

C. Nervous system

- Examination of cranial nerves
- Motor system examination
- Examination of reflexes
- Examination of the sensory system

D. Special senses

- Eye: Tests for vision (Acuity and colour perception)
- Ear: Hearing tests

Textbooks:

1. HH Sudhakar D Venkatesh "Basics of Medial Physiology", 5th edition, Wolters Kluwer,2023.
2. K Sembulingam, Prema Sembulingam, "Essentials of Physiology for Paramedical Students" JAYPEE, 2021.

Reference Books:

1. John E Hall and Michael E. Hall, Guyton & Hall, "Textbook of Medical Physiology" 14th edition, 2020
2. Eric P. Widmaier, Hershel Raff, and Kevin T. Strang "Vanders Human Physiology" 15TH edition, 2018.

AHSJ1303	**BIOCHEMISTRY**	**L**	**T**	**P**	**C**
		3	**1**	**2**	**5**

Course Description:

This course introduces students to the structure and function of essential biomolecules, which are the organic compounds that constitute the various components of living cells. The course covers the biochemical reactions that facilitate cellular growth, maintenance, reproduction, and energy utilization and storage.

Course Objectives:

By the end of this course, students will be able to:

1. Understand the structure and functions of the cell membrane and organelles.
2. Comprehend the chemistry of carbohydrates, lipids, proteins, and nucleic acids.
3. Explain enzyme actions, mechanisms, inhibition, and clinical enzymology.
4. Grasp the significance of nutrition, including vitamins and minerals.
5. Describe the structure and functions of immunoglobulins and hemoglobin.

THEORY **Total: 60 Hrs**

UNIT-I **4 Hrs**

Cell and Membrane: Cell organelles and their functions, membrane structure, transport mechanisms across membranes, ionophores, membrane proteins, and transporters.

UNIT- II: **15 Hrs**

Chemistry of Biomolecules

- **Chemistry of Carbohydrates:** Definition, classification, important monosaccharides, stereoisomers, anomers, mutarotation, and reactions of monosaccharides (tautomerization, reduction, dehydration, osazone formation). Important disaccharides and polysaccharides.
- **Chemistry of Lipids:** Definition, classification, nature of fatty acids, triacylglycerol, saponification, iodine number, rancidity, antioxidants, complex lipids, steroids, and cholesterol functions.
- **Chemistry of Amino Acids, Peptides, and Proteins:** Definition, classification, peptide bonds, biologically important peptides, essential and non-essential amino acids, protein structure (primary, secondary, tertiary, quaternary), precipitation, denaturation, coagulation, and color reactions of amino acids.
- **Chemistry of Nucleic Acids:** Nitrogenous bases, nucleosides, nucleotides, DNA, genes, and types of RNA involved in protein synthesis.

UNIT-III: **5 Hrs**

Enzymes: Definition, classification, factors affecting enzyme activity, mechanism of action, coenzymes, proenzymes, isoenzymes, measurement units, competitive and non-competitive inhibitors, and clinical enzymology with normal values.

UNIT- IV: **12 Hrs**

Nutrition and Vitamins

- **Nutrition:** Calorific values of food, basal metabolic rate, specific dynamic action, energy requirements, nutritional importance of carbohydrates, lipids, proteins, nitrogen balance, protein supplementation, Kwashiorkor, Marasmus, and Recommended Dietary Allowance (RDA).
- **Vitamins:** Overview of chemistry, sources, requirements, biochemical functions, deficiency symptoms of vitamins A, D, E, K, B-complex (thiamine, riboflavin, niacin, pantothenic acid, pyridoxine, biotin, folic acid, B-12), and Vitamin C.
- **Mineral Metabolism:** Classification of macro and micro elements, including sodium, potassium, calcium, phosphorus, iron, iodine, magnesium, copper, zinc, fluoride, manganese, selenium, and molybdenum.

UNIT -V: **4 Hrs**

Immunology and Hemoglobin

- **Immunology:** Definitions of antigens and antibodies, structure and functions of antibodies.
- **Hemoglobin:** Structure and functions of hemoglobin, its derivatives, degradation process, and jaundice.

Course Outcomes: Upon successful completion of this course, students will be able to:

- Describe the structures and functions of cell membranes and organelles.
- Understand and explain the chemistry and classifications of major biomolecules.
- Classify enzymes and explain their mechanisms, inhibition types, and clinical relevance.
- Comprehend the basics of nutrition, including sources, recommended dietary allowances (RDA), functions, and deficiency symptoms of vitamins and minerals.
- Explain the structure and functions of immunoglobulins and hemoglobin.

Textbooks: latest editions

1. Concise Textbook of Biochemistry for Paramedical Students (2nd Edition, 2023) by DM Vasudevan

2. A Textbook on Biochemistry for Paramedical Students (2022) by Dr. Kiran Dahiya

Reference Book:

1. Textbook of Biochemistry for Medical Students (10th Edition, 2023) by DM Vasudeva

MEDICAL TERMINOLOGY

Course Description- This course provides a comprehensive understanding of medical terms used in critical care and healthcare settings. It focuses on the structure, pronunciation, and application of medical vocabulary related to body systems, diseases, diagnostic procedures, and critical care interventions, enabling students to communicate effectively in clinical environments.

Course Objective-

1. Understand the structure of medical terms (prefixes, suffixes, root words).
2. Interpret and use medical terminology in critical care settings.
3. Apply terminology related to body systems, diseases, and procedures.
4. Communicate effectively with healthcare professionals using standard medical language.
5. Develop accuracy in documentation and reporting in ICU and emergency care.

Unit I: Foundations of Medical Terminology-I 3hrs

- Greek and Latin roots; Prefixes — a/an (without), brady/tachy (slow/fast), hyper/hypo, poly/oligo, bi/uni, intra/extra/peri, sub/supra, pre/post;
- Suffixes — itis (inflammation), ectomy, ostomy, plasty, scopy, graphy, ology, emia, penia, phagia, pnoea,

Unit II: Foundations of Medical Terminology-II 3hrs

- cardia; Building and dissecting medical words; Spelling and pronunciation rules; Directional
- positional terms (anterior, posterior, medial, lateral, ipsilateral, contralateral)

Unit III: Organ-System-I 3hrs

- Cardiovascular — myocardial infarction, arrhythmia, cardiomegaly, tachycardia, bradycardia, pericarditis, haemopericardium; Respiratory — pneumothorax, bronchospasm, atelectasis, dyspnoea, tachypnoea, hypoxaemia, hypercarbia, haemoptysis, bronchopleural fistula;

Unit IV: Critical Care Terminology 3hrs

- Critical care abbreviations — NPO, SOB, DNR/DNAR, ARDS, SIADH, DIC, ECMO, CRRT, TPN, GCS, ABG

Unit V: Organ-System-II 3hrs

- Neurological — encephalopathy, hemiparesis, aphasia, seizure, comatose, decerebrate/decorticate posturing; Renal — oliguria, anuria, uraemia, AKI, proteinuria; Gastrointestinal — haematemesis, melaena, ileus, peritonitis;

References

Core Textbooks

1. Chabner, D. – *The Language of Medicine*
2. Ehrlich, A. & Schroeder, C. – *Medical Terminology for Health Professions*

3. Rice, J. – *Medical Terminology: A Word Building Approach*

Reference Books

4. Taber's Cyclopedic Medical Dictionary
5. Dorland's Illustrated Medical Dictionary

UNIVERSITY CORE – I
Semester – I

TAUT1101 COMMUNICATIVE ENGLISH L T P C
3 0 0 3

Course Description:

The creation of the Course is to facilitate Stakeholders in productively using the Language to functional advantage to form meaningful engagements in a social context and influence their professional dynamic.

Course Objectives:

The objective of this course is to make students to:

1. To expand and enhance vocabulary systematically for clear communication, richer expression, and deeper comprehension across various contexts."
2. To provide the grammatical knowledge and skills necessary to communicate effectively in English, both orally and in writing.
3. To strengthen their ability to write academic papers, essays and summaries using the "Mind Mapping,' dynamic.
4. To enhance communication skills by analyse, evaluate, and express their opinions on various topics, fostering the development of critical thinking abilities
5. To develop proficiency in listening, speaking, reading and writing, enabling individuals to communicate effectively in various real-life situations.

UNIT-I **9 Hrs**

Vocabulary and Reading: Special Features of English Vocabulary, Reading With Purpose; Understanding What is Read; Drawing a Conclusion Based on Inferences, Deduction, Reading Between the Lines, Context, Connotation, Higher Order Thinking; How to Explain Specific Information with Clarity; Defining and Giving Reasons; Giving Directions; Professional Vocabulary.

UNIT-II **9 Hrs**

Basic Grammar: Subject-Verb Agreement; Verb Tenses; Active-Passive Voice; Direct and Indirect Speech; Question Tags; Degrees of Comparison; Articles; Avoiding Jargon.

UNIT-III **9 Hrs**

Writing: Letter Writing; Report Writing; E-Communication, Drafting and Collating Key Information, Taking Notes from Lectures, Reading Materials, Reporting on Minutes of the Meeting, Precis Writing

UNIT-IV **9 Hrs**

Basics of Communication: Role of Communication; Purpose of Communication; Barriers to Communication; Verbal and Non-Verbal Communication, Communication at the Workplace; Human Needs and Communication; "Mind Mapping" Communication; E-Communication.

UNIT-V **9 Hrs**

Presentations: Self-Introduction; Individual Presentation; Group Discussions; Debates.

Course Outcomes:

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

1. To review grammatical structures of English and the use of these forms in specific communicative contexts, which include: class activities, homework assignments, reading of texts and writing and functional real-world facets.
2. To improve their accuracy and fluency in producing and understanding spoken and written English and endorse this proficiency in both personal and professional realms.
3. To attain and enhance competence in the four modes of literacy: Writing, Speaking, Reading and Listening.
4. To develop their ability as critical thinkers.
5. To empower the individuals to connect, engage, and thrive in diverse personal and professional environments.

Text Books:

1. Meenakshi Raman and Sangeeta Sharma, "Technical Communication: Principles and Practice", 3rd Edition, Oxford University Press, 2015.
2. M. Ashraf Rizvi, "Effective Technical Communication", Second Edition, McGraw. Hill Education, 2017.
3. Wilfred Funk and Norman Lewis, "30 Days to a More Powerful Vocabulary", Latest Edition, Pocket Books, 2021.

Reference Books:

1. Grant Taylor, "English Conversation Practice", Tata McGraw-Hill Education India, 2016.
2. Gary Blake and Robert W. Bly, "The Elements of Technical Writing", 2nd Edition, 2000, Longman.
3. Raymond Murphy, "English Grammar in Use", Fourth Edition, Cambridge University Press, 2019.

University Elective – I

Semester – I

S. No	Name of the Course	Host Department
1	Basics of Physiotherapy	School of Health Sciences – Physiotherapy
2	Biostatistics	School of Health Sciences – BMS & GMB
3	Constitution of India	School of Social Sciences
4	Ethical Hacking	School of Technology - CSE
5	Fundamentals of Computers	School of Technology - CSE
6	Gender and Development	School of Social Sciences
7	Leadership Development	School of Management
8	Mathematical Thinking	School of Technology
9	Nursing	Apollo Institute of Nursing
10	One Health	School of Health Sciences – PH
11	Basic emergency care and life support skills	School of Health Sciences – AHS
12	Basics of Health Management	School of Health Sciences – AHS
13	Entrepreneurship	School of Management
14	Managerial Economics	School of Management
15	Organic Farming	School of Health Sciences – BMS & GMB
16	Personality Development	School of Health Sciences – Psychology
17	Social Entrepreneurship	School of Management

TAUT1201A **BASICS OF PHYSIOTHERAPY**
L T P C

3 0 0 3

Course Description:

The course is designed to aim at imparting a basic level health program. This program is formulated to enable student to gain adequate knowledge, skills and leading to an ability to identify the basics of early features of the health issues

Course Objectives:

The objective of this course is to make students to:

1. Gather and interpret information within a holistic framework pertaining to health.
2. The overall content of the curriculum focuses on health care and clinical education experiences for each student
3. Understand the basic fundamentals of physiotherapy
4. Familiarizes participants with different procedures and techniques used in physiotherapy and their practical application across various conditions
5. Provide participants with a substantial understanding of physiotherapy and promote safe practices and ethical behaviour in physiotherapy practice.

UNIT-I Basics of Physiotherapy **5 Hrs**

i. What is Physiotherapy?
ii. Types of Physiotherapy
iii. Benefits of Physiotherapy
iv. Why is Physiotherapy done?

UNIT-II Women's Health **5 Hrs**

i. Pre-natal exercises & Care
ii. Post Natal exercises

UNIT-III Acute injuries & management and the uses of Orthotics & Prosthetics 10 Hrs

i. Mechanism of injury
ii. Acute muscle injuries
-Muscle strain
-Risks of muscle strain
-Muscle imbalance:
-Muscle inflexibility:
iii. Ligament sprain and difference between sprain and strain
iv. Orthotics & Prosthetics

UNIT-IV Ergonomics & Health and Aerobics **13 Hrs**

i. work-related musculoskeletal disorders (MSDs).
ii. Risk factors associated with work-related MSDs & Possible Causes
iii. Common ergonomic symptoms
iv. Different types of Ergonomics & principles of ergonomics and v. Ergonomic Control Methods
v. Awkward body postures – hazards
vi. Physical Activity and exercise
vii. Physical Fitness and Maximum Oxygen Consumption
viii. Aerobic Exercise Training and Physiological Response to Aerobic Exercise
ix. Cardiovascular Response to Exercise and Respiratory Response to Exercise
x. Responses Providing Additional Oxygen to Muscle and Exercise Program
xi. Warm-Up Period, Aerobic Exercise Period and Cool-Down Period Application

UNIT-V Education & Awareness about common diseases and BLS **12 Hrs**

i. Bell's palsy
ii. Diabetes
iii. Coronary artery heart disease
iv. OA Knee
v. Stroke
vi. LBA
vii. Early identification of congenital anomalies
viii. BLS Theory
ix. BLS Practical's

Course Outcomes:

1. Gain the basic knowledge of Physiotherapy
2. Familiarize the procedures and techniques used in physiotherapy
3. Protect and manage from the sport injuries
4. Gain Knowledge about Ergonomics
5. To maintain physical fitness

Text Books:

1. Physiotherapy In Obstetrics and Gynecology-Polden and Mantle, Jaypee Brothers
2. Women's Health- Ruth Sapsford, Lippincott,1998
3. Textbook of orthopedics medicine Vol I & II by James Cyriax – Bailliere
4. Susan B O'Sullivan, Physical Rehabilitation 6th Edition, 6 edition F A Davis; 2013. ISBN-13: 978-0803625792
5. Arias" Practical Guide To High Risk Pregnancy and Delivery by Amarnath Bhide, Sabaratnam Arulkumaran

Reference Books:

1. John Ebenezer- Essentials of Orthopedics for Physiotherapists- 3rd edition 2016
2. Davidson's principles and practice of medicine
3. Fundamentals of Ergonomics in Theory and Practice- Alan Hedge- 2019
4. Introduction to Ergonomics, Third Edition" -Robert Bridger- 2018
5. Human Factors and Ergonomics in Practice: Improving System Performance and Human Well-Being"- Steven Shorrock, Claire Williams- 2020
6. Acute Care Handbook for Physical Therapists- Jaime C. Paz, Michele P. West- 2019
7. Sports Injury Prevention and Rehabilitation: Integrating Medicine and Science for Performance Solutions" David Joyce, Daniel Lewindon- 2015
8. Orthotic Intervention for the Hand and Upper Extremity: Splinting Principles and Process"- Marylyn A. Jacobs, Noelle M. Austin- 2013
9. Prosthetics and Orthotics: Lower Limb and Spine"- Joan E. Edelstein, Alex Moroz- 2017
10. "Essentials of Physiotherapy"- Prakash Narain Tandon- 2016
11. Pathology for the Physical Therapist Assistant - Catherine C. Goodman, Kenda S. Fuller- 2020 (3rd Edition

TAUT1201B **BIOSTATICS** **L T P C**
3 0 0 3

Course Description:

Biostatistics is the application of statistical methods to biological and health-related fields. This course provides a comprehensive introduction to the principles and techniques of biostatistics essential for conducting research in medicine, public health, and biology. Students will learn how to effectively collect, analyze, and interpret data from biological and health sciences, with a focus on understanding and addressing key issues such as experimental design, sampling methods, data visualization, hypothesis testing, and regression analysis.

Course Objectives:

1. Gain a solid understanding of biostatistical principles including descriptive statistics, probability, hypothesis testing, and regression analysis.
2. Apply these principles to analyze data from biological and health sciences, focusing on experimental and observational studies.
3. Critically interpret statistical results and effectively communicate findings to different audiences.
4. Develop proficiency in using statistical software for data manipulation, analysis, and visualization.

5. Design studies, evaluate literature, and collaborate in interdisciplinary teams, preparing for advanced study and research in biostatistics and related fields.

UNIT-I Descriptive methods **9 Hrs**

Frequency Distribution, Characteristics of a Frequency Distribution, Tabular and Graphical Presentation of Data: Line Graphs, Bar Charts, Histograms, Ogives.

UNIT-II Measures of central tendency **9 Hrs**

Arithmetic Mean, Median, Mode, Position of Averages, Selection of the Appropriate Measure of Central Tendency, Geometric Mean, Harmonic Mean.

UNIT-III Measures of dispersion **9 Hrs**

Range, Interquartile Range, Mean Deviation, Variance and Standard Deviation

UNIT-IV Sampling Designs **9 Hrs**

Sampling and Sample Designs, Significance of Probability and Non-probability sampling methods, Crossover Design, Case Control Design, Cohort Study Design, Designing clinical trials -Single- and Double-Blind Experiments.

UNIT-V Data analysis and interpretation **9 Hrs**

Tests of hypothesis, Tests of significance, chi-square test, Goodness of fit, Analysis of variance.

Course Outcomes:

1. Ability to design experiments, sampling variables, analyze the biological data, interpret andpresent the results in meaningful way.
2. Create tables and graphs for data presentation
3. Describe measures of central tendency and dispersion along with calculating probabilityfeatures of experiments.
4. Discuss the correlation between various types of data along with associated variables.
5. Test hypothesis and carry out related statistical tests

Text Books:

1. Daniel WW, Cross CL (2013) Biostatistics: A Foundation Sciences
2. Biostatistics: A Foundation for Analysis in the Health Sciences, 11th Edition Chad L. Cross, Wayne W. Daniel , ISBN: 978-1-119-49657-1, December 2018

Reference Books

1. Forthofer RN, Lee ES, Hernandez M (2006) To Design, Analysis, and Discovery. Elsevier Ltd., Amsterdam.
2. Principles of Biostatistics, 3rd Edition, By Marcello Pagano, Kimberlee Gauvreau, Heather Mattie (2022

TAUT1201C **CONSTITUTION OF INDIA** **L T P C**
3 0 0 3

Course Description:

The Constitution of India course provides a comprehensive understanding of the fundamental principles, structure, and functioning of the Indian Constitution. This course examines the historical evolution, key features, and various interpretations of the Constitution, highlighting its significance in shaping India's legal and political landscape. Through this course, students will gain insights into the roles and responsibilities of different branches of government, fundamental rights and duties of citizens, and the constitutional mechanisms that ensure the democratic functioning of the nation.

Course Objectives:

1 To realize the significance of constitution of India to students from all walks of life andhelp them to understand the basic concepts of Indian constitution.
2 To identify the importance of fundamental rights as well as fundamental duties.
3 To understand the functioning of Union, State and Local Governments in Indian federalsystem.
4 To learn procedure and effects of emergency, composition and activities of election commission and amendment procedure.
5 To acquire knowledge to appear for competitive examinations.

UNIT-I **9 Hrs**

Historical Background – Constituent Assembly of India – Philosophical Foundations of The Indian Constitution – Preamble – Constitutional amendments

UNIT-II **9Hrs**

Fundamental Rights – Directive Principles of State Policy – Fundamental Duties – Citizenship – Constitutional Remedies for Citizens;

UNIT-III **9 Hrs**

Union Government – Structures of the Union Government and Functions – President – Vice President – Prime Minister – Cabinet – Parliament – Supreme Court of India – Judicial Review.

UNIT-IV **9 Hrs**

State Government – Structure and Functions – Governor – Chief Minister – Cabinet – State Legislature – Judicial System in States – High Courts and other Subordinate Courts.

UNIT-V **9 Hrs**

Statutory Institutions -Elections-Election Commission of India, National Human Rights Commission, National Commission for Women; Local Self Government; Lok pal.

Course Outcomes:

At the end of the course the student should be able to:

1. Understand and explain the significance of Indian Constitution as the fundamental law of the land.
2. Exercise his fundamental rights in proper sense at the same time identifies his responsibilities in national building.
3. Analyze the Indian political system, the powers and functions of the Union, State and Local Governments in detail
4. Understand Electoral Process, Emergency provisions and Amendment procedure.
5. Take part in competitive examinations with confidence.

Text Books:

1. Durga Das Basu, "Introduction to the Constitution of India ", Prentice Hall of India, New Delhi.
2. R.C.Agarwal, (1997) "Indian Political System", S.Chand and Company, New Delhi.

Reference Books:

1. Sharma, Brij Kishore, "Introduction to the Constitution of India", Prentice Hall of India, New Delhi.
2. The Constitution of India (2022) : https://cdnbbsr.s3waas.gov.in/s380537a945c7aaa788ccfcdf1b99b5d8f/uploads/2023/05/2023050195.pdf
3. Refer the website through the link given for Constitution of India in various Indian Languages https://legislative.gov.in/constitution-of-india/
4. Indian Constitution at Work by National Council of Educational Research and Training, Sri Aurobindo Marg, New Delhi

TAUT1201D **ETHICAL HACKING** **L T P C**
3 0 0 3

Course Description:

This course is about to learn ethical hacking and security challenges in computer networking. Which addresses the data security issues and types of attacks includes malwares, viruses, sniffer and denial of service. It teaches ethical responsibilities, professional integrity and making appropriate use of the tools and techniques.

Course Objectives:

The objective of this course is to make students to:

1. Know the concepts of hacking, ports and penetration testing
2. Understand the foot printing types and techniques of scanning
3. Understand the process of system hacking, trojans and backdoors
4. Apply the concepts of sniffing, packet analysis & session Hijacking
5. Learn the ethical issues and responsibilities associated with ethical hacking

UNIT-I **9 Hrs**

Introduction to Hacking: Hacking, Types and phases of hacking. Introduction to Ports & Protocols: Ports, Protocols, Primary Network Types. Introduction to Penetration Testing: Penetration test, Categories and Types of Penetration tests, Structure of Penetration Test Report.

UNIT-II **9 Hrs**

Foot printing: Foot printing, Types, Using ping and ns Lookup commands in Windows command line. Scanning: Scanning, Basics of Scanning, Basic Techniques of Scanning, Enumerating DNS using dns enum, Performing flag scan using hping3.

UNIT-III **10 Hrs**

Issues Hacking into System: System Hacking, Password Cracking, Default password databases, Manual and Automated Password Cracking, Process of System Hacking, Using Keyloggers. Trojans & Backdoors: Trojans, Working of Trojan, Infection Techniques, Attack, Lifecycle and Classification of Virus, Worms, Virus Construction Kit.

UNIT-IV **9 Hrs**

Types, Sniffing, Packet Analysis & Session Hijacking: Sniffing, Packet Analysis, Types of Sniffing, Active and Passive Sniffing Techniques, Session Hijacking. Cryptography: Cryptography, Digital Signature, Hash Functions.

UNIT-V **8 Hrs**

An introduction to the particular legal, professional and ethical issues likely to face the domain of ethical hacking. Ethical responsibilities, professional integrity and making appropriate use of the tools and techniques associated with ethical hacking.

Course Outcomes:

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

1. Explain the concepts related to hacking, ports and protocols, penetration testing
2. Determine the applicable foot printing techniques and scanning methods
3. Explain the process of system hacking and explain the concepts Trojans, backdoors, worms and virus and it's countermeasures
4. Demonstrate systematic understanding of the concepts of sniffing and cryptography
5. Understand the legal and professional responsibilities of ethical hacking

Text Books:

1. Jiawei Hacking: Be a Hacker with Ethics, Harsh Bothra, Khanna Publications, 2019.
2. Ethical Hacking and Penetration Testing Guide, Rafay Baloch, 2014.

Reference Books:

1. Alex Berson Kali Linux Wireless Penetration Testing Beginner's Guide, Vivek Ramachandran, Cameron Buchanan, Packt Publishing, 2015.
2. SQL Injection Attacks and Defense, 1st Edition, Justin Clarke-Salt, Syngress Publication.
3. Mastering Modern Web Penetration Testing, Prakhar Prasad, Packt Publishing, October 2016.

TAUT1201E **FUNDAMENTALS OF COMPUTERS** **L T P C**
3 0 0 3

Course Description:

The course is designed to aim at imparting a basic level appreciation program. The incumbent can use the computer for basic purposes of preparing his personnel/business letters, viewing information on the Internet (the web), sending mail, using internet banking services, etc. and allows to become digitally literate.

Course Objectives:

The objective of this course is to make students to:

1. To introduce the fundamental concepts of computers, including their characteristics, types, and applications.
2. To explain the functional components of a computer and various input/output devices.
3. To understand different types of computer memory and storage devices.
4. To introduce computer languages and software, including algorithms and programming languages and provide an overview of operating systems and basic networking concepts.
5. To introduce the components and practical applications of MS Office.

UNIT-I **9 Hrs**

Introduction to Computer: Computer Characteristics, Concept of Hardware, Software, Evolution of computer and Generations, Types of Computers–Analog and Digital computers, Hybrid Computers, General Purpose and Special Purpose Computers, Limitations of Applications of Computer in Various Fields.

UNIT-II **9 Hrs**

Structure and Working of Computer: Functional Block Diagram of Computer. CPU, ALU, Memory UNIT-, Bus Structure of Digital Computer–Address, Data and Control Bus.
Input/Output Devices: Input Device– Keyboard, Mouse, Scanner, MICR, OMR. Output Devices–VDU, Printers– Dot Matrix, Daisy-wheel, Inkjet, Laser, Line Printers and Plotters.

UNIT-III **9 Hrs**

Computer Memory: Memory Concept, Memory Cell, Memory Organization, Semiconductor Memory – RAM, ROM, PROM, EPROM, Secondary Storage Devices – Magnetic Tape, Magnetic Disk (Floppy Disk and Hard Disk.), Compact Disk.
Computer Language and Software: Algorithm, Flowcharts, Machine Language, Assembly Language, High Level Language, Assembler, Compiler, Interpreter. Characteristics of Good Language. Software – System and Application Software.

UNIT-IV **9 Hrs**

Operating System: Operating System, Evolution of Operating System. Functions of Operating System. Types of Operating Systems. Detailed Study of Windows Operating System. Introduction and Features of LINUXOS.
Networking: Concept, Basic Elements of a Communication System, Data Transmission Media, Topologies, LAN, MAN, WAN, Internet

UNIT-V **9 Hrs**

MSOffice: Introduction to MS Office, Components and Features. **MSWord:** Creating Letter, Table, Fonts, Page Layout Document**,** Formatting, Spell Check, Print Preview, Template, Color, Mail Merge, AutoText, Inserting Picture, WordArt.
MS Excel: Introduction to Excel, Sorting, Queries, Graphs, Scientific Functions.
PowerPoint: Introduction to PowerPoint, Creation of Slides, Inserting Pictures, Preparing Slide Show with Animation. **MS Access:** Creation and Manipulation of Files.

Course Outcomes:

Upon completion of the course, student will be able to:

1. Understand the basic characteristics, types, and applications of computers.
2. Comprehend the functional components and input/output devices of a computer.
3. Describe various memory types and secondary storage devices.
4. Differentiate between machine, assembly, and high-level languages and their associated tools. Understand the role and types of operating systems, with knowledge of Windows and Linux, and basic networking concepts.
5. Utilize MS Word, Excel, PowerPoint, and Access for practical applications.

Text Books:

1. Peter Norton: Computing Fundamentals.6th Edition, Mc Graw Hill-Osborne, 2007.
2. Sarita Dhawale, Thakur Akash Ashok: Fundamentals of Computer, Thakur Publication Pvt. Ltd.

Reference Books:

1. Deborah Morley and Charles S.Parker; Fundamentals of Computers; Cengage Learning, India edition; 2009.
2. Alex is Leon and Mathews Leon; Fundamentals of Information Technology; Vikas Publication, Chennai.
3. Francis Scheid; Theory and Problems of Introduction to Computer Science Schaum's Outline Series; Tata Mc Graw Hill publication.

TAUT1201F **GENDER AND DEVELOPMENT** **L T P C**
3 0 0 3

Course Description:

The course is important for professionals from the point of creating engendered perspectives and sensitivity toward issues concerning women, men, and sexual minorities. It further reaffirms the belief in the importance of grassroots experiences and narratives while dealing with gender issues.

Course Objectives:

1. Understand key concepts, and issues in gender and development
2. Understand the social construction of gender and develop gender perspectives in analyzing social realities
3. Understand how the gender dynamics of power and inequality play out in the social institutions of households, markets, and states and within the arena of civil society.
4. Create awareness about the magnitude of gender disparities in the present context
5. Examine through the gender lens, the interlinkage between cultural practices social processes, and development approaches

UNIT-I Basic Concepts and Theories of Feminism **10 Hrs**

Concepts- gender, gender studies, gender identity, gender role stereotyping, gender division of labor, gender discrimination, gender equality, and equity. Overview of feminist theories – Liberal feminism, Radical Feminism, Black feminism, postmodern feminism, Eco- feminism; The international background to the Women's Movement, The genesis of the Women's Movement in India. Contemporary Contestations – Intersex and Transgender Movements. Feminist thinkers in the 18th, 19th, 20th, and 21st Centuries.

UNIT-II Gender Issues **10 Hrs**

Major gender issues – national and global - causes and consequences., LGBTQIA+ issues (Gender violence in private and public spaces: Domestic violence, Dowry, trafficking in women and children, rape, sex-selective abortion, female infanticide, female foeticide, child marriage, prostitution • Gender, leadership, and workplace; Sexual Harassment at Workplace). Gender-based violence, patriarchy, sexism, racism, casteism, economic inequality, and misogyny. Gender and health (Physical and mental), reproductive health, and sexuality.

Feminization of poverty. Issues of the rights of sexual minorities and transgender - Article 377 and beyond.

UNIT-III Gender Perspectives in Development **10 Hrs**

Gender Analysis Tools: Gender budgeting, Gender mainstreaming, SIG, Gender Parity Index, Gender Inequality Index, Human Development Index, Gender Development Index, Gender Empowerment Measure, Approaches to development-- Women in Development (WID), Women and Development (WAD), Gender and Development(GAD), Millennium Development Goals, and Sustainable Development Gender Analysis Frameworks; Gender blind; neutral and redistributive policies; Welfare, Efficiency and Empowerment approaches to Gender; Strategic and practical gender needs/interests; Case Studies to understand the engagement with gender, (Poverty alleviation Forestry; Drinking Water and Sanitation; Health programmes, Urban renewal and slum rehabilitation Programmes, and micro-credit programmes like SHGs.

UNIT-IV Mechanisms Addressing Issues and Best Practices **10 Hrs**

Constitutional and legislative safeguards, policies, and programmes • Institutional mechanisms: National Commission for Women, Rashtriya Mahila Kosh, Crime Against Women Cell, Family Court, Family Counselling Centers and Crisis intervention centers • Best practices to address disparity, violence, and safety issues, International initiatives world conferences, women's decade, CEDAW. Indian initiatives – Towards Equality Report, National Perspective Plan for women, National Policy for the Empowerment of Women-2001, National and State women's Commissions, Nirbhaya, Women Development Corporation; Legal remedies and Social Welfare Services available to Women Facing Violence.

UNIT-V Gender and Media **5 Hrs**

Discourse on Women and Media Studies- Mainstream Media, Feminist Media. • Coverage of Women's issues, sexual minorities, and issues of women in Mass Media and Media Organizations (Audio-Visual and Print media). • Digital Media and legal protection (cybercrimes and laws). • Alternative Media – Folk Art, Street Play and Theatre. • Indecent Representation of Women (Prohibition) Act, 1986, Pornography, Impact of media on Gender. Construction of masculinity and feminity in media.

Course Outcomes:

By the end of the course, students should be able to:

1. Understand the concept of gender and the social construction of feminity and masculinity
2. Develop sensitivity towards the existing practices leading to gender discrimination and marginalization in society.
3. Develop the ability to identify social, economic and political systems that adversely affect the well-being and functioning of women.
4. Suggest affirmative action in planning to promote gender equity, equality, and safety for women and sexual minorities
5. Understand the major theoretical and empirical issues that emerge in the gender field.

Text Books:

1. Nalini Visvanathan (Ed.), (2006) The Women, Gender and Development Reader, Zubaan, New Delhi
2. Kannabiran, Kalpana& Ritu Menon. 2007. From Mathura to Manorma: Resisting Violence Against Women, New Delhi: Women Unlimited

Reference Books:

1. Seth, M. 2001. Women and Development: The Indian Experience. New Delhi: Sage Publications.
2. Banerjee, N; S. Sen &N. Dhawan. 2011. Mapping the Field: Gender Relations in Contemporary India, Volume 1, Kolkata: Stree
3. Bose, C.E. &Minjeong Kim. 2009. Global Gender Research: Transnational Perspectives, New York: Routledge

Notes

1. https://www.studocu.com/row/document/kohat-university-of-science-and-technology/gender-studies/gender-studies-new-lecture-notes-1-7/5176872
2. https://teentalk.ca/learn-about/gender-identity/#:~:text=There%20are%20many%20different%20gender,or%20a%20combination%20of%20these.
3. https://genderspectrum.org/articles/understanding-gender

TAUT1201G **LEADERSHIP DEVELOPMENT** **L T P C**
3 0 0 3

Course Description:

This course provides a comprehensive introduction to the fundamental concepts of leadership. Students will gain knowledge of different leadership levels and styles, and understand the significance of vision and strategy formulation.

Course Objectives:

1. Understand the basic concepts of leadership
2. Knowledge of leadership development strategy
3. Knowledge of leadership development approaches
4. Knowledge of leadership traits
5. Awareness on self-awareness exercises.

UNIT-I **9 Hrs**

Understanding Leadership-Defining Leadership; Leadership styles, Entrepreneurial leaders, Different levels of leaders

UNIT-II **9 Hrs**

Strategy formulation- formulation of vision, Strategy formulation and communication, role of the leader in managing change, foundation for effective team development

UNIT-III **9 Hrs**

Leadership development approaches- Significance of leadership development strategy, leadership development approaches- One-to-one coaching, Mentor schemes, Role of HR and development, Buddy pairs, Action learning sets, Work-based projects

UNIT-IV **9 Hrs**

Recognizing Leadership Traits-Historical Leaders; Traits Leaders Display, Leadership Studies: What Traits Do Effective Leaders Exhibit.

UNIT-V **9 Hrs**

Recognising self - Exercises of Self-awareness using Johari Window, Development diaries, Feedback exercises, Personal vision setting

Course Outcomes:

1. Understand the basic concepts of leadership
2. Understand the significance of vision and strategy formulation
3. Knowledge of leadership development approaches.
4. Knowledge of leadership traits.
5. Knowledge of self awareness techniques

Text Books:

1. Rosemary Ryan, Leadership Development - A guide for HR and Training professionals, ELSEVIER, UK
2. Kim S. Cameron, Positive Leadership: Strategies for Extraordinary Performance,

Reference Books:

1. Manuel London, Leadership Development: Paths To Self-insight and Professional Growth, Psychology Press, New York.
2. Susan E. Murphy, Ronald E. Riggio, The Future of Leadership Development, Routledge is an imprint of Taylor & Franci

TAUT1201H **MATHEMATICAL THINKING** **L T P C**
3 0 0 3

Course Description:
Mathematical Thinking is a university elective course that teaches fundamental concepts of basic algebraic and mathematical operations. After learning this course, students will easily be able to learn more problems solving skills and use this course for practicing. The course emphasizes problem-solving skills and analytical thinking, and equips students with the skills necessary to tackle real-world problems using basic mathematical and arithmetical concepts.

Course Outcomes:
At the end of this course, the students will be able:

1. To familiarize the students with the fundamental concepts of basic numbers, mathematical operations, and divisibility rules
2. Summarize the basic concepts mathematical operations on numbers and calculate LCM, GCD to solve simple problems.
3. Compute To probability concepts and statistical methods in various applications engineering.
4. Understand the formula for evaluate the square root and cube root of different types numbers
5. Impart the arrangements and selections of things and counting numbers and check for independence of events.

UNIT-I **9 Hrs**

Number system and Tests of Divisibility: Digits, numbers, Indian-Hindu-Arabic system, Roman Numbers, Face Value and Place values, Various Types of Numbers or Standard Numbers, Prime number, composite numbers, Perfect Numbers, Co-primes (or) Relative Primes, Twin primes, perfect numbers, Testing of prime numbers, Mathematical operations on even and odd numbers.

UNIT-II **9 Hrs**

LCM and GCD or HCF: Factors and Multiplers, Highest Common Factor (H.C.F.) or Greatest Common Measure (G.C.M.) or Greatest Common Divisor (G.C.D.) factorization method, division method, finding the H.C.F. of more than two numbers, factorization method of finding L.C.M, H.C.F. and L.C.M. of fractions.

UNIT-III **9 Hrs**

System Simplifications: BODMAS' Rule, Modulus of a Real Number, Virnaculum (or Bar), Algebraic identities, set theory operations (union, intersection, complements).

UNIT-IV **9 Hrs**

Square Roots, Cube Roots, averages and percentages: Square Root, cube root, Problems on numbers, concept of averages, problems on averages, concept of percentage and problems on percentages.

UNIT-V **9 Hrs**

Permutations, combinations and Probability: Fundamental principle with respect of addition and multiplication, permutations, combination, relation between permutation and combination, Random experiment, sample space and basic problems of events of a probability.

Course Outcomes:

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

1. To explain fundamental concepts of basic number system, including standard numbers, mathematical operations, and divisibility rules.
2. To apply mathematical operations on numbers and calculate lcm, gcd to solve simple problems.
3. To evaluate the arrangements and selections of things and counting numbers.
4. To understand the simplications by using identities and apply the different kinds of operations on the numbers.
5. To evaluate square root and cube root of different types numbers and calculate appropriate solutions for different problems.

Text Books:

1. Quantitative Aptitude Text Book, Dr.RS.Agrrwal.
2. Quantitative Aptitude, Text Book,S.Chandu.
3. Andhra Pradesh Academy of IPE text books.

Reference Books:

1. Quantitative Aptitude, Text Book, Quicker Mathematics ,second edition
2. Quantitative Aptitude, Text Book,Abjuirh guwaha,Fourth edition
3. www.online quantitative aptitude testseries.com
4. Quantitative Aptitude, GSR Publications,Gunturu,third edition
5. Quantitative Aptitude, verbal reasoning,Guptha publication,3rd edition
6. www.enaduprathibaonline.com and www.sakshionlineseries.com

TAUT1201I **NURSING** **L T P C**
3 0 0 3

Course Description:

This module is designed to help the students to acquire comprehensive knowledge in basic concepts of Health, Nursing, Vital signs, Basic Life support, home care management of Diabetes & Hypertension and Adolescent health.

Course Objectives:

Students undergoing this course are expected to:

1. Understand the concept of health, illness, and Nursing
2. Learn the technique of assessing and monitoring vital signs
3. Perform BLS using evidence based national or international guidelines in the management of adult victims with the cardiac arrest.
4. Understand the concept of home care management of Diabetes and Hypertensive persons
5. Develop understanding about the normal growth and development, needs and health issues of adolescents

UNIT-I **03 Hrs**

Concepts of Health and Nursing: Definition of Health and ill ness, Health-illness continuum, Factors influencing Health, Nursing as a profession and Career ladder.

UNIT-II **12 Hrs**

Vital signs: Temperature: Physiology, regulation, factors affecting body temperature, Assessment of body temperature: sites, technique and special considerations.
Pulse: Physiology & regulation, characteristics of the pulse, factors affecting pulse, Assessment of the pulse: sites, location, technique and special considerations.
Respiration: Physiology and regulation, mechanics of breathing, characteristics of the respiration, factors affecting respiration, Assessment of respiration: technique and special considerations.
Blood pressure: Physiology and regulation, characteristics of the blood pressure, factors affecting blood pressure. Assessment of blood pressure: sites, equipment and technique and special considerations. Recording of vital signs.
Pain: Definition, types physiology of pain and factors influencing the pain

UNIT-III **8 Hrs**
Basic life support / basic cardiopulmonary life support (BLS/BCLS)

Introduction, definition, purposes, indications, contraindications and steps in procedure.

UNIT-IV **12 Hrs**

Home care management of Diabetes and Hypertension

Diabetes- Introduction to Diabetes Mellitus – A National and Global burden: Classification, risk factors, pathophysiology, manifestations, screening, diagnostic criteria and complications, The treatment Modalities of Diabetes Mellitus: (Life style modifications Diet therapy, Exercise, Medical Management, Self-Management, Practical Aspects: Blood Glucose monitoring, Diabetic foot care, Exercises, Diabetic Diet Planning, Self-Insulin administration)
Hypertension- Introduction to Hypertension, Types, risk factors, pathophysiology ,manifestations, diagnostic criteria and complications, treatment modalities : life style modifications, Diet therapy Exercise ,Medical management

UNIT-V **10 Hrs**

Adolescent Health: Growth and Development of adolescent, Nutritional and developmental needs of adolescent, Common health problems including mental health problems, Reproductive and sexual health issues

Course Outcomes:

At the end of this course, students should be able to:

1. Acquire a thorough knowledge on concept of health and illness.
2. Demonstrate skills in monitoring the vital signs
3. Develop skills in performing BLS/BCLS
4. Able to attain knowledge and skills on treatment modalities of DM

5. Aware of normal Growth and development and common health problems in adolescent

Text Books:

1. Potter and perrys, Fundamentals of Nursing,4th edition, Mosby, Elsevier publication
2. Lewis, textbook of Medical Surgical Nursing 4th South Asian edition, Elsevier publication
3. Dorothy R. Marlow, Text book of paediatric nursing, sixth edition, Elsevier publications,

Reference Books:

1. Joyce M black textbook of medical surgical nursing ,8th edition, Elsevier publications,
2. Kozier and Erbs, textbook of fundamentals of Nursing, Elsevier publications.

TAUT1201J **ONE HEALTH** **L T P C**
3 0 0 3

Course Description:

This course introduces students to the One Health approach, an interdisciplinary approach that recognizes the interconnectedness of human, animal and environmental health. Students will learn about the history of One Health, its relevance to global health and its role in addressing a range of health challenges, including zoonotic diseases, environmental health hazards and antimicrobial resistance. The course will also explore current and emerging One Health challenges and innovations and the ethical considerations of One Health research and practice.

Course Objectives:

1. To explain the relevance of One Health to global health.
2. To understand the interdisciplinary nature of One Health research and practice.
3. To analyze the impact of environmental health hazards on human and animal health.
4. To identify emerging One Health challenges and innovations.
5. To evaluate ethical considerations in One Health research and practice.

UNIT-I **9 Hrs**

Overview of One Health and its relevance to global health, Definition of One Health and its history, Examples of One Health challenges, such as zoonotic diseases and antimicrobial resistance, The role of inter-disciplinarity in One Health research and practice, Global One Health initiatives and their impact

UNIT-II **9 Hrs**

Environmental health and its relationship to One Health, Overview of environmental health and its impact on human and animal health, Environmental risks to health, such as pollution and climate change, Case studies highlighting the impact of environmental hazards on human and animal health, The role of One Health in addressing environmental health challenges

UNIT-III **9 Hrs**

Zoonotic diseases and One Health, Overview of zoonotic diseases and their impact on human and animal health, The ecology of zoonotic diseases and how they emerge and spread, Case studies of major zoonotic disease outbreaks, such as Ebola and COVID-19, The One Health approach to preventing and controlling zoonotic diseases.

UNIT-IV **9 Hrs**

Antimicrobial resistance and One Health, Overview of antimicrobial resistance and its impact on human and animal health, the relationship between antimicrobial use in animal agriculture and human health, the role of One Health in addressing the global challenge of antimicrobial resistance, Case studies of One Health approaches to controlling antimicrobial resistance, such as the WHO Global Action Plan

UNIT-V **9 Hrs**

Future directions in One Health research and practice, Emerging One Health challenges-food security and emerging infectious diseases, Innovations in One Health research and practice, such as digital technologies and genomics, Opportunities for One Health collaboration across sectors and disciplines, Ethical considerations in One Health research and practice.

Course Outcomes:

By the end of the course, students will be able to:

1. Describe the One Health approach and its relevance to global health
2. Analyze the impact of environmental health hazards on human and animal health
3. Evaluate the role of One Health in addressing zoonotic diseases and controlling antimicrobial resistance
4. Identify emerging One Health challenges and innovations
5. Discuss ethical considerations in One Health research and practice

Text Books:

1. One Health: People, Animals and the Environment by Ronald M. Atlas and Stanley Maloy
2. One Health: The Human-Animal-Environment Interfaces in Emerging Infectious Diseases by John S. Mackenzie and Martyn Jeggo

Reference Books:

1. One Health: The Theory and Practice of Integrated Health Approaches edited by Jakob Zinsstag, Esther Schelling, David Waltner-Toews and Maxine Whittaker
2. One Health and the Politics of Antimicrobial Resistance edited by Laura H. Kahn, Bruce Kaplan and Thomas P. Monath
3. The One Health Initiative: A Global Movement to Achieve Sustainable Health and Well-being edited by Bruce Kaplan and Thomas P. Monath.

BASIC EMERGENCY CARE AND LIFE SUPPORT SKILLS

TAUT1201K **L T P C**
3 0 0 3

Course Description:

This course introduces students to the fundamental skills required for providing basic emergency care and life support. It covers essential techniques in CPR, AED use, and basic first aid to prepare students for real-life emergency situations.

Course Objectives:

Students undergoing this course are expected to:

1. To understand the principles and techniques of basic life support.
2. To acquire essential first aid skills.
3. To know the use of AED
4. To get trained in the practical aspects of CPR.
5. To know the various assessment aspects of a patient in an emergency

UNIT-I Basic Life Support (BLS) and CPR **9 Hrs**

Introduction to BLS and CPR, Steps of Adult, Child, and Infant CPR, Airway Management, Rescue Breathing and Chest Compressions

UNIT-II Automated External Defibrillator (AED) 9 Hrs

What is an AED? When and How to Use an AED, Safety Precautions, Different types of Defibrillators

UNIT-III Basic First Aid Technique 9 Hrs

Principles of First Aid, Managing Bleeding and Wounds, Fractures and Sprains, Burns and Scalds.

UNIT-IV Recognizing Medical Emergencies 9 Hrs

Identifying Common Medical Emergencies, Initial Assessment and Response, Managing Breathing and Cardiac Emergencies.

UNIT-V Practical Skills Practice 9 Hrs

Hands-on CPR Practice, AED Operation Drills, First Aid Skills Practice, Scenario-Based Training

Course Outcomes:

At the end of this course, students should be able to:

1. Acquire a thorough knowledge of the principles and techniques of basic life support.
2. Apply essential first aid skills.
3. Demonstrate the use of AED in Emergencies.
4. Demonstrate the practical aspects of CPR
5. Evaluate various assessment plans by the specific emergency.

Text Books:

1. "Basic Life Support Provider Manual" by American Heart Association Pang, Ning Tan, Michael Steinbach and Vipin Kumar “Introduction to Data Mining”, Pearson Education, 2007.
2. "First Aid Manual" by St. John Ambulance

TAUT1201L **BASICS OF HEALTH MANAGEMENT** **L T P C**
3 0 0 3

Course Description:

This course provides an essential foundation in health management, focusing on key areas such as basic life support, first aid, stroke management, and the prevention and management of both communicable and non-communicable diseases. Students will develop practical skills and knowledge to effectively manage health-related situations in various settings.

Course Objectives:

Students undergoing this course are expected to:

1. To understand the principles and techniques of basic life support.
2. To acquire essential first aid skills.
3. To comprehend the causes, symptoms, and management of stroke.
4. To learn about non-communicable diseases, their risk factors, and management strategies.
5. To understand communicable diseases, their transmission, prevention, and control.

UNIT-I Basic Life Support **9 Hrs**

Overview of Basic Life Support (BLS), Cardiopulmonary Resuscitation (CPR) Techniques, Use of Automated External Defibrillators (AEDs), Airway Management and Breathing Support, BLS Protocols and Procedures.

UNIT-II First Aid **9 Hrs**

Introduction to First Aid Principles, Managing Wounds and Bleeding, Fractures and Musculoskeletal Injuries, Burns and Scalds Treatment, Handling Medical Emergencies (e.g., heart attack, choking, seizures)

UNIT-III Stroke **9 Hrs**

Understanding Stroke: Types and Causes, Symptoms and Warning Signs of Stroke, Immediate Response and Management, Stroke Rehabilitation and Recovery, Prevention and Risk Reduction Strategies

UNIT-IV Non-Communicable Diseases **9 Hrs**

Definition and Classification of Non-Communicable Diseases (NCDs), Common NCDs: Cardiovascular Diseases, Diabetes, Cancer, Chronic Respiratory Diseases, Risk Factors and Prevention Strategies, Management and Treatment Approaches, Public Health Implications and Policy Responses

UNIT-V Communicable Diseases **9 Hrs**

Introduction to Communicable Diseases, Modes of Transmission and Epidemiology, Prevention and Control Measures (e.g., vaccination, hygiene, quarantine), Management of Common Communicable Diseases (e.g., TB, HIV/AIDS, Influenza), Emerging Infectious Diseases and Global Health Security

Course Outcomes:

At the end of this course, students should be able to:

1. Perform basic life support techniques.
2. Administer essential first aid.
3. Recognize and manage stroke symptoms and treatments.
4. Understand and address non-communicable diseases.
5. Implement communicable disease control measures.

Text Books:

1. "Basic Life Support Provider Manual" by American Heart Association
2. "First Aid Manual" by St. John Ambulance, St. Andrew's First Aid, and the British Red Cross

Reference Books:

1. "Stroke: Practical Guide to Management" by Charles P. Warlow
2. "Non-Communicable Diseases in the Developing World" by Rachel Nugent
3. "Communicable Disease Control and Health Protection Handbook" by Jeremy Hawker et al.

TAUT1201N **ENTREPRENEURSHIP** **L T P C**
3 0 0 3

Course Description:
This course provides an in-depth understanding of entrepreneurship, its applications, and its scope. Students will learn to generate broad ideas for starting an enterprise or startup and convert them into viable opportunities. The course covers the essentials of managing startups, understanding small and medium enterprises, and gaining knowledge of various financial institutions.

Course Objectives:

1. Understand the concept of Entrepreneurship, its applications and scope.
2. Application of knowledge for generating a broad idea for a starting an enterprise/start up and converting to opportunity.
3. Knowledge of managing the start-up's
4. Understand the small and medium enterprises
5. Knowledge of different financial institutions

UNIT-I **9 Hrs**

Entrepreneurship: Definition and Concept of entrepreneurship - Entrepreneur Characteristics – Classification of Entrepreneurs –Role of Entrepreneurship in Economic Development

UNIT-II **9 Hrs**

Idea to Opportunity- Introduction, Sources of New Ideas, Techniques for Generating Ideas, Assessing Business Potential of an Idea, Opportunity Recognition, Sources and process, Indian Economy—Opportunities, Steps Involved in Tapping Opportunity

UNIT-III **9 Hrs**

Entrepreneurship Development - Intrapreneurship, Entrepreneurship as a Career Option, Female Entrepreneurship and problems, Types of Start-ups, Start-ups and mistakes, Managing Start-ups During Downturn

UNIT-IV **9 Hrs**

Entrepreneurship Trends- Small and Medium Business Enterprises, International Entrepreneurship, Entrepreneurship—Emerging Trends in the Global Knowledge Economy

UNIT-V **9 Hrs**

Institutions Supporting and Taxation Benefits: Central level Institutions: NABARD; SIDBI,– State Level Institutions –DICs – SFC - Government Policy for MSMEs - Tax Incentives and Concessions.

Course Outcomes:

1. Basic understanding of entrepreneurship
2. Knowledge of idea generation and opportunities identification of entrepreneurship
3. Understand different forms of enterprises
4. Understand different emerging trends of entrepreneurship
5. Knowledge of different financial institutions

Text Books:

1. Arya Kumar, Entrepreneurship, Pearson, Delhi
2. Poornima MCH, Entrepreneurship Development –Small Business Enterprises, Pearson, Delhi

Reference Books:

1. Anil Kumar, S., ET.al., Entrepreneurship Development, New Age International Publishers, New Delhi
2. Khanka, SS, Entrepreneurship Development, S. Chand, New Delhi
3. Peter F. Drucker,Innovation and Entrepreneurship
4. A.Sahay, M. S. Chhikara, New Vistas of Entrepreneurship: Challenges &Opportunities

TAUT1201O **MANAGERIAL ECONOMICS** **L T P C**
3 0 0 3

Course Description:

This course provides a solid foundation in the fundamentals of economics and managerial economics. Students will learn to apply concepts of production cost and revenues for effective business decisions. The course also covers analyzing capital investments to maximize returns, understanding different forms of business organizations, and evaluating business organizations and marketing strategies.

Course Objectives:

1. Understand the fundamentals of Economics and Managerial economics
2. Apply the Concept of Production cost and revenues for effective Business decision
3. Analyze how to invest their capital and maximize returns.
4. Understand different forms of business organizations
5. Evaluate Business organizations and marketing strategies

UNIT-I **9 Hrs**

Introduction: Meaning, Nature, Significance, Functions, and Advantages, ME and its role in other fields. Demand **-** Concept, Function, Law of Demand - Demand Elasticity- Types – Measurement. Demand Forecasting- Factors governing forecasting and methods.

UNIT-II **9 Hrs**

Production: Introduction – Nature, meaning, significance, functions and advantages. Production Function– Least-cost combination– Short run and Long run Production Function- Isoquants and Isocosts, MRTS - Cobb-Douglas Production Function - Laws of Returns

UNIT-III **9 Hrs**

Cost & Break-Even Analysis - Cost concepts and Cost behavior- Break-Even Analysis (BEA) - Determination of Break-Even Point (Simple Problems)-Managerial significance and limitations of Break-Even Analysis.

UNIT-IV **9 Hrs**

Business Organizations Introduction – Nature, meaning, significance, functions and advantages. Forms of Business Organizations- Sole Proprietary - Partnership - Joint Stock Companies - Public Sector Enterprises.

UNIT-V **9 Hrs**

Markets Types of Markets - Perfect and Imperfect Competition - Features of Perfect Competition Monopoly- Monopolistic Competition–Oligopoly-Price-Output Determination - Pricing Methods and Strategies.

Course Outcomes:

1. Basic understanding of managerial economics
2. Develop an understanding of the applications of production
3. Interpret cost analysis
4. Understand different forms of business organizations.
5. Analyse the causes and consequences of different market conditions.

Text Books:

1. Varshney & Maheswari: Managerial Economics, Sultan Chand, 2013.
2. Aryasri: Business Economics and Financial Analysis, 4/e, MGH, 2019.

Reference Books:

1. Ahuja Hl Managerial economics Schand,3/e,2013
2. S.A. Siddiqui and A.S. Siddiqui: Managerial Economics and Financial Analysis, New AgeInternational, 2013.
3. Joseph G. Nellis and David Parker: Principles of Business Economics, Pearson, 2/e, NewDelhi.

TAUT1201P **ORGANIC FARMING** **L T P C**
3 0 0 3

Course Description:

By the end of the course, students will be equipped with the knowledge and skills to plan, establish, and manage organic farms effectively. This course serves as a foundation for aspiring organic farmers, agricultural professionals, and individuals interested in sustainable food production and environmental conservation.

Course Objectives:

1. To Understand the principles and practices of organic farming.
2. To Analyze the environmental, economic, and social implications of conventional versus organic agricultural systems.
3. To Apply organic farming techniques to enhance soil health and fertility.
4. To Examine the certification processes and regulations governing organic farming.
5. To explore ways to engage with local communities and promote organic practices.

UNIT-I **9 Hrs**

Introduction to Organic Farming, Overview of organic farming principles and practices, Historical development and evolution of organic agriculture, Importance of organic farming in sustainable agriculture, Comparison between conventional and organic farming systems, Certification and regulatory requirements for organic farming.

UNIT-II **9 Hrs**

Soil Health and Management, Importance of soil health in organic farming, Soil composition and structure, Soil fertility management without synthetic inputs, Soil conservation techniques: cover cropping, crop rotation, mulching, Composting and vermicomposting for organic matter enrichment.

UNIT-III **9 Hrs**

Crop Management in Organic Systems, Selection of suitable crops for organic farming, Organic seed selection, saving, and sourcing, Crop planning and rotation strategies, Weed management without herbicides: mechanical, cultural, and biological control methods, Pest and disease management in organic systems: integrated pest management (IPM), biological control, and natural remedies.

UNIT-IV **9 Hrs**

Organic Livestock Management, Principles of organic livestock production, Organic feed sourcing and formulation, Housing and space requirements for organic livestock, Health care and disease management without antibiotics and synthetic chemicals, Organic certification requirements for livestock operations.

UNIT-V **9 Hrs**

Marketing and Economics of Organic Farming, Market trends and consumer demand for organic products, Certification and labeling requirements for organic products, Marketing strategies for organic farmers: direct sales, farmers markets, CSA (Community Supported Agriculture), Economic viability and

Community Supported Agriculture), Economic viability and profitability of organic farming, Government support programs and incentives for organic farmers.

Course Outcomes:

Upon completion of the course the student shall be able to,

1. Demonstrate a comprehensive understanding of the principles of organic farming and their application in agricultural systems.
2. Critically evaluate the sustainability of different agricultural practices, considering environmental impact, economic viability, and social equity.
3. Design and implement an organic farming plan for a specific crop or agricultural enterprise.
4. Analyze case studies and research articles to assess the effectiveness of organic farming practices in various contexts.
5. Communicate effectively about organic farming principles and practices, both orally and in writing.

Text Books:

1. "Teaming with Microbes: The Organic Gardener's Guide to the Soil Food Web" by Jeff Lowenfels and Wayne Lewis
2. "The Organic Farmer's Business Handbook: A Complete Guide to Managing Finances, Crops, and Staff - and Making a Profit" by Richard Wiswall

Reference Books:

1. "Introduction to Permaculture" by Bill Mollison

2. "Crop Rotation on Organic Farms: A Planning Manual" by Charles L. Mohler and Sue Ellen Johnson
3. "The Organic Farming Manual: A Comprehensive Guide to Starting and Running a Certified Organic Farm" by Anne Larkin Hansen

TAUT1201Q PERSONALITY DEVELOPMENT L T P C
3 0 0 3

Course Description:

Personality Development is a comprehensive course designed to equip undergraduates with the essential skills and knowledge required for personal growth and professional success. The course focuses on enhancing self-awareness, emotional intelligence, communication, and interpersonal skills. Students will learn how to build confidence, manage stress, and develop effective time management strategies. Additionally, the course covers critical aspects of professional development, including resume writing, interview techniques, and personal branding.

Course Objectives:

1. To develop self-awareness and emotional intelligence.
2. To enhance communication and interpersonal skills.
3. To build confidence and self-esteem.
4. To foster professional and personal growth.
5. To prepare students for successful careers and meaningful personal lives.

UNIT-I Introduction to Personality Development 9 Hrs

Definition and importance of personality development; Initial self-assessment and goal setting; Short-term and long-term goal setting; Understanding oneself: strengths, weaknesses, opportunities, threats (SWOT analysis); Values, beliefs, and attitudes; Personal vision and mission statements; Components of emotional intelligence (EQ); Self-regulation and self-motivation; Empathy and social skills.

UNIT-II Communication Skills and Interpersonal Skills 9 Hrs

Communication Skills; Verbal and non-verbal communication; Active listening and feedback; Public speaking and presentation skills; Building and maintaining relationships; Conflict resolution and negotiation; Teamwork and collaboration; Importance of cultural sensitivity in a globalized world; Developing intercultural communication skills

UNIT-III Critical Thinking, Problem Solving and Self-Esteem 9 Hrs

Enhancing analytical and critical thinking skills; Creative problem-solving techniques Decision-making process; Confidence and Self-Esteem; Building self-confidence; Overcoming self-doubt and negative thinking; Techniques for boosting self-esteem.

UNIT-IV Time Management and Stress Management 7 Hrs

Prioritization and productivity techniques; Overcoming procrastination; Identifying sources of stress; Techniques for managing and reducing stress; Work-life balance.

UNIT-V Professional Development and Leadership Skills 11 Hrs

Resume writing and job interview skills; Professional etiquette and workplace behavior Networking skills; Traits of effective leaders; Leadership styles and theories; Developing leadership qualities; Personal Branding, Building a personal brand; Online presence and social media etiquette; Personal branding strategies; Final self-assessment and reflection on personal growth

Course Outcomes:

By the end of this course, students will be able to:

1. Develop a personal vision and mission statement to guide future actions and decisions.
2. Exhibit improved verbal and non-verbal communication skills.
3. Apply strategies to boost self-confidence and maintain high self-esteem.
4. Implement effective time management techniques to enhance productivity.
5. Develop and demonstrate leadership qualities in various scenarios.

Text Books:

1. Student's Hand Book- Skill Genie-Higher Education Department, Govt. Of Andhra Pradesh -https://svimstpt.ap.nic.in/edu/skill_genie.pdf.
2. The only skill that matters- Jonathan.Levi (2019)- Super Human Enterprises, LLC. All rights reserved. ISBN:978-1-5445-0435-3

Reference Books:

1. Online courses and TED Talks on personality development and self-improvement.
2. "How to Win Friends and Influence People" by Dale Carnegie (1936) Revised- 2022.

TAUT1201R **SOCIAL ENTREPRENEURSHIP** **L T P C**
3 0 0 3

Course Description:

This course explores the role of social entrepreneurship in societies, economies, and politics. Students will learn about the three pillars of social entrepreneurship and the different types of partners and their advantages. The course also covers the typical process steps of creating a marketing concept and describes the characteristics of the financing structure of social enterprises.

Course Objectives:

1. Understand the role of social entrepreneurship in societies, economies and politics
2. Explain the three pillars of social entrepreneurship.
3. Describe different types of partners for social entrepreneurs and their particular advantages.
4. Understand the typical process steps of a marketing conception.
5. Describe the characteristics of the financing structure of social enterprises.

UNIT-I **9 Hrs**

Introduction - Meaning of social entrepreneurship- concepts and typologies, its disparity with social business and CSR, social entrepreneur & personality, social enterprise.

UNIT-II **9 Hrs**

Drivers and scope: Role of Social Entrepreneurship in -Societies, Economies and Politics, The Drivers of Social Entrepreneurship, Size and Scope of Social Entrepreneurship, Opportunities for Social Entrepreneurs.

UNIT-III **9 Hrs**

Collaboration and Partnerships - Reasons for Crafting Collaborations, Specific Types of Collaborations, Different Collaboration Partners, Potential Risks and Challenges, Guidelines to Establish a Collaboration.

UNIT-IV **9 Hrs**

Elements of a Marketing Conception- Market analysis, Marketing Goals, Competitive Strategy, Measures, Controlling; Peculiarities Concerning Marketing for Social Enterprises, Marketing Importance for Social Enterprises.

UNIT-V **9 Hrs**

Finance- Types of Financing Instruments- Donations, Equity capital, Debt capital, Hybrid capital; Financing institutions-value banks, social investment advisors, social stock exchange, Venture Philanthropy Funds, Social Investment Funds, Funding Consultancies

Course Outcomes:

1. Knowledge of social entrepreneurship differentiation from other related concepts
2. Understand the role of social entrepreneurship in societies, economies and politics
3. Analysis of different types of partners for social entrepreneurs.
4. Understand the typical process steps of a marketing conception.
5. Awareness of the peculiarities of financial elements in social enterprises

Text Books:

1. Christine K. Volkmann & Kim Oliver Tokarski. 2012.Social Entrepreneurship and Social Business. Springer Gabler
2. Madhukar Shukla: Social Entrepreneurship in India. Sage publications

Reference Books:

1. Archana Singh (auth.) The Process of Social Value Creation: A Multiple-Case Study on Social Entrepreneurship in India. Springer India.2016.
2. Ryszard Praszkier; Andrzej Nowak. Social entrepreneurship : theory and practice [1 ed.]. Cambridge University Press
3. Alex Nicholls. Social Entrepreneurship: New Models of Sustainable Social Change. Oxford University Press, USA

II Semester

AHSJ1304 MICROBIOLOGY L T P C

3 1 2 5

Course Description:

This course will cover on general properties of pathogenic bacteria, viruses, fungi and parasites along with immune mechanisms, its response, methods of sterilization and disinfection, healthcare associated infections and hospital infection control practices. It helps the student to understand the natural history of infectious diseases to deal with etiology, pathogenesis, clinical features, laboratory diagnosis, treatment and control of infections in the community including immunoprophylaxis.

Course Objectives:

Students undergoing the course shall be expected to:

- Learn the general properties, structure and physiological aspects of bacteria and identification of bacteria.
- Learn about infection, immunity, various antigen-antibody reactions, immune mechanisms and hypersensitivity reactions and various infection control practices.
- Learn about pathogenesis, laboratory diagnosis and prophylactic measures of various bacterial infections.
- Learn about general properties of viruses and fungi and morphology, pathogenesis, laboratory diagnosis and prophylactic measures of various viral and fungal infections.
- Learn about classification of parasites and their morphological forms, life cycle, pathogenesis, laboratory diagnosis and prophylactic measures of various parasitic infections.

THEORY **Total: 60 Hrs**

UNIT-I **10 Hrs**

INTRODUCTION TO MEDICAL MICROBIOLOGY

- Importance of Medical Microbiology
- Historical aspects

GENERAL PROPERTIES & PHYSIOLOGICAL ASPECTS OF BACTERIA

- Structure of bacteria and its appendages like capsule, flagella, pili and spore
- Classification based on morphology, arrangement and motility
- Microscopy & Staining techniques
- Bacterial Growth Curve, Nutritional requirements of bacteria

BACTERIAL IDENTIFICATION METHODS

- Culture media, Culture Methods
- Specimen collection and transport to the laboratory
- Laboratory methods of Identification of Bacteria
- Antibiotic Sensitivity testing – Diffusion and Dilution methods

UNIT-II **12 Hrs**

INFECTION CONTROL PRACTICES

Infection – Definition, types and sources of infection, mode of transmission, types of infectious diseases, microbial pathogenicity

- Sterilization, Disinfection and Asepsis
- Standard Safety Precautions
- Biomedical Waste Management
- Hospital acquired infections, mode of spread, types and predisposing factors, investigation and surveillance

IMMUNOLOGY

Immunity – Definitions, terminology, Innate, acquired and herd immunity

- Antigen & Antibody
- Antigen-Antibody Reactions – Precipitation reactions, Agglutination reactions, ELISA, IFA
- Immune response
- Hypersensitivity - Definition and Classification and Type I, II, III, IV types of hypersensitivity
- Immunoprophylaxis – Immunization schedule, vaccines, storage & handling, hazards of immunization

UNIT-III **16 Hrs**

PATHOGENIC BACTERIA– Morphology, pathogenicity, laboratory diagnosis and prophylaxis of the following organisms

- **Gram Positive Cocci:** Staphylococci, Streptococci & Pneumococci
- **Gram Negative Cocci:** Meningococci, Gonococci
- **Gram Positive Bacilli:** Corynebacterium diphtheriae, Clostridium perfringens, Clostridium tetani, Clostridium botulinum, Bacillus anthracis, Bacillus cereus
- **Gram Negative Bacilli:** Escherichia coli, Klebsiella, Proteus, Salmonella, Shigella, Vibrio, Bordetella, Hemophilus
- **Acid Fast bacilli:** Mycobacterium tuberculosis, Mycobacterium leprae
- **Spirochaetes:** Treponema, Borrelia, Leptospira
- Ricketssiae

UNIT-IV **12 Hrs**

GENERAL VIROLOGY

- **General Properties of Viruses** – Structure, viral multiplication, viral cultivation, classification, inclusion bodies, antiviral agents
- Specimen collection and transport of viral disease samples to laboratory

PATHOGENIC VIRUSES – Morphology, Pathogenicity, laboratory diagnosis and prophylaxis of the following organisms

- RNA Viruses – Polio virus, influenza virus, mumps virus, measles virus, rubella virus, rabies virus, dengue virus, chickungunya virus, Japanese encephalitis virus,
- DNA Viruses – Herpes simplex virus, Varicella zoster virus, Epstein Barr virus, Variola, Molluscum contagiosum, Adeno virus, Human Papilloma virus
- Viral Hepatitis – Hepatitis A, B, C, D and E
- Rota Virus
- SARS Virus, Corona virus
- Human Immunodeficiency Virus (HIV)

PATHOGENIC FUNGI – Morphology, pathogenicity, laboratory diagnosis and prophylaxis of the following organisms

- Introduction, classification of fungi and fungal diseases, antifungal agents
- Superficial mycoses, subcutaneous mycoses, systemic mycoses and opportunistic mycoses
- Mycetism and mycotoxicosis

UNIT-V **10 Hrs**

PARASITOLOGY – Mode of infection, pathogenicity, clinical picture, laboratory diagnosis of the following parasites

- **Protozoans:** Entamoeba histolytica, Trichomonas vaginalis, Leishmania donovani, Plasmodium spp., Toxoplasma gondii, Pneumocystis jirovecii, Cryptosporidium parvum
- **Cestodes:** Taeniasolium, Taenia saginata, Diphylobothrium latum
- **Trematodes:** Schistosoma haematobium, Fasciola hepatica, Fasciolposis buskii, Clonrchis sinensis, Paragonimuswestermanii
- **Nematodes:** Ascaris lumbricoides, Ankylostoma duodenale, Enterobius vermicularis, Strongyloidesstercoralis, Wucherariabancrofti

Course Outcomes:

At the end of the course student should be able to:

- Describe the General Properties and physiological aspects of Bacteria, Culture media, culture methods and identification of Bacteria.
- Explain about immunity, antigen, antibody and various antigen-antibody reactions, immune mechanisms and hypersensitivity reactions along sterilization & disinfections methods and various infection control practices.
- Describe the morphology, pathogenesis, laboratory diagnosis and prophylactic measures of various bacterial infections.
- Describe the General Properties of Viruses and Fungi and morphology, pathogenesis, laboratory diagnosis and prophylactic measures of various viral and fungal infections.
- Classify the parasites and describe the morphological forms, life cycle, pathogenesis, laboratory diagnosis and prophylactic measures of various parasitic infections.

PRACTICALS **Total: 30 Hrs**

Students undergoing the course shall be able to:

- Perform commonly employed bed-side tests for detection of infectious agents such as blood film for malaria, filariasis, gram staining, AFB staining, serology and stool sample for ova and cyst.
- Use the correct method of collection, storage and transport of clinical material for microbiological investigations

The assessment of the students will be done with the help of following exercises:

- Spotters
- Performing Gram stain, Acid-fast staining
- Stool Examination

Textbooks:

1. The Short Textbook of Medical Microbiology (including Parasitology): Satish Gupte
2. Medical Parasitology: C P Baveja & V Baveja
3. Ananthanarayan and Paniker's Textbook of Microbiology for Nurses

Reference Books:

1. Ananthanarayan and Paniker's Text book of Microbiology-12th Edition
2. Apurba Sastry,S; Bhat,S; Essentials of Medical Microbiology –4th Edition
3. Baveja. C.P; Text book of Microbiology – 7th Edition
4. Paniker's Text book of Medical Parasitology – 9th Edition

AHSJ1305 **PATHOLOGY** **L T P C**

3 1 2 5

Course Description:

Pathology is a vast expanding and ever-changing subject and it's the key to understanding diseases worldwide. The allied health sciences are an endeavor to present this vast subject understandably to the learners. The aim of Teaching/learning Pathology at AHS is to provide knowledge/insight into etiology, pathogenesis, and pathophysiology &diseases.

Course Objectives:

- Describe the normal structure of a cell functions& its probable disease version. (cell in health disease)
- Cellular responses to injury& Adaptations, reversible irreversible injuries
- Inflammation & repair sequence of events happening during this.
- Infections, hemodynamic, Immunopathology, neoplasia, nutritional genetic disorder in disease conditions
- Systemic pathology ... Starting from the Heart, blood vessels, hematopathology.
- System-wise diseases discussion respiratory, GIT, hepatobiliary, urinary, MGT, FGT, Breast, Bones & joints, endocrines, Diabetes, skin, CNS & eye.
- Experiencing the practice of Clinical Pathology Starting with anticoagulants, HB estimation, blood, cell counts, hematocrit, PBS, ESR, RC, BM, examination, CSF, Semen analysis, urine &other body fluids.
- make the student understand the overall subject matter.

THEORY **Total: 60 Hrs**

UNIT-I **12 Hrs**

General Pathology -General pathology provides an overview of the basic pathologic mechanisms underlying diseases including cellular adaptations, inflammation, tissue repair, Chronic inflammation, hemodynamic disorders, immunological disorders, neoplasia, genetics and effects of radiation.

UNIT-II **12 Hrs**

Systemic Pathology 1 -Deals with various organ systems like vascular, Cardiac, LN, Respiratory system, head and neck, GIT, liver & hepatobiliary system.

UNIT-III **12 Hrs**

Systemic Pathology 2- Pancreas, Urinary, Male genital system, female genital system, breast, bones, joints, soft tissue tumors, endocrines, Diabetes, Skin, CNS, peripheral nerves &Skeletal system.

UNIT-IV **12 Hrs**

Haemato pathology -Disorders of RBCs, WBCs, Platelets, anaemias, leukaemias, disorders of hemostasis, coagulation disorders, plasma cell disorders& blood

UNIT-V **12 Hrs**

Clinical pathology – deals with anticoagulants, Hb estimation blood cell counts, hematocrit, ESR, Reticulocyte count, BM examination, semen analysis, CSF and other body fluids analysis, urine examination

Course outcome:

At the end of the course, the student can able to expand/ learn

1. Define the **basic concepts and scope of pathology** and explain its role in the study of diseases.
2. Describe the **hematological changes and consequences** associated with various disease processes.
3. Explain the **pathogenesis, pathophysiology, and clinical manifestations** of common diseases.
4. Identify the possible **complications and outcomes** of major pathological conditions.
5. Apply knowledge of pathology in understanding **disease mechanisms and their relevance to clinical practice** in Allied Health Sciences.

PRACTICALS **Total: 30 Hrs**

(Only theoretical lectures as there is no provision of technicians, or logistics provided for practicals for AHS students).

Hb estimation, RBC count, WBC count, platelet count, PBS, ESR, PCV, fluids, Urine examination.

Assessment of the student will be:

- Assignments
- Midterm examinations
- Workbook

References

- A well-illustrated textbook is available for AHS students – Text of pathology for AHS students – DR. Ramdas Nayak
- Robbins & Cotran text book of pathology
- Harsh Mohan text book of pathology
- Anderson’s text book of pathology
- Bancroft text book of histological techniques

AHSJ1306 **PHARMACOLOGY** **L T P C**

3 1 2 5

Course Description:

This course will cover general pharmacology with special emphasis on common drugs used, drug nomenclature, their routes of drug administration, dosage formulations, dose and frequency of administration. This course also covers side effects, toxicity, management of their toxicity and drug interactions.

Course Objectives:

Students undergoing this course are expected to:

- Describe the general principles of drug action, handling of drugs by the body and drugs acting on ANS & autacoid system.
- Explain the mechanism of action, therapeutic uses and adverse effects of drugs used in common CNS disorders.
- Explain the mechanism of action, therapeutic uses and adverse effects of drugs used in common cardiovascular diseases and haematological disorders.
- Explain the mechanism of action, therapeutic uses and adverse effects drugs used in common endocrine, respiratory and gastrointestinal disorders.
- Enlist drugs used in common infections, cancers and immunological disorders and explain their mechanism of action.

THEORY **Total: 60 Hrs**

UNIT-I **12 Hrs**

General Pharmacology: Introduction, Definitions, Sources of Drugs, Drug nomenclature – Routes of administration & Pharmacokinetics – Pharmacodynamics – Factors modifying drug action – Adverse Drug Effects & Pharmacovigilance.

Drugs Acting on Autonomic Nervous System: Cholinergic Drugs –Anticholinergic Drugs – Adrenergic Drugs – Antiadrenergic Drugs

Autacoids and Related Drugs: Histamine and Anti-histaminics –Prostaglandins, Leukotrienes (Eicosanoids) and Platelet Activating Factor – Nonsteroidal Anti-inflammatory Drugs (Antipyretic-Analgesics).

UNIT-II **9 Hrs**

Drugs Acting on Central Nervous System: General Anaesthetics –Local anaesthetics– Sedative & Hypnotics – Antiepileptic Drugs – Antiparkinsonian Drugs – Antipsychotic and mood stabilizers – Antidepressant and Antianxiety Drugs – Opioid Analgesics and Antagonists – Skeletal muscle relaxants.

UNIT-III **11 Hrs**

Cardiovascular Drugs: Drugs Affecting Renin-Angiotensin System & CCBs –Diuretics – Cardiac Glycosides and Drugs for Heart Failure – Antianginal Drugs –Antihypertensive Drugs – Antiarrhythmic Drugs – Hypolipidemic Drugs

Drugs Affecting Blood and Blood Formation: Haematinics and Erythropoietin – Coagulants & Anticoagulants – Antiplatelet drugs & Fibrinolytics – IV fluids, Plasma expanders & Drugs for shock.

UNIT-IV **10 Hrs**

Hormones and Related Drugs: Introduction, Thyroid Hormone and Thyroid Inhibitors – Insulin, Oral Hypoglycaemic Drugs and Glucagon – Corticosteroids– Sex hormones & Hormonal Contraceptives –Drugs Affecting Calcium Balance – Tocolytics & Ecbolics.

Respiratory System Drugs: Drugs for Cough – Drugs for Bronchial Asthma

Gastrointestinal Drugs: Drugs for Peptic Ulcer and Gastroesophageal Reflux Disease – Antiemetic & Prokinetic drugs – Drugs for Constipation and Diarrhoea

UNIT-V **18 Hrs**

Antimicrobial Drugs: Beta-Lactam Antibiotics- Penicillin's – Cephalosporins, Monobactams & Carbapenems – Sulfonamides, Cotrimoxazole and Quinolones – Tetracyclines and Macrolides –Aminoglycosides and Misc. Antibacterial Antibiotics – Antitubercular Drugs & Antileprotic Drugs –Antifungal Drugs – Antiviral Drugs (Non- retroviral) – Antiviral Drugs (Anti - retroviral) – Antimalarial Drugs – Antiamoebic and Other Antiprotozoal Drugs – Anthelmintic Drugs

Chemotherapy of Neoplastic Diseases: Anticancer Drugs

Miscellaneous Drugs: Immunosuppressant Drugs – Drugs Acting on Skin and Mucous Membranes – Antiseptics and Disinfectants – Ocular Pharmacology

Course Outcomes:

At the end of this course, students should be able to:

- Apply the pharmacokinetic and pharmacodynamics principles that describe drug actions.
- Explain the rationale for selection of suitable drugs used in various CNS disorders.
- Explain the rationale for selection of suitable drugs used in various cardiovascular and haematological disorders.

- Explain the rationale for selection of suitable drugs used in various endocrine, respiratory and gastrointestinal disorders.
- Explain the rationale for selection of suitable drugs used in common infections, cancers and immunological disorders.

PRACTICALS **Total: 30 Hrs**

Course Objective:

The course will cover general pharmacology with special emphasis on route of administration, type of formulations, dose and frequency of administration, importance of manufacturing and expiry dates, storage instructions of each drug, calculation of drug doses and general principles in the management of poisoning.

The assessment of the students will be done with the help of following exercises.

- Spotters
- Dosage calculations
- Dosage formulations

Textbooks:

1. Textbook of Pharmacology for Dental & Allied Health Sciences – Padmaja Uday Kumar- 5th edition- 2023.
2. Fundamentals of Pharmacology for Allied Health Science- Dr Pradnya Deolekar- 3rd edition- 2019.
3. Textbook of Pharmacology for Allied Sciences- Kamalakannan - 3rd edition- 2019.

Reference Books:

1. Essentials of Medical Pharmacology - K.D. Tripathi- 8th edition Reprint-2023.
2. Basic & Clinical Pharmacology. Katzung BG (Ed), Publisher: Prentice Hall International Ltd., London- 15th Edition-2021.

PSYCHOLOGY and SOCIOLOGY

L	T	P	C
2	0	0	0

Course Description: This course introduces essential concepts of psychology and sociology relevant to healthcare practice. It focuses on understanding human behavior, emotions, stress, and social factors affecting health, with specific application to critical care settings. The course enables students to enhance patient interaction, communication, stress management, and professional competence in clinical environments.

Course Outcome: At the end of the course, students should be able.

1. Explain the fundamental concepts, schools, methods, and branches of psychology relevant to healthcare.
2. Describe emotions, stress, and anxiety, including their physiological effects and coping mechanisms in clinical settings.
3. Apply principles of clinical psychology in assessing patient behavior, communication, and basic stress management in critical care.
4. Explain key sociological concepts, social structures, and determinants of health influencing patient care.
5. Describe the healthcare system in India, and demonstrate appropriate communication, ethics, and professional behavior as a Critical Care Technologist

Unit 1: Introduction to Psychology **5HRS**

Describe Schools: Structuralism, functionalism, behaviorism, Psychoanalysis.

Describe Methods: Introspection, observation, inventory and experimental method.

Describe in brief Branches: pure psychology and applied psychology

Describe importance of study of Psychology to Critical Care

Unit 2: Motivation & Emotions and Stress **6HRS**

Motivation- Concepts and theories and types. Describe Emotions Concept and definition, Theories of emotions, Physiological changes due to emotional state. Nature and control of anger, fear and anxiety. Describe Different types of Stress and Anxiety, Tension, Physiological symptoms, causes reactions to stresses, psycho-somatic problems, copying strategies.

Unit 3: Introduction to Abnormal Behaviour **7HRS**

Nature of Normal and Abnormal behaviour- Psychoticism Vs Neuroticism- Abnormal behaviour assessment- overview about DSM-V and ICD-11, clinical judgement, psychotherapy, self-management methods, patient interaction in Critical Care, stress management, Group therapy, Pediatric, child and geriatric clinical psychology.

Unit 4: Introduction to Sociology **6HRS**

Definition, scope and importance of sociology, Relationship between sociology and healthcare

Basic concepts: Society, Community, Culture, Social structure

Social institutions: Family, religion, education, healthcare

Social determinants of health: Income, education, occupation, Urban vs rural health differences, Poverty, malnutrition and disease.

Unit 5: HEALTHCARE SYSTEM & SOCIETY **6HRS**

Role of environment and sanitation, Disability and rehabilitation, Structure of healthcare system in India, Role of healthcare professionals in society, Critical Care Technologist -patient relationship, Communication skills in healthcare, Ethics and professionalism, Role of media and health education.

Total Hours-30hours

Textbook reference:

- **Applied Sociology** — *A. K. Srivastava*
- **Sociology for Health Professionals** — *Basavanthappa B.T*
- **Textbook of Psychology** — *S. K. Mangal*

Reference Book:

- **Psychology** — David G. Myers
- **Introduction to Sociology** — Haralambos and Holborn

FIRST YEAR – 2ND SEMESTER

PROGRAM CORE

Fundamentals of Critical Care

L	T	P	C
3	0	0	3

Course Description: The Fundamentals of Respiratory Therapy course provides a comprehensive introduction to the principles and practices of respiratory care. Designed for students pursuing a career in respiratory therapy, this course covers the essential knowledge and skills required to assess, treat, and manage patients with respiratory disorders.

Course Outcome:

At the end of the course, students should be able.

1. Define critical care, describe the history and evolution of ICU, and classify ICU types and levels
2. Describe the roles and responsibilities of the Critical Care Technology practitioner within the interprofessional ICU team
3. Demonstrate basic ICU equipment orientation — bedside monitors, infusion pumps, suction apparatus, portable oxygen — and safety checks
4. Analyse the organisation of a model ICU — staffing ratios, bed configuration, zoning, equipment layout, alarm management principles
5. Apply basic life support (BLS) and recognise cardiac arrest, respiratory failure and shock in simulated scenarios.

UNIT -1 -History & Organisation of Critical Care

History of ICU — from iron lung (1950s) to modern Level-III MICU; Definitions — ICU, CCU, HDU, SDU, Step-down; ICU classification — ISCCM Level I (basic), II (intermediate), III (full-intensity); Types of ICU — Medical, Surgical, Cardiac, Neuro, Neonatal, Paediatric, Burn, Trauma, Transplant; ICU design — open vs closed bay, single vs multi-bed, positive/negative pressure rooms; Nurse:patient ratios (1:1 Level III, 1:2 Level II); Staffing model — intensivist-led (closed) vs open; Bed management and capacity planning; NABH ICU accreditation standards overview

UNIT – 2- CCT Practitioner Role & Ethics

Interprofessional ICU team — intensivist, resident, CCT practitioner, ICU nurse, physiotherapist, clinical pharmacist, dietitian, social worker; CCT practitioner scope

of practice, India and global standards; Delegation and supervision principles; Shift handover protocols (SBAR); ICU governance — M&M rounds, safety briefings; Ethical framework in ICU — autonomy, beneficence, non-maleficence, justice; DNR/DNAR orders; Organ donation awareness; AHPI code of professional conduct

UNIT - 3 - ICU Equipment Orientation

Bedside patient monitor — ECG lead systems, SpO2 plethysmography, NIBP, ETCO2, temperature, invasive pressure; Infusion pumps — syringe (50 ml) and volumetric; Suction apparatus — wall-mounted and portable; Portable oxygen — cylinders, flow meters, humidifiers; Oxygen delivery systems — nasal cannula, simple mask, venturi mask, NRM; Basic ventilator orientation — circuit, display, alarms (detail in BCCT203); Defibrillator/AED — intro; Warming blankets; ICU bed — CPR function, Trendelenburg, reverse Trendelenburg; Equipment maintenance logs; Electrical safety in ICU — microshock, earthing

UNIT -4- BLS & Emergency Recognition

BLS algorithm — AHA/ILCOR 2020 guidelines; Recognition of cardiac arrest — unresponsive, apnoeic, pulseless; CPR — compression rate (100–120/min), depth (5–6 cm), ratio (30:2); AED — pad placement, safe zone clearance; Recognition of respiratory failure — RR, SpO2, accessory muscle use; Recognition of shock — BP, HR, CRT, consciousness level; Recognition of altered consciousness — GCS scoring; Code blue activation protocol; Resuscitation team roles; Post ROSC care overview; ACLS overview (detail in BCCT304); Documentation of emergency events

UNIT – 5: Infection Control & Patient Safety in ICU *(6 HRS)*

Infection control in ICU — importance, sources of infection, chain of infection, Standard precautions — hand hygiene (World Health Organization 5 moments), use of PPE (gloves, gowns, masks, eye protection)

Transmission-based precautions — contact, droplet, airborne precautions, ICU-acquired infections (HAIs) — Bundle care approach — VAP bundle, CLABSI bundle, CAUTI bundle, Biomedical waste management — segregation, color coding, disposal as per Biomedical Waste Management Rules, 2016, Sterilization and disinfection — methods (autoclaving, chemical disinfection), ICU equipment care, Antimicrobial stewardship — prevention of resistance, rational antibiotic use, Patient safety goals in ICU — identification, medication safety, fall prevention, pressure ulcer prevention, Needle-stick

injury protocol and post-exposure prophylaxis (PEP), Documentation and incident reporting — safety audits, infection surveillance

University Core – II
Semester – II

TAUT1102	**ENVIRONMENTAL STUDIES**	**L T P C**
		3 0 0 3

Course Description:

This course provides degree-seeking students with an array of opportunities to learn, practice and motivate communities on environmental importance. It further helps to understand the resources, optimize the recourses in future days, and address the gaps in the eco system.

Course Objectives:

Students undergoing this course are expected to:

1. Understand eco system and scope of multidisciplinary
2. Creating the awareness about environmental problems among people.
3. Imparting basic knowledge about the environment and its allied problems.
4. Developing an attitude of concern for the environment.
5. Understand the developments in global goals

Unit-I **8 Hrs**

Multidisciplinary nature of environmental studies; Definition, scope and importance; Need for public awareness; **Natural Resources:** Renewable and non-renewable resources; Forest resources: Water resources: Mineral resources; Food resources: Energy resources: Land resources; Equitable use of resources for sustainable lifestyles; Natural resources and associated problems.

Unit-II **8 Hrs**

Ecosystems: Concept of an ecosystem.; Introduction, types, characteristic features, structure and function of the following ecosystem: - Forest ecosystem; Grassland ecosystem; Desert ecosystem; Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries); Environment Protection Act,1986; Public awareness.; Environment and human health.

Unit-III **8 Hrs**

Biodiversity and its conservation: Introduction – Definition- genetic, species and ecosystem diversity.; Biogeographical classification of India; India as a mega-diversity nation; Hot-sports of biodiversity.; Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts.; Endangered and endemic species of India; Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

Unit- IV **8 Hrs**

Environmental Pollution Definition; Cause, effects and control measures of Air pollution; Water pollution; Soil pollution; Marine pollution; Noise pollution; Thermal pollution and nuclear hazards - Solid waste Management: Causes, effects and control measures of urban and industrial wastes. - Role of an individual in prevention of pollution - Disaster management: floods, earthquake, cyclone and landslides.

Unit-V **8 Hrs**

Social Issues and the Environment: From Unsustainable to Sustainable development; Water conservation- rain water harvesting- watershed management; Resettlement and rehabilitation of people; its problems and concerns.; Environmental ethics: Issues and possible solutions.; Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust - Wasteland reclamation.; Consumerism and waste products.; Population and environment.

Field work **5 Hrs**

Field visits to nearby; awareness campaign; special lectures by experts; quiz, debate competitions, short film Contest, rally etc

Course Outcomes:

At the end of this course, students should be able to:

1. Understand key concepts from economic, political, and social analysis as they pertain to the design and evaluation of environmental policies and institutions.
2. Appreciate concepts and methods from ecological and physical sciences and their application in environmental problem solving.

3. Appreciate the ethical, cross-cultural, and historical context of environmental issues and the links between human and natural systems.
4. Reflect critically about their roles and identities as citizens, consumers and environmental activists
5. Be part in Development goals and educating the communities.

Text Books:

1. Textbook of Environmental Studies (English, Paperback, Asthana D. K.) S.Chand & co , New Delhi
2. Textbook of Environmental Studies for Undergraduate Courses, Erach B Haruchu, UGC, KINDLE Edition, Amazon.

Reference Book:

1. Encyclopedia of Environment and Society- set of 5 volumes, Sage Publications

University Elective – II

Semester – II

S. No	Name of the Course
Indian Languages	
1	Telugu
2	Tamil
3	Hindi
4	Professional English
Foreign Languages	
5	French
6	German
7	Spanish
8	Japanese

TAUT1202C **HINDI** **L T P C**
3 0 0 3

Course Description:

बच्चों में हिन्दी पढ़ने, लिखने की क्षमता बढ़ाना । आपस में अपनी भावनाओं को प्रकट करने की क्षमता बढ़ाना मुख्य उद्देश्य है।

Course Objectives:

1. संज्ञा, संज्ञा के प्रकार,सर्वनाम, सर्वनाम के प्रकार, क्रिया, क्रिया के प्रकार, क्रर्शेषण, क्रर्शेषण के प्रकार
2. लिंग, वचन, काल, वाच्य, अर्थ, विलोम शब्द, शब्दों का वाक्य में प्रयोग
3. हिंदी सीखने की आर्श्यकता बताते हुए छोटी बहन के नाम पर पत्र।,
   विहार यात्रा का वर्णन करते हुए अपने ममत्र के नाम पत्र।,
   शूल्क भरने के लिए पैसे भेजने अपने क्रपता के नाम पत्र।
4. कफन - प्रेमचंद, वापसी - उषा प्रियम्वदा यशपाल – परदा
5. यरकान्त त्रिपाठी निराला - जूही की कली,महादेवी वर्मा - मैं नीर भरी दुख की बदली,
   सुममत्रानंदन पंत - भारत माता

UNIT-I **9 Hrs**

1. संज्ञा, संज्ञा के प्रकार
2. सर्वनाम, सर्वनाम के प्रकार
3. क्रिया, क्रिया के प्रकार
4. विशेषण, विशेषण के प्रकार

UNIT-II **9 Hrs**

1. लिंग,वचन, काल,कारक
2. अर्थ, विलोम शब्द
3. शब्दों का वाक्य में प्रयोग

UNIT-III (पत्र लेखन) **9 Hrs**

1. हिंदी सीखने की आवश्यकता बताते हुए छोटी बहन के नाम पर पत्र।
2. विहार यात्रा का वर्णन करते हुए अपने मित्र के नाम पत्र।
3. शूल्क भरने के लिए पैसे भेजने अपने पिता के नाम पत्र।

UNIT-IV (कहानी और कहानीकार) **9 Hrs**

1. कफन - प्रेमचंद

2. वापसी - उषा प्रियम्वदा
3. यशपाल – परदा

UNIT-V (कवि और कविता) 9 Hrs

1. सूर्यकांत त्रिपाठी निराला - जूही की काली
2. महादेवी वर्मा - मैं नीर भरी दुख की बदली
3. सुमित्रानंदन पंत - भारत माता

Course Outcomes:

1. बच्चों में पढने का क्षमता बढाना
2. लिखने की क्षमता बढाना
3. बोलने की क्षमता बढाना
4. भाषा के प्रक्रत रुलच उत्पन्न कराना
5. दैनंददन जीर्न में भाषा का प्रयोग करना

Text Books:

1. हिन्दी व्याकरण
2. विश्वनाथ तिवारी की हिंदी कविता
3. प्रेमचंद की कहानियां

Reference Books:

विविधि प्रकार के कहानी और व्याकरण के किताबें संदर्भ ग्रंथ सूची
1. हिन्दी व्याकरण -कांता रानी मंजूषा,हरदेव बिहारी
2.विश्वनाद प्रसाद तिवारी - हिंदी कविता
3.विश्वनाद प्रसाद तिवारी- आधुनिक हिंदी कविता
4.पुष्पपाल सिंह - समकालीन हिंदी कविता

TAUT1202D **PROFESSIONAL ENGLISH**

L T P C

3 0 0 3

Course Description:

This course aims to enhance the English language proficiency of engineering students in professional contexts. Through a combination of theoretical knowledge and practical exercises, students will develop their skills in technical writing, oral communication, presentation, and critical thinking. The course will focus on various aspects of professional communication, including report writing, academic writing, technical presentations, and effective communication in interdisciplinary teams. Additionally, students will engage with real-world engineering scenarios to apply language skills in practical contexts.

Course Objectives:

Students undergoing this course are expected to:

1. Develop proficiency in technical writing for engineering reports, research proposals, and documentation.
2. Enhance oral communication skills for effective presentations, meetings, and discussions and thereby improve their employability skills.
3. Improve critical thinking and analytical skills through the evaluation of technical information and arguments.
4. Foster teamwork, collaboration skills in interdisciplinary engineering projects.
5. Develop awareness of cultural and linguistic diversity in professional settings.

UNIT-I **9 Hrs**

Pronunciation: Course techniques include recordings, partner work, group activities and one-on-one instructor feedback. Your speech will become clearer, more fluent and easier to understand. You'll improve your enunciation of individual sounds, intonation, stress patterns, pace and pausing.

UNIT-II **9 Hrs**

Speaking Professionally: You'll build greater confidence through individual work, group interaction and feedback from your peers and instructor. To express yourself more clearly and concisely, whether you are speaking in impromptu situations or making well-planned Presentations. Focus on language that familiarizes you with the use of English in everyday situations and contexts.

UNIT-III **9 Hrs**

Refine Your Grammar: Express yourself more accurately and eloquently by improving your English Grammar. You'll get the strong foundation you need to write and speak more clearly, precisely and persuasively. You'll explore the relationship between words in sentences, and analyse structure and meaning, clarify common problem points and improve punctuation. You'll have the opportunity to practice with your peers and get helpful feedback. You'll also learn what resources are best for ongoing grammar help. You'll apply them to produce effective, concise written work with newfound confidence. You'll express yourself more clearly and persuasively by using varied, well-structured sentences and placing content more strategically. You'll also develop editing skills to rid your work of errors.

UNIT-IV **9 Hrs**

Writing Essentials – Professional Writing Improve your written English for personal, professional and academic purposes. You'll refine your sentence structure, punctuation and verb tenses, and eliminate the most common errors that confuse readers. You'll enhance your writing style. Develop editing skills that help you revise your work. Lectures, discussions, e-learning tools and assignments will help you develop the communication skills you'll need in today's business environment.

UNIT-V **9 Hrs**

You'll be equipped to create power packed Power Point Presentations. Be in better stead to introducing yourself. To know the nuances that goes into the presenting of information, and articulating information. Know how to make an impressive introduction. To imbibe Life Skills that is necessary to lead a fruitful and a fulfilling life.

Course Outcomes:

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

1. To understand the importance of Professional English in work place and learn the correct pronunciation and delivery of speech.
2. To read technical proposals properly and make them to write good technical reports.
3. To achieve better comprehending skills, vocabulary and professional speaking skills.
4. To learn and identify the Common Errors in Writing and Speaking.
5. Acquire digital competence, employment and workplace communication skills.

Text Books:

1. Technical Communication: Process and Product by Sharon J. Gerson and Steven M. Gerson
2. Engineering Communication: From Principles to Practice by David Ingre, C. O'Brien
3. Technical Writing Basics: A Guide to Style and Form by Brian R. Holloway

Reference Books:

1. The Encyclopaedia Britannica" - A comprehensive general encyclopaedia covering a wide range of topics.
2. The Oxford English Dictionary (OED)" - A comprehensive dictionary of the English language.

TAUT1202A **FRENCH**
L T P C

3 0 0 3

Course Description:

This course introduces students to French by intensively studying important aspects of pronunciation, vocabulary, grammar and sentence formation through practice sets and audio visual lessons. It introduces the workings and sounds of the language and provides the necessary tools to enable students to make sentences from scratch.

Course Objectives:

1. To train the students to know about France, French culture and basics
2. To teach them to learn basic grammar and vocabulary.
3. To train them to learn tenses in French
4. To train them to talk about their daily routine
5. To train them to converse in French in day-to-day scenarios

UNIT-I **9 Hrs**

Introduction to France and its regions - French alphabets and numbers, countries and nationality
Grammaire – Verbs – s'appeler, être, avoir, definite and indefinite articles
Communication – Greetings, Self Introduction

UNIT-II **9 Hrs**

Basic vocabulary, colours, months and days
Grammaire - Verbes - Conjugation : Present tense (ER, IR, RE ending verbs) – Adjective possesive Communication – Talk about family and friends, date, time etc.

UNIT-III **9 Hrs**

Hobbies, interests and daily routine
Grammaire – Irregular verbs – Releflexive verbs - Future proche
Communication – Talking about hobbies and interests

UNIT-IV **9 Hrs**

Vocabulary of places and transport
Grammaire – Pertinent verbs, adjective demonstrative, past tense, propositions
Communication – Narrating an incident or story

UNIT-V **9 Hrs**

Vocabulary of food, services, money
Grammaire – Negation, Verbs – acheter, manger, payer, articles partitifs. Communication – Accept and refuse an invitation, situation in a restaurant

Course Outcomes:

After the course, the students will be able to:

1. Acquire familiarity in the French alphabet & basic vocabulary
2. Listen and identify individual sounds of French
3. Use basic sounds and words while speaking
4. Read and understand simple advertisements, brochures and invitations
5. Understand and use basic grammar and appropriate vocabulary in completing language tasks

Text Books:

1. Grammaire Progressive du Français, CLÉ International, 2010.
2. Saison 1, Marie-Noëlle Cocton et al, Didier, 2014.
3. Cosmopolite A1 - Nathalie Hirschsprung, Tony Tricot

Reference Books:

1. Préparation à l'examen du DELF A1 – Hachette
2. Réussir le DELF A1 – Bruno Girardeau

TAUT1202B **GERMAN** **L T P C**

3 0 0 3

Course Description:

German Language Training

Course Objectives:

1. Importance of German Language in Global prospective
2. To develop Reading skills for Basic Level
3. German writing skills, particularly emails & short messages
4. To develop basic German Speaking skills in order to meet the General activities
5. Listening practise to understand German Accent of the Native German Speakers

UNIT-I **9 Hrs**

GUTEN TAG!: Saying hello and goodbye, introducing oneself and others, talking about oneself and others, numbers 1-20, spelling words and names, talking about countries and languages, the alphabet, first verbs in present tense, how to ask questions, useful terms and expressions

UNIT-II **9 Hrs**

FRUENDE, KOLLEGEN UND ICH: Talking about hobbies, days of the week, numbers from 20 on up, months and seasons in the year, talking about work and job, definite article, personal pronouns, the verbs to have (haben) and to be (sein), plurals of nouns.

UNIT-III **9 Hrs**

IN DER STADT: Getting around a town and asking for the way, giving directions, indefinite articles, negation with kein, imperative forms.

UNIT- IV **9 Hrs**

GUTEN APPETIT!: Talking about food, planning a trip to the grocery store, food and meals and talking about it, verbs that require the accusative

UNIT- V **9 Hrs**

TAG FÜR TAG: Telling and understanding time, talking about one's family, possessive articles (mein, dein) and modal auxiliaries (müssen, können, wollen).

Course Outcomes:

1. Basic Reading skills
2. Basic Writing skills with basic Grammar
3. Speaking skills and to do advance German Course
4. Understanding basic German for Daily Communication
5. Awareness of European Union and opportunities in Europe

Text Books:

1. A1-German Level- Netzwerk A1 Book- Prescribed by International Institute- Goethe Institute Delhi.

III Semester

MECHANICAL VENTILATION-I

L T P C
3 1 0 4

Course Description: This course typically involves teaching students about the basics of ventilator, classification, operating modes, management, trouble shooting of ventilator. It includes principles behind these instruments, their components, calibration, safety protocols and techniques to ensure optimal patient care and equipment functionality

Course objective:

At the end of the course, students should be able.

1. Explain advanced ventilator modes — PRVC, APRV, HFOV, PAV, NAVA — with their indications and setting guidelines
2. Perform detailed ventilator waveform analysis to identify patient-ventilator asynchrony, auto-PEEP and optimal PEEP titration
3. Manage NIV (CPAP, BiPAP) setup and monitoring; identify NIV failure criteria
4. Implement weaning assessment and conduct spontaneous breathing trials (SBT) following protocol-driven guidelines
5. Manage tracheostomy care — inner cannula change, tube change preparation, decannulation readiness assessment

UNIT -1 Airway Anatomy & Assessment **12HRS**

- Airway anatomy (upper & lower airway)
- Physiology of respiration
- Airway patency
- Causes of airway obstruction
- Signs of airway compromise
- Airway assessment (Look, Listen, Feel)
- Airway maneuvers (head tilt–chin lift, jaw thrust)
- Mallampati grading (basic)
- Airway positioning (sniffing, recovery position)
- Basics of oxygenation (SpO_2 monitoring)

UNIT – 2: Basic Airway Management Techniques

12HRS

- Principles of airway management (ABC approach)
- Oropharyngeal airway (OPA)
- Nasopharyngeal airway (NPA)
- Bag-Valve-Mask (BVM) ventilation

- Oxygen delivery devices (nasal cannula, masks)
- Suctioning techniques
- Airway clearance (choking management)
- Airway management in trauma & unconscious patients
- Introduction to advanced airway (intubation overview)
- Complications of airway management
- Infection control in airway procedures

UNIT -3 Indications & Goals of MV **12HRS**

- Respiratory failure types — Type I (hypoxaemic: PaO2 50 mmHg); Indications for intubation — GCS ≤8, SpO2 35, fatigue; Phases of MV — initiation, stabilisation, weaning; Oxygenation goals (PaO2/FiO2 >300 healthy, >200 mild ARDS, >100 severe ARDS); Ventilation goals (PaCO2 35–45, permissive hypercapnia in ARDS); Complications — VILI (barotrauma, volutrauma, atelectrauma, biotrauma), VAP, haemodynamic compromise, diaphragm atrophy; Lung-protective ventilation principles (ARDSNet 2000); NIV — CPAP vs BiPAP indications (COPD, cardiogenic pulmonary oedema, immunocompromised); HFNC — Optiflow principle

UNIT-4 Ventilator Parameters & Physiology **12HRS**

- Tidal volume — 6 ml/kg IBW (protective) vs 8–10 ml/kg (normal lungs); IBW calculation; RR and minute ventilation (VE = VT × RR, normal 5–8 L/min); FiO2 — 0.21 to 1.0, O2 toxicity (>0.60 prolonged); PEEP — alveolar recruitment, FRC restoration, oxygenation improvement, haemodynamic compromise; I:E ratio — 1:2 standard, inverse ratio (1:1) in ARDS; Inspiratory time and flow — square vs decelerating waveform; Trigger sensitivity — pressure (-2 cmH2O) vs flow (2 L/min); Rise time and cycle criteria (PSV); Auto-PEEP — detection (end-expiratory port occlusion), management (reduce VE); Peak, plateau, mean pressures; Static compliance (Cstat = VT / [Pplat - PEEP]); Dynamic compliance; Resistance = (PIP - Pplat) / flow

UNIT-5 Ventilator Operation & Setup

12HRS

- ICU ventilator circuit — inspiratory limb, expiratory limb, Y-piece, HME vs heated humidifier (MR850), water trap, filter; ETT — ID selection (male 8.0–8.5, female 7.5–8.0 mm), depth marking (22 cm F, 23 cm M), cuff pressure monitoring (20–30 cmH2O with manometer); Tracheostomy tube types; Pre-use check procedure — circuit integrity, flow sensor, O2 cell, alarm test, self-test; Setting initial parameters for

ARDS; Setting for COPD; Setting for TBI; Manual ventilation (Ambu bag) — compression technique, rate, volume, PEEP valve; Closed suction system — operation and frequency; Circuit change — frequency (no routine change), aseptic technique; Humidification choice — HME (travel, short-term) vs active (long-term, thick secretions)

Pressure-time waveform — inspiratory rise, plateau, expiratory decay; Flow-time waveform — inspiratory peak flow, expiratory flow (auto PEEP detection by flow not returning to zero); Volume-time waveform — tidal delivery confirmation (leak detection); P-V loop — resistance (width) and compliance (slope); F-V loop; Scalars analysis interpretation; Alarm taxonomy — HIGH PRIORITY (apnoea, disconnect, high pressure), MEDIUM (low VE, FiO2), LOW (flow, I time); High pressure alarm — secretions, kinking, biting, bronchospasm, pneumothorax (systematic approach); Apnoea alarm — causes and response (manual ventilation); Low VT — circuit leak, cuff deflation; Patient-ventilator asynchrony recognition — flow starvation, double triggering, reverse triggering

COURSE OUTCOMES:

By the end of this course, students will be able to

1. Operate and control the ventilator,
2. Initiate, titrate and adjust NIV and HFNC Settings
3. Decision making and assisting in intubation and tracheostomy
4. Change the different modes of mechanical ventilation according to the patient's demand and situation
5. Titrate the ventilator settings according to the patient's demand

TOTAL HOURS:60HOURS

TEXT BOOK

- Clinical application of mechanical ventilation 4th edition by DAVID CHANG

REFERENCE BOOKS

- Pilbeam's mechanical ventilation 7th edition by J.M. CARIO
- EGAN'S Fundamentals of respiratory 12th edition by ROBERT .M.KACMAREK, JAMES K.STOLLER

ARTERIAL BLOOD GAS & ACID-BASE BALANCE

L T P C
3 1 0 4

Course Description: This course provides a comprehensive understanding of arterial blood gas (ABG) analysis and acid–base balance, focusing on physiological principles, interpretation of ABG parameters, and identification of acid–base disorders. It equips students with the skills to perform arterial sampling, analyze results, and apply clinical reasoning in managing critically ill patients in emergency and intensive care settings.

Course objective:

At the end of the course the students should be able.

1. Understand the physiological principles of acid–base balance and homeostasis.
2. Interpret arterial blood gas values to identify acid–base disorders.
3. Perform safe and accurate arterial blood sampling and handling techniques.
4. Correlate ABG findings with clinical conditions in critical care settings.
5. Apply clinical decision-making in the management of acid–base imbalances.

UNIT -1 ABG Principles & Normal Values **12hrs**

Henderson-Hasselbalch equation — pH = pKa + log([HCO3]/[0.03 × pCO2]); pH scale and clinical significance (acceptable range 7.35 7.45); pCO2 — ventilatory component (normal 35–45 mmHg); pO2 and SaO2 relationship; FiO2 and P/F ratio (Horowitz Index); Alveolar arterial oxygen gradient (A-a DO2); HCO3 — metabolic component (22–26 mEq/L); Base excess (BE) and standard base excess (SBE, normal ±2 mEq/L); Anion gap = Na − (Cl + HCO3), normal 8–12, corrected for albumin; Lactate — normal

UNIT -2 Acid-Base Disorders & Interpretation **12hours**

Primary respiratory acidosis — pH ↓, pCO2 ↑; renal compensation (+1 mEq/L HCO3 per 10 mmHg pCO2 rise); causes: COPD, OSA, MV hypoventilation; Primary respiratory alkalosis — pH ↑, pCO2 ↓; respiratory compensation; causes: pain, anxiety, hepatic failure, PE, ventilator setting; Primary metabolic acidosis — pH ↓, HCO3 ↓; Winter's formula (expected pCO2 = 1.5×HCO3 + 8±2); AG-elevated (MUDPILES: methanol, uraemia, DKA, propylene glycol, isoniazid, lactic acidosis, ethylene glycol, salicylates); Non-AG (hyperchloraemic); Primary metabolic alkalosis — pH ↑, HCO3 ↑; causes: vomiting, NG drainage, diuretics, contraction alkalosis; Compensation; Mixed disorders — triple acid-base disorders; Systematic 6-step interpretation algorithm; 25 structured ABG cases (practice)

UNIT -3- Sampling Technique & Analyser Operation 12hours

Radial artery — palpation, Allen's test (adequacy of ulnar collateral flow); ABG sampling on simulator — 45° angle approach, syringe preparation (lithium heparin or balanced heparin), 1–2 ml aspirate, air bubble exclusion immediately, cap, label, send within 15 min; Blood gas analyser types — Radiometer ABL90 FLEX, Siemens RAPIDPoint, Abbott i-STAT; Electrode types — pH (glass electrode), pCO2 (Severinghaus electrode), pO2 (Clark electrode); Quality control for ABG — Level 1, 2, 3 controls; Calibration schedule; Pre-analytical errors — anticoagulant excess, air contamination, delayed analysis, temperature; VBG-ABG correlation (acceptable for pH, pCO2 with offset correction)

UNIT-4 Clinical Correlation & Ventilator Adjustments 12hours

ABG-guided ventilator adjustments — RR to correct pCO2 (↑RR to reduce pCO2); FiO2/PEEP titration tables (ARDSNet FiO2-PEEP table); Permissive hypercapnia (pH >7.2 acceptable in ARDS); Targeted normocapnia in TBI (pCO2 35–40 mmHg); Targeted hyperoxia avoidance post-resuscitation; Correction of metabolic acidosis — bicarbonate (controversial, use for pH

UNIT – 5: Special Applications & Case-Based ABG 12hours

ABG in ARDS
ABG in COPD
ABG in DKA
ABG in sepsis and septic shock
ABG in renal failure
ABG in poisoning and drug overdose
Oxygenation indices (P/F ratio, Oxygenation Index)
Dead space and V/Q mismatch
ABG vs VBG interpretation
Serial ABG monitoring and trend analysis
Acid-base disorders in ICU conditions (MODS, post-cardiac arrest, trauma, shock)
Case-based ABG interpretation
Point-of-care ABG testing (POCT)
Documentation and reporting of ABG findings

Total hrs: 60hrs

COURSE OUTCOMES:

At the end of this course, students should be able to

1. Describe ABG analysis principles — pH, pCO2, pO2, HCO3, BE, lactate — and normal reference ranges
2. Describe ABG analysis principles — pH, pCO2, pO2, HCO3, BE, lactate — and normal reference ranges
3. Systematically interpret ABG results including primary disorders, compensatory responses and mixed disturbances
4. Demonstrate radial artery sampling technique on simulator; operate a blood gas analyser safely
5. Correlate ABG findings with ventilator settings, clinical presentation and ICU management decisions

TEXT BOOKS:

- Arterial Blood Gases Made Easy,Authors: Iain A. M. Hennessey & Alan G. Japp
- Arterial Blood Gas Interpretation in Clinical Practice, Author: Anil Mane

REFERENCE BOOKS:

- Acid–Base Physiology, Author: Peter D. Brandis
- The Acid–Base Status of the Blood,Author: Ole Siggaard-Andersen

BASIC ICU MONITORING AND PROCEDURES

L	T	P	C
3	1	0	4

Course Description: This course introduces the fundamental principles of patient monitoring and essential procedures performed in the Intensive Care Unit (ICU). It focuses on the use of monitoring equipment, interpretation of vital parameters, and assisting in common ICU procedures to ensure safe and effective patient care in critical settings.

Course Objective:

1. Understand the principles and components of basic ICU monitoring systems.
2. Operate and interpret data from monitoring devices such as cardiac monitors, pulse oximeters, and blood pressure systems.
3. Assist in common ICU procedures including airway management, vascular access, and suctioning.
4. Identify and respond to abnormal physiological parameters in critically ill patients.
5. Apply infection control, safety, and ethical practices during ICU monitoring and procedures.

UNIT-1 Multi-Parameter Bedside Monitor 12hrs

Monitor hardware — ECG amplifier (CMRR, bandwidth), SpO2 plethysmography, NIBP oscillometric algorithm, temperature thermistors, display modules; ECG lead systems — 3-lead (rhythm), 5 lead (ischaemia), 12-lead acquisition; Rhythm monitoring — QRS detection, arrhythmia detection alarms; SpO2 — Penaz method, probe types, interference (nail polish, motion, poor perfusion, carboxyhaemoglobin [falsely normal]); NIBP — cuff selection (40% limb circumference), auscultatory vs oscillometric; Temperature probes — tympanic, axillary, rectal, oesophageal, PA catheter core; ETCO2 — mainstream vs sidestream capnography, waveform interpretation (normal ABCD phases); Network integration — HL7/FHIR data transfer to HIS; Alarm management — JCI NPSG 06.01.01; Biomedical device management logs

UNIT -2 Invasive Haemodynamic Monitoring 12hrs

Arterial line — indications, sites (radial first-line, femoral, brachial, dorsalis pedis), waveform components (systolic peak, anacrotic notch, dicrotic notch, diastolic), artefacts (resonance, damping); CVP monitoring — IJV/subclavian CVC, normal values (2–8 mmHg), waveform (a, c, x, v, y) and clinical significance; PAC/Swan-Ganz — insertion, PCWP (≤18 = non-cardiogenic oedema), PA pressures, thermodilution CO, SvO2; Continuous CO monitoring —

PiCCO (transpulmonary thermodilution + pulse contour), LiDCO, FloTrac/EV1000 (uncalibrated pulse contour); Near-continuous CO — oesophageal Doppler; Static preload markers (CVP, PCWP) vs dynamic (PPV, SVV, PLR test)

UNIT-3 Transducer Setup & Calibration 12hrs

Pressure transducer system components — disposable dome, manifold, fast flush device (Intraflo), high-pressure tubing; Heparinised flush preparation (4 U/ml); Transducer zeroing — mid-axillary line (phlebostatic axis) with patient supine; Square-wave (fast-flush) test — optimal damping coefficient 0.5–0.7; Natural frequency ≥25 Hz; Under damped waveform — overshoot artefact; Over-damped waveform — clot, kink, air bubble management; Two-point calibration; Digital vs analogue display; Troubleshooting flowchart; Documentation of zero time and calibration results

UNIT -4 Alarm Management, Maintenance & Safety 12hrs

Alarm philosophy — actionable vs nuisance alarms; ECRI Institute Top 10 ICU Technology Hazards; Alarm fatigue evidence and mitigation strategies; Alarm limit individualisation — patient-specific thresholds; Daily equipment checklist and preventive maintenance schedule; Biomedical engineering interface and PPM schedule; Electrical safety — microshock (mA level), macroshock, ground fault circuit interrupters; ICU equipment handover procedure; Decontamination before and after use; Documentation requirements for equipment safety events

UNIT – 5: ICU Procedures 12hrs

- **Airway procedures** — endotracheal intubation assistance, suctioning, airway care
- **Vascular access procedures** — peripheral IV cannulation, central venous catheter (CVC) assistance, arterial line assistance
- **Oxygen therapy & ventilation procedures** — oxygen delivery methods, ventilator setup assistance, nebulization
- **ABG sampling procedure** — radial artery puncture, sample handling
- **Urinary catheterization** — Foley catheter insertion and care
- **Nasogastric (NG) tube insertion** — feeding and decompression
- **Chest tube assistance** — insertion support, drainage system monitoring
- **Defibrillation & cardioversion assistance**
- **Basic bedside procedures** — wound dressing, pressure sore care
- **Infection control during procedures** — aseptic techniques, PPE use
- **Documentation of procedures performed**
- **Complications and safety precautions during ICU procedures**

Course Outcomes:

At the end of this course, students should be able to:

1. Describe principles, components and operation of multi-parameter ICU bedside monitors (ECG, SpO2, NIBP, IBP, ETCO2, temperature).
2. Explain invasive haemodynamic monitoring — arterial lines, CVP, PAC — indications, waveform characteristics and interpretation
3. Set up, calibrate and operate ICU monitoring systems; perform zero-referencing and square-wave testing for invasive pressure transducers
4. Identify and troubleshoot common monitoring artefacts — damping, over-shooting, motion artefact — and differentiate from true physiological changes.
5. Configure alarm limits for different ICU patient scenarios; document monitoring data accurately

TEXT BOOKS:

- Critical Care Nursing: Monitoring and Treatment for Advanced Nursing Practice,Author: Kathy J. Booker

REFERENCE BOOKS:

- Irwin and Rippe's Intensive Care Medicine
- Evidence-Based Critical Care, Author: Paul Ellis Marik

Clinical skills I

L	T	P	C
0	0	12	6

Course Description: This course provides foundational clinical skills essential for healthcare practice, focusing on patient assessment, basic procedures, infection control, and safe patient handling. It equips students with hands-on competencies required for effective participation in clinical and emergency care settings.

Course objective:

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

1. Understand the principles of basic clinical skills and patient care.
2. Demonstrate accurate measurement and recording of vital signs.
3. Perform basic clinical procedures with adherence to safety and infection control protocols.
4. Develop effective communication skills with patients and healthcare teams.
5. Apply ethical and professional standards in clinical practice

Unit 1: Infection control **30 hrs**

- ✓ Describe the protocol for the hospital & Respiratory care department
- ✓ the personal protective equipment (PPE), handle PPE as per instructions and explain its importance.
- ✓ Explain in detail about nosocomial infections.
- ✓ Demonstrate the steps of waste management.

Unit 2: Aseptic techniques **30 hrs**

- ✓ Importance of sterilization.
- ✓ Demonstrate the steps of handwashing techniques.
- ✓ Explain the different Aseptic techniques.
- ✓ Explain the disinfection techniques of laboratory, wards, ICU and OT.

Unit 3: Vital signs **30 hrs**

Vital signs measurement

- ✓ Explain the indications to check Respiratory rate and demonstrate the methods and techniques to assess RR.
- ✓ Explain the difference methods to assess Blood Pressure and Heart rate. Demonstrate the manual BP measurement.
- ✓ Demonstrate the techniques to assess Pulse rate at various site.

- ✓ Explain the actions to be taken during the abnormal reading.
- ✓ Identify the clinical features and correlates with the abnormality and explain the action plan.

Unit 4CU Orientation & Equipment **30 hrs**

- ✓ ICU layout orientation tour; equipment identification and naming; observe nursing shift handover (SBAR); observe bedside monitor alarm settings; observe ventilator display panel (do not touch); observe infusion pump programming; ICU documentation review with mentor; infection control practice in ICU.

Unit 5: Applied Observation & Log Completion **30 hrs**

Observe ICU procedures — ABG sampling, central line dressing (observer only); observe patient intra-hospital transfer; observe ICU discharge process; observe ICU admission protocol; clinical log consolidation; mentor feedback and reflective discussion; portfolio entry preparation; self-assessment reflection sheet

Course Outcomes:

By the end of this course, students will be able to:

- Identify and describe the infection control methods.
- Able to demonstrate the sterilization techniques over respiratory equipments
- Able to assess vital signs.
- Identify and name ICU equipment (monitors, ventilators, pumps, suction units) and observe their basic operation
- Observe and document ICU layout, equipment placement, bed configuration and daily routine during ward rounds

University Core – III
Semester – II

TAUT2101	**HEALTH AND WELLNESS**	**L T P C**
		3 0 0 3

Course Description:

The course is designed to help students to learn more about human health. This course helps to understand how current health knowledge helps to make future human beings even stronger and healthier.

Course Objectives:

1. To help understand the importance of a healthy lifestyle
2. To familiarize students about physical and mental health
3. To create awareness of various life style related diseases

4. To understand the multiple dimensions of health and wellness, including physical, mental, emotional, social, and environmental aspects
5. To Equip students with the knowledge and skills to develop, implement, and maintain healthy lifestyle practices

UNIT-I **9 Hrs**

Define and differentiate health and wellness, Importance of health and wellness, Basic concepts of genetics, including genes, DNA, chromosomes, and inheritance patterns. Genetic factors affecting macronutrient (carbohydrates, proteins, and fats) digestion. Genetic variations associated with micronutrient (vitamins and minerals) digestion; malnutrition, under nutrition and over nutrition

UNIT-II **9 Hrs**

Brief overview of Body systems – Skeletal system, Muscular system, Circulatory System, Lymphatic system, Cardiovascular system, Respiratory system, Nervous system (Central nervous system, Peripheral nervous system, Somatic and Autonomic nervous systems), Digestive system, Urinary system, Endocrine system, Reproductive system, Integumentary system

UNIT-III **9 Hrs**

Sedentary lifestyle and its risk of disease, Lifestyle Disease and its Management, Factors affecting mental health - Stress, anxiety, and depression, Identification of suicidal tendencies, Substance abuse (Drugs, Cigarette, Alcohol), de-addiction, counselling and rehabilitation. Four Vital signs- Pulse rate, Respiratory rate, Blood pressure, Body temperature, other measurements-Body mass index, Waist-Hip Ratio, Basal Metabolic Rate

UNIT-IV **9 Hrs**

Risk factors and Pathology of the following Diseases and their Management –
- Diabetes
- Hypertension
- Coronary Heart Disease
- Obesity
- Osteoporosis
- Osteoarthritis
- Rheumatoid-arthritis
- Cancers (Blood, Breast, Brain, Lung, Liver and Kidney)
- Polycystic ovarian syndrome (PCOS)
- Pain (including Low Back pain)

UNIT-V **9 Hrs**

Introduction to Functional Foods; Nutrients and Bioactive Compounds in Functional Foods; Functional Foods for Cardiovascular Health, Weight Management, Immune Function, Cognitive Health, Chronic Disease Prevention; Yoga and its importance in Health and Wellness

Course Outcomes:

Upon successful competition of the course the student would be able to –

1. Understand the relationship between fitness and wellness
2. Gain knowledge regarding various aspects and its practical implication for Wellbeing.
3. Learn about behavior change theories and strategies for promoting healthy habits such as exercise, stress management, and nutrition
4. Study techniques for setting realistic health goals, creating wellness plans, and overcoming barriers to maintaining a healthy lifestyle.
5. Learn about the principles of a balanced diet, regular physical activity, mental health management, social relationships, and environmental factors that influence health

Text Books:

1. Physical Activity and Health by Claude Bouchard, Steven N. Blair, William L. Haskell.
2. Mental Health Workbook by Emily Attached & Marzia Fernandez, 2021.
3. Mental Health Workbook for Women: Exercises to Transform Negative Thoughts and Improve WellBeing by Nashay Lorick, 2022.

Reference Books:

1. Lifestyle Diseases: Lifestyle Disease Management, by C. Nyambichu & Jeff Lumiri, 2018.
2. Physical Activity and Mental Health by Angela Clow & Sarah Edmunds, 2013.

University Elective – III

Semester – III

S. No	Name of the Course	Host Department
1	Community Engagement	School of Social Sciences
2	Clinical Nutrition	School of Health Sciences – BMS & GMB
3	Emotional Intelligence & Mental Health	School of Health Sciences – Psychology
4	Human Rights	School of Social Sciences
5	Industry 4.0	School of Technology – CSE
6	Medical Terminology	School of Health Sciences – BMS & GMB
7	Social Network Analysis	School of Health Sciences – PH
8	Antibiotic Resistance & Biomedical Waste Management	School of Health Sciences – AHS
9	Behavior Change Communication	School of Health Sciences – PH
10	Disability Management	School of Health Sciences – Psychology
11	Disaster Management	School of Social Sciences
12	Human Values & Professional Ethics	School of Social Sciences
13	Infection Prevention & Control	School of Health Sciences – AHS
14	NSS & Youth Development	School of Social Sciences

TAUT2201 **COMMUNITY ENGAGEMENT**
L T P C

3 0 0 3

Course Description:

This course provides degree-seeking students with an array of opportunities to engage in an immersive community service-learning experience. It further helps to understand the resources, optimize the recourses in future days, and address the gaps in the communities.

Course Objectives:

Students undergoing this course are expected to:

1. Understand community issues, needs, problems, strengths and recourses
2. Demonstrate the ability to work with a diverse population
3. Formulate more precise personal and professional life goals
4. Demonstrate the ability to communicate effectively and collaborate with institutions and public
5. Demonstrate the ability to take initiative, follow directions, lead, and solve problems

UNIT-I Social Structure **5 Hrs**

Concept of Society; Community; Association and Institution; Individual and Society; Social Groups- Meaning, Characteristics and Classification; Social Process; Social Change; Structure and Characteristics of urban, rural and tribal communities.

UNIT-II Social Organisation and Disorganisation **5 Hrs**

Social Organisation- meaning, elements and types; Voluntary Associations; Social System- definition, types and roles; Social Control- meaning, aims and process of social control; Social norms, morals and values; Social Disorganisation- definition, causes, control and planning.

UNIT-III Social Problems and Welfare State **8 Hrs**

Social Problems- Poverty, Housing, food supply, illiteracy, Prostitution, dowry, child labour, child abuse, delinquency, crime, substance abuse, HIV/ AIDS, Covid-19; Venerable Group- elderly, handicapped, minority and another marginal group; Fundamental rights of individual, women and children, NITI Aayog, Ministry of Social Justice & Empowerment, Ministry of

Rural Development, Ministry of Tribal Affairs, Ministry of Health & Family Welfare, and Role of Local Bodies for transformation; Corporate Social Responsibility; Social Work.

Proposed Field activities: Field visit- Interaction with Local Self Government, Visit of Gram Panchayat & Staff, Socio-Economic Survey *(5 hours/ one day).*

UNIT-IV Communication Strategies and Community Engagement 18 Hrs

Social Behaviour Change Communication (SBCC); Focused Group Discussion; SWOT analysis; Participatory Learning Action.

Proposed Field activities: Meeting, Mobilizing, Transect Walk, Identification of Natural Leaders, Timeline, Mapping, Case Study, Documentation; Outreach- Special Camp Viz., Health Education, Medical Camp, Environment Protection, Sustainability, Technology & Innovation, Nutrition, Swachh Bharat (*15 Hours/ 4 days).*

UNIT-V Sustainable Development Goals 2023 9 Hrs

Millennium Development Goals; Sustainable Development Goals (SDGs) 2030- 17 Goals; SDG Pyramid; Localizing SDGs; Gram Panchayat Development Plan (GPDP).

Proposed Field activities: Mapping the activities with SDG 2030 (6 Hours/ 1 day).

Course Outcomes:

By the end of the course, students should able to:

1. Understand and apply the concept related to community and social structure.
2. Develop the ability to involve and work with the social system.
3. Understand various social problems emerging in society and solve them.
4. Apply SBCC tools and SWOT analysis.
5. Appreciate Sustainable Development Goals and contribute beyond SDG 2030.

Text Books:

1. Krishna Kant Singh & Ram Shankar Singh, (2011), Social Work and Community Development.
2. Makara Rumley, (2020), Modern-Day Strategies for Community Engagement: How to Effectively Build Bridges Between People and the Bottom Line.

Reference Books:

1. Hall, B. L., Tandon, R. & Tremblay, C. (2015). Strengthening Community University Research Partnerships: Global Perspectives.
2. http://unescochaircbrsr.org/unesco/pdf/UNESCO%20Book%20Web_with%20BookCovers_Aug202015_FINAL.pdf

3. GUNi (Ed.). (2014). Knowledge, Engagement and Higher Education: Contributing to Social Change (Higher Education in the World 5). Hampshire (UK)/New York (USA): Palgrave Macmillan.
4. UNESCO Chair in Community Based Research & Social Responsibility in Higher Education (2015). Institutionalizing Community University Research Partnerships: A User's Manual. http://unescochair-cbrsr.org/unesco/pdf/CURP_Guidelines.pdf
5. Vallaeys, F. (2014). University Social Responsibility: A Mature and Responsible Definition. In GUNi (Ed.), Knowledge, Engagement and Higher Education: Contributing to Social Change (Higher Education in the World 5) (pp. 88-96

TAUT2202 **CLINICAL NUTRITION**

L T P C

3 0 0 3

Course Description:

Upon completion of the course, students will be prepared to apply their knowledge of clinical nutrition to promote health and manage diseases effectively, contributing to multidisciplinary healthcare teams. This course is essential for healthcare professionals, nutritionists, dietitians, and anyone interested in understanding the role of nutrition in clinical care and wellness promotion.

Course Objectives:

To enable the students to:

1. Develop proficiency in conducting comprehensive nutritional assessments using various methods such as dietary recall, biochemical tests, and anthropometric measurements.
2. Understand the impact of diet on the prevention, management, and progression of chronic diseases commonly encountered in clinical practice, including diabetes, cardiovascular diseases, and obesity.
3. Acquire skills in designing individualized nutrition plans tailored to specific patient needs and health conditions across different life stages (e.g., pediatric, geriatric, maternal).
4. Evaluate ethical issues related to nutritional counseling, respecting cultural dietary practices, and providing evidence-based dietary recommendations within clinical settings.
5. Critically appraise current research and controversies in clinical nutrition, integrating evidence-based guidelines into decision-making processes to optimize patient outcomes.

UNIT-I **9 Hrs**

Introduction to nutrition - Food as source of nutrients, functions of food, definition of nutrition, nutrients & energy, adequate, optimum & good nutrition, malnutrition, Effect of cooking & heat processing on the nutritive value of foods, role of nutrition in prior pregnancy, during pregnancy, during lactation, in adolescence, Fitness, Athletics & Sports

UNIT-II **9 Hrs**

Food guide - Basic five food groups How to use food guide (according to R.D.A.) Interrelationship between nutrition & health: - Visible symptoms of good health, Use of food in body - Digestion, Absorption, transport & utilization, Role of fibres in human nutrition. malnutrition, Protein energy malnutrition.

UNIT-III **9 Hrs**

Biomolecules as a nutrient: Carbohydrates: Functions, classification, food sources, storage in body. Fats & oils: composition, saturated and unsaturated fatty acids, classification, food sources, function of fats. Proteins - composition, sources, essential & non-essential amino acids, functions, Protein deficiency.

UNIT-IV **9 Hrs**

Water minerals and Vitamins: Water - as a nutrient, function, sources, requirement, water balance & effect of deficiency. Minerals - macro & micronutrients. - Functions, sources. Bioavailability and deficiency of Calcium, Iron, Iodine, Sodium & Potassium, Vitamins (water & fat soluble) - definition, classification & functions.

UNIT-V **9 Hrs**

Role of nutrients in disease management: Importance of nutrition in kidney and liver diseases with respect to their nutritional value. Case study- diabetes, cancer, Osteoporosis, Heart related diseases, role of Antioxidants as a nutrient in disease control.

Course Outcomes:

Upon completion of the course, the student shall be able to

1. Demonstrate proficiency in conducting thorough nutritional assessments using a variety of methods, interpreting results, and applying findings to develop dietary recommendations.
2. Apply knowledge of macro and micronutrients, dietary supplements, and hydration to design effective nutrition plans for individuals with diverse health needs and conditions.
3. Implement dietary interventions that contribute to the prevention, management, and improvement of chronic diseases, integrating nutritional strategies into comprehensive healthcare plans.
4. Evaluate and address ethical considerations in nutritional counseling, respecting cultural diversity and individual preferences while adhering to professional standards and evidence-based practices.
5. Critically analyze current research literature in clinical nutrition, utilizing evidence-based guidelines to make informed decisions and enhance patient outcomes in clinical settings.

Text Books:

1. Kathleen ML and Escott S. Krause's Food, Nutrition and Diet Therapy, 9thedn, W.B. Saunders Company Pennsylvania, 2000.
2. Davidson S, Passmore R, Breck JFT. Human Nutrition and Dietetics, The English Language Book Society and Churchill Livingston, 1975.

Reference Books:

1. Thomas B. Manual of Dietetic Practice. Blackwell Scientific Publications, Oxford, London, 1988.
2. Robinson CH. Normal and Therapeutic Nutrition. Oxford Publishing Co, Bombay, 1972.

TAUT2203 EMOTIONAL INTELLIGENCE AND MENTAL HEALTH

L T P C

3 0 0 3

Course Description:

This course will explore the relationship between emotional intelligence and mental health. Students will learn about the importance of emotional intelligence in promoting positive mental health, and will develop skills in recognizing and regulating emotions, managing stress, and building resilience. The course will cover topics such as emotional intelligence theories, emotional regulation strategies, mindfulness, self-compassion, and the impact of emotions on mental health.

Course Objectives:

By the end of this course, students will be able to:

1. Understand the role of emotional intelligence in mental health
2. Develop skills in recognizing and regulating emotions
3. Understand the impact of stress on mental health and develop strategies for managing stress
4. Understand the importance of self-compassion in promoting positive mental health
5. Develop critical thinking and analytical skills in relation to emotional intelligence and mental health

UNIT-I **9 Hrs**

Introduction to Emotional Intelligence and Mental Health; Definition and history of emotional intelligence, the role of emotional intelligence in mental health, Professional organizations and ethical codes related to emotional intelligence

UNIT-II **9 Hrs**

Theoretical Perspectives on Emotional Intelligence; Ability model of emotional intelligence, Trait model of emotional intelligence, Mixed model of emotional intelligence, Mindfulness and Mental Health, Mindfulness and Mental Health.

UNIT-III **9 Hrs**

Stress and Mental Health, Resilience and Mental Health; The impact of stress on mental health, Stress management techniques (e.g., relaxation techniques, time management, exercise) Definition and benefits of resilience, Factors that contribute to resilience, Building resilience in oneself and others.

UNIT-IV **9 Hrs**

Self-Compassion and Mental Health, Emotions and Relationships; Definition and benefits of self-compassion, Practice of self-compassion, Relationship between self-compassion and mental health, Emotions and Relationship.

UNIT-V **9 Hrs**

Emotional Intelligence in the Workplace, Ethics and Emotional Intelligence; Emotional intelligence and job performance, the role of emotional intelligence in leadership, Emotional intelligence training in the workplace, Ethical issues related to emotional intelligence, Professional codes and standards related to emotional intelligence , Final Project Presentations Students will present their final projects, which may include research papers, case studies, or other projects related to emotional intelligence and mental health.

Course Outcomes:

1. Able to provide an overview of emotional intelligence and mental health
2. Will understand the importance of emotional intelligence
3. The impact of stress on mental health, Stress management techniques
4. Relationship between emotional intelligence and mental health
5. Understand the importance of Emotional Intelligence in the workplace.

Text Books:

1. Neff, K. (2011). Self-compassion: Stop Beating Yourself Up and Leave Insecurity Behind. HarperCollins.
2. Goleman, D. (2007). Emotional Intelligence (10th ed.). Bantam Books.

Reference Books:

1. Covey, Stephen R., author. (2020). The 7 habits of highly effective people: powerful lessons in personal change. New York :Simon & Schuster.
2. Tolle, E. (2016). The power of now: A guide to spiritual enlightenment. Yellow Kite.

TAUT2204 **HUMAN RIGHTS** **L T P C**
3 0 0 3

Course Description:

This course offers a comprehensive introduction to the field of human rights, exploring the historical development, philosophical foundations, and contemporary issues surrounding the protection and promotion of human rights globally. Students will engage with key concepts, major international human rights instruments, and the roles of various actors in the human rights landscape.

Course Objectives:

This course is intended to prepare the students to

1. Know Human Rights, its need importance, and kind of rights
2. Understand the Human Rights of vulnerable groups
3. Identify and analyze key international human rights documents and treaties.
4. Know about the institutions enforcing the Human Rights
5. Understand the violations of Human Rights and the safeguards available to citizens.

UNIT-I Concept of Human Rights – Indian and International Perspectives **5 Hrs**

1. Evolution of Human Rights
2. Definitions under Indian and International documents

UNIT-II Broad classification of Human Rights and Relevant Constitutional Provisions. **11 Hrs**

1. Right to Life, Liberty and Dignity
2. Right to Equality
3. Right against Exploitation
4. Cultural and Educational Rights
5. Economic Rights
6. Political Rights
7. Social Rights

UNIT-III Human Rights of Women and Children **11 Hrs**

1. Social Practice and Constitutional Safeguards
2. Female Foeticide and Infanticide
3. Physical assault and harassment
4. Domestic violence
5. Conditions of Working Women

UNIT-IV Institutions for Implementation **9 Hrs**

1. Human Rights Commission

2. Judiciary

UNIT-V Violations and Redressal **9 Hrs**

1. Violation by State
2. Violation by Individuals
3. nuclear weapons, bio war and terrorism
4. Safeguards.

Course Outcomes:

After the successful completion of this course the students will be able to

1. Know about Human Rights, its need importance and kind of rights
2. Understand the Human Rights of vulnerable groups
3. Know about the institutions enforcing the Human Rights
4. Understand the violations of Human Rights and the safeguards available to citizens.
5. Develop critical thinking and analytical skills by examining case studies and current events.

Text Books:

1. Human Rights in India: Historical, Social and Political Perspectives (Law in India) Hardcover – Illustrated by Chiranjivi J. Nirmal (Author)
2. History of Human Rights, Narrated by Andrea Giordani

Reference Books:

1. The Universal Declaration of Human Rights- UNO publication
2. Making Sense of Human Rights- by James Nickel.
3. The Idea of Natural Rights- by Brian Tierney.
4. The Law of Peoples- by John Rawls.
5. On Human Rights. - by James Griffin.
6. Human Rights: Contemporary Issues by V.K. Ahuja
7. Human Rights, M Girija, S Chand Edu tech Pvt. Ltd.

TAUT2205 **INDUSTRY 4.0** **L T P C**
3 0 0 3

Course Description:
The Industry 4.0 aims to the "smart" and connected production systems that are designed to sense, predict, and interact with the physical world, so as to make decisions that support production in real-time. In manufacturing, it can increase productivity, energy efficiency, and sustainability.

Course Objectives:

The objective of this course is to make students:

1. To impart basic idea in Industry 4.0.
2. To provide students with good depth of knowledge of designing Industrial 4.0 Systems for various application.
3. To learn the artificial intelligence and machine learning techniques/ tools in health care.
4. To understand the bigdata technology and its applications in health care.
5. To learn the design and analysis of Industry 4.0 systems for healthcare applications.

UNIT-I **9 Hrs**

Introduction: Introduction, Historical Context, General framework, Application areas, Dissemination of Industry 4.0 and the disciplines that contribute to its development, Artificial intelligence, The Internet of Things and Industrial Internet of Things, Additive manufacturing, Robotization and automation, Current situation of Industry 4.0.

UNIT-II **9 Hrs**

Cyber Physical System: Introduction to Cyber Physical Systems (CPS), Architecture of CPS-Components, Data science and technology for CPS, Emerging applications in CPS in different fields. Case study: Application of CPS in health care domain.

UNIT-III **9 Hrs**

Artificial Intelligence & Machine Learning: Artificial Intelligence: Artificial Intelligence (AI) – What & Why? History of AI- Foundations of AI, the AI Environment, Application Domains and Tools.
Machine Learning- Introduction–Definition–Types of Machine Learning–Supervised, Unsupervised, Reinforcement Learning–Algorithms for Machine Learning–Problems solved by Machine Learning-Applications areas of Machine Learning in Health care.

UNIT-IV **9 Hrs**

Big Data & Cloud Computing: What is Big Data, Evolution of Big Data, sources of Big Data? Characteristics of Big Data Vs – Big Data Myths- Data Discovery-Traditional Approach, Big Data Technology: Big Data Technology Process– Applications of Bigdata in Healthcare.
Cloud Computing: Need– Definition – Types of Cloud-Types of Services– SaaS, PaaS, Iaas

UNIT-V **9 Hrs**

Impact of Industry 4.0 on Healthcare Industry: An introduction Discover how Industry 4.0 is impacting and transforming the Healthcare Industry including self-diagnosis systems for patients, real-time diagnosis, 3D printed organs and Internet-of-Medical Things (IOMT).

Course Outcomes:

Upon completion of the course, student will be able to:

1. Understand the basic concepts of Industry 4.0 and the other related fields
2. Analyze, design and develop systems to solve the Engineering problems by integrating thermal, design and manufacturing Domains.
3. Understand the various artificial intelligence and machine learning tools in health care domain.
4. Apply bigdata technology in health care applications.
5. Apply the learned Engineering knowledge for the Development of society and self.

Text Books:

1. Jean-Claude André, ―Industry 4.0, Wiley- ISTE, July 2019, ISBN: 781786304827, 2019.
2. Diego Galar Pascual, Pasquale Daponte, Uday Kumar, ―Handbook of Industry 4.0 and SMART Systems, Taylor and Francis,2020

Reference Books:

1. P. Kaliraj, T. Devi, BigDataApplicationsinIndustry4.0, 2022, ISBN9781032008110, CRC Press, Taylor & Francis Group
2. P. Kaliraj, Devi Thirupathi, "Artificial Intelligence Theory, Models and Applications", Auerbach Publications, CRC Press, Taylor and Francis group, 2021.
3. Ethem Alpaydin, "Introduction to Machine Learning", Third Edition, MIT Press, 2014.
4. P. Kaliraj, T. Devi, Industry 4.0 and Education: Transformative Technology and Applications, 2022, CRC Press, Taylor & Francis Group.

TAUT2206 **MEDICAL TERMINOLOGY**

L T P C

3 0 0 3

Course Description:

The purpose of this course is to develop a student's understanding and use of hospital and medical terminology. There is a focus on understanding the terns commonly used to identify the cause and effects of disease conditions.

Course Objectives:

1. To understand the associate medical terms with specific body systems.
2. To identify and interpret diagnostic and symptomatic terms related to the diseases specific to each body system.
3. To describe designated diagnostic testing procedures (laboratory, x-ray, surgical, pharmacy, etc.).
4. To Enable students to understand, use, and correctly pronounce a wide range of medical terms.
5. To Prepare students to effectively communicate with healthcare professionals and patients using accurate medical terminology.

UNIT-I **9 Hrs**

Basics of medical terminology, Specialties in a Hospital, The Human body in health and disease

UNIT-II **9 Hrs**

The Skeletal System, The Muscular System, The lymphatic and immune systems

UNIT-III **9 Hrs**

The Respiratory System, The Circulatory System, The Digestive System, The Urinary System

UNIT-IV **9 Hrs**

The Nervous system, Special senses - Eyes and Ears, Skin - The Integumentary system

UNIT-V **9 Hrs**

The Endocrine system, The Reproductive System, Diagnostic procedures, Nuclear Medicine and Pharmacology

Course Outcomes:

Upon successful completion of the course student would be –

1. Able to Identify and interpret complex medical terms by breaking them into their component word parts in order to decipher their meaning.
2. Able to understand common diseases and disorders of the body systems
3. Able to identify diagnostic tools and techniques for the common diseases and disorders of the human body
4. Able to interpret medical records, lab reports, and other documentation to ensure clear and precise communication within healthcare teams and with patients
5. Able to learn the roots, prefixes, and suffixes that form medical terms, as well as the terminology related to various body systems, diseases, procedures, and treatments. Students will be able to deconstruct complex terms into their component parts to understand their meanings.

Text Books:

1. Medical Terminology for Health Professions, 7th Edition by Ann Ehrlich; Carol L Schroeder, ISBN 13: 9781111543297, Published by Delmar Cengage Learning (2013)
2. Workbook for Ehrlich/Schroeder's Medical Terminology for Health Professions, 7th by Carol Schroeder, Ann Ehrlich Published by Delmar Cengage Learning; 7th edition, 2012, ISBN-13 : 978-1111543280

Reference Books:

1. Quick and Easy Medical Terminology - With Access by Peggy C. Leonard, ISBN13: 978-0323595995, 9th Edition
2. Medical Terminology Systems: A Body Systems Approach - With Access by Barbara A. Gylys, ISBN13: 978-0803658677, 8th Edition
3. Understanding Medical Terminology by Agnes C. Frenay, ISBN13: 978-0697140586, 9th Edition

TAUT2207 **SOCIAL NETWORK ANALYSIS**

L T P C

3 0 0 3

Course Description:

A thorough introduction to Social Network Analysis (SNA), an interdisciplinary topic that studies the connections and interactions between people, groups, and things in various social contexts, is provided in this course. Students will receive a broad understanding of the core ideas, approaches and uses of SNA in a variety of disciplines. The course will cover data gathering methods, network visualization, fundamental network metrics, sophisticated network ideas and practical SNA implementations. Students will learn the skills necessary to evaluate social networks and gain useful insights from intricate network data through hands-on exercises.

Course Objectives:

1. To introduce students to the foundational concepts and historical background of Social Network Analysis (SNA).
2. To familiarize students with the basic building blocks of social networks, including nodes and edges and different types of social networks (e.g., online, offline, professional, friendship).
3. To provide students with an understanding of key network measures such as degree centrality, betweenness centrality, clustering coefficients and network density.
4. To demonstrate real-world applications of SNA, such as social network mining, influence and opinion dynamics, social network marketing and cybersecurity.
5. To equip students with practical skills for analyzing and interpreting social network data.

UNIT-I **9 Hrs**

Overview of Social Network Analysis: Definition, history and key concepts. Nodes and Edges: Understanding the basic building blocks of social networks. Types of Social Networks: Exploring different types of social networks (e.g., online, offline, professional, friendship).Importance and Applications of SNA: How SNA is used in various fields (e.g., Engineering, Sociology, Psychology, Marketing and Business).

UNIT-II **9 Hrs**

Data Collection Methods: Techniques for gathering social network data (e.g., surveys, interviews, online platforms). Data Representation: Different formats for representing network data (e.g., adjacency matrix, edge list).Network Visualization: Introduction to visualization tools for nd interpreting network structures.

UNIT-III **9 Hrs**

Degree Centrality: Identifying influential nodes based on their connections. Betweenness Centrality: Understanding nodes that act as bridges in the network. Clustering Coefficients: Analyzing the degree of interconnectedness within local neighbourhoods. Network Density: Assessing the overall connectivity of a social network.

UNIT-IV **9 Hrs**

Small World Phenomenon: Exploring the "six degrees of separation" concept. Homophily and Social Influence: Understanding how social networks shape individuals' behaviour and beliefs. Network Resilience and Robustness: Examining the impact of node removal on the network's stability. Network Motifs: Identifying recurring patterns in complex social networks.

UNIT-V **9 Hrs**

Social Network Mining: Using SNA to extract meaningful patterns and insights from large-scale networks. Influence and Opinion Dynamics: Analyzing how information spreads through social networks. Social Network Marketing: Leveraging SNA for targeted marketing campaigns and product promotion. Online Social Networks and Cyber security: Understanding network-based threats and vulnerabilities.

Course Outcomes:

By the end of the course, students will be able to:

1. Comprehend the foundational concepts, methodologies and tools of Social Network Analysis.
2. Extract meaningful insights from social network data, identifying influential nodes and understanding network dynamics.
3. Apply SNA concepts to real-world challenges in areas such as marketing, cyber security and social dynamics.
4. Utilize SNA techniques to inform decision-making processes.
5. Conduct and interpret SNA in various domains effectively.

Text Books:

1. Social Network Analysis: Methods and Applications" by S. K. Garg, 2019, Wiley India.
2. Introduction to Social Network Analysis: Concepts, Methods and Applications" by R. K. Singh, 2020, Springer India.

Reference Books:

1. Social Network Analysis: Methods and Applications" by Stanley Wasserman, Katherine Faust (1994, Cambridge University Press)
2. Analyzing Social Networks" by Stephen P. Borgatti, Martin G. Everett, Jeffrey C. Johnson (2013, SAGE Publications)
3. Networks, Crowds and Markets: Reasoning About a Highly Connected World" by David Easley, Jon Kleinberg (2010, Cambridge University Press).

ANTIBIOTIC RESISTANCE & BIOMEDICAL WASTE MANAGEMENT

TAUT2208 **L T P C**
3 0 0 3

Course Description:

This course covers antibiotics and drug resistance, including mechanisms and trends, and explores biomedical waste management, focusing on segregation, treatment, and disposal. Emphasis is placed on antimicrobial stewardship and modern technologies for handling biomedical waste and ensuring environmental safety.

Course Objectives:

Students undergoing this course are expected to:

1. Understand the history, mechanisms, and types of antibiotic resistance.
2. Analyze trends in drug resistance and actions to combat it.
3. Evaluate the consequences of antibiotic resistance and implement antimicrobial stewardship.
4. Learn principles and practices of biomedical waste management and environmental safety.
5. Utilize modern technologies and personal protective equipment for effective biomedical waste handling.

UNIT-I **9 Hrs**

Antibiotics: Antibiotic Resistance, History of antibiotics, How resistance happens and spreads, Types of resistance- intrinsic, acquired, passive.

UNIT-II **9 Hrs**

Drug resistance - I: Trends in drug resistance, Actions to fight resistance, Bacterial persistence, Antibiotic sensitivity

UNIT-III **9 Hrs**

Drug resistance - II: Consequences of antibiotic resistance, Antimicrobial Stewardship – Barriers and opportunities, tools and models in hospitals.

UNIT-IV **9 Hrs**

Biomedical waste management and environmental safety - I: Definition of Biomedical, Waste, Waste minimization, BMW – Segregation, collection, transportation, treatment and disposal (including colour coding).

UNIT-V **9 Hr**

Biomedical waste management and environmental safety - II: Liquid BMW, Radioactive waste, Metals / Chemicals / Drug waste, BMW Management & methods of disinfection, Modern Technology for Handling BMW, Use of Personal protective equipment (PPE), Monitoring & controlling cross-infection (Protective devices).

Course Outcomes:

At the end of this course, students should be able to:

1. Explain antibiotic resistance, its history, and mechanisms.
2. Analyse trends and strategies in drug resistance management.
3. Assess the consequences of antibiotic resistance and implement antimicrobial stewardship.
4. Understand principles and practices of biomedical waste management.
5. Apply modern technologies and PPE for effective biomedical waste handling and infection control.

Text Books:

1. "Antibiotics: Actions, Origins, Resistance" by Christopher Walsh
2. "Antimicrobial Stewardship: Principles and Practice" by Matthew Laundy, Lynda A. Sisson, and Matthew Dryden.

Reference Books:

1. "Biomedical Waste Management in Hospitals: A Manual for Health Professionals" by Sushrut S. N. H.

TAUT2209 BEHAVIOR CHANGE COMMUNICATION

L T P C

3 0 0 3

Course Description:

This course introduces students to the fundamentals of behavioral theory, research and interventions in health education and promotion. The course will expose students to a wide range of theories, basic statistics and the use of open-source software in the analysis and evaluation of health aspects at the community level in a holistic manner. Furthermore, students will understand the concept of intersectoral and multidisciplinary coordination in order to improve data visualization in health education and promotion through the use of appropriate statistical tools.

Course Objectives:

1. To understand the behavioral, social and cultural factors associated with health and illness.
2. To explore factors that influence and barriers to practicing health behavior and changing poor health habits across age groups.
3. To understand the structure of society, the role of society and various types of communication and identify the role of society, community, health education and communication in health.
4. To describe the methods, models, tools and processes used in understanding health behavior change, health education and promotion.
5. To apply relevant social and behavioral theories to diagnose and understand individual, social network, organizational, community and policymaker behaviors associated with the planning, implementation, evaluation and maintenance of community-based primary health care programs.

UNIT-I **5 Hrs**

Introduction to Social and Health Behavioral Health, Importance of social and behavioral factors in health, Historical perspectives on population and diseases.

UNIT-II **8 Hrs**

Health behavior: role of behavior factors in disease and disorders, Health behavior, health habits, Illness behavior, Practicing and changing health behavior, Barrier to modify poor health behavior, intervening with children, adolescents, adults and at risk, social determinants of Health, Changing health habits.

UNIT-III **12 Hrs**

Basic concepts of society, community, and family, Society: features and types, Concept of culture: characteristics, elements, variability, social institutions: marriage and family. Working with communities, Community: Definition, concept of community participation, Benefits of community participation, Health communication, Communication: Definition, scope and

requirements, Types of communication, Components of communication, Communication stages, Common communication approach, Methods of communication, Characteristics of effective communication, Barriers of effective communication.

UNIT-IV **10 Hrs**

Health Behaviour Models, Social Epidemiology, Health belief model, Theory of planned behaviour, Transtheoretical Model and change process, Social network theory, Diffusion of innovation, Social reaction to diseases, Comparative health cultures, Health disparities.

UNIT-V **10 Hrs**

Introduction Social network analysis, Basic of social network analysis, Introduction to open-source software and classification in health approaches, Introduction to Node XL software, Install, data visualize, data analysis and application among community level for policy-maker behaviors associated with the planning, implementation, evaluation, and maintenance of community-based health programs.

Course Outcomes:

End of the course completion student would be

1. Understand behavioral, social and cultural factors associated with health and illness.
2. Develop strategies to address barriers to practicing healthy behaviors and changing poor health habits across age groups.
3. Analyze the structure of society and various types of communication and identify the role of society, community, health education and communication in health.
4. Apply appropriate methods, models, tools and processes for understanding health behavior change, health education and promotion.
5. Utilize SNA tools, strategies and social and behavioral theories to diagnose and understand individual, social network, organizational, community and policymaker behaviors in community-based primary health care programs.

Text Books:

1. Essentials of health behavior: Social and behavioral theory in public health by Mark Edberg (Jones and Bartlett publishers
2. Mahajan BK. Methods in Bio-statistics. Jaypee Brothers, Medical Publishers (p) Ltd.,

G16, EMCA House, 23/23B, Ansari Road, Daryaganj, Post Box: 7193, New Delhi 110 002, India, 1991. List Current Essential Reference

Reference Books:

1. Foster and Anderson: Medical Anthropology, Wiley, New York
2. Anderson & Taylor, Sociology: Understanding a Diverse Society.
3. Neubeck and Glasberg, Selected Material from Sociology: Diversity, Conflict, and Change.

TAUT2201A DISABILITY MANAGEMENT L T P C
3 0 0 3

Course Description:

Disability Management course is designed to provide students with an in-depth understanding of the strategies, practices, and policies essential for supporting individuals with disabilities in various settings. This course covers the principles and techniques of disability management, focusing on creating inclusive environments in the workplace, educational institutions, and the community.

Course Objectives:

1. Understand the social, medical, and legal aspects of disability.
2. Evaluate the impact of disability on individuals and society.
3. Analyze policies and regulations related to disability management.
4. Develop strategies for supporting individuals with disabilities in various contexts.
5. Promote inclusivity and diversity in the workplace and community.

UNIT-I Introduction to Disability Management 9 Hrs

Definition and classification of disabilities**,** Historical perspectives on disability**,** Disability as a social construct**,** Medical aspects of Disability**,** Common medical conditions leading to disability**,** Assessing functional limitations and impairments

UNIT- II Social and Psychological Aspects of Disability 9 Hrs

The impact of disability on quality of life, Stigma and discrimination, Coping and psychological adjustment to disability, Role of healthcare professionals in disability management, Psychological Interventions and Chronic Health Disorders; Therapies, Pharmacological Interventions, Individual Therapy, Relaxation, Stress Management and exercise, Social Support Interventions, Help on the Internet, Support Groups

UNIT- III Legal and Ethical Framework 9 Hrs

Disability rights and legislation, Equal opportunity and anti-discrimination laws, Ethical considerations in disability management, Emerging technologies and their impact on disability management, the future of disability policy and practice

UNIT- IV Workplace Disability Management **9 Hrs**

Reasonable accommodation and the Americans with Disabilities Act (ADA), Return-to-work programs Workplace diversity and inclusion, Current Issues

UNIT- V Community and Public Health Approach **9 Hrs**

Community resources and services for individuals with disabilities, Accessibility and universal design Disability awareness and advocacy, Analysis of real-life cases in disability management, Developing disability management plans, Accommodation strategies and their implementation, Current Issues and Future Trends

Course Outcomes:

By the end of the course, the students would be able to;

1. Understand various aspects and causes of disability.
2. Get insight on the efficacy of interventions and therapies to deal disability.
3. Assess the ethical and legal consideration of disability.
4. Acknowledge the importance of ADA act and it implementation in workplace.
5. Know and participate in various community based disability programs.

Text Books:

1. Preventing chronic disease: a vital investment. WHO global report. Geneva, World Health Organization, 2005 (http://www.who.int/chp/chronic_disease_ report/en, accessed 15 May 2008).
2. Singh D. Transforming chronic care: evidence about improving care for people with long-term conditions. Birmingham, University of Birmingham, 2005.

Reference Books:

1. Chronic diseases [web site]. Geneva, World Health Organization, 2008 (http://www.who.int/topics/chronic_disease/en, accessed 15 May 2008).
2. National Center for Health Statistics definitions: health condition [web site]. Atlanta, United States Centers for Disease Control and Prevention, 2008.

TAUT2201B **DISASTER MANAGEMENT** **L T P C**
3 0 0 3

Course Description:

The Disaster Management course is designed to provide students with a comprehensive understanding of the principles, strategies, and practices essential for effectively managing disasters. This course explores the various types of natural and human-made disasters, their causes, impacts, and the processes involved in mitigating, preparing for, responding to, and recovering from such events.

Course Objectives:

The main objectives of this course are to:

1. To impart knowledge and concepts of disaster, disaster management and disaster risk reduction.
2. To enhance the students understanding on Hazard Vulnerability and Risk Analysis
3. To develop positive attitude towards practical response to different stages of disaster
4. To management by adopting advance technology and sustainable development.
5. To ensure disaster response skills in assessment, analysis, intervention and evaluation in the Practice of reducing disaster risk.

UNIT- I **9 Hrs**

Concepts of Disaster and Vulnerability

- Hazards and disasters - Concepts, vulnerability and risks
- Hazard and disaster type- Natural, Water-related, Pandemic and Human induced hazards and disasters
- Causes and impacts of disasters- Impact on natural eco-system; physical, psychological and social impact
- Disaster and financial resilience
- GIS and Remote Sensing

  Disaster vulnerability profile of India - Specific to geographical regions and states (as per regional significance).

UNIT- II **9 Hrs**

Disasters Intervention Practices

- Disaster Management Cycle-Rescue, relief, rehabilitation, reconstruction, prevention, mitigation and preparedness
- Disaster risk reduction (ORR) - community based ORR, Institutions concerned with safety, Disaster mitigation and construction techniques as per Indian Standard
- Early warning systems
- Trauma and Stress management
- First-aid and emergency procedures

Awareness generation strategies for the community on safe practices in disaster (as per regional significance)

UNIT- III **9 Hrs**

Disaster Management

Components of disasters management - Preparedness of rescue & relief, mitigation, rehabilitation & reconstruction
Institutional framework of disaster management in India (NDMA-SDMA-DDMA, NDRF, Civic volunteers, NIDM),
Phases of disasters/risk management and post-disaster responses Compensation and insurance

UNIT- IV **9 Hrs**

Applications of remote sensing & GIS in disaster management

- Capacity building for disaster/damage mitigation (structural and non-structural measures).
- Disaster risk reduction strategies and National Disaster Management Guidelines
- Disaster Management Act-2005
- Regional issues as per regional requirement/ university can take minimum two topics as per High Powered Committee.

UNIT- V **9 Hrs**

Practical exposure requirements: Field work/ community visit and Vulnerability Mapping, Safe community planning and implementation, Mock Drill/ Regional issues as per region/university

Course Outcomes:

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

1. Define and analysis factors contributing to disasters, threats to development, life and nature
2. Demonstrate, and practice disaster risk reduction activities towards sustainable development
3. Formulate, organize and assess disaster risk reduction
4. Plan activities according to the nature of disasters and factors of vulnerabilities
5. Able to mitigate disaster and educate communities

Mode of Evaluation: Continuous Assessment Test, Quizzes, Assignments, Multiple choice questions test, field work report, project report.

Text Books:

1. “Disaster Management” by Harsh K. Gupta
2. “Disaster Management: Future Challenges and Opportunities” by Jagbir Singh

Reference Books:

1. Singh, R. (2017), "Disaster Management Guidelines for Earthquakes, Landslides, Avalanches and Tsunami". Horizon Press Publications
2. Taimpo (2016), "Disaster Management and Preparedness" CRC Press Publications
3. Nidhi, G.D. (2014), "Disaster Management Preparedness". CBS Publications Pvt. Ltd.
4. Gupta, A. K., Nair, S.S., Shiraz, A. and Dey, S.(2013), "Flood Disaster Risk Management CBS Publications Pvt. Ltd.
5. Singh, R. (2016), "Disaster Management Guidelines for Natural Disasters" Oxford University Press Pvt. Ltd.

TAUT2201C HUMAN VALUES & PROFESSIONAL ETHICS L T P C
3 0 0 3

Course Description:

The Human Values and Professional Ethics course aims to explore the fundamental principles that underpin ethical behavior and moral reasoning. This course provides students with an understanding of core human values and ethical frameworks, fostering the development of personal integrity, social responsibility, and professional ethics. Through this course, students will engage with key philosophical theories, contemporary ethical issues, and the application of ethical principles in various contexts.

Course Objectives:

1. Understand the need, guidelines, content, and process for Value Education.
2. Understand the concept of harmony within oneself.
3. Understand the values in human relationships.
4. Understand the interconnectedness and mutual fulfillment among the four orders of nature.
5. Understand the implications of a holistic understanding of harmony on professional ethics.

UNIT-I **9 Hrs**

Introduction – Need, guidelines, content and process for Value Education Value Education

- Understanding the need, basic guidelines, content and process for Value Education
- Self-exploration what is it? Its content and process; “Natural acceptance” and Experiential Validation as the mechanism for self-exploration.

UNIT-II **9 Hrs**

Understanding harmony in the human being- Harmony in myself!

- Understanding human being as a coexistence of the sentient I and the material body
- Understanding the harmony of I with the body: Sanyam and Swasthya; correct appraisal of physical needs, meaning of prosperity in detail.

UNIT-III **9 Hrs**

Understanding harmony in the Family and Society- Harmony in Human relationship

- Understanding values in human –
- Human relationship; meaning of Nyaya and program for its fulfillment to ensure Ubhay- trupti; Trust (Vishwas) and Respect (Samman) as the foundational values of relationship
- Visualizing a universal harmonious order in society-Undivided Society (Akhand Samaj), Universal Order (Sarvabhaum Vyawastha) from family to world family.

UNIT-IV **9 Hrs**

Understanding Harmony in Nature; Coexistence

- Interconnectedness and mutual fulfillment among the four orders of nature-recyclability and self-regulation in nature.
- Holistic perception of harmony at all levels of existence.

UNIT-V **9 Hrs**

Implications of the above Holistic understanding of harmony on professional ethics

- Definitiveness of Ethical Human Conduct
- Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order
- Competence in professional ethics
- Ability to utilize the professional competence for augmenting universal human order

Course Outcomes:

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

1. Students will be able to explain the need, guidelines, content, and process for Value Education.
2. Students will demonstrate an understanding of the harmony within oneself, identifying the sentient self and the material body.
3. They will be capable of visualizing and explaining the concept of a universal harmonious order from the family level to the global level.
4. They will recognize and explain the importance of recyclability and self-regulation in nature, and develop a holistic view of harmony at all levels of existence.
5. They will be able to define and advocate for ethical human conduct in their professional lives.

Text Books:

1. "Value Education and Professional Ethics" by R.S. Naagarazan
2. "Human Values and Professional Ethics" by Rishabh Anand

Reference Books:

1. Mind and Body: Holistic Approach" by Dr. V.K. Sharma
2. "Integrative Body-Mind Training"** by Yi-Yuan Tang
3. Understanding Harmony in the Family and Society
4. "Human Values and Professional Ethics"** by Jayashree Suresh
5. "Ethics in Engineering Practice and Research"** by Caroline Whitbeck

TAUT2201D INFECTION PREVENTION AND CONTROL L T P C
3 0 0 3

Course Description:

This course covers infection control principles, antibiotic resistance, and antimicrobial stewardship. Students will learn about sterilization, disinfection, hand hygiene, PPE, and managing drug resistance in healthcare settings.

Course Objectives:

Students undergoing this course are expected to:

1. Understand evidence-based infection control practices.
2. Learn prevention and control of healthcare-associated infections.
3. Analyse the history and mechanisms of antibiotic resistance.
4. Examine trends and actions to combat drug resistance.

5. Implement antimicrobial stewardship in hospitals.

UNIT-I **9 Hrs**

Evidence-based infection control principles and practices: Sterilization, Disinfection, Effective hand hygiene, Use of Personal Protective Equipment (PPE).

UNIT-II **9 Hrs**

Infection control: Prevention & control of common healthcare-associated infections, Components of an effective infection control program, Guidelines (NABH and JCI) for Hospital Infection Control.

UNIT-III **9 Hrs**

Antibiotics: Antibiotic Resistance, History of antibiotics, How resistance happens and spreads, Types of resistance- intrinsic, acquired, passive.

UNIT-IV **9 Hrs**

Drug resistance: Trends in drug resistance, Actions to fight resistance, Bacterial persistence, Antibiotic sensitivity.

UNIT-V **9 Hrs**

Consequences of antibiotic resistance, Antimicrobial Stewardship – Barriers and opportunities, tools and models in hospitals

Course Outcomes:

At the end of this course, students should be able to:

1. Apply effective infection control practices.
2. Prevent and manage healthcare-associated infections.
3. Explain the history and spread of antibiotic resistance.
4. Identify and combat drug resistance trends.
5. Implement antimicrobial stewardship strategies.

Text Books:

1. "Infection Prevention and Control: Theory and Practice for Healthcare Professionals" by Debbie Weston
2. "Antibiotics: Actions, Origins, Resistance" by Christopher Walsh

Reference Books:

1. "Antimicrobial Stewardship: Principles and Practice" by Matthew Laundy, Lynda A. Sisson, and Matthew Dryden

TAUT2201E NSS & YOUTH DEVELOPMENT L T P C
3 0 0 3

Course Description:

The National Service Scheme (NSS) aims to develop students' personalities through community service and national integration. It encourages students to work towards societal development, fostering a sense of responsibility and civic duty. The program bridges academic learning and real-life experiences, promoting overall personal growth and social awareness among youth.

Course Objectives:

1. To explain the nature, functions and importance of NSS.
2. To explain the role of NSS in the context of youth, community and voluntary service.
3. To develop the necessary communication and soft skills.
4. To appreciate the importance of health, hygiene and sanitation for a healthy nation.
5. To develop the concept and skills of managing environment issues and disaster management.

UNIT-I 9 Hrs

Youth Development Program in India and Role of Youth Leaders National Youth Policy; Youth Development Program at National Level, State Level, Volunteer Level; Youth centric and youth led organizations Role and Importance of youth leadership, Leadership capability and its development.

UNIT-II 9Hrs

Meaning type of leader, Qualities, Traits, Role, Importance of a Good Leader Social, psychologic factors affecting the youth.
Life Skills-Self-awareness, Empathy, Effective Communication, Decision Making; Role of Music and Art in Youth Development.

UNIT-III 9 Hrs
Basic Features of the Indian Constitution consumer protection act right to Information; Child Protection Act, Problems of Aging: Problems Protection of Interests.

UNIT-IV 9 Hrs
Side effects of modern lifestyle and their countermeasures Diet, exercise, sleep in Indian lifestyle; Collection, Utilization and Camp; Management of Camps; Biography of Swami Vivekananda.

UNIT-V 9 Hrs
Field Work - Rural visit- campaign- rally- Competitions.

Course Outcomes:

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

1. Explain the role and functions of NSS.
2. Appraise the role of NSS volunteers in developing the society as a whole.
3. Develop the necessary skills of effective communication, leadership and healthy living.
4. Develop the necessary skills to mitigate disasters and other environmental challenges.
5. Develop consciousness about personal health and hygiene.

Text Books:

1. Communication Skills by N Rao & R P Das (HPH)
2. Biodiversity, Environment & Disaster Management by Shamna Hussain (Unique Publishers)

Reference Books:

1. NSS Manual published by the Ministry of Youth Affairs & Sports, Govt. of India
2. National Youth Policy Document
3. National Service Scheme - A Youth Volunteers Programme For Under Graduate Students as Per UGC Guidelines by J D S Panwar, A K Jain & B K Rathi (Astral)
4. Environmental Studies by P K Pandey (Mahaveer Publications)

IV Semester

MECHANICAL VENTILATION - II

L T P C
3 1 0 4

Course Description: This course builds on foundational knowledge of mechanical ventilation, focusing on advanced ventilatory modes, patient–ventilator interactions, waveform analysis, and management of complex respiratory conditions. It equips students with the skills to optimize ventilator settings, troubleshoot complications, and support critically ill patients requiring advanced respiratory care

Course Objective:

At the end of the course, students should be able.

1. Understand advanced modes of mechanical ventilation and their clinical applications.
2. Analyze ventilator waveforms and graphics for patient assessment and troubleshooting.
3. Apply appropriate ventilator strategies for various respiratory conditions such as ARDS, COPD, and respiratory failure.
4. Identify and manage patient–ventilator asynchrony and ventilation-related complications.
5. Optimize ventilator settings based on patient condition, blood gas analysis, and clinical response.

UNIT -1 Advanced Ventilator Modes & Strategies 12hrs

Advanced Airway – Topics

- Indications for advanced airway
- Rapid Sequence Intubation (RSI)
- Pre-intubation assessment
- Pre-oxygenation techniques
- Airway equipment preparation
- Endotracheal intubation techniques
- Video laryngoscopy
- Supraglottic airway devices
- Difficult airway management
- Airway algorithms (Plan A, B, C, D)
- Confirmation of tube placement
- Mechanical ventilation initiation
- Sedation and paralytics in airway management
- Post-intubation care
- Complications of advanced airway
- Extubation and airway removal
- Emergency surgical airway (cricothyrotomy)

UNIT -2 Advanced Ventilator Modes & Strategies 12hrs

PRVC (Pressure-Regulated Volume Control) — dual-control mode, advantages in varying compliance; SIMV — synchronised intermittent mandatory ventilation, disadvantage (increased work of breathing); PSV (Pressure Support Ventilation) — settings (inspiratory trigger, rise time, cycle-off criteria), asynchrony; APRV (Airway Pressure Release Ventilation) — P-high, P-low, T-high, T-low settings for ARDS; HFOV (High-Frequency Oscillatory Ventilation) — frequency, amplitude, MAP; PAV+ (Proportional Assist Ventilation Plus) — WOB partition; NAVA (Neurally Adjusted Ventilatory Assist) — Edi catheter; Adaptive support ventilation; CPAP mode; BiLevel (BiPAP); Mode selection rationale in different conditions (COPD, ARDS, TBI, post-cardiac surgery, weaning)

UNIT -3 Advanced Waveform Analysis & PEEP Titration 12hrs

Pressure-time waveform analysis — identify asynchrony (delayed cycling, premature cycling, reverse triggering, double triggering); Flow time waveform — expiratory flow pattern for auto-PEEP detection; P-V curve analysis — quasi-static inflation-deflation; Lower inflection point (LIP) and upper inflection point (UIP); PEEP titration methods — decremental PEEP trial, transpulmonary pressure measurement (oesophageal balloon), electrical impedance tomography (EIT) overview; Driving pressure ($\Delta P = Pplat – PEEP$

UNIT -4 Non-Invasive Ventilation 12hrs

NIV types — CPAP (single pressure, open circuit) vs BiPAP (two pressures, closed circuit); Indications — COPD exacerbation (evidence-base), acute cardiogenic pulmonary oedema, immunocompromised respiratory failure, post-extubation (high-risk patients), DNI/DNR patients; Absolute and relative contraindications; Interface selection — nasal mask, oronasal mask, full-face mask, helmet (helmet BiPAP advantage); Circuit — leak ports, PEEP valve; Setting IPAP and EPAP; Titration (typical start: EPAP 5, IPAP 10 cmH2O, titrate to SpO2 and RR); NIV failure criteria — pH 35, GCS ≤8, inability to protect airway, copious secretions; HFNC (High-flow nasal cannula) — mechanism, ROX index for failure prediction.

UNIT -5 Weaning, Tracheostomy & Extubation 12hrs

Weaning readiness criteria — cause resolved, SpO2 >90% on FiO2 ≤0.4, PEEP ≤5–8, adequate cough, no vasoactives (or low-dose); SBT — T-piece vs PSV (5–8 cmH2O/PEEP 5) for 30–120 min; SBT failure criteria — RR >35, SpO2 140, BP >180/

Course Outcomes:

At the end of this course, students should be able to:

1. Explain advanced ventilator modes — PRVC, APRV, HFOV, PAV, NAVA — with their indications and setting guidelines.
2. Perform detailed ventilator waveform analysis to identify patient-ventilator asynchrony, auto-PEEP and optimal PEEP titration
3. Manage NIV (CPAP, BiPAP) setup and monitoring; identify NIV failure criteria
4. Implement weaning assessment and conduct spontaneous breathing trials (SBT) following protocol-driven guidelines
5. Manage tracheostomy care — inner cannula change, tube change preparation, decannulation readiness assessment

TOTAL HRS:60

TEXT BOOKS:

- Pilbeam's Mechanical Ventilation: Physiological and Clinical Applications, Cairo J. M
- The Ventilator Book,Author: William Owens

REFERENCE BOOKS:

- Principles and Practice of Mechanical Ventilation, Martin J. Tobin
- Management of the Mechanically Ventilated Patient, Lynelle N. B. Pierce

HEMODYNAMIC MONITORING

L	T	P	C
3	1	0	4

Course Description: This course focuses on the principles and techniques of hemodynamic monitoring used to assess cardiovascular function in critically ill patients. It covers invasive and non-invasive monitoring methods, interpretation of key parameters, and their clinical application in managing conditions such as shock and cardiac dysfunction in intensive care settings.

Course objective:

At the end of the course, students should be able.

1. Understand the principles of cardiovascular physiology and hemodynamic monitoring.
2. Identify and operate invasive and non-invasive hemodynamic monitoring systems.
3. Interpret hemodynamic parameters such as cardiac output, CVP, MAP, and pulmonary pressures.
4. Correlate hemodynamic data with clinical conditions like shock, heart failure, and sepsis.
5. Apply clinical decision-making in managing hemodynamic instability in critically ill patients.

UNIT-1 - Advanced Hemodynamic Monitoring 12hrs

Cardiac output measurement methods — thermodilution (PA catheter, triplicate injections), pulse contour analysis (PiCCO, FloTrac, LiDCO), Fick principle, oesophageal Doppler (peak velocity, FTc), bioimpedance; Derived haemodynamic variables — SVR = (MAP CVP)×80/CO, PVR, LVSWI, RVSWI; Pulmonary capillary wedge pressure (PCWP) — interpretation, respiratory variation; Mixed vs central venous oxygen saturation (SvO2 vs ScvO2 — ScvO2 5–8% higher); GEDV (Global End-Diastolic Volume) and ITBV (PiCCO); Extravascular lung water (EVLWI — PiCCO); Global ejection fraction (GEF)

UNIT-2 Fluid Responsiveness & Dynamic Preload 12HRS

Static preload markers — limitations of CVP (Frank-Starling operating point, respiratory variation); CVP ≤8 does not predict fluid responsiveness; Dynamic preload markers — Pulse Pressure Variation (PPV >13% predictive in volume-ventilated, no arrhythmia); Stroke Volume Variation (SVV); Inferior Vena Cava (IVC) collapsibility index (US) — >50% spontaneous breathing = fluid responsive; Passive Leg Raise (PLR) test — gold standard for fluid responsiveness, 200–300 ml autotransfusion effect; Fluid challenge test (250 ml crystalloid/3 min) with CO assessment; End-expiratory occlusion test; Haemodynamic coherence; De-resuscitation concept

UNIT -3 Shock Profiles & Goal 12HRS

Haemodynamic profiles of shock — hypovolaemic: low CO, high SVR, low PCWP; cardiogenic: low CO, high SVR, high PCWP; distributive (septic): high CO (early), low SVR, low PCWP; obstructive (PE, tamponade): low CO, high SVR, high PCWP; Mixed shock states; EGDT (Early Goal-Directed Therapy) — original Rivers protocol and ProCESS/ARISE/ProMISe trials; Current goal-directed approach in septic shock; Haemodynamic targets — MAP ≥65, ScvO2 ≥70%, lactate clearance ≥10%/2h; Vasopressor

choice by profile; Haemodynamic monitoring in cardiac surgery ICU — IABP waveform, ECMO monitoring

UNIT-4POCUSforHemodynamics
12hrs

POCUS overview — lung ultrasound (LUS), cardiac (focused ECHO), IVC, FAST; Cardiac POCUS — 4 views: parasternal long-axis (PLAX), parasternal short-axis (PSAX), apical 4-chamber (A4C), subcostal; Gross LV function assessment (visual estimate, hyperdynamic vs impaired); RV size and function; Pericardial effusion detection; IVC diameter and respiratory variation; Lung ultrasound — B-lines (3 per zone = pulmonary oedema), A-lines (normal aeration), consolidation, pleural effusion; BLUE protocol for respiratory failure; RUSH protocol (Rapid Ultrasound for Shock and Hypotension); FALLS protocol

UNIT – 5: Haemodynamic Management & Therapeutic Interventions (12 HRS)

- Fluid therapy — crystalloids vs colloids, balanced fluids
- Fluid resuscitation strategies in ICU
- De-resuscitation and fluid removal (diuretics, RRT)
- Vasopressors — norepinephrine, dopamine, vasopressin
- Inotropes — dobutamine, milrinone
- Vasodilators — indications and use
- Haemodynamic drug titration based on monitoring parameters
- Lactate monitoring and clearance
- Perfusion markers — urine output, capillary refill time, skin perfusion
- Blood transfusion thresholds and haemodynamic impact
- Mechanical circulatory support —
    - Intra-aortic balloon pump (IABP)
    - Extracorporeal membrane oxygenation (ECMO) (basic principles)
- Haemodynamic management in special conditions — sepsis, cardiac failure, trauma
- Integration of haemodynamic data for clinical decision making
- Documentation and ICU protocols for haemodynamic management

Total Hrs: 60hrs

Course Outcomes:

At the end of this course, students should be able to:

1. Explain advanced haemodynamic monitoring concepts — cardiac output methods, fluid responsiveness assessment, DO2/VO2 optimisation
2. Interpret PA catheter, PiCCO, FloTrac and oesophageal Doppler data to guide ICU haemodynamic management

3. Set up and operate advanced haemodynamic monitoring devices; perform PLR test and dynamic preload assessment
4. Differentiate haemodynamic profiles of shock types and apply goal-directed therapy protocols
5. Demonstrate POCUS (Point-of-Care Ultrasound) basics for haemodynamic assessment in ICU

TEXT BOOKS:

- Hemodynamic Monitoring Made Incredibly Visual
- The ICU Book, Paul L. Marino

REFERENCE BOOKS:

- Hemodynamic Monitoring: Evolving Technologies and Clinical Practice, Michael R. Pinsky, Laurent Brochard, Jean-Louis Teboul

INFECTION CONTROL, QA & ICU SAFETY

L	T	P	C
3	1	0	4

Course Description: This course provides an overview of infection prevention and control practices, quality assurance principles, and safety protocols in the ICU. It focuses on minimizing healthcare-associated infections, ensuring patient and staff safety, and implementing quality standards to improve clinical outcomes in critical care settings.

Course Objective:

At the end of the course, students should be able.

1. Understand the principles of infection control and prevention in healthcare settings.
2. Implement standard precautions, sterilization, and biomedical waste management practices.
3. Apply quality assurance and continuous improvement strategies in ICU care.
4. Identify and manage potential safety risks for patients and healthcare workers in the ICU.
5. Adhere to ethical, legal, and regulatory standards related to infection control and patient safety.

UNIT-1 NABH/JCI ICU Accreditation Standards 12hrs

NABH 5th Edition — ICU-specific standards: IPC, FMS, COP, MOM; JCI International Standards for ICU; NABH Infection Control standards — IPC chapter requirements; ICU accreditation documents — policies, SOPs, audit tools; NABH accreditation process — pre-assessment, assessment, certification; NABL ISO 15189 for ICU point-of-care testing labs; ISO 9001:2015 quality management application to ICU processes; Internal audit methodology; Mock surveys; Corrective and Preventive Actions (CAPA)

UNIT-2HCAI Surveillance & Antimicrobial Stewardship 12hrs

HCAI surveillance methodology — ICU surveillance definitions (NHSN/ISCCM); VAP rate (events per 1000 ventilator-days); CLABSI rate (events per 1000 central-line days); CAUTI rate; Device utilisation ratios; Data collection tools and calculation; Trend analysis — run charts, control charts; Benchmarking against ISCCM/ICMR national data; Antimicrobial stewardship programme (ASP) in ICU — key elements (pre-authorisation, prospective audit, de-escalation, formulary restriction); Antibiogram — local data-driven empirical therapy; Carbapenem stewardship; Antibiotic consumption metrics (DDD, DOT)

UNIT-3 QA Tools & ICU Quality Metrics
12hrs

PDSA (Plan-Do-Study-Act) cycle — ICU application; Run chart — median, rules for special cause variation; Control chart (SPC) — UCL, LCL, centre line; Cause-and-effect (fishbone) diagram — 6Ms; 5-Why analysis; Failure Mode and Effect Analysis (FMEA) — ICU equipment; Process mapping and value stream mapping; ICU quality indicators — ventilator weaning rate, SBT success rate, ICU readmission rate, glycaemic control compliance; Balanced scorecard for ICU; Mortality and Morbidity (M&M) rounds structure

UNIT-4 ICU Safety Culture & Reporting 12hrs

Safety culture assessment tools — Safety Attitudes Questionnaire (SAQ); Team STEPPS for ICU communication; Human factors in ICU — cognitive load, situation awareness, communication failures; Near miss reporting culture — Just Culture principles; Incident reporting systems — Indian — NABH sentinel events; WHO Surgical Safety Checklist adaptation for ICU procedures; Daily goals checklist; ICU safety rounds; Peer-to-peer safety observation programme; Patient safety leadership in ICU.

UNIT – 5: Risk Management, Legal Aspects & Documentation in ICU (12 HRS)

- Risk management in ICU — identification, assessment, mitigation strategies
- Clinical risk assessment tools — risk registers, hazard identification
- Medical errors — types, root causes, prevention strategies
- Sentinel events — identification, reporting, analysis
- Root Cause Analysis (RCA) — structured approach and ICU application
- Clinical audit and compliance monitoring
- Legal aspects in ICU — consent (informed, implied), medico-legal cases (MLC)
- Documentation standards — ICU charts, electronic health records (EHR)
- Confidentiality and data protection in healthcare
- End-of-life care policies — DNR/DNAR, withdrawal/withholding of care
- Ethical-legal interface in critical care decision-making
- ICU policies and protocols — standardisation and implementation

- Communication and documentation during critical events
- Accreditation compliance documentation — audit trails, records maintenance
- Quality improvement reporting and feedback systems

Course Outcomes:

At the end of this course, students should be able to:

1. Describe NABH/JCI ICU accreditation standards for infection control, equipment QA and patient safety
2. Explain ICU bundle compliance monitoring, HCAI surveillance and antimicrobial stewardship principles
3. Apply QA/QC tools — PDSA cycle, run charts, cause-and-effect diagrams — to ICU process improvement projects
4. Implement CLABSI, VAP, CAUTI bundle audits; document compliance rates; identify gaps and corrective actions

TOTAL HOURS:60HRS

TEXT BOOKS:

- Textbook of Applied Microbiology and Infection Control (Including Safety), I. Clement
- Applied Microbiology and Infection Control Including Safety, Dr. Ranjani Prema & Kailash Narayan Sharma

REFERENCE BOOKS:

- Essentials of Hospital Infection Control, S. Apurba Sastry & R. Deepashree

CLINICAL SKILLS – II

L	T	P	C
0	0	20	10

Course Description: This course advances clinical competencies required in critical care settings, focusing on patient assessment, advanced procedures, emergency interventions, and equipment handling. It emphasizes hands-on skill development, clinical decision-making, and safe practice in managing critically ill patients in ICU and emergency environments.

Course Objective:

At the end of the course, students should be able.

1. Develop proficiency in advanced clinical skills and bedside procedures in critical care.
2. Perform systematic patient assessment and monitor critically ill patients effectively.
3. Assist in emergency and life-saving interventions in ICU settings.
4. Operate and manage critical care equipment safely and efficiently.
5. Apply infection control, patient safety, and ethical practices in all clinical procedures.

Unit-1 Advanced Patient Assessment & Monitoring 60hrs

- Primary and secondary survey (ABCDE approach)
- Neurological assessment (GCS, pupil reflex)
- Cardiovascular monitoring (ECG basics, hemodynamics overview)
- Respiratory assessment and oxygenation monitoring
- Fluid balance and urine output monitoring

Unit-2 **60hrs**

Airway and Respiratory Care

- Airway assessment and management techniques
- Oxygen therapy devices and delivery systems
- Suctioning (oral, nasal, endotracheal)
- Basic ventilator handling and monitoring
- Nebulization and chest physiotherapy basics

Unit-3 **60hrs**

Emergency & Critical Care Procedures

- Basic Life Support (BLS) and introduction to ACLS concepts
- Defibrillation and AED use
- IV cannulation and fluid administration
- Blood sampling and ABG collection (overview)
- Nasogastric tube insertion and care

Unit-4 **60hrs**

ICU Equipment Handling

- Cardiac monitors and alarm systems
- Infusion pumps and syringe pumps
- Defibrillator and crash cart management
- Basic ventilator settings and alarms
- Biomedical equipment safety and troubleshooting

Unit-5 **60hrs**

Infection Control, Safety & Professional Skills

- Standard precautions and aseptic techniques
- ICU infection prevention practices

- Biomedical waste management
- Documentation and reporting in ICU
- Communication, teamwork, and ethical practice

Total Hrs: 300hrs

Course Outcomes:

By the end of this course, students will be able to:

1. Demonstrate competency in advanced patient assessment and monitoring in ICU settings.
2. Perform and assist in critical care procedures such as airway management, suctioning, and vascular access.
3. Apply clinical reasoning in emergency situations and support life-saving interventions.
4. Operate ICU equipment including monitors, ventilators, and infusion devices effectively.
5. Ensure adherence to infection control, safety, and professional standards in clinical practice.

V Semester

CRITICAL CARE CARDIOLOGY & ECG

L T P C
3 1 0 4

Course Description: This course focuses on the principles of cardiovascular physiology, cardiac monitoring, and electrocardiography (ECG) in critical care settings. It emphasizes the identification and interpretation of cardiac rhythms, recognition of life-threatening arrhythmias, and their clinical management to support critically ill patients.

Course Objective:

At the end of the course, students should be able.

1. Understand the fundamentals of cardiovascular physiology and cardiac electrophysiology.
2. Interpret normal and abnormal ECG patterns, including arrhythmias and ischemic changes.
3. Identify life-threatening cardiac conditions and initiate appropriate interventions.
4. Operate and monitor cardiac equipment such as ECG machines and cardiac monitors.
5. Apply clinical decision-making in the management of cardiac emergencies in critical care settings.

UNIT-1 Advanced 12-Lead ECG Interpretation **12hrs**

ECG axes and lead system review; STEMI recognition — ST elevation criteria by territory (LAD: V1–V4, RCA: II,III,aVF, LCx: I,aVL,V5–V6), reciprocal changes; STEMI equivalents — LBBB (Sgarbossa criteria), Wellens pattern, de Winter T-waves, aVR elevation; NSTEMI/UA — ST depression, T-wave inversions; Right ventricular MI — right-sided leads (V4R); Posterior MI — V7–V9; BBB — LBBB (broad QRS, M pattern V6, WilliaM), RBBB (rSR' V1, W-pattern V6, MaRRoW); Fascicular blocks; WPW — delta wave, short PR; LVH and RVH criteria; Pericarditis — saddle-shaped ST in multiple leads, PR depression; Myocarditis ECG patterns; Pulmonary embolism — S1Q3T3, sinus tachycardia, RBBB, AF; Hyperkalaemia — peaked T, sine wave, VF; Hypokalaemia — U waves, ST depression; Hypothermia — J (Osborn) waves; Long QT — QTc >440 ms male, >470 ms female; Drug-induced QT prolongation; Pacemaker rhythms — AAI, VVI, DDD, demand vs asynchronous, pacemaker failure patterns (failure to pace, capture, sense)

UNIT-2 ICU Arrhythmia Management **12hrs**

AF in ICU — rate vs rhythm control; rate control: metoprolol, diltiazem, digoxin (low EF); rhythm: amiodarone (150 mg IV bolus), cardioversion (100 J biphasic); anticoagulation in ICU AF; New-onset AF incidence in sepsis; SVT (AVNRT, AVRT) — vagal manoeuvres, adenosine 6–12 mg rapid IV push, verapamil; Atrial flutter — 2:1 block recognition, rate

control, cardioversion; VT (monomorphic) — haemodynamically stable: amiodarone 150 mg IV; unstable: synchronised cardioversion (200 J); VF/pulseless VT — unsynchronised defibrillation (360 J monophasic / 150–200 J biphasic), ACLS algorithm; Torsades de Pointes — magnesium 2 g IV, correct QT-prolonging drugs, temporary pacing for pause-dependent TdP; Bradycardia with haemodynamic compromise — atropine 0.5 mg IV (up to 3 mg); adrenaline 2–10 mcg/min; transcutaneous pacing; Permanent pacemaker interrogation basics; ICD basics — sensing, therapy delivery; ACLS drug review

UNIT-3 Post-Cardiac Surgery ICU Management **12hrs**

Post-CABG/valve surgery ICU admission assessment — cardiac index (target >2.2), MAP, filling pressures, pacing wire check; Low cardiac output syndrome — inotropes (dobutamine, milrinone, levosimendan), IABP timing, ECMO criteria; Haemorrhage — mediastinal drain output (>200 ml/hr ×2 hrs → surgical re-exploration), coagulation correction; Vasodilatory shock — vasopressin, norepinephrine; Post-op AF (30 50% incidence, peak 48–72 hrs); Temporary pacing — AV sequential (DDD) pacing; Pacing wire care and troubleshooting; Cardiac tamponade post-sternotomy — echo, pericardiocentesis vs surgical; Sternal wound care; Ventilator weaning after cardiac surgery (extubation target 4–6 hrs post-op); Renal protection post-cardiac surgery; IABP timing — diastolic augmentation and systolic unloading; ECMO in cardiac ICU — VA-ECMO circuit, cannulation sites, monitoring, anticoagulation, weaning

UNIT-4 Acute Coronary Syndromes in ICU **12hrs**

STEMI management — primary PCI (door-to-balloon <90 min), fibrinolysis if PCI unavailable; DAPT (aspirin + ticagrelor/clopidogrel); anticoagulation (UFH, enoxaparin, bivalirudin); GPIIb/IIIa inhibitors; Killip classification; Cardiogenic shock complicating MI — haemodynamic targets, vasopressors, MCS; IABP-Shock II trial; Right ventricular MI management — volume loading caution, avoid nitrates; NSTEMI/UA — GRACE score, early invasive vs conservative; CCU monitoring post-PCI; Mechanical complications of MI — VSD, free wall rupture, acute MR; Heart failure complicating ACS — Forrester classification, vasodilators, diuretics, MCS

UNIT-5 Hemodynamic Monitoring & Mechanical Circulatory Support in Cardiac ICU **12hrs**

- Key hemodynamic parameters — MAP, CVP, CO, CI, SVR, PCWP
- Invasive monitoring — arterial line, CVP, pulmonary artery catheter
- Fluid responsiveness — PPV, SVV, passive leg raising
- Shock types and hemodynamic profiles
- Vasoactive drugs — inotropes and vasopressors
- Advanced monitoring systems — PiCCO, LiDCO, FloTrac

- Mechanical circulatory support — IABP, Impella, VAD, VA-ECMO (basics, indications)
- Complications and basic management of monitoring and MCS
  Total Hrs: 60hrs

Course Outcomes:

By the end of this course, students will be able to:

1. Interpret advanced 12-lead ECGs, including arrhythmias, ischemic changes, and electrolyte abnormalities.

2. Apply appropriate management strategies for ICU arrhythmias using pharmacological and electrical interventions.
3. Demonstrate understanding of post-cardiac surgery care, including monitoring, complications, and supportive therapies.
4. Analyze and manage acute coronary syndromes using clinical guidelines, risk stratification, and interventional approaches.
5. Interpret hemodynamic parameters and assist in the management of critically ill cardiac patients using monitoring systems and mechanical circulatory support.

Text Book:

- Clinical Electrocardiography: A Simplified Approach

Reference Books:

- ECG Interpretation: From Pathophysiology to Clinical Application

NEUROCRITICAL CARE

L	T	P	C
3	1	0	4

Course Description: This course focuses on the assessment, monitoring, and management of critically ill patients with neurological disorders in intensive care settings. It covers conditions such as stroke, traumatic brain injury, seizures, and coma, along with advanced neuro-monitoring techniques and prevention of secondary brain injury

Course Objective:

At the end of the course, students should be able.

1. Understand the pathophysiology of acute neurological disorders in critically ill patients.

2. Perform neurological assessment and monitoring including GCS and intracranial pressure (ICP).
3. Identify and manage neurocritical emergencies such as stroke, head injury, and status epilepticus.
4. Apply principles of airway, ventilation, and hemodynamic management in neuro patients.
5. Prevent secondary brain injury through timely interventions and critical care strategies.

UNIT-1 Traumatic Brain Injury & Raised ICP **12hrs**

TBI classification — mild (GCS 13–15), moderate (9–12), severe (≤8); Primary vs secondary brain injury; Monroe-Kellie doctrine; Cerebral compliance and pressure-volume curve; CPP = MAP − ICP (target ≥60 mmHg, upper limit 70 mmHg); ICP monitoring devices — intraventricular drain (EVD — gold standard, also therapeutic), intraparenchymal (Camino, Codman); Normal ICP 90 target), normocapnia (35–40 mmHg), avoid hyperthermia; Osmotherapy — mannitol 0.25–1.0 g/kg IV (onset 15–30 min) or 3% hypertonic saline (continuous or bolus); Barbiturate coma (thiopental/pentobarbital) — last resort; Decompressive craniectomy; TBI nutrition — high protein (1.5–2.5 g/kg/day), early EN; DECRA and RESCUEicp trial results; Hypothermia in TBI — evidence review

UNIT-2 Neurovascular Emergencies **12hrs**

Ischaemic stroke — NIHSS scoring, CT brain (early ischaemic changes), DWI MRI, IV tPA (0.9 mg/kg, max 90 mg, 4.5 hr window), thrombectomy (6–24 hr DAWN/DEFUSE-3); BP management (3 cm, hydrocephalus); SAH — grading (Hunt-Hess, WFNS), Fisher/modified Fisher grade, CT scan patterns, early aneurysm securing (coiling vs clipping), vasospasm (peak day 4–14) — transcranial Doppler, nimodipine 60 mg 4-hrly, triple-H therapy (current evidence); TCD monitoring in SAH

UNIT-3 Status Epilepticus, Neuro-Monitoring & Brain Death **12hrs**

Status epilepticus — ACEP/AAN guidelines: Stage 1 (0–5 min): lorazepam 0.1 mg/kg IV; Stage 2 (5–20 min): levetiracetam 60 mg/kg IV or valproate 40 mg/kg IV or fosphenytoin 20 mg PE/kg; Stage 3 (20–40 min): intubation + propofol or midazolam infusion; Stage 4 (>40 min): barbiturate coma; EEG in ICU — NCSE diagnosis, seizure monitoring in TBI/SAH, BIS monitoring; Continuous EEG (cEEG) — indications; Neurological scoring — FOUR score (4 domains: eye, motor, brainstem, respiration, each 0–4); GCS limitations (intubated patient); Pupillometry — NPi, automated (Neuroptics); Cerebral microdialysis overview; Near-infrared spectroscopy (rSO2); Brain death determination — 2 clinical assessments 6 hrs apart, prerequisite conditions (normothermia, normotension, no drug confounders), clinical tests (GCS 1T or FOUR

score 0, brainstem reflexes absent, apnoea test: $PaCO_2 \geq 60$ mmHg after 10 min disconnection), confirmatory tests (EEG isoelectricity, CT angiography, radionuclide scan); Indian THOA 1994 amendments — notification, certification; Organ donation after brain death

UNIT-4 Spinal Cord Injury & Neuromuscular Emergencies
12hrs

Acute spinal cord injury — ASIA impairment scale, C3–C5 diaphragm paralysis (phrenic nerve), ventilatory management, neurogenic shock (low BP + bradycardia), methylprednisolone — current evidence (not routine); GBS (Guillain-Barré Syndrome) — ascending paralysis, respiratory monitoring (VC <20 ml/kg or VC <1 L = intubation trigger), autonomic instability, IVIG vs plasmapheresis; Myasthenic crisis — edrophonium test, neostigmine, pyridostigmine, IVIG, thymectomy; NMJ disorders in ICU; Critical illness polyneuropathy/myopathy (CIPNM) — diagnosis, rehabilitation

UNIT-5 **12hrs**
Neuro Monitoring & Neuroprotective Strategies
Neurological monitoring — GCS, pupil assessment, FOUR score
Intracranial pressure (ICP) monitoring — methods and normal values
Cerebral perfusion pressure (CPP) and its clinical significance
Advanced monitoring — EEG, transcranial Doppler, brain oxygen monitoring
Neuroprotective strategies — sedation, osmotherapy (mannitol, hypertonic saline), temperature control
Management of raised ICP and brain herniation
Brain death criteria and organ donation basics
Prevention of secondary brain injury in ICU

Course Outcomes:

By the end of this course, students will be able to:

1. Explain the principles of neurocritical care and neurological pathophysiology
2. Perform neurological assessment and interpret neuro-monitoring data
3. Identify and assist in the management of neurocritical emergencies.
4. Apply ICU protocols in managing patients with brain and spinal cord injuries.
5. Ensure patient safety, infection control, and multidisciplinary care in neuro ICU settings.

Total hours-60hrs

Books:

- The NeuroICU Book, Author: Kiwon Lee
- Neurocritical Care: A Guide to Practical Management, A. Joseph Layon et al.

ICU ADMINISTRATION & PATIENT RELATION

L	T	P	C
3	1	0	4

Course Description:. This course focuses on the administrative, organizational, and communication aspects of intensive care unit (ICU) management. It covers ICU planning, resource management, quality assurance, documentation, and effective communication with patients and families to ensure safe, ethical, and patient-centered care.

Course Objective:

At the end of the course, students should be able.

1. Understand the principles of ICU organization, administration, and workflow management.
2. Apply effective communication strategies with patients, families, and healthcare teams.
3. Implement quality assurance, documentation, and accreditation standards in ICU settings.
4. Manage resources, staffing, and equipment efficiently in critical care environments.
5. Adhere to ethical, legal, and professional practices in patient care and communication.

UNIT-1 ICU Administration & Operations
12hrs

ICU organisational models — open vs closed (intensivist-led); staffing ratios (ISCCM Level III: 1:1 nurse, 1:6 resident); Job descriptions — intensivist, CCT practitioner, ICU nurse, respiratory therapist, physiotherapist, pharmacist; Duty roster, shift handover policy; ICU budget components — staff salaries, equipment (capex), consumables (opex), pharmacy, maintenance; Procurement process — tender, vendor evaluation, NABH biomedical equipment standards; ICU bed management — admission, discharge, step-down criteria; Capacity planning — surge protocol; Credentialing and privileging for ICU procedures; Regulatory compliance — NABH ICU standards, JCI, PCE Act, CGHS/ECHS; ICU governance — M&M rounds, safety briefings, quality committee

UNIT-2 ICU KPIs & Performance Management
12hrs

ICU key performance indicators — standardised mortality ratio (SMR = observed/expected mortality), ICU LOS, readmission rate (<48 hrs readmission), ventilator weaning rate, SBT success rate, device bundle compliance (VAP, CLABSI, CAUTI rates), glycaemic control compliance, hand hygiene compliance, early mobilisation rate,

analgesia-first protocol compliance, nutrition initiation <48 hrs; Data collection and reporting — ICU dashboard; Benchmarking — ISCCM national ICU data, NHSN; Balanced scorecard — financial, patient, process, learning dimensions; Staff performance appraisal — KRA (Key Result Areas); ICU leadership — transformational leadership, servant leadership model; Team building and inter-professional collaboration

UNIT-3 **Patient & Family Communication in ICU - 12hrs**

Family meeting structure — pre-meeting preparation, opening, agenda, information delivery, question-answer, summarize-plan; NURSE mnemonic for empathetic communication (Name, Understand, Respect, Support, Explore); SPIKES protocol for breaking bad news;
Cultural competency in ICU — religion, caste, language barriers in Indian context; Communication with language barriers — interpreter services; Written communication — ICU family information booklets; Prognostic communication — uncertainty, avoiding false hope; Ethics of truth-telling vs non-disclosure in Indian families; Patient participation in care; Family presence during procedures and resuscitation; Palliative care communication — goals of care conversations, EOL planning; Bereavement support; Communication during organ donation discussion — NOTTO guidelines

UNIT-4 Leadership, Conflict Resolution & Staff Welfare - 12hrs

Leadership styles — authoritative, democratic, laissez-faire; Situational leadership; Conflict resolution — ICU inter-professional conflicts, patient-family disputes, resource allocation conflicts; De-escalation techniques; Whistleblowing and professional duty; Staff welfare — burnout recognition (Maslach inventory), compassion fatigue, PTSD in ICU staff (30% prevalence); Peer support programmes; Mindfulness in ICU; Work-life balance; Occupational health hazards in ICU — needlestick, radiation, noise, shift work; Critical incident stress debriefing (CISD); Mentoring and coaching in ICU.

UNIT-5 **12hrs**

Patient Communication, Ethics & End-of-Life Care in ICU

Communication in ICU — principles, barriers, and strategies
Breaking bad news (SPIKES protocol)
Informed consent and shared decision-making
Handling difficult conversations and conflict resolution
End-of-life care — DNR orders, withdrawal/withholding of life support
Palliative care in ICU settings
Ethical principles — autonomy, beneficence, non-maleficence, justice
Legal aspects in ICU — documentation, medico-legal cases
Family counseling and psychological support

Total Hrs: 60hrs

Course Outcomes:

By the end of this course, students will be able to:

1. Explain the structure, functions, and management of ICU services.
2. Demonstrate effective communication and patient relation skills in critical care settings.
3. Apply quality assurance and documentation practices in ICU administration.
4. Participate in resource management and coordination of multidisciplinary care.
5. Ensure ethical, legal, and patient-centered practices in ICU environments.

Text Book:

- Hospital Administration (Core Theory)
- Hospital Administration (Gold Standard – India)

CLINICAL SKILLS – III

L T P C

0 0 16 8

Course Description: This course focuses on advanced clinical skills required in critical care settings, emphasizing independent patient management, advanced procedures, and integration of monitoring data for clinical decision-making. It prepares students to handle complex ICU scenarios, assist in invasive procedures, and ensure safe, evidence-based care for critically ill patients.

Course Objective:

At the end of the course, students should be able.

1. Develop competency in advanced clinical procedures and critical care interventions.
2. Integrate patient assessment findings with monitoring data for clinical decision-making.
3. Assist in invasive procedures and advanced life-support techniques in ICU settings.
4. Manage critically ill patients using evidence-based protocols and guidelines.
5. Ensure patient safety, infection control, and ethical practices in advanced clinical care**.**

Unit I: Advanced Patient Assessment & Clinical Decision-Making 48hrs

Comprehensive ICU assessment (ABCDE approach)
Interpretation of ABG, electrolytes, and lab parameters
Early warning scores and clinical deterioration recognition
Clinical decision-making in critical care scenarios

Unit II: Advanced Airway & Ventilation Skills 48hrs

- Endotracheal intubation assistance and airway devices
- Mechanical ventilation basics and monitoring
- Ventilator alarms and troubleshooting
- Weaning and extubation criteria

Unit III: Invasive Procedures & Monitoring 48hrs

- Arterial line and central venous catheter (assisting and care)
- Hemodynamic monitoring basics (CVP, MAP interpretation)
- Chest tube management
- Urinary catheterization and fluid balance

Unit IV: Emergency & Life Support Skills 48hrs

- Advanced Cardiac Life Support (ACLS) principles
- Defibrillation and cardioversion
- Emergency drug administration
- Management of shock and cardiac arrest

Unit V: ICU Protocols, Safety & Professional Practice 48hrs

- Infection control in ICU procedures
- Sedation, analgesia, and patient comfort
- Documentation and ICU protocols
- Ethical issues and end-of-life care
- Teamwork and communication in critical care

TOTAL HOURS-240HRS

Course Outcomes (COs):

CO 1: Demonstrate proficiency in advanced ICU procedures and patient management.
CO 2: Interpret clinical and monitoring data to support decision-making in critical care.
CO 3: Assist in invasive procedures such as intubation, central line insertion, and ABG analysis.
CO 4: Apply advanced life-support principles in emergency and ICU settings.
CO 5: Maintain safety, infection control, and professional standards in complex clinical situations.

Programme Specific Elective-I
Choice – 1

Emergency & Trauma Care

L	T	P	C
3	0	0	3

Course Description: This course provides comprehensive knowledge and skills required for the assessment and management of emergency and trauma patients. It focuses on pre-hospital and in-hospital emergency care, trauma assessment, resuscitation, and stabilization using standardized protocols to improve patient outcomes**.**

Course Objective:

At the end of the course, students should be able.

1. Understand the principles of emergency medical services and trauma care systems.
2. Perform rapid assessment and triage of critically ill and injured patients.
3. Apply primary and secondary survey techniques in trauma management.
4. Assist in resuscitation and stabilization of patients in emergency situations.
5. Demonstrate safe, ethical, and effective patient care in emergency and trauma settings.

UNIT -1 **9hrs**

Introduction to Emergency & Trauma Care and EMS Systems

- Concepts of emergency care and trauma systems
- Organization of Emergency Medical Services (EMS)
- Pre-hospital care and ambulance services
- Roles and responsibilities of emergency care professionals
- Triage systems (START, SALT triage)
- Disaster management and mass casualty incidents
- Legal and ethical aspects in emergency care
- Communication and coordination in emergency services

UNIT -2 **9hrs**

Primary Survey & Initial Resuscitation (ABCDE Approach)

- Primary survey — Airway, Breathing, Circulation, Disability, Exposure
- Airway management — basic and advanced techniques
- Oxygen therapy and ventilation support
- Circulatory assessment — shock recognition and control of bleeding
- Disability assessment — GCS and neurological status
- Exposure and environmental control (hypothermia prevention)
- Basic Life Support (BLS) and introduction to Advanced Life Support
- Initial resuscitation and stabilization protocols

UNIT -3 Advanced Cardiac Life Support (ACLS) 9hrs

Cardiac arrest rhythms — VF, pulseless VT, PEA, asystole; ACLS algorithm — 2-min CPR cycles, analysis, defibrillation (200 J), drug administration; Adrenaline 1 mg IV every 3–5 min; Amiodarone 300 mg IV (refractory VF/VT); Antiarrhythmics post-defibrillation; Reversible causes — 4Hs and 4Ts (Hypoxia, Hypovolaemia, Hypothermia, Hypo/Hyperkalaemia; Tension pneumothorax, Tamponade, Toxins, Thrombosis); Peri-arrest: bradycardia algorithm, tachycardia algorithm (stable vs unstable), AF management; Post-ROSC care — 12-lead ECG, cath lab activation, targeted temperature management (TTM) 33–36°C (72 hrs), avoid hyperoxia (SpO2 94–98%), BP target MAP ≥65; ECPR (ECMO-CPR) — criteria and activation; Termination of resuscitation criteria; Family witnessed resuscitation

UNIT -4 ATLS & Trauma Resuscitation 9hrs

ATLS Primary Survey — ABCDE: A (Airway with c-spine control), B (Breathing and ventilation), C (Circulation with haemorrhage control), D (Disability: GCS, pupils), E (Exposure: undress and environment); Life-threatening chest injuries — tension pneumothorax (needle decompression — 2nd ICS MCL), open chest wound (3-sided occlusive dressing), massive haemothorax (ICD), flail chest (intubation criteria), cardiac tamponade (pericardiocentesis or thoracotomy); Massive transfusion protocol (MTP) — ratio 1:1:1 (PRBC:FFP:platelets), TXA (tranexamic acid 1 g IV within 3 hrs — CRASH-2),

permissive hypotension (target SBP 80–90 until haemostasis); FAST exam; Secondary survey — head-to-toe examination; Specific injuries: TBI, spinal cord, abdominal trauma, pelvic fractures; Damage control surgery and resuscitation principles; Paediatric trauma — ATLS paediatric modifications

UNIT -5 Airway Emergencies & RSI - 9hrs

Airway assessment — LEMON (Look, Evaluate, Mallampati, Obstruction, Neck); Difficult airway management — DAS/ASA difficult airway algorithm; RSI technique — optimisation, pre-oxygenation (BVM or HFNC); Pre-treatment drugs; Induction: propofol (1–2 mg/kg) or ketamine (1.5 mg/kg — haemodynamically unstable); NMBAs: succinylcholine (1.5 mg/kg — avoid in burns >48 hrs, hyperkalaemia, denervation) or rocuronium (1.2 mg/kg); Sellick's manoeuvre — evidence review; Intubation: laryngoscope (Macintosh, Miller), video laryngoscope (McGrath, C-MAC, Glidescope); Tube placement confirmation — capnography, bilateral breath sounds; Failed intubation

Total Hrs: 45hrs

Course Outcomes:

By the end of this course, students will be able to:

1. Apply ACLS algorithms for cardiac arrest, peri-arrest arrhythmias and post-ROSC care in simulated scenarios
2. Perform primary and secondary survey using ATLS principles for trauma patients.
3. Manage airway emergencies — RSI, cricothyroidotomy, surgical airway — in simulation
4. Coordinate team roles during resuscitation using CRM (Crew Resource Management) principles
5. Apply toxicology management principles for common ICU poisonings and overdoses

Text Book:

- Emergency Care and Transportation of the Sick and Injured
- Basic Emergency Care: Approach to the Acutely Ill and Injured

Choice – 2

ICU Simulation Skills

L	T	P	C
3	0	0	3

Course Description: This course focuses on the development of clinical competencies through simulation-based training in intensive care settings. It utilizes high-fidelity simulators and scenario-based learning to enhance critical thinking, decision-making, teamwork, and technical skills required for managing critically ill patients in a safe and controlled environment.

Course Objective:

At the end of the course, students should be able.

1. Develop clinical skills through simulation-based training in ICU scenarios.
2. Enhance critical thinking and decision-making in emergency and critical care situations.
3. Practice teamwork, communication, and leadership in simulated ICU environments.
4. Apply theoretical knowledge to manage simulated critical care cases effectively.
5. Improve patient safety by identifying and minimizing errors through simulation practice.

UNIT -1 Procedure Simulation **9hrs**

Ventilator setup from scratch (full pre-use check, circuit assembly, parameter setting) on high-fidelity simulator; ABG sampling on radial artery simulator (Allen's test, needle technique, air bubble expulsion); Transducer setup (zeroing, square-wave test, troubleshoot damped waveform); CRRT circuit priming (Prismaflex simulator or wet-lab model); Infusion pump programming — vasoactive drugs (norepinephrine, dopamine); SpO2 probe rotation and documentation; Scenario: ventilator alarm cascade response (ETT obstruction → suction → chest assessment → physician communication)

UNIT -2 Teamwork & Communication Simulation **9hrs**

Team-based simulation: ICU deteriorating patient — respiratory distress with SpO2 decline; Roles: CCT practitioner, nurse, physician; Closed-loop communication; Situational awareness; SBAR report to intensivist; Simulation: cardiac arrest in ventilated patient — team

CPR, ventilation, defibrillation assistance; Simulation: CRRT circuit clotting — alarm response, filter change decision; Debriefing with video playback; Self-reflection after each scenario; Performance feedback from faculty; Portfolio entry for simulation logbook

UNIT -3 Supervised Skills
Consolidation
Extended supervised practice in ICU monitoring (vital signs, invasive pressure reading); ventilator circuit management; infusion pump programming; closed suction practice; ABG sample handling (from collection to analyser

UNIT -4 **9hrs**

ICU chart documentation; handover practice; reflective journal; self-assessment competency grid completion; remediation of any DOPS gaps from BCCT206

UNIT -5 **9hrs**
Debriefing, Evaluation & Patient Safety in Simulation
Principles of simulation-based learning and debriefing techniques, Structured debriefing models (e.g., plus-delta, advocacy–inquiry), Performance assessment and feedback methods (OSCE, checklists), Identification of errors and clinical decision-making gaps, Crisis resource management (CRM) — teamwork, leadership, communication, Patient safety concepts and error prevention strategies, Documentation and reporting in simulated scenarios, Reflective learning and continuous skill improvement

Total Hrs: 45hrs

Course Outcomes:

By the end of this course, students will be able to:

1. Consolidate basic ICU monitoring and ventilator circuit skills through additional supervised practice sessions
2. Perform a self-directed observation of a clinical scenario and present findings with reflective analysis

Text Book:

- Simulation in EMS and Critical Care Transport

CHOICE 3

Renal Replacement Therapy (Intro)

Course Description: This course introduces the fundamental principles of renal replacement therapy (RRT) used in the management of acute and chronic kidney failure in critical care settings. It covers basic concepts of dialysis modalities, indications, equipment, and patient monitoring, enabling students to understand the role of RRT in maintaining fluid, electrolyte, and metabolic balance.

Cpurse Objective:

1. Understand the basic physiology of renal function and indications for renal replacement therapy.
2. Describe different modalities of RRT, including hemodialysis, peritoneal dialysis, and continuous renal replacement therapy (CRRT).
3. Identify the components and functioning of dialysis equipment and circuits.
4. Monitor patients undergoing RRT and recognize common complications.
5. Apply infection control and safety practices during renal replacement procedures.

UNIT 1- INtrodcution of Renal Replacemnt therapy

UNIT 2 AKI & RRT Indications 9hrs

KDIGO AKI staging — Stage 1 (1.5× Cr), Stage 2 (2× Cr), Stage 3 (3× Cr or 6.5), Intoxication, Overload (fluid refractory), Uraemia (uraemic pericarditis, encephalopathy); Non-urgent indications — Stage 3 AKI with oliguria; Contraindications — no absolute; Goals of RRT — solute clearance, fluid removal, acid-base correction; Timing of RRT — early vs late (IDEAL-ICU, STARRT-AKI trials data)

UNIT 3 RRT Modalities & Technical Components 9hrs

Intermittent Haemodialysis (IHD) — diffusion principle, 3–4 hr sessions, rapid solute and fluid removal, haemodynamic instability risk; CRRT (Continuous RRT) — 24-hr therapy, haemodynamically stable, modalities: CVVH (convection — haemofilter), CVVHD (diffusion — dialyser), CVVHDF (combined — haemodiafiltration), SLED/SLEDD (Slow Low-Efficiency Dialysis/Diafiltration — hybrid); Peritoneal dialysis (PD) — overview, paediatric ICU use; CRRT dose — effluent rate 20–25 ml/kg/hr (post-dilution); Vascular access — Quinton Mahurkar catheter (jugular first choice), subclavian (avoid), femoral; CRRT machine — Prismaflex, Aquarius, Infomed HF440 — components: blood pump, effluent pump,

replacement fluid pump, weighing system; CRRT filter membrane — polyacrylonitrile, polysulphone, polyethersulphone.

UNIT 4 CRRT Circuit Setup & Anticoagulation 9hrs

Prismaflex CRRT circuit assembly — blood tubing set, haemofilter, effluent bag, replacement fluid bag; Priming procedure — 2000 ml saline flush; Access catheter flushing and aspiration; Connection to patient — aseptic technique; Anticoagulation options — regional citrate anticoagulation (RCA): trisodium citrate infusion + calcium gluconate replacement (preferred for CRRT); UFH anticoagulation — PTT target 45–60 sec (systemic); Argatroban (HIT patients); No anticoagulation (high bleeding risk); Circuit troubleshooting — high TMP (clogged filter), access pressure alarms (kinked catheter, patient position), air detector alarm; CRRT downtime minimisation

UNIT 5 CRRT Monitoring, Fluid Balance & Documentation 9hrs

CRRT parameters monitoring — blood flow rate (200–300 ml/min), effluent rate, TMP (target <250 mmHg), access pressure, return pressure, filter lifespan; Fluid balance prescription — ultrafiltration rate to achieve target; Cumulative fluid balance tracking; Electrolyte replacement in CRRT — potassium, phosphate, magnesium; Drug dosing during CRRT — antimicrobials (vancomycin, meropenem dose adjustment); Nutritional implications (amino acid loss in CRRT effluent); Circuit lifespan extension — citrate management; CRRT flowsheet documentation; Transition from CRRT to IHD; Discontinuation criteria

COURSE OUTCOME-

1. Describe the principles, indications and contraindications of renal replacement therapy (RRT) in ICU acquired AKI
2. Explain the different RRT modalities — IHD, CRRT (CVVH, CVVHD, CVVHDF, SLED) — with their technical components
3. Set up a CRRT circuit under supervision; perform access flushing, filter priming and anticoagulation initiation
4. Monitor CRRT parameters — effluent rate, transmembrane pressure, access and return pressures — and identify alarm causes
5. Document CRRT sessions accurately; adjust fluid balance targets under senior clinician guidance

TOTAL HRS-45HRS

BOOKS:

- Textbook of Dialysis Therapy
- Replacement of Renal Function by Dialysis

VI Semester

APPLIED CRITICAL CARE (CASE SEMINARS)

L	T	P	C
3	1	0	4

Course Description: This course focuses on the application of critical care knowledge through case-based seminars and discussions. It enhances clinical reasoning, decision-making, and problem-solving skills by analyzing real-life ICU scenarios, integrating multidisciplinary approaches, and applying evidence-based management strategies.

Course Objective:

At the end of the course, students should be able.

1. Apply theoretical knowledge to analyze and manage real-life critical care cases.
2. Develop clinical reasoning and decision-making skills through case discussions.
3. Interpret clinical data including ABG, ECG, imaging, and laboratory findings.
4. Integrate multidisciplinary approaches in managing critically ill patients.
5. Enhance communication, presentation, and teamwork skills in clinical settings.

UNIT-1 Complex Case Analysis 12hrs

5 structured case seminars on complex ICU scenarios: (1) MODS in septic shock — organ support prioritisation; (2) Refractory ARDS — ECMO criteria and management; (3) Cardiogenic shock complicating MI — MCS options; (4) Difficult weaning — CINMA, cardiac weaning failure, diaphragm dysfunction; (5) Multi-drug resistant infection in ICU — targeted antibiotic therapy, source control; Each case: pre-seminar reading assignment; seminar discussion (Socratic method); management plan development; faculty facilitated debrief; peer critique

UNIT-2 Evidence-Based Practice Application 12hrs

3 tutorials: (1) critical appraisal of landmark ICU trials (ARDSNet, PROSEVA, ARISE, ProCESS, IDEAL-ICU); (2) applying Surviving Sepsis Campaign guidelines to a case; (3) clinical prediction rules in ICU — SOFA trajectory, APACHE-II limitations; Bayesian reasoning at the bedside; GRADE evidence assessment; Clinical practice guideline interpretation; Choosing Wisely in ICU — evidence for common interventions (albumin, steroids, selenium); Evidence gaps in critical care.

UNIT-3 **12hrs**

Cardiovascular & Hemodynamic Case Discussions

- Case discussions on shock (cardiogenic, septic, hypovolemic)

- Acute coronary syndrome and arrhythmia cases
- Hemodynamic monitoring interpretation (MAP, CVP, CO)
- Use of vasoactive drugs and fluid management
- Case-based approach to cardiac emergencies

UNIT-4 **12hrs**

Neurological & Trauma Case Discussions

- Traumatic brain injury and stroke cases
- Raised intracranial pressure (ICP) management
- Seizures and status epilepticus
- Neuro-monitoring and GCS-based decision-making
- Polytrauma case discussions

UNIT-5 **12hrs**

Multisystem ICU Cases & Ethical Decision-Making Sepsis and septic shock case discussions

- Multi-organ dysfunction syndrome (MODS)
- Renal failure and RRT case scenarios
- Ventilator management and ARDS cases
- Ethical dilemmas in ICU — end-of-life care, DNR, consent
- Case presentations with evidence-based management plans

Total Hrs: 60hrs

Course Outcomes:

By the end of this course, students will be able to:

1. Critically analyse complex ICU cases integrating pathophysiology, monitoring data, pharmacotherapy and clinical guidelines
2. Develop evidence-based management plans for challenging ICU scenarios — multi-organ failure, refractory shock, difficult weaning
3. Evaluate the quality of clinical evidence and apply it to bedside ICU decision-making
4. Reflect on personal clinical reasoning using structured self-assessment and peer feedback frameworks

ICU LAWS , ETHICS & ACCREDITATION

L	T	P	C
3	1	0	4

Course Description: This course provides an understanding of the legal, ethical, and regulatory frameworks governing intensive care practice. It covers medico-legal aspects, patient rights, ethical decision-making, and accreditation standards such as NABH and JCI, enabling students to ensure safe, compliant, and patient-centered care in ICU settings.

Course Objective:

At the end of the course, students should be able.

1. Understand legal principles and medico-legal responsibilities in ICU practice.
2. Apply ethical principles in clinical decision-making, including end-of-life care.
3. Identify patient rights, consent procedures, and confidentiality requirements.
4. Understand accreditation standards (NABH, JCI) and quality indicators in ICU.
5. Ensure compliance with laws, ethical guidelines, and safety protocols in critical care settings

UNIT-1 Medicolegal Aspects of ICU **12hrs**

- ✓ Medical negligence — Indian Consumer Protection Act 2019, Supreme Court judgements (Jacob Mathew case); MLC case documentation — injuries, assault, poisoning, RTA; Dying declaration — conditions and evidentiary value; Post-mortem request in ICU deaths; Coroner's inquest; Organ donation law — THOA 1994, 2011 amendment, brain death certification (Form 8, 9, 10), near-relative consent; DNR/DNAR orders — legal status in India, documentation; Advance directives (Living Will) — Supreme Court 2018 judgement; Withdrawal of treatment — ATS/ACCP ethics consensus; Mental Healthcare Act 2017; Rights of unconscious patient; Confidentiality and medical records in ICU; Pharmacy laws for ICU controlled substances — Narcotics and Psychotropic Substances Act 1985; NABH documentation standards as legal defence

UNIT-2 Accreditation & Compliance **12hrs**

NABH 5th Edition — hospital accreditation process; ICU-specific chapters: COP (Care of Patients), IPC (Infection Prevention & Control), MOM (Management of Medications), FMS (Facility Management & Safety); Document management — policy, procedure, SOP hierarchy; Version control; Staff education and training documentation; Patient safety goals

documentation; Internal audit methodology — planning, conduct, reporting, CAPA; External assessment — timeline, assessor interaction, response to findings; JCI Standards overview (international comparison); NABL ISO 15189 for ICU POCT laboratory; ISO 9001 quality management; Accreditation maintenance — surveillance visits, renewal

UNIT-3 **12hrs**

Ethical Principles & Decision-Making in ICU

- Principles of medical ethics — autonomy, beneficence, non-maleficence, justice
- Ethical dilemmas in ICU settings
- End-of-life care — DNR, withdrawal and withholding of life support
- Brain death criteria and organ donation ethics
- Informed consent and surrogate decision-making
- Palliative care in critical care settings

UNIT-4 **12hrs**

Medico-Legal Aspects in Critical Care

- Legal responsibilities of healthcare professionals
- Medical negligence and malpractice in ICU
- Documentation and medico-legal records
- Consent laws and patient rights
- Confidentiality and data protection
- Handling medico-legal cases (MLC) in ICU

UNIT-5 **12hrs**

Accreditation & Quality Standards in ICU

- Overview of accreditation systems — National Accreditation Board for Hospitals & Healthcare Providers and Joint Commission International
- ICU-specific standards — patient care, safety, infection control
- Quality indicators in ICU — mortality, infection rates, length of stay
- Audit processes and quality improvement cycles (PDCA)
- Risk management and patient safety programs
- Documentation, SOPs, and policy implementation

Course Outcomes

Total Hrs: 60hrs

By the end of this course, students will be able to:

1. Describe key medicolegal aspects of ICU practice — MLC cases, organ donation, DNR, consent law, negligence
2. Explain NABH/JCI accreditation processes relevant to ICU, including document management, audit and compliance
3. Apply legal, ethical and accreditation frameworks to ICU practice scenarios

FIRST AID AND EMERGENCY CARE

L	T	P	C
3	1	0	4

Course Description: This course provides fundamental knowledge and practical skills required to deliver immediate care in emergency situations. It focuses on initial assessment, life-saving interventions, and stabilization of patients before definitive medical care, ensuring effective response in pre-hospital and emergency settings.

Course Objective:

At the end of the course, students should be able.

1. Understand the principles and importance of first aid in emergency situations.
2. Perform initial assessment and provide basic life support in emergencies.
3. Manage common medical and trauma emergencies using first aid techniques.
4. Apply safe and effective patient handling and transportation methods.
5. Demonstrate ethical, legal, and safety considerations in emergency care.

UNIT-1 Advanced Cardiac Life Support (ACLS) 12hrs

Cardiac arrest rhythms — VF, pulseless VT, PEA, asystole; ACLS algorithm — 2-min CPR cycles, analysis, defibrillation (200 J), drug administration; Adrenaline 1 mg IV every 3–5 min; Amiodarone 300 mg IV (refractory VF/VT); Antiarrhythmics post-defibrillation; Reversible causes — 4Hs and 4Ts (Hypoxia, Hypovolaemia, Hypothermia, Hypo/Hyperkalaemia; Tension pneumothorax, Tamponade, Toxins, Thrombosis); Peri-arrest: bradycardia algorithm,

tachycardia algorithm (stable vs unstable), AF management; Post-ROSC care — 12-lead ECG, cath lab activation, targeted temperature management (TTM)
33–36°C (72 hrs), avoid hyperoxia (SpO2 94–98%), BP target MAP ≥65; ECPR (ECMO-CPR) — criteria and activation; Termination of resuscitation criteria; Family witnessed resuscitation

UNIT-2 ATLS & Trauma Resuscitation 12hrs

ATLS Primary Survey — ABCDE: A (Airway with c-spine control), B (Breathing and ventilation), C (Circulation with haemorrhage control), D (Disability: GCS, pupils), E (Exposure: undress and environment); Life-threatening chest injuries — tension pneumothorax (needle decompression — 2nd ICS MCL), open chest wound (3-sided occlusive dressing), massive haemothorax (ICD), flail chest (intubation criteria), cardiac tamponade (pericardiocentesis or thoracotomy); Massive transfusion protocol (MTP) — ratio 1:1:1 (PRBC:FFP:platelets), TXA (tranexamic acid 1 g IV within 3 hrs — CRASH-2), permissive hypotension (target SBP 80–90 until haemostasis); FAST exam; Secondary survey — head-to-toe examination; Specific injuries: TBI, spinal cord, abdominal trauma, pelvic fractures; Damage control surgery and resuscitation principles; Paediatric trauma — ATLS paediatric modifications

UNIT-3 Airway Emergencies & RSI - 12hrs

Airway assessment — LEMON (Look, Evaluate, Mallampati, Obstruction, Neck); Difficult airway management — DAS/ASA difficult airway algorithm; RSI technique — optimisation, pre-oxygenation (BVM or HFNC); Pre-treatment drugs; Induction: propofol (1–2 mg/kg) or ketamine (1.5 mg/kg — haemodynamically unstable); NMBAs: succinylcholine (1.5 mg/kg — avoid in burns >48 hrs, hyperkalaemia, denervation) or rocuronium (1.2 mg/kg); Sellick's manoeuvre — evidence review; Intubation: laryngoscope (Macintosh, Miller), video laryngoscope (McGrath, C-MAC, Glidescope); Tube placement confirmation — capnography, bilateral breath sounds; Failed intubation Airway assessment — LEMON (Look, Evaluate, Mallampati, Obstruction, Neck); Difficult airway management — DAS/ASA difficult airway algorithm; RSI technique — optimisation, pre-oxygenation (BVM or HFNC); Pre-treatment drugs; Induction: propofol (1–2 mg/kg) or ketamine (1.5 mg/kg — haemodynamically unstable); NMBAs: succinylcholine (1.5 mg/kg — avoid in burns >48 hrs, hyperkalaemia, denervation) or rocuronium (1.2 mg/kg); Sellick's manoeuvre — evidence review; Intubation:

laryngoscope (Macintosh, Miller), video laryngoscope (McGrath, C-MAC, Glidescope); Tube placement confirmation — capnography, bilateral breath sounds; Failed intubation

UNIT-4 Toxicology in ICU
12hrs

- ✓ Approach to poisoning — history, GCS, pupils, skin, temperature (toxidrome recognition); Toxidromes: anticholinergic (hot, dry, mad, fast, red), cholinergic (SLUDGE: salivation, lacrimation, urination, defaecation, GI, emesis), opioid (miosis, RR, sedation), sympathomimetic (mydriasis, HTN, tachycardia); Specific antidotes — naloxone (opioid), flumazenil (benzodiazepine — caution), physostigmine (anticholinergic), atropine (organophosphate), pralidoxime (2-PAM — organophosphate), N-acetylcysteine (paracetamol), digoxin-specific antibody Fab, fomepizole (methanol, ethylene glycol); Decontamination — activated charcoal (within 1 hr, no altered consciousness), gastric lavage (limited indications); Haemodialysis for toxic removal — lithium, salicylates, methanol; Organophosphate poisoning — Indian context (agricultural).

UNIT-5 **12hrs**

Special Emergencies & Disaster Management

- Management of burns, electrocution, and chemical injuries
- Poisoning and overdose — first aid management
- Environmental emergencies — heat stroke, hypothermia, drowning
- Bites and stings — snakebite, insect bites, animal bites
- Obstetric and pediatric emergencies (basic first aid)
- Disaster management — principles, triage, mass casualty handling
- Psychological first aid and crowd management
- Transportation of patients and scene safety

Course Outcomes:

Total hrs: 60hrs

By the end of this course, students will be able to:

1. Apply ACLS algorithms for cardiac arrest, peri-arrest arrhythmias and post-ROSC care in simulated scenarios
2. Perform primary and secondary survey using ATLS principles for trauma patients

3. : Manage airway emergencies — RSI, cricothyroidotomy, surgical airway — in simulation
4. Coordinate team roles during resuscitation using CRM (Crew Resource Management) principles
5. Apply toxicology management principles for common ICU poisonings and overdoses

CLINICAL SKILLS - IV

L	T	P	C
0	0	16	8

Course Description: This course focuses on advanced and independent clinical practice in critical care settings. It emphasizes comprehensive patient management, advanced procedures, integration of multidisciplinary care, and clinical decision-making in complex ICU scenarios, preparing students for professional practice.

Course Objective:

At the end of the course, students should be able.

1. Develop advanced competency in independent management of critically ill patients.
2. Integrate clinical findings, monitoring data, and investigations for decision-making.
3. Perform and assist in advanced ICU procedures and interventions.
4. Apply evidence-based protocols in managing complex critical care cases.
5. Demonstrate leadership, teamwork, and professional responsibility in ICU settings.

Unit-1 **48hrs**

Advanced Clinical Assessment & Decision-Making
Comprehensive ICU patient evaluation
Interpretation of ABG, ECG, imaging, and laboratory data
Clinical reasoning and decision-making in complex cases
Early identification of deterioration and escalation of care

Unit-2 **48hrs**

Advanced Airway, Ventilation & Respiratory Care
Advanced airway management and intubation assistance
Mechanical ventilation modes and settings
Ventilator troubleshooting and waveform analysis
Weaning strategies and extubation protocols

Unit-3 **48hrs**

Advanced Hemodynamic Monitoring & Support
Invasive monitoring — arterial line, CVP, cardiac output
Interpretation of hemodynamic parameters (MAP, SVR, CI)
Shock management and fluid therapy

Use of inotropes and vasopressors

Unit-4 **48hrs**

Critical Care Procedures & Emergency Management

Central line and arterial line assistance

Defibrillation, cardioversion, and pacing

Advanced Cardiac Life Support (ACLS)

Management of cardiac arrest and multi-organ failure

Unit-5 **48hrs**

ICU Management, Ethics & Professional Practice

ICU protocols and multidisciplinary coordination

Infection control and patient safety in advanced care

Ethical issues and end-of-life care

Documentation, reporting, and legal aspects

Leadership and team management in ICU

Total Hrs: 240hrs

Course Outcomes:

By the end of this course, students will be able to:

1. Independently assess and manage critically ill patients in ICU settings.
2. Interpret advanced monitoring data and clinical investigations accurately.
3. Assist and perform advanced invasive procedures safely.
4. Apply advanced life support and critical care protocols in emergencies.
5. Demonstrate professionalism, communication, and leadership in multidisciplinary care.

Programme Specific Elective-II
Choice - 1

RESEARCH METHODS & BIOSTATICS

L	T	P	C
3	0	0	3

Course Description: This course introduces the fundamental concepts of research methodology and biostatistics in healthcare. It focuses on study design, data collection, statistical analysis, and interpretation of results, enabling students to conduct research, critically appraise scientific literature, and apply evidence-based practices in clinical settings.

Course Objective:

At the end of the course, students should be able.

1. Understand the basic principles and types of research in healthcare.
2. Design research studies, including formulation of research questions and hypotheses.
3. Apply statistical methods for data analysis and interpretation.
4. Interpret research findings and critically evaluate scientific literature.
5. Apply ethical principles and guidelines in conducting research.

UNIT -1 Research Foundations & Study Design
9hrs

Research question formulation — PICO framework (Population, Intervention, Comparison, Outcome); Hypothesis — null and alternative; Types of variables — independent, dependent, confounding; Study designs — experimental (RCT, crossover), observational (cohort, case-control, cross-sectional, ecological); Systematic review and meta-analysis; Case series and case reports; Clinical audit vs research; Evidence-based medicine hierarchy (Oxford CEBM); Critical appraisal tools — CONSORT 2010 (RCT), STROBE (observational), PRISMA (systematic review); Literature search — PubMed, Cochrane, EMBASE, Google Scholar; MeSH terms; Reference management (Zotero, Mendeley)

UNIT -2 Biostatistics **9hrs**

Types of data — nominal, ordinal, interval, ratio; Descriptive statistics — mean, median, mode, SD, IQR, range, percentiles; Frequency distribution, histogram, box plot; Normal distribution — properties, Zscores; Inferential statistics; Hypothesis testing — Type I (α) and Type II (β) errors, p-value interpretation; Confidence interval; Sample size calculation — effect size, power (80%), alpha (0.05); Parametric tests — independent t-test, paired t-test, ANOVA, Pearson correlation; Non-parametric tests — Mann-Whitney U, Wilcoxon, Kruskal-Wallis,

Spearman rank, Chi-square, Fisher exact; Survival analysis — Kaplan Meier curves, log-rank test, Cox regression; Logistic regression — odds ratio, 95% CI; Diagnostic test statistics — sensitivity, specificity, PPV, NPV, ROC-AUC; NNT and NNH

UNIT -3 Research Ethics & Methodology **9hrs**

ICMR National Ethical Guidelines 2017; Helsinki Declaration; Institutional Ethics Committee — structure, submission, approval process; Informed consent in research — waiver of consent (retrospective, MCI); Privacy and confidentiality; Data protection — DPDP Act 2023; Randomisation and allocation concealment; Blinding — open, single, double; Intention-to-treat vs per-protocol analysis; Bias types — selection, information, confounding; Measurement tools — validated scales, reliability (Cronbach alpha), validity; Plagiarism and research misconduct; Predatory journals — Beall's list awareness

UNIT -4 Data Collection, Analysis & Reporting 9hrs

Data collection tools — paper CRF, REDCap, ODK; Data entry, cleaning and validation; SPSS/R/Excel — hands-on practical; Data presentation — tables, figures, graphs (ICU context); Interpreting forest plots; Systematic review methodology; Manuscript structure — IMRaD (Introduction, Methods, Results, Discussion); Abstract types — structured, unstructured; Poster presentation — content and design; Oral presentation skills; Journal submission process; Peer review process; Quality improvement tools — PDSA, run chart, control chart, fishbone; ICU QI project design and reporting (SQUIRE 2.0)

UNIT -5 **9hrs**

Advanced Research Applications & Evidence-Based Practice

Evidence-based practice (EBP) — integration of clinical expertise, patient values, and best evidence

Clinical guidelines — development, appraisal (AGREE II tool), implementation in ICU

Translational research — bench to bedside concept

Health technology assessment (HTA) and cost-effectiveness analysis

Big data and artificial intelligence in healthcare research

Registry-based research and real-world evidence (RWE)

Grant writing and research funding basics

Research dissemination — conferences, indexing, citation metrics (h-index, impact factor)

Critical appraisal of ICU research articles (journal club)

Total Hrs: 45hrs

Course Outcomes:

By the end of this course, students will be able to:

1. Define research concepts — research question, hypothesis, study design, variables — and explain evidence-based practice in critical care
2. Select appropriate study designs (RCT, cohort, case-control, cross-sectional, systematic review) for ICU research questions
3. Apply biostatistical methods — descriptive statistics, confidence intervals, hypothesis testing, regression — using SPSS/R/Excel
4. Critically appraise published ICU research using CONSORT, STROBE, PRISMA frameworks
5. Develop an ICU-relevant research protocol and present findings following ethical guidelines

Text Book:

- C KOTHARI-Research methodology

Choice – 2

ENTREPRENEURSHIP & HEALTHCARE INNOVATION

L	T	P	C
3	0	0	3

Course Description: This course introduces the principles of entrepreneurship and innovation in the healthcare sector. It focuses on identifying healthcare problems, developing innovative solutions, business planning, and understanding healthcare systems, enabling students to create sustainable and impactful healthcare ventures.

Course Objective:

At the end of the course, students should be able.

1. Understand the fundamentals of entrepreneurship and innovation in healthcare.
2. Identify unmet clinical needs and develop innovative healthcare solutions.
3. Apply basic business concepts including business models, marketing, and financial planning.
4. Explore healthcare startups, digital health technologies, and emerging trends.
5. Develop skills in leadership, problem-solving, and strategic decision-making for healthcare ventures.

UNIT -1 Entrepreneurship Fundamentals & Health Ecosystem **9hrs**

Definitions — entrepreneur, intrapreneur, social entrepreneur; Entrepreneurial mindset — risk tolerance, innovation orientation; Healthcare startup ecosystem in India — NITI Aayog, Startup India, BIRAC, AIC; Incubators and accelerators — AIC-AIIMS, T-Hub, CIIE; Health technology innovation — MedTech, HealthIT, AI in healthcare; Regulatory pathway for medical devices in India — CDSCO Class A, B, C, D devices; IP basics — patents, trademarks, copyrights; Unicorn health startups in India — Practo, PharmEasy, Niramai, SigTuple

UNIT -2 Business Model & Market Analysis 9hrs

Business Model Canvas — 9 building blocks; Value proposition design — patient/provider jobs, pains, gains; Market segmentation — B2B (hospital), B2C (patient), B2G (government); Total addressable market (TAM), SAM, SOM; Competitive analysis — SWOT, Porter's Five Forces; Pricing strategies for healthcare; Unit economics — CAC, LTV, burn rate; Break-even analysis; Pitching to investors — elevator pitch, investor deck structure; Funding stages — bootstrapping, angel, seed, Series A; Government schemes — PMKSY, MSME support

UNIT -3 Design Thinking & Innovation **9hrs**

Design thinking process — Empathise, Define, Ideate, Prototype, Test (Stanford d.school); Empathy maps and user personas for ICU patients/caregivers; Problem statement formulation; Brainstorming techniques — mind mapping, SCAMPER, six thinking hats; Prototyping — paper, digital mockup; Usability testing in ICU context; Lean startup — MVP (Minimum Viable Product) concept; Agile methodology overview; Social innovation — rural critical care access; Frugal innovation (Jugaad); ICU workflow improvement projects as innovation examples

UNIT -4 Innovation Proposal & Presentation (7 **9hrs**

ICU problem identification — current gaps (monitoring, communication, infection control, CRRT, weaning); Innovation proposal components — problem, solution, target user, impact, feasibility; Team building for innovation; Grant writing basics — BIRAC SBIRI, DBT grant structure; Healthcare incubation application process; Intellectual property strategy; Regulatory submission timeline for medical devices; Ethics of healthcare innovation — patient data, AI bias; Social entrepreneurship — access to critical care in Tier 2/3 cities

UNIT -5 **9hrs**

Healthcare Startup Implementation, Scaling & Sustainability
Startup execution — from prototype to market launch

Go-to-market strategy — pilot testing, hospital partnerships, adoption pathways
Regulatory compliance and clinical validation in healthcare products
Quality assurance and patient safety in innovation deployment
Digital health implementation — telemedicine, remote monitoring, AI tools
Scaling strategies — expansion, partnerships, franchising, platform models
Financial management — revenue models, cost control, sustainability planning
Healthcare entrepreneurship challenges — regulatory, ethical, operational barriers
Case studies of successful healthcare startups (India & global)
Exit strategies — acquisition, merger, IPO

Total Hrs: 45hrs

Course Outcomes:

By the end of this course, students will be able to:

1. Describe entrepreneurship concepts, healthcare startup ecosystem in India and global trends in health technology innovation
2. Explain business model development, value proposition design and market analysis for health products and services
3. Develop a basic business plan or innovation proposal for a critical care-related product, service or process
4. Apply design thinking methodology to identify and solve problems in ICU workflow or patient care

Text Book:

- The Business of Healthcare Innovation
- Entrepreneurship and Professional Management for Paramedical Students

PUBLIC HEALTH & EMERGENCY CARE

L	T	P	C
3	0	0	3

Course Description: This course focuses on the principles of public health and their application in emergency care settings. It covers disease prevention, health promotion, epidemiology, disaster management, and the organization of emergency medical services, enabling students to respond effectively to public health emergencies and mass casualty incidents

Course Objective:

At the end of the course, students should be able

1. Understand the basic concepts of public health, epidemiology, and disease prevention.
2. Identify and manage public health emergencies and outbreaks.
3. Apply principles of disaster management and mass casualty handling.
4. Understand the structure and functioning of emergency medical services (EMS).
5. Promote community health, safety, and preventive strategies in emergency care.

UNIT-1 Epidemiology of Critical Illness in India
9 hrs

Burden of critical illness in India — ICU admission diagnoses; Incidence of ARDS, sepsis, ALF in India; ICU mortality rates (Indian ICU Collaborative data); Social determinants of health affecting critical illness; Non-communicable diseases — cardiovascular disease, diabetes, COPD burden; Communicable diseases — sepsis from malaria, leptospirosis, dengue (Indian context); Malnutrition and critical illness; ISCCM Intensive Care Survey data; National Health Mission targets; Universal Health Coverage and Ayushman Bharat

UNIT-2 Prevention & Public Health in Critical Care
9 hrs

Primary prevention — cardiovascular risk factor modification, vaccination (pneumococcal, influenza, meningococcal); Secondary prevention — early recognition of sepsis (qSOFA in community), thrombolysis access for STEMI; Tertiary prevention — ICU rehabilitation, post-ICU syndrome (PICS) — cognitive, physical, psychological; Post-ICU follow-up clinic; Telemedicine for rural critical care access; Road traffic accident prevention; Drowning prevention; National Organ and Tissue Transplant Organisation (NOTTO) —
donation rates in India

UNIT-3 Emergency Medical Services in India

EMS systems in India — 108 ambulance service, national EMS policy; Pre-hospital care — ABCDE assessment, oxygen administration, IV access; Triage — hospital triage (Manchester Triage System, Australasian Triage Scale); START triage — for field MCI; SALT triage — Sort, Assess, Lifesaving interventions, Treatment/transport; Golden hour concept; ATLS (Advanced Trauma Life Support) overview; Role of CCT practitioner in emergency department; ED to ICU transfer protocol; Code blue team activation and response

UNIT 4 Disaster Management & Pandemic Preparedness
9 hrs

Disaster types — natural (flood, earthquake, cyclone), man-made (industrial, bioterrorism), pandemic; Hospital Incident Command System (HICS); ICU surge capacity — contingency and crisis standard of care; Crisis standards of care — triage of limited resources; Mass casualty incident (MCI) — ICU activation plan; Pandemic preparedness — COVID-19 lessons (PPE, cohorting, ventilator sharing debates); Bioterrorism agents — recognition and ICU management; National Disaster Management Act 2005; NDRF; SDMA and hospital disaster preparedness

UNIT-5 **9 hrs**

Public Health Surveillance, Policy & Health Systems Strengthening

- Public health surveillance systems — IDSP (Integrated Disease Surveillance Programme), real-time reporting and outbreak detection
- Screening programs in India — NPCDCS (NCD screening), TB, HIV, maternal and child health
- Health policies and programs — National Health Policy, Ayushman Bharat, Health & Wellness Centres
- Health systems strengthening — primary, secondary, tertiary care integration
- Referral systems and continuum of care — community to ICU pathway
- Health economics — cost of critical care, insurance models, government schemes
- Role of public–private partnerships (PPP) in emergency and critical care
- Quality indicators in public health and emergency care
- Community awareness and health education strategies

Total Hrs: 45 hrs

COURSE OUTCOMES:

By the end of this course, students will be able to

1. Describe epidemiology of critical illness — incidence, prevalence, mortality of ICU conditions in India and globally
2. Explain public health concepts — primary, secondary and tertiary prevention — with relevance to critical care conditions
3. Describe emergency medical services (EMS) system in India, pre-hospital care, triage and disaster management

4. Apply mass casualty incident (MCI) triage protocols (START, SALT) and ICU surge capacity planning principles

TEXT BOOK-

- Handbook of emergency medicine

VII & VIII SEMESTER SYLLABUS

Internship Guidelines

Effective from 2026 Admitted Batch

DESCRIPTION

The internship for BSc Allied Health Science spans one year, providing students with extensive practical training across key departments of various Hospitals. This hands-on experience aims to develop confidence, proficiency, and advanced skills necessary for a career in Allied Health Sciences.

OBJECTIVES

- **Skill Development:** Develop competence in beginning and intermediate clinical skills procedures relevant to respective departments.
- **Observational Learning:** Observe and understand advanced and specialized procedures in hospital settings.
- **Clinical Practice**: Apply theoretical knowledge gained in classrooms to practical settings, demonstrating proficiency in conducting invasive and noninvasive techniques.
- **Logbook Maintenance**: Maintain a detailed work logbook endorsed by supervisors or trainers, documenting daily activities and achievements during the internship.

GENERAL GUIDELINES

1. Every candidate, after passing the final semester exams (should not have any back papers), is required to undergo a compulsory rotatory internship for a period of 12 months (365 calendar days) to be eligible for the award of the degree.
2. Internship is in partial fulfilment of the requirements of the course, and no candidate shall be declared to have completed the course otherwise.
3. All parts of the internship shall be done in the teaching hospital under a National Medical Commission (NMC)/National Accreditation Board for Hospital and Healthcare Providers (NABH).
4. The interns should conduct themselves in a manner befitting the profession and should dress appropriately in their respective work areas.
5. Interns should complete postings in all specialties as decided by the department.
6. Students are eligible to commence internship from next month of completion of their end semester examination (6^{th} semester).
7. Each intern should maintain a logbook wherever he/she is posted. The intern has to get a signature from the supervising staff at the end of each posting.
8. Project work/ duties during the internship must be duly undertaken and performed.
9. A review meeting to assess the progress of the project and logbook will be conducted on the first Saturday of every third month. A detailed report on the progress must be submitted following each meeting.
10. The intern is allowed to take his internship from other than the parent institution, provided there is a NOC obtained from both the parent institution and the institution offering the internship. Dean has to permit the student for internship after verifying the NOC.

GUIDELINES FOR COMPLETION, LEAVE &REPETITION
COMPLETION

The internship shall be completed within months of passing the final semester examination whenever in force but not limited to.

LEAVE

- Normal Leave: Intern shall be permitted a maximum of 12 days leave with prior permission during the entire period of internship.
- The entire period of 12 days cannot be availed during any one-week / two-week postings applicable to a single department.

- Medical Leave: Medical leave shall be included within the 12 days of normal leave. Any medical leave beyond this period shall be recommended only by a duly constituted committee at the college level, which consists of the Dean, HOD, Supervisor and medical practitioner. The internship shall be extended if the leave of absence extends beyond this period**.**

Department	Role of RTT Internees
OP / IP	• perform oxygen delivery systems — cylinder safety, regulators, flowmeters • Administer oxygen therapy, humidification, and aerosol therapy • Conduct basic respiratory and cardiovascular assessment • Assist in bronchial hygiene therapy and medicated aerosol therapy • Perform incentive spirometry and basic pulmonary rehabilitation • Monitor patients on CPAP and BiPAP support
INPATIENT HOSPITAL	• Participate in clinical rounds and patient charting • Follow infection control and isolation protocols • Assist in procedures — ICD care, thoracocentesis, pleurodesis • Conduct 6-minute walk test (6MWT) and functional assessment • Monitor vital parameters and early signs of deterioration
Specialty Rotation GENERAL ICU / CRITICAL CARE ICU / NEURO ICU / CARDIAC ICU	Clinical Monitoring & Procedures Ventilation & Respiratory Support Airway Management Critical Care Skills
Specialty Rotations GENERAL ICU / CRITICAL CARE ICU / NEURO ICU / CARDIAC ICU	• Assist in neonatal resuscitation and newborn assessment • Identify and manage respiratory distress in neonates • Support care of high-risk infants and premature babies • Perform neonatal respiratory support (CPAP, oxygen therapy) • Assist in neonatal transport and stabilization

	• Monitor neonatal ventilator settings and parameters insertion, blood gas analysis and interpretation
Specialty Rotations GENERAL ICU / CRITICAL CARE ICU / NEURO ICU / CARDIAC ICU	Developing skills to initiate ventilators, monitoring, and management of ill patients.
Specialty Rotations GENERAL ICU / CRITICAL CARE ICU / NEURO ICU / CARDIAC ICU	Able to establish the Artificial airway care, suctioning, intubation and artificial airway management.
Specialty Rotations GENERAL ICU / CRITICAL CARE ICU	Able to perform other procedures performed in intensive care units.
Specialty Rotations NEONATAL ICU	Develop skills for Neonatal and Paediatric module covers respiratory care modalities and diagnostic procedures: the normal birth and assessment of the newborn.
Specialty Rotations NEONATAL ICU	Anticipating the high-risk infant, stabilization of the high-risk infant, evaluation of the high-risk infant, diseases that cause respiratory distress.
Specialty Rotations NEONATAL ICU	Developing skills for Respiratory care techniques and management in neonatal intensive care units.
Specialty Rotations NEONATAL ICU	Able to perform infant transport and other procedures performed in Neonatal and Paediatric intensive care units.
Diagnostic Labs	Pulmonary Function Testing (PFT Lab)

	Perform and assist in spirometry, lung volumes, and DLCO Interpret flow-volume loops, volume-time curves, MVV Ensure quality control and patient preparation.
Diagnostic Labs	Bronchoscopy / Thoracoscopy Support Assist in patient preparation (pre & post procedure) Prepare instruments, drugs, and monitoring equipment Maintain sterile technique during procedures
Diagnostic Labs	Sleep Lab (Polysomnography) Assist in sleep studies and monitoring Understand sleep-related breathing disorders (OSA, CSA) Interpret basic sleep study parameters

COMPETENCIES TO BE ACQUIRED DURING INTERNSHIP

1. **Clinical Assessment & Monitoring**

Perform comprehensive patient assessment (ABCDE approach)
Monitor vital signs and recognize early deterioration
Interpret ICU monitoring data (ECG, SpO_2, BP, CVP basics)
Assess neurological status (GCS, pupil reflex)

2. Respiratory Care & Ventilation

Administer oxygen therapy and aerosol therapy
Assist in airway management (intubation, suctioning, tracheostomy care)
Initiate and monitor mechanical ventilation (basic modes)
Perform ABG sampling and interpretation

3. Critical Care Procedures

Assist in invasive procedures (arterial line, central line, ICD care)
Perform basic bedside procedures under supervision
Maintain aseptic techniques during procedures
Assist in bronchoscopy and thoracocentesis

4. Emergency & Life Support Skills

Perform Basic Life Support (BLS) and assist in ACLS
Assist in defibrillation and cardioversion
Identify and manage shock and emergency conditions
Participate in code blue and rapid response teams

5. Infection Control & Patient Safety

Apply standard precautions and isolation techniques
Follow biomedical waste management protocols
Prevent healthcare-associated infections (HAIs)
Ensure patient safety during all procedures

6. ICU Equipment Handling

Operate monitors, ventilators, infusion pumps, defibrillators
Troubleshoot equipment alarms and malfunctions
Ensure proper maintenance and calibration awareness

7. Diagnostic & Laboratory Skills

Assist in PFT, ABG, and sleep studies
Interpret basic diagnostic reports
Prepare patients for diagnostic procedures

8. Communication & Teamwork

Communicate effectively with patients and relatives
Participate in multidisciplinary team discussions
Maintain accurate documentation and reporting

9. Professionalism & Ethics

Adhere to ethical and legal standards in patient care
Maintain confidentiality and informed consent
Demonstrate accountability and professional behavior

10. Clinical Decision-Making & Critical Thinking

Correlate clinical findings with investigations
Assist in developing patient care plans
Apply evidence-based practices in ICU care

ASSESSMENT PLAN

A Student wants to complete the project work in addition to an Internship.

Course Code :
Course Name : Internship-I

S. No.	Component of Assessment	Marks Allotted	Type of Assessment	Scheme of Evaluation

1	**Internship**	80	Continuous Evaluation	• Twenty (20) marks for review assessment. • Each review assessment will carry 20 marks. • A total of three review assessment will be held over 12 months, scheduled on the first Saturday of every third month. • The 20 marks for each review assessment will be distributed as follows: 5 marks for the logbook, 5 marks for the report, 5 marks for the presentation, and 5 marks for the viva. • 20 Marks for final Internship report submission.
2	**Final Assessment**	20	End Assessment	Twenty (20) marks • Final Presentation (10marks) • Viva-voce (10 marks)
	Total	**100**		

Course Code :
Course Name : Internship-II

S. No.	Component of Assessment	Marks Allotted	Type of Assessment	Scheme of Evaluation

1	**Internship**	80	Continuous Evaluation	• Twenty (20) marks for review assessment. • Each review assessment will carry 20 marks. • A total of three review assessment will be held over 12 months, scheduled on the first Saturday of every third month. • The 20 marks for each review assessment will be distributed as follows: 5 marks for the logbook, 5 marks for the report, 5 marks for the presentation, and 5 marks for the viva. • 20 Marks for final Internship report submission.
2	**Final Assessment**	20	End Assessment	Twenty (20) marks • Final Presentation (10marks) • Viva-voce (10 marks)
	Total	**100**		

Course Code :
Course Name : Project Work

S. No.	Component of Assessment	Marks Allotted	Type of Assessment	Scheme of Evaluation

1	**Project Work**	80	Continuous Evaluation	Continuous Assessment -80mark Project Planning and Proposal approval - 20 mark Project Execution - 20 mark Log Book- 20 mark Project Report - 20 mark
2	**Project Work/Dissertation**	20	Final Assessment	Twenty (20) marks • Final Presentation (10marks) • Viva-voce (10 marks)
	Total	**100**		

SEMESTER VII INTERNSHIP
Course Outcome:

1. To became a competent Allied Health science professional Engaged in Patient care
2. To learn the routine functioning of the health care system
3. To gain practical and clinical skills
4. To learn various difficulties in the field through valuable experience
5. To explore the broad field opportunities and engage in Specialization

SEMESTER VIII INTERNSHIP & PROJECT WORK
Course Outcome:

1. To conduct High quality Scientific research
2. Ability to apply the excellent theoretical knowledge gained in the Academic career
3. Pursue academic excellence through relevant research
4. To identify existing research gaps
5. Ability to engage in furtherance of the medical field.