YENEPOYA

(DEEMED TO BE UNIVERSITY)
Recognized under Sec 3(A) of the UGC Act 1956
Accredited by NAAC with 'A' Grade

YENEPOYA (DEEMED TO BE UNIVERSITY)

Deralakatte, Mangaluru -575018

REGULATIONS AND CURRICULUM GOVERNING

UNDERGRADUATE PROGRAM
B.Sc ANAESTHESIA IN OT TECHNOLOGY

(REVISED CURRICULUM – AMENDED UP TO 2020)

Structure of the program clearly indicating courses, credits/Electives

Ref. Page No. 9, 10, 11, 20-26

ATTESTED
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Ref: No. Y/REG/ACA/38-ACM/2020

14.05.2020

NOTIFICATION – 38-ACM/12 /2020 dtd. 14.05.2020

Sub: Revised curriculum of the existing B.Sc. (Tech) programmes and Starting of additional programmes under the Faculty of Allied and Healthcare Professions

Ref: Resolution of the Academic council at its 38th meeting held on 27.04.2020, vide agenda - 23

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The Academic Council at its 38th meeting held on 27.04.2020 and subsequently the Board of Management at its 49th meeting held on 30.04.2020 have resolved to approve the revised curricula and regulations of existing 08 B.Sc. Technology Programmes (Anaesthesia & O.T. Technology, Renal Dialysis Technology, Respiratory Care Technology, Medical Laboratory Technology, Medical Imaging Technology, Cardio Vascular Technology, Perfusion Technology, Optometry Technology) and starting of 04 new programmes under the Faculty of Allied & Healthcare Professions

1. B.Sc. in Physician Assistant
2. B.Sc. in Clinical Psychology
3. B.Sc. in Emergency Medicine Technology
4. B.Sc. in Neuro Science Technology

All these programmes shall follow Choice Based Credit System.

This notification will supersede all the earlier notifications issued on this subject.

REGISTRAR

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CC to:

1. Dean, Faculty of Allied and Healthcare Professions
2. Controller of Examinations
3. File copy

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Yenepoya (Deemed to be) University,

Regulations & programme curriculum for

B.Sc. Anaesthesia & Operation Theatre technology under Choice Based Credit System.

1. Preamble

Health care sector has become one of the largest employment generation sectors in India and abroad. Rapidly changing and expanding horizon of the health care sector demands formal training programs in all its allied areas. Advanced complex instrumentation & equipment require technologists not only to operate but also to care & maintain these instruments and equipment. These technologists should possess a strong scientific foundation to be able to perform these tasks at a much higher level than the traditionally trained technicians of the past used to perform. The students who are trained in the technological aspects of medical care with a good scientific foundation will be in a position to competently assist the Physician or Surgeon. Hence to prepare the students to meet the demands of the healthcare sector and in accordance with Ministry of Human Resource Development (HRD), Govt. of India education system, Choice based Credit system is introduced from the academic year 2020- 21 onwards.

Surgery plays a very important role in treatment of patients, since ancient times and a lot of diseases are cured by surgery or operation only. After the discovery of anaesthesia surgical procedure could be carried out without any agony to the patient. In an operation theatre, Anaesthetists, Surgeons, Nurses and the Technicians work together. A successful operation is a combined effort of all of them. So along with the skills of doctors and nurses, the skills of the technician also matters in a successful patient outcome. Hence, hospital needs a qualified and skilled Anaesthesia and OT technologist.

This program enables the understanding of the skills and professional attributes to become an Anaesthesia and OT technologist.

Choice based Credit System is a flexible system of learning. The distinguishing features of CBCS are following:

- It permits students to learn at their own pace.
- Choose Electives from a wide range of Elective courses offered by the other departments/university.
- Undergo additional courses acquire more than the required number of credits.
- Adopt an Inter-disciplinary and Intra-disciplinary approach in learning.

- Make best use of the available expertise of the faculty across the departments or disciplines.
- Has an inbuilt evaluation system to assess the analytical and creative skills of students in addition to the conventional domain knowledge assessment pattern.

2. Programme Outcome:

Upon successful completion of the undergraduate course, students will have developed a broad knowledge in the field of Anaesthesia and operation theatre technology.

In particular they will:

PO 1: To be a member of surgical team. Anaesthesia and OT technologist assists the anaesthetist and surgeon during the peri operative period, know the preparation and maintenance of anaesthesia equipment, anaesthesia delivery systems and monitoring equipment before, during and after anaesthesia administration, and should have knowledge about types of anaesthesia

PO 2: To know the preparation and maintenance of operation theatre equipment and the first level maintenance of anaesthesia and surgical equipment. They acquire a thorough knowledge of the set-up, operation and trouble shooting of anaesthesia delivery systems, monitors, ancillary devices and operation theatre equipment used during surgery

PO 3: to know the usage of anesthetic drugs, gases emergency drugs, other medications used during surgery; know how to check and maintain adequate supply of anaesthesia drugs, emergency drugs, other drugs, instruments and surgical supplies, sterilization of anesthesia and surgical instruments.

PO 4: to know the various types of IV cannulas and IV infusion fluids and infusion sets. Assist the anaesthetist in insertion of peripheral venous cannula and administration of IV fluids, various drugs antibiotics, blood and blood products. Setting up the arterial pressure monitoring line and assist the anaesthetists in insertion of arterial cannula and invasive pressure monitoring, collection of blood sample for arterial blood gas analysis. Assist in the insertion of central venous cannula.

PO 5: to be able to communicate to the patients during peri-operative period

PO 6: to acquire an understanding of anatomy, physiology and pharmacology as it applies to anaesthesia and surgical care. Understands medical terminology as it relates to anaesthesia, surgery and peri- operative patient care

PO 7: to assist the anaesthesiologist with patient assessments, evaluations, transport, positioning, induction, maintenance, monitoring and documentation of vital parameters and recovery of anaesthesia and insertion intravenous and other invasive lines, and airway management.

Expected skill to be acquired by the end of the programme:

PO 8: assist anaesthetists in waking the patients, removing airway devices, transferring patients to PO care units after the surgery and care of patients in ICU or PO care units.

PO 9: to have the knowledge of practice of basic patient care and to coordinate with other members of the team in patient management in critical areas.

PO 10: should be able to provide basic life support in unresponsive patient.

PO 11: To protect and uphold the rights of the patient with the knowledge of ethical and legal issues and responsibilities in patient care and to maintain professional confidentiality

3. Duration of the Programme:

The duration of the programme shall extend over 8 semesters (three academic years with one year internship) each semester comprising minimum of 15 weeks with the minimum of 90 actual working days of instruction in each semester. The successful completion of the Undergraduate program, along with internship as applicable will lead to Bachelor's degree in Anaesthesia & operation theatre technology (B.Sc Anaesthesia & operation theatre technology).

4. Semester:

An academic year shall consist of two semesters;

Odd Semester 1st, 3rd, 5th & 7th	July/August to December/January
Even semester 2nd, 4th, 6th & 8th	January/February to June/July

5. Medium of Instructions:

The medium of instruction and examination shall be English.

6. Eligibility for admission:

To be eligible for admission in B. Sc Anaesthesia & operation theatre technology, a candidate should have passed two-years Pre University examination/ Pre Degree examination/ two years after ten years of schooling or its equivalent as recognized by the Yenepoya (Deemed to be) University with Physics, Chemistry and Biology as principal courses of study.

Candidate needs to secure 40% or above marks in the qualifying examination to be eligible for admission. For SC/ST/OBC candidates minimum marks required in the qualifying exam is 35% marks.

7. Semester System and Choice Based Credit System:

The semester system accelerates the teaching-learning process. The credit-based semester system provides flexibility in designing curriculum and assigning credits based on the course content and hours of teaching. The choice-based credit system provides a cafeteria 'type approach in which the students can take courses of their choice, undergo additional courses and acquire more than the required credits, and adopt an interdisciplinary approach to learning.

8. Definition of Key words:

a. **Academic Year:** Two consecutive (one odd + one even) semesters constitute one academic year.

b. **Choice Based Credit System**: The CBCS provides choice for students to select from the prescribed courses (Core, Ability Enhancement, Skill enhancement, Self-learning, Discipline Specific courses).

c. **Course:** Usually referred to, as "papers" is a component of a programme. The courses shall define learning objectives and learning outcomes. A course shall comprise lectures/ tutorials/ laboratory work/ field work/ outreach activities/ project work/ vocational training/viva/ seminars/ term papers/assignments/ presentations/ self-study etc. or a combination of some of these.

d. **Credits:** Credit defines the quantum of contents/syllabus prescribed for a course and determines the number of hours of instruction required per week. Thus, normally in each of the courses, credits will be assigned on the basis of the number of lectures/tutorial laboratory work and other forms of learning required, to complete the course contents in a 15-20week schedule: One credit =1 hour of lecture per week/ two hours of Laboratory or practical/three hours of clinical rotation, field work/posting. All courses need not carry the same credits.

	Lecture - L	**Tutorial - T**	**Practical - P**	**Clinical Training/ Rotation CT/CR**
1 Credit	1 Hour	1 Hour	2 Hours	3-5 Hours

e. **Programme:** An educational program leading to award of a degree, diploma or certificate.

f. **Grade Point**: It is a numerical weight allotted to each letter grade on a 10-point scale.

g. **Credit Point**: It is the product of grade point and number of credits for a course.

h. **Cumulative Grade Point Average (CGPA**): It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.

i. **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters: O, A+, A, B+, B, C, P, F, AB.

j. **Semester Grade Point Average (SGPA):** It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.

k. **Transcript or Grade Card or Certificate:** Based on the grades earned, a grade certificate shall be issued to all the registered students after every semester. The grade certificate will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester.

l. **Semester System and Choice Based Credit System:** The semester system accelerates the teaching-learning process. The credit-based semester system provides flexibility in designing curriculum and assigning credits based on the course content and hours of teaching. The choice-based credit system provides a cafeteria ‘type approach in which the students can take

courses of their choice, undergo additional courses and acquire more than the required credits, and adopt an interdisciplinary approach to learning.

9. Types of Courses

Courses in a programme may be of three kinds:

- Core Course
- Ability Enhancement Compulsory Course (Foundation course)
- Elective Course

9.1 Core Course: A course, which should compulsorily be studied by a candidate as a core requirement is termed as a Core course. This is the course which is to be compulsorily studied by a student as a core requirement to complete the program of study in a said discipline.

9.2 Ability Enhancement Compulsory Courses (AECC): Ability enhancement compulsory courses (AECC) are the courses based upon the content that leads to knowledge enhancement.

Example:

1. Environmental science
2. English/ MIL communication

These are mandatory for all disciplines.

9.3 Elective Course (EC):

9.3.1 Generic elective

9.3.2 Skill enhancement course

9.3.3 Self-learning courses (SWAYAM/MOOC)

9.3.4 Discipline Specific Elective courses

9. 3.1 Generic elective: An Elective Course chosen from pool of courses which are unrelated from unrelated discipline/subject with intention to seek exposure beyond disciplines of choice. The purpose of this is to offer the students the option to explore disciplines of interest beyond the choices they make in core and discipline specific elective courses.

9.3.2: Skill enhancement course: SEC courses are value-based and/or skill- based and are aimed at providing hands-on-training, competencies and skills. These courses may be chosen from a pool of courses designed to provide value-based and/or skill-based knowledge.

9.3.3 : Self – learning course: with respect to- UGC (Credit Framework for Online Learning Courses through SWAYAM) Regulation, 2021. New Delhi, the 25thMarch, 2021. Vide No.F.1-100/2016 (MOOCs/e-content)

The List of MOOCS (Massive open online courses) and SWAYAM(Study webs of active learning for young aspiring minds)will be finalized by the faculty of allied health professions as per subject to time-to-time UGC notification and will be submitted to the academic council of the DU. Yenepoya(Deemed to be university) shall adopt the regulation of UGC governing MOOCS/ SWAYAM courses as amended from time to time.

The college/ department will designate course coordinator/facilitator to guide the students throughout the course to facilitate the completion of the chosen course.

9.3.3.1 Evaluation and Certification of MOOCs:

Evaluation will be based on predefined norms and parameters and announced in the overview of the Course at the time of offering the course. Formative continuous online assessments and end of course proctored exams shall be completed by the student.

The Yenepoya (Deemed to be) University incorporate the marks/grade obtained by the student, as communicated by the Host Institution through the PI of the SWAYAM course in the marks sheet of the student that counts for final award of the degree by the University.

9.3.3.2 Credit Mobility of MOOCs:

The Yenepoya (Deemed to be) University will give the equivalent credit weightage to the students for the credits earned through online learning courses through SWAYAM platform in the credit plan of the program.

In case a student fails to complete the MOOCS course He/ She may be allowed to complete the course requirements by registering for another course online in subsequent semester or opt for a course offered at this Yenepoya (Deemed to be) University.

10. Assigning Credit Hours per Course

While there is flexibility for the departments in allocation of credits to various courses offered, the general formula shall be:

- Every Core course shall be restricted to a maximum of 4 credits.
- The elective course offered by the Yenepoya (Deemed to be) University shall be restricted to a maximum of 2 credits.
- A candidate shall compulsorily complete total Twelve Credits of Elective courses
- These courses shall be selected either from the Generic Electives, Skill enhancement courses offered by Yenepoya (Deemed to be) university or from the SWAYAM/MOOC/NPTEL courses notified by the UGC time to time and enlisted by the faculty of Allied Health Care Professions. A Candidate shall have freedom to choose the courses of once own choice and at their own pace from the external online platform (SWAYAM/MOOC) or a mix of courses offered by Yenepoya (Deemed to be) University but, require to complete before appearing the Sixth semester end examination.
- A candidate who is desirous to add more credits shall be permitted to do so during the academic duration. Extra credits earned by a candidate shall be included in the marks card on submission of course completion certificate. However, it shall not be considered for awarding the Grade in the UG programme.
- The credits assigned to the course is indicated as L:T:P format. For example, for a 4credit course format could be: 4:0:0 or 1:2:1 or 3:1:0 or 0:0:4 etc.

11. Assigning Total Credits for a Programme:

The UGC, in its notification No.F.1-1/2015 (Sec.) dated 10/4/15 has provided a set of "Model curricula and syllabi for CBCS programmes. In conformation with this notification, at Yenepoya (Deemed to be University), for UG programs with duration of 3years study period or 6 semesters, the total credits shall be a maximum of 140 credits and for the UG programme with duration of 4 years study period or 8 semesters, the total credits shall be a maximum of 160 credits.

12. CBCS Program Coding System

The coding system shall be in the consonance with the system followed by the office of the controller of examination. Presently the following coding pattern is followed.

12.1 First two letters describe the faculty name followed by level of programme (UG – 01; PG – 02) and two letters represent the programme.

12.2 Course code shall have prefix denoting semester number followed by an alphabet of respective type of courses such as C = Core, AECC= Ability Enhancement Compulsory, GE=Generic Elective, SE= Skill Enhancement, SL = Self -Learning, P=Practical followed by numbers denoting number of courses taught-

1st SEM: 1C1, 1C2, 1C3, 1AECC1, 1AECC2, GE1/SE1/SL1 1P1 etc.
2nd SEM: 2C1, 2C2, 2AECC1, A2ECC2, GE2/SE2/SL2, 2P1,etc.
3rd SEM: 3C1, 3C2, 3AECC1, 3AECC2, GE3/SE3/SL3, 3P1, 3P2etc.
4th SEM: 4C1, 4C2, 4C3, 4P1,4P2 , GE4/SE4/SL4etc.
5th SEM: 5C1, 5C2, 5GE1/5SE1, 5P1, 5P2, 5P3,GE5/SE5/SL5etc.
6th SEM: 6C1, 6C2, 6GE1/6SE1, 6P1, 6P2, 6P, GE6/SE6/SL6etc.
7th SEM: 7C1
8th SEM: 8C1

13 Attendance:

13.1 Each course (theory, practical, clinical etc.) shall be treated as an independent unit for the purpose of attendance. Candidates having minimum 80% attendance in each of the Courses can only qualify to appear for the Semester End Examination. The Candidates with less than 80% of attendance shall be required to repeat that Course by attending the semester.

13.2 There shall be no provision for condonation of shortage of attendance.

13.3 For SWAYAM/MOOC/NPTEL it shall be as per the regulations governing the courses of implementing authority.

13.4 The HOD/Course Coordinator through the Dean of Faculties shall announce the names of the candidates who will not be eligible to take the Semester End- Examinations (SEE) in the various courses and send a copy of the same to the Controller of Examinations (COE) Office. Registrations of such candidates for those courses shall be treated as cancelled.

14 Scheme of examination

14.1 Evaluation of a course shall be done based on continuous internal assessment (CIA) mode followed by semester end university examination (SEE) for each course.

14.2 The components of CIA (Continuous Internal Assessment) may include 2 internal assessment tests, assignments and assessment of conduct/discipline.

14.3 The marks for CIA shall be 40% and SEE shall be 60%.

14.4 There shall be no minimum marks for CIA for a pass, but the minimum marks for pass per course shall be 50% CIA and SEE added together.

14.5 There shall be examinations at the end of each semester ordinarily during December/January for odd,(1^{st}&3^{rd}) semesters and during June/July for even (2^{nd} & 3^{rd})semesters. The SEE for 5^{th} & 6^{th} semester will be held during December/January and June/July of each year

14.6 The SEE duration shall be three hours.

14.7 The question paper pattern shall be decided by the Board of Studies (BOS) of the respective departments.

Internal assessment format per course (distribution of marks)

Internal Assessment Components	**Maximum Marks**
Two IA tests	20
Assignment	10
Conduct/discipline	10
Total Marks	**40**

First internal assessment shall be held in the 6^{th} week of the semester and 2^{nd} internal assessment will be held one month before semester end university examination.

Question Paper Pattern

	SUBJECTS HAVING MAXIMUM MARKS = 60				**Duration**
Type of question	**Number of questions**	**To be Answered**	**Marks for each question**	**Total**	180 minutes
LONG ESSAY TYPE	02	01	10	10	
SHORT ESSAY TYPE	10	08	05	40	
SHORT ANSWERS	07	05	02	10	
			Total	**60**	

Question Paper Pattern for AECC SEE

	SUBJECTS HAVING MAXIMUM MARKS = 40				Duration
Type of question	**Number of questions**	**To be Answered**	**Marks for each question**	**Total**	
LONG ESSAY TYPE	02	01	10	10	90 minutes
SHORT ESSAY TYPE	05	03	05	15	
SHORT ANSWERS	07	05	03	15	
			Total	**40**	

Practical examination

SL No.	Components	Marks	Total marks
1	Case scenario	1X10	10
2	Viva voce	1X10	10
3	spotters	1X20	20
4	OSPE/OSCE	1X20	20

PARTICULARS OF PRACTICAL, VIVA-VOCE

- Practical examination will be aimed at examination of clinical skills and competence of the candidates for undertaking independent work as a specialist.
- Viva- Voce examination shall aim at assessing depth of knowledge, logical reasoning, confidence & oral communication skills.
- OSCE/OSPE- shall have minimum of 4 stations.

15 Evaluation of Answer Scripts

15.1 Each theory examination shall have single evaluation. There shall be provision for re-evaluation on a payment of a fee. An external examiner shall value the paper, if the difference is more than 15% of previous marks the answer script shall be sent for third evaluation. In

such an event, the average of the best two out of the three scores will be taken as the final score.

15.2 Practical examination shall be jointly conducted and evaluated by one internal examiner and one external examiner.

16 Classification of Successful candidates:

The results of successful candidates at the end of each semester shall be declared in terms of Grade Point Average (GPA) and Alpha-Sign Grade. The results at the end of the sixth semester shall be classified on the basis of the Cumulative Grade Point Average (CGPA) obtained in all the six semesters and the corresponding overall alpha sign grade.

16.1 Letter Grades and Grade Points:

16.1.1 The Deemed to be University would be following the absolute grading system, where the marks are compounded to grades based on pre-determined class intervals.

16.1.2 The UGC recommended 10-point grading system with the following letter grades are given below:

Letter Grade	Grade Point
O (Outstanding)	10
A+ (Excellent)	9
A (Very Good)	8
B+ (Good)	7
B (Above Average)	6
C (Average)	5
P (Pass)	4
F (Fail)/ RA (Reappear)	0
Ab (Absent)	0
Not Eligible (NC) detained	0

16.1.3 A student obtaining Grade RA/ Ab shall be considered failed and will be required to reappear in the end semester examination.

16.2 The Semester Grade Point Average (SGPA)

The performance of a student in a semester is indicated by a number called 'Semester Grade Point Average' (SGPA). The SGPA is the weighted average of the grade points obtained in all the courses by the student during the semester.

For example, if a student takes five (Theory/Practical) in a semester with credits C1, C2, C3, C4 and C5 and the student's grade points in these courses are G1, G2, G3, G4 and G5, respectively, and then students' SGPA is equal to:

$$SGPA = \frac{C1G1 + C2G2 + C3G3 + C4G4 + C5G5}{C1 + C2 + C3 + C4 + C5}$$

The SGPA is calculated to two decimal points. It should be noted that, the SGPA for any semester shall take into consideration the F and ABS grade awarded in that semester. For example if a student has a F or ABS grade in program 4, the SGPA shall then be computed as:

$$SGPA = \frac{C1G1 + C2G2 + C3G3 + C4 * ZERO + C5G5}{C1 + C2 + C3 + C4 + C5}$$

16.3 Cumulative Grade Point Average (CGPA)

The CGPA is calculated with the SGPA of all the VI semesters to two decimal points and is indicated in final grade report card/final transcript showing the grades of all VI semesters and their courses. The CGPA shall reflect the failed status in case of F grade(s), till the course(s) is/are passed. When the program(s) is/are passed by obtaining a pass grade on subsequent examination(s) the CGPA shall only reflect the new grade and not the fail grades earned earlier. The CGPA is calculated as:

$$CGPA = \frac{C1S1+C2S2+C3S3+C4S4+C5S5+C6S6}{C1+C2+ C3+ C4+ C5+C6}$$

where C1, C2, C3,…. is the total number of credits for semester I,II,III,…. and S1, S2, S3….is the SGPA of semester I, II, III,…..

Calculation of GPA & CGPA: An example (1st semester)

Program Code	Course	Credits (a)	Grade Obtained	Credit Value (b)	Grade Points (axb)
	Course 1	4	B	8	32
	Course 2	4	B	8	32
	Course 3	4	O	10	40
	Course 4	2	C	7	14
	Course 5	2	A	9	18
	Total	16	-	-	136

1st Semester GPA = Total Grade Points / Total Credits = 136 / 16 = 8.5 2nd Semester GPA = 7 with respect to 18 Credits

Then 1st Year CGPA = (8.5 x 16) + (7 x 18) / 16 + 18 = 7.7

17 Declaration of Class

The class shall be awarded on the basis of Cumulative marks scored in all the Courses

First Class with Distinction= Aggregate Marks 75% and above

First Class = Aggregate Marks 60 to 74.9%

Second Class = Aggregate Marks 50 to 59.9%

17.1 Promotion Criteria

- The students are allowed to carry over any number of courses till sixth semester. But student is eligible to appear for the End semester exam of sixth semester if he/she has cleared all the Courses both Core and AECC of first, second, third & fourth semesters. If student has any pending course of first to fourth semesters he/she is not eligible to appear for the end semester exam of the sixth semester. However, Fifth semester courses are allowed to club with sixth semester end examination. But, all the Core courses and AECC Courses of first to fourth semester should be completed to be eligible for 6th end semester exam.

- Candidate should also complete 12 credits of elective course to be eligible for the 6^{th} (in case of 3year program) end Semester Examination.

- Candidate should clear all Courses (Core, AECC & Elective courses) of all the semester, to be eligible to start the one year of mandatory internship.

- A fail in any one Course will mean the candidate has to reappear for the exam in that Course only.

- A candidate who passes the semester examinations in parts is eligible for only CGPA and letter grade but not for Class/ ranking/award/medal from the University.

18 Internship

A candidate has to mandatorily complete 1 year (2 semesters) of internship. The total credits per semester are 18 and for two semesters it is 36.

The internship time period provides the candidate the opportunity to develop confidence and increased skill in simulation and treatment delivery. Candidate will demonstrate competence in basic and intermediate procedures and will observe the advanced and specialized treatment procedures. The candidate will complete the clinical training by practicing all the skills learned in classroom and clinical instruction. The candidate is expected to work for minimum 8 hours per day and this may be more depending on the need and the healthcare setting.

18.1 Eligibility

A candidate should have passed in all the courses (Core, AECC, and Electives) amounting to 122 number of credits before entering in to internship.

19 Eligibility for the award of Degree

A candidate shall have passed in all the Courses of all six semesters and should have successfully completed one year of mandatory internship (02 semesters) as required for the programme.

20 Maximum Period for Completion of Programme:

A candidate shall complete Six semesters (Three Years) programme within Six years from the date of admission. Hence, the maximum period for completion of the programme is seven years.

21 Minimum for a pass:

21.1 A candidate shall be declared to have passed the UG programme if he/she secures at least CGPA of 4.0 (Course Alpha-Sign Grade P) in the aggregate of both internal assessment and semester end examination marks.

21.2 The candidates who pass all the semester examinations in the first attempts in Three years are eligible for ranks provided they secure at least a CGPA of 8.0 (at least Alpha-Sign Grade A).

21.3 The results of the candidates who have passed the sixth semester examination but not passed the lower semester examinations shall be declared as NCL (Not Completed Lower semester examinations). Such candidates shall be eligible for the degree only after completion of all the lower semester examinations.

21.4 A candidate who passes the semester examinations in parts is eligible for only CGPA and Alpha-Sign Grade but not for ranking.

21.5 There shall be no minimum in respect of internal assessment and viva-voce marks.

22 Re-Entry after Break of the study:

22.1 Candidates admitted to a program abstaining for more than 3 months must seek readmission into the appropriate semester.

22.2 The candidate shall follow the syllabus in vogue (currently approved/is being followed) for the program.

22.3 All re-admissions of candidates are subject to the approval of the University.

Programme Structure

Semester 1

Sl. No	Category	Course Name	Max Marks		Total Marks	Hours Per week				Credits
			IA	SEE		L	T	P	clinics	
1	Core	Anatomy	40	60	100	4	-	-	-	4
2	Core	Physiology	40	60	100	4	-	-	-	4
3	Core	Biochemistry	40	60	100	4	-	-	-	4
4	Core	Anaesthesia equipment I	40	60	100	1	-	6	-	4
5	AECC	English & Communication	10	40	50	2	-	-	-	2
6	AECC	Constitution of India	10	40	50	2	-	-	-	2
Total					500					20

Note: of the total available 36 hours per week for teaching learning process, 23 hours per week is dedicated to core and AECC courses. Remaining hours are available for Electives/value added courses/Extracurricular activities etc.

Semester 2

Sl. No	Category	Course Name	Max Marks		Total Marks	Hours Per week				Credits
			IA	SEE		L	T	P	clinics	
1	Core	General pathology	40	60	100	4	-	-	-	4
2	Core	Microbiology	40	60	100	4	-	-	-	4
3	Core	Introduction to Anaesthesia & OT technology	40	60	100	1	-	6	-	4
4	AECC	Environmental Studies	10	40	50	2				2
5	AECC	Health Care	10	40	50	2				2
6	AECC	Medical Ethics	10	40	50	1	-	-		1
7	AECC	Sociology	10	40	50	1				1
Total					500					18

Note : of the total available 36 hours per week for teaching learning process, 21 hours per week is dedicated to core and AECC courses. Remaining hours are available for Electives/value added courses/Extracurricular activities etc.

Semester 3

Sl. No	**Category**	**Course Name**	**Max Marks**		**Total Marks**	**Hours Per week**				**Credits**
			IA	**SEE**		L	T	P	Clinics	
1	Core	Systemic pathology	40	60	100	2	-	2	-	3
2	Core	Applied microbiology	40	60	100	2	-	2	-	3
3	Core	Pharmacology	40	60	100	4	-	-	-	4
4	Core	Anaesthesia Equipment II	40	60	100	2		4		4
5	Core	Basic of anaesthesia & OT technology	40	60	100	1		-	9	4
6	AECC	Kannada	10	40	50	2	-	-		2
Total					450					20

Note : of the total available 36 hours per week for teaching learning process, 30 hours per week is dedicated to core and AECC courses. Remaining hours are available for Electives/value added courses/Extracurricular activities etc.

Semester 4

Sl. No	Category	Course Name	Max Marks		Total Marks	Hours Per week				Credits
			IA	SEE		L	T	P	Clinics	
1	Core	Disinfection, Sterilization and Infection Control	40	60	100	2		2	-	3
2	Core	Medicine Relevant to A&OTT	40	60	100	2	-	-	-	2
3	Core	Applied Anaesthesia & OT Technology	40	60	100	2		4	-	4
5	Core	Practical Applied Anaesthesia & OT Technology	40	60	100		-	-	12	4
5	AECC	Human Rights and Gender Equity	10	40	50	2	-	-		2
6	AECC	Biostatistics	10	40	50	2	-	-		2
Total					500					17

Note : of the total available 36 hours per week for teaching learning process, 16 hours per week is dedicated to core and AECC courses. Remaining hours are available for Electives/value added courses/Extracurricular activities etc.

Semester 5

Sl. No	Category	Course Name	Max Marks		Total Marks	Hours Per week				Credits
			IA	SEE		L	T	P	Clinics	
1	Core	Anaesthesia Techniques I (General Anaesthesia)	40	60	100	2	2	-		4
2	Core	Clinical Anaesthesia Techniques I (General Anaesthesia)	40	60	100		-	-	9	3
3	Core	Anaesthesia Techniques II (Regional Anesthesia)	40	60	100	2	2	-		4
4	Core	Clinical Anaesthesia Techniques II (Regional	40	60	100		-	-	9	3
5	Core	Anaesthesia Techniques III (Monitoring)	40	60	100	2	2	-		4
Total					500					18

Note : of the total available 36 hours per week for teaching learning process, 30 hours per week is dedicated to core and AECC courses. Remaining hours are available for Electives/value added courses/Extracurricular activities etc.

Semester 6

Sl. No	Category	Course Name	Max Marks		Total Marks	Hours Per week				Credits
			IA	SEE		L	T	P	Clinics	
1	Core	Specialty Anaesthesia I	40	60	100	2	2	-	-	4
2	Core	Clinical Specialty Anaesthesia I	40	60	100		-	-	9	3
3	Core	Specialty Anaesthesia II	40	60	100	2	2	-	-	4
4	Core	Clinical Specialty Anaesthesia II	40	60	100		-	-	9	3
5	Core	IntensiveCare and Emergency Medicine	40	60	100	2	2	-	-	4
Total					500					18

Note: of the total available 36 hours per week for teaching learning process, 30 hours per week is dedicated to core and AECC courses. Remaining hours are available for Electives/value added courses/Extracurricular activities etc.

Semester VII

Sl. No	Category	Course Name	Max Marks		Total Marks	Hours Per day			Credits
			IA	SEE		L	T	P	
1	Core	Internship I	40	60	100	-	-	6	1
Total					100				18

Semester VIII

Sl. No	Category	Course Name	Max Marks		Total Marks	Hours Per day			Credits
			IA	SEE		L	T	P	
1	Core	Internship II	40	60	100	-	-	6	1
Total					100				18

Total credit		**111**
Elective		**12**
Internship		**36**
Total Credit of the program		**159**

SEMESTER I

ANATOMY

Course: Core

Credits: 04 **Number of hours: 60**

Course objectives:

- Identify and locate each of the body systems to apply anatomical knowledge to perform minor technical procedural skills.
- Know the normal disposition of the structures in the body while clinically examining a patient and while conducting clinical procedures.
- Describe the functions of each body system
- Discuss the interrelationship of systems in maintaining homeostasis.
- Know the anatomical basis of disease and injury

COURSE CONTENT:

Unit 1: Introduction: Human body as a whole **2 Hours**

Definition of anatomy and its divisions. Terms of location, positions and planes. Cell and its organelles.

Epithelium: definition, classification, describe with examples, function. Glands: classification, describe serous & mucous glands with examples. Basic tissues: classification with examples

Demonstration: Histology of types of epithelium. Histology of serous, mucous & mixed salivary gland.

Unit 2: Locomotion and support **12 hours**

Bone: classification, names of bone cells, parts of long bone, microscopy of compact bone, names of all bones, vertebral column, inter-vertebral disc, fontanelles of fetal skull.

Joints: classification of joints with examples, synovial joint (in detail for radiology). Muscular system: classification of muscular tissue & histology, names of muscles of the body.

Demonstration: Bones & joints. Histology of compact bone (TS & LS). Demonstration of all muscles of the body. Histology of skeletal, smooth &cardiac muscle (TS & LS). Histology of the 3 types of cartilage. Demo of all bones showing parts, radiographs of normal.

Unit 3: Cardiovascular system **8 hours**

Heart: size, location, chambers, exterior & interior, blood supply of heart. Systemic &pulmonary circulation, branches of aorta, common carotid artery, subclavian artery, axillary artery, brachial artery, superficial palmar arch, femoral artery, internal iliac artery, peripheral pulse, inferior vena cava, portal vein, Porto-systemic anastomosis, great saphenous vein, Dural venous sinuses. Lymphatic system: cisterna chyli& thoracic duct, histology of lymphatic tissues, names of regional lymphatics, axillary and inguinal lymph nodes in brief

Demonstration of heart and vessels in the body. Histology of large artery, medium sized artery & vein, large vein. Histology of lymph node, spleen, tonsil & thymus. Normal chest radiograph showing heart shadows. Normal angiograms

Unit 4: Gastro-intestinal system **8 hours**

Parts of GIT, oral cavity, lip, tongue (with histology), tonsil, dentition, pharynx, salivary glands, Waldeyer's ring, oesophagus, stomach, small and large intestine, liver, gall bladder, pancreas, radiographs of abdomen

Demonstration of parts of gastro intestinal system. Normal radiographs of gastro intestinal system. Histology of gastro intestinal system.

Unit 5: Respiratory system **4 hours**

Parts of RS, nose, nasal cavity, larynx, trachea, lungs, broncho-pulmonary segments, histology of trachea, lung and pleura, names of paranasal air sinuses.

Demonstration of parts of respiratory System Normal radiographs of chest. -Histology of lung and trachea

Unit 6 Peritoneum **1 hour**

Description in brief. Demonstration of reflections.

Unit 7 Urinary system **2 hours**

Kidney, ureter, urinary bladder, male and female urethra. Histology of kidney, ureter and urinary bladder

Demonstration of parts of urinary system. Histology of kidney, ureter, urinary bladder. Radiographs of abdomen-IVP, retrograde cystogram.

Unit 8 Reproductive system **2 hours**

Parts of male reproductive system, testis, vas deferens, epididymis, prostate (gross & histology). Parts of female reproductive system, uterus, fallopian tubes, ovary (gross & histology). Mammary gland: gross

Demonstration of section of male and female pelvis with organs in situ. Histology of testis, vas deferens, epididymis, prostate, uterus, fallopian tube, ovary. Radiographs of pelvis, hysterosalpingogram.

Unit 9 Endocrine glands **2 hours**

Endocrine glands: pituitary gland, thyroid gland, parathyroid gland, suprarenal glad (Gross & Histology).

Demonstration of the glands. Histology of pituitary, thyroid, parathyroid, suprarenal glands.

Unit 10 Nervous system **12 hours**

Neuron,classificationofnervoussystem,cerebrum,cerebellum,midbrain,pons,medullaoblongata,spinalcordwithspinalnerve(gross&histology),meninges, ventricles & cerebrospinal fluid, names of basal nuclei, blood supply of brain, cranial nerves. Sympathetic trunk& names of parasympathetic ganglia

Histology of peripheral nerve & optic nerve. Demonstration of all plexuses and nerves in the body. Demonstration of all parts of brain. Histology of cerebrum, cerebellum, spinal cord.

Unit 11: Sensory organs **3 hours**

Skin: histology, appendages of skin. Eye: parts of eye & lacrimal apparatus. Extra-ocular muscles & nerve supply. Parts of ear: external, middle and inner ear and contents.

Histology of thin and thick skin. Demonstration and histology of eyeball. Histology of cornea & retina.

Unit 12: Embryology **4 hours**

Spermatogenesis & oogenesis. Ovulation, fertilization. Fetal circulation. Placenta, Demonstration of models.

Course Outcome:

- Demonstrate the structure of various organs in the human body and correlate the structure with the functions to know how both structure and function are modified by disease.
- Identify and locate all the structures of the body.

- Identify the microscopic structures of various tissues and organs in the human body and correlate the structure with the functions for understanding the altered state in various disease processes.
- Understand the basic principles of embryology including major variations, abnormalities and the congenital anomalies involved in development of the organs and systems.

Recommended Books

- Chaurasia BD. BD Chaurasia's Human Anatomy. CBS Publishers & Distributors PVt Ltd.; 2010.
- Sampath Madhyastha, Manipal Manual of Anatomy for Allied Health Sciences,New Delhi: CBS publishers and distributors.
- Waugh A, Grant A. Ross & Wilson Anatomy and physiology in health and illness E-book. Elsevier Health Sciences; 2014 Jun 25.
- Dilly PN. Essentials of Human Embryology. Postgraduate Medical Journal. 1984 Jun;60(704):447.
- Inderbir S. Textbook of human histology with color atlas. New Delhi: Jaypee Brothers Medical Publishers. 2006.

PHYSIOLOGY

Course: Core **Number of Hours :60 Hours**

Credits: 04

Course objectives:

- To broadly understand the physiological structure of each organ system and its physiological functions.
- To understand broadly the clinical abnormalities of organs and its clinical physiological implications.

COURSE CONTENT:

1. **General Physiology** **2 hours**

Introduction to physiology

Homeostasis: Definition, Positive feedback, negative feedback.

Body Fluid Compartments *Transport mechanisms (brief)*

2. Blood 7 hours

Introduction: composition and function of blood.

Blood Cells: types, Normal Count, Red blood cells: function. Erythropoiesis: Definition, Stages, Factors affecting, Hemoglobin: Function, concentration Physiological variation of RBC Count and Hb *Structure of Hb, methods of estimation*

White blood cells: different types, functions, normal count, differential count *Immunity(brief)*

Platelets: origin, normal count, functions *Morphology*

Haemostasis: definition, steps, clotting factors, mechanism of clotting, disorders of clotting, Blood groups: ABO system, Rh system: Rh factor, Rh incompatibility. Blood grouping & typing, cross matching. Blood transfusion: indication, universal donor and recipient concept. Selection criteria of a blood donor, transfusion reactions. *Anticoagulants: classification, examples and uses*

Anemias: definition, Symptoms and signs (brief). Blood indices: color index, MCH, MCV, MCHC (def and Normal Values). ESR and PCV: normal values, definition, determination (methods).

Morphological and etiological classification of Anemia Plasma proteins: types and concentration, functions of albumin, globulin, fibrinogen, prothrombin. Blood volume: normal value, determination of blood volume *Regulation of blood volume (brief), Functions of Lymph*

3. Muscle Nerve physiology 5 hours

Introduction, Classification and structure of muscle, sarcomere *contractile proteins*

Neuromuscular junction, Transmission across neuromuscular junction. Excitation contraction coupling. Mechanism of muscle contraction, rigor mortis .*Fatigue*

4. Cardiovascular system 8 hours

Heart: physiological anatomy, nerve supply. Properties of cardiac muscle Cardiac cycle: definition, systole, diastole, phases, JVP (brief) Cardiac output, stroke volume, EDV (only definitions).Heart sounds, normal heart sounds, mechanism and features, areas of auscultation.

Intra-ventricular pressure curves, Significance of Heart sounds

Blood pressure: definition, normal value, clinical measurement of blood pressure, hypotension, hypertension Heart rate:Physiological variations, regulation (brief), radial pulse, Electrocardiogram (ECG): Definition, Normal ECG, Causes of ECG waves, Uses of ECG.Cardiac shock: Definition, Types (brief), Triple response.

5. Respiratory system **6 hours**

Introduction: Functions of respiratory system, physiological anatomy of respiratory system, respiratory tract Respiratory organs: lungs, alveoli, respiratory membrane Mechanism of breathing: Inspiration and Expiration, muscles involved, Mechanism.

Surfactant: Composition, Function, *intra pulmonary pleural pressure, surface tension*

Transport of oxygen: forms of transport, Oxygen Hemoglobin Curve. Lung volumes and capacities: Spirogram, Definitions and normal Volumes. Regulation of respiration: Nervous and chemical regulation, respiratory Centre, Herring Breurreflexes. Hypoxia: Definition, Classification, Description (in brief). Cyanosis, Asphyxia, Dyspnea, Dysbarism, Artificial Respiration, Apnoea. (Definition Only)

6. Digestive System **5 hours**

Introduction Physiological anatomy of gastro intestinal tract (All Structures in brief), functions of digestive system. Functions of Saliva Deglutition: definition, stages

Stomach: functions Gastric secretion: composition, function, Phases of secretion Pancreas: Functions (exocrine), pancreatic juice: composition and regulation. Secretin and CCK-PZ

Liver: Functions, Bile secretion, composition, function of bile; Bilirubin metabolism, types of bilirubin, Vandenberg reaction, Jaundice: types, significance. Gall bladder: Functions.

Small intestine: functions, digestion and absorption, movements. (brief)Large intestine: functions, defecation reflex

7. Renal System **5 hours**

Introduction: Functions of kidneys, composition of urine, nephron, cortical and juxtamedullary nephrons (comparison), Juxta Glomerular Apparatus: structure and function. *Vasa recta*

Mechanism of urine formation GFR: Definition, Normal Values, factors effecting GFR, Measurement (Creatine, Inulin Clearance). Tubular reabsorption, TMG, Tubular secretion (brief).

Mechanism of urine concentration: Counter-current mechanisms, Role of ADH *Diuresis, Diuretics*. Micturition, innervation of bladder, cystometrogram.

8. Skin and Body temperature **1 hour**

Structure and function of Skin *Sweat Glands* Body Temperature: physiological variation. Regulatory mechanisms: Mechanisms Activated by Heat/Cold Role of hypothalamus, and fever.

Body temperature measurement, hypothermia

9. Endocrine System **5 hours**

Introduction: Definition, classification of endocrine glands & their hormones.

Hypothalamic- pituitary Axis Pituitary hormones: anterior and posterior pituitary hormones, Functions of Growth hormone,

Thyroid gland: Thyroid Hormones: physiological function, regulation of secretion, disorders: hypo and hyper secretion of hormone. *Physiological anatomy of Thyroid*

Adrenal cortex: functions of Cortisol and Aldosterone Adrenal medulla: functions of Adrenaline and Noradrenaline. *Physiologicalanatomy of Adrenal*

Pancreas (Endocrine): Hormones of pancreas. Insulin: functions, regulation of blood glucose level, Diabetes mellitus*Abnormalities of pancreatic hormones(brief)*Regulation of Calcium Metabolism: Hormones involved, actions of PTH, Calcitonin, Vit D3*Tetany*

10. Reproductive system **4 hours**

Introduction, Function of reproductive system, Changes during puberty.

Sex Differentiation

Male reproductive system: functions of testes Spermatogenesis: Definition, site, stages, factors influencing, Endocrine functions of testes*Sperm, semen*. Androgens: testosterone functions.

Female reproductive system, Menstrual cycle: Definition, changes, ovulation Functions of progesterone and estrogen *Hormonal Regulation* Physiological changes during pregnancy, Lactation(brief), milk ejection reflex

11. Nervous system **8 hours**

Introduction: Parts of CNS and PNS, Functions of nervous system

Neuron: definition, structure Nerve Fiber: classification, conduction of impulses continuous and saltatory. *Neuroglia*

Synapse: Definition, structure, types, properties (brief). Receptors: definition, classification, properties (brief). Reflex: Definition, Reflex Arc, Examples.

Babinski's sign. Tone, Posture(definition), Spinal cord nerve tracts: Diagram and Functions: Lateral Spino Thalamic Tract, Dorsal Column, Pyramidal Tract.*UMN and LMN lesion, Hemiplegia, Stroke (brief)*Functions of: Cerebral cortex, Cerebellum, Hypothalamus, Basal Ganglia *EEG, Parkinsonism*

Cerebro Spinal Fluid (CSF): site of formation, circulation (brief), functions .*Lumbar puncture*. Autonomic Nervous System: Sympathetic and parasympathetic distribution and functions (brief).

12. Special senses **4 hours**

Vision: Functions of different parts(brief)Optic Pathway, Dark Adaptation, Color vision. *Structure of eye, Structure of retina*.

Hearing: Function of Middle Ear, Functions of inner ear, mechanism of hearing (brief).

Chemical Senses: Taste: types, receptor, Smell: physiology, receptors.

Recommended Books

1. Guyton (Arthur): Text Book of Physiology. Latest Ed. Prism publishers.
2. Ganong William F: Review of Medical Physiology. Latest Ed. Tata McGraw Hill
3. Chatterjee CC: Human Physiology Latest Ed. Vol-1, Medical Allied Agency. Choudhary Sujith K: Concise Medical Physiology Latest Ed. New CentralBook.

BIOCHEMISTRY

Course: Core

Credit: 04 **Number of hours:60**

Course objectives:

- Understanding the basic principles and procedures in specimen collection, reagent preparation and testing in Clinical laboratory
- Understanding the properties of biomolecules, their function and biochemical process involved in health and disease.
- Understanding the importance of nutrition in health and disease

COURSE CONTENT:

1. **Introduction and scope of Biochemistry** **2 hours**
2. **Specimen collection:** **4 hours**

Pre-analytical variables. Collection of blood. Collection of CSF & other fluids. Urine collection. Use of preservatives. Anticoagulants.

3. **Safety measurements, Conventional and SI units** **2 hours**
4. **Dilutions** **2 hours**

Diluting solutions: e.g. preparation of 0.1 N NaCl from 1 N NaCl& from 2NNaCl etc., preparing working standard from stock standard, body fluid dilutions, reagent dilution techniques, calculating the dilution of a solution, body fluid reagent etc., saturated and supersaturated solutions.

5. Carbohydrate chemistry **4 hours**

Classification, Isomerism, General reactions of carbohydrates

6. Lipids **4 hours**

Chemistry of fatty acids, triglycerides, cholesterol, phospholipids, lipoproteins, Classification and functions.

7. Protein chemistry, structure **4 hours**

8. Plasma Proteins **2 hours**

Concentration, biochemical changes in disease, interpretation

9. Enzymes **6 hours**

Definition, classification, coenzymes, cofactors, factors effecting enzyme activity, inhibitors, units of measurements, isoenzymes, biological interpretation

10. Vitamins **6 hours**

Definition, classification, sources, functions, deficiency disorders

11. Minerals **6 hours**

Na, K, Ca, P, Fe, Cu, selenium- sources, daily requirements, availability and properties

12. Nutrition **3 hours**

Calorific value, nitrogen balance, respiratory quotient, basal metabolic rate, dietary fibers, nutritional importance of lipids, carbohydrates and proteins, vitamins. nutrition, nutritional support with special emphasis on parental nutrition.

13. Quality control **2 hours**

Accuracy, precision. Specificity, sensitivity, limits of error allowable in laboratory, percentage error. Normal values and Interpretations.

14. Special Investigations **11 hours**

Serum electrophoresis, immunoglobulins, drugs: digitoxin, theophylline's, regulation of acid base status, Henderson Hassel Bach equations, buffers of the fluid, pH regulation, disturbance in acid base balance,

anion gap, metabolic acidosis, metabolic alkalosis, respiratory acidosis, respiratory alkalosis, basic principles and estimation of blood gases and pH, basic principles and estimation of electrolytes, water balance, sodium regulation, bicarbonate buffers,

15. Bio Medical waste management **2 hours**

Course outcome

At the end of the course students must demonstrate an understanding of

- Various biomolecules in our body and their classification
- Sample collection for various tests performed in laboratory
- Preparation of dilutions of chemicals and body fluids.
- Various terms used in quality control
- Biomedical wastes management
- Significance of various special investigations

Recommended Books:

1. Varley H. Practical clinical biochemistry. Practical clinical biochemistry.. 1954.
2. Naithani M, Singh P. Teitz textbook of clinical chemistry & molecular diagnostics. Medical Journal, Armed Forces India. 2006 Apr;62(2):204.
3. Kaplan LA, Pesce AJ, Kazmierczak SC. Clinical chemistry. Theory, analysis, correlation. 2003.
4. Ramakrishna(S) Prasanna(KG), Rajna ® Text book of Medical Biochemistry Latest Ed Orient Longman Bombay –1980
5. Vasudevan (DM) Sreekumari(S) Text book of Biochemistry for Medical students ,Latest Ed
6. Das(Debajyothi) Biochemistry Latest ED Academic, Publishers, Culcutta – 1992
7. Rajagopal G & Ramakrishna - 1983 Practical Biochemistry for Medical Students Oriental Blackswan Pvt. Ltd.
8. Burtis CA and Ashwood ER, Tietz Fundamentals of Clinical chemistry, Harcort (India) Ltd, 7th Ed, 20154.

ANAESTHESIA EQUIPMENT 1

Course core **Practical 90 Hours.**

Credits: 06

Course Objectives:

1. Basic Idea about Physics Related to the Functioning of Anaesthesia Equipments
2. Storage of Medical gases and Distribution of Medical Gases. Various safety features involved in Storage and Distribution of Medical Gases
3. Vacuum and Suction Equipment: Importance of Suction equipment, Various types and components of Suction apparatus, Precautions to be taken during suctioning.
4. Anaesthesia Machine and Anaesthesia Workstation : Various Components , Safety features, Prevention of Delivery of Hypoxic GasMixtures
5. The Breathing System: General Principles, Classifications: Components and Functional Analysis of Magill , Bain Circuit andCircle System.

Unit 1: Physics Related to Anaesthesia: 3 hours Theory

Gas Laws Boyle's Law, Charle's Law, Graham's Law, Dalton's Law, Flow of Gases, Critical Temperature, Venturi Principle, Avogadro Hypothesis, Saturated Vapor Pressure.

Unit 2: Medical Gas Cylinders and Containers:

4 Hours Theory + 10 hours Practical

Compressed Gases: Storage and Units of Pressure

Medical Gas Cylinders: Components, Supply Sources of Oxygen, Nitrous Oxide, Medical Air , Instrument air, Carbon dioxide and Nitrogen

Safety features and Rules for Safe Use of Cylinders

Unit 3: Medical Gas Pipeline Systems 4 hours theory + 10 hours Practical

Components : Supply Sources, Piped Distribution System, Pressure Relief Valves, Shutoff Valves, Pressure Gauges, Terminal Units, Gas-specific Connection Point (Socket Assembly)

Safety features of Medical Gas Distribution systemTesting Medical Gas Distribution Systems.

Unit 4: Suction Equipments 4 hours theory + 10 hours Practical

Purpose and General Principle, Equipment and Vacuum Sources, Components of Piped Vacuum Unit, Portable Suction Units, VacuumRegulator and Gauge, Overfill Protection

Suction Catheters Types and Parts, Closed Suction Catheter System, Suctioning Techniques

Hazards of Suctioning.

Unit5: The Anesthesia Machine and Anesthesia Workstation

8 hours theory + 34 hours practical

Pneumatic System: The High-pressure System, The Intermediate System,The Low pressure System

The High-pressure System: Components, Safety features in High-pressureSystem

Intermediate Pressure System:, Safety features in Intermediate PressureSystem

Low-pressure System: Safety features in Low-pressure System

Unit 6: Prevention of delivery of Hypoxic Gas Mixture: Components andSafety System

2 hours Theory and 6 hours Practical

Unit 7: The Breathing System: General Principles, Common Components,and Classifications

5 Hours theory + 20 hours Practical

General Principles, Components: Breathing System Classification

Mapleson Breathing Systems, Magill Circuit: Functional Analysis, Bain Circuit: Functional Analysis, Advantages and Disadvantages of the Mapleson Systems

The Circle System: Components, Carbon dioxide Absorbents, Indicators of Absorbents, Advantages and Disadvantages of Circle System

Course outcome: At the end of this course Student should have

1. Basic Idea about Physics Related to the Functioning of AnaesthesiaEquipments

2. Storage of Medical gases and Distribution of Medical Gases. Various safety features involved in Storage and Distribution of Medical Gases

3. Vacuum and Suction Equipment: Importance of Suction equipment, Various types and components of Suction apparatus, Precautions to be taken during suctioning.
4. Anaesthesia Machine and Anaesthesia Workstation : Various Components , Safety features, Prevention of Delivery of Hypoxic GasMixtures
5. The Breathing System: General Principles, Classifications: Components and Functional Analysis of Magill , Bain Circuit andCircle System.

Recommended Books

1. Jerry A.Dorsch & Susan E. Dorsch, Understanding Anaesthesia Equipment: 5th Edition. Ajay Yadav, Short Textbook of Anaesthesia: 6th Edition.
2. PaulD Davis & Gavin N C Kenny, Basic physics and Measurement in Anaesthesia: 5th Edition.

ENGLISH AND COMMUNICATION

Course: AECC

Credit: 02 **Number of hours 30 hours**

Course Objectives

The course is designed to enable students to enhance their ability to speak and write English required for effective communication in their professional work. Students will practise their skills in verbal and written English during clinical and classroom experience.

Unit 1: PHONETICS (4 Hours)

- Brief introduction to the history of English Language & Phonetics
- Vowels, Diphthongs, Consonants
- Native pronunciation of English words

Unit – 2: Difference between American & British English (2 Hours)

- Difference with regards to the Vocabulary, Accent, Grammar & Spellings.
- Syllables & Word Stress

Unit– 3: Grammatical Skills (10 hours)

- Verb Tenses
- Appropriate Use of Prepositions
- Articles
- Subject Verb Agreement
- Appropriate usage of Punctuation and Capitalization
- Modals
- Transformation of Sentence structures
- Active Passive Voice

- Reporting skills
- Question Tags
- Homonyms & Homophones
- Degrees of Comparison
- One-word Substitution
- Linkers

Unit – 4: Written Communication Skills **(5 Hours)**

- Drafting of formal letters
- Email drafts – Do's and don'ts in professional emails.
- Article and Essay writing
- Notice writing
- Speech writing
- News Report writing
- Dialogue writing

Unit 5: Oral Communication Skills **(6 Hours)**

- Way of Communicating when we meet people.

Face to Face Communication

Tone of voice

Body Language

- Small Talk
- Elevator Speech
- Etiquettes of Phone Conversation & Phone role play

- Basics of meeting online
- Video conference role play
- Group discussion
- First Impressions
- Interview Skills: Purpose of an Interview

Do's & Don'ts of an Interview

Unit 6: Presentation Skills **(3Hours)**

- Debating
- Speech Relay
- Presentations

Course Outcomes

On completion of the course, the students will be able to

- Apply the concepts and principles of English Language use in professional development such as pronunciation, vocabulary, grammar, paraphrasing, voice modulation, Spelling, pause and silence.
- Apply LSRW (Listening, Speaking, Reading and Writing) Skill in combination to learn, teach, educate and share information, ideas and results.

Recommended Books:

- Raymond Murphy. English Grammar in Use. Cambridge University. 2012.
- David Green. Contemporary English Grammar Structures and Composition. Macmillan Publishers. 2015.

Constitution of India

Course: Core

Credits: 02 **Number of hours: 30 hours**

Course Objectives

- State and explain the constitution of India and its Constituent Assembly
- Explain fundamental rights and duties of citizen
- Identify union, state and federalism of India
- Knowledge of electoral process in India.
- State the basic concepts of Human Rights and its functions and authorities in society.

COURSE CONTENT:

Unit 1: Indian Constitution **5 hours**

- Meaning and Importance of Constitution
- The Constituent Assembly
- The Preamble
- Salient Features of Constitution

Unit 2: Fundamental Rights and Directive Principles **3 hours**

- Meaning and Differences between Fundamental Rights and Directive Principles
- Fundamental Rights
- Rights Information Act Meaning, importance of RTI 2005

Unit 3: Union Government **4 hours**

- President of India- Election, Powers and Position
- Prime Minister and council of Ministers
- Parliament – LokSabha, RajyaSabha- Organisations and Powers

Unit 4: State Government **4 hours**

- The Governor
- Chief Minister and Council of Ministers
- State Legislature VidhanaSabha, VidhanaParishad – organization and Powers

Unit 5: Federalism in India **2 hours**

- Meaning Federal and Unitary Features

Unit 6: The Judiciary **2 hours**

- The supreme Court – Organization, Jurisdiction and Role
- The High Court – Organization Jurisdiction and Role

Unit 7: Electoral Process in India **2 hours**

- Election Commission – Organization, Functions

Unit 8: Local Governments **2 hours**

- Rural and Urban – Organisation, Powers and Functions

Unit 9: Human Rights **3 hours**

- Human rights – Meaning
- Universal Declaration of Human Rights
- Remedies against Violation of Human Rights in India

Unit 10: Special constitutional provisions **3 hours**

- Special Rights created in the constitution for: Dalits, Backwards, women and Children and the Religious and Linguistic Minorities.
- Constitution and Sustainable Development in India.
- Minority Commission in India

Course Outcome:

- This course is to keep the students abreast with the knowledge of the Constitution of India.
- To make the students understand the importance of human rights as citizens of India.

Recommended Books

- Basu, D.D , Constitution of India, New Delhi Himalaya Publication ; 2001

- Dinesh Shelton, David P Stuart, International Human Rights in Nutshell. Thomas Burgenthel, West Nutshell Publisher; London; 2005.
- Parvathy Appaiah, Constitution of India, Mangalore Divya Deepa Publication; 2005
- ParvathyAppaiah, Human Rights. Divya Deepa Publication Mangalore; 2016
- RajRam. M, Constitution of India Himalaya Publication, New Delhi; 1999

SEMESTER II

GENERAL PATHOLOGY

Course: Core **Number of Hours: 60**

Credits: 4

Course Objectives:

- To be able to define the medical terms, define and classify disease and understand the concepts of the disease.
- Able to describe the causes and mechanism of common diseases that occur during the routine work and also changes seen in different individuals and various organs and fluids.
- Able to enumerate the laboratory tests eg: urine, blood, body fluids and its application on various diseases.

COURSE CONTENT:

Unit 1: Introduction (8 Hours)

Unit 2: Cellular Responses to Stress and Injury (12 Hours)

- Types of cellular responses to injury
- Cellular adaptations
- In brief cell injury and types of cell injury, intracellular accumulation
- Necrosis and apoptosis (brief)
- Pathologic calcification, hyaline change, pigments

Unit 3: Acute Inflammation (12 Hours)

- Definition, cardinal signs and sequence of events in acute inflammation
- List chemical mediators of inflammation, outcomes of acute inflammation, morphological types/patterns of acute inflammation and briefly systemic effects of inflammation
- In brief cutaneous wound healing (primary and secondary) Factors that influence wound healing, complications of wound healing
- Types of chronic inflammation, Granulomatous diseases, briefly about tuberculosis, leprosy and syphilis

Unit 4: Hemodynamic Disorders, Thromboembolism and Shock

(6 Hours)

- Edema and thrombosis
- Embolism, infarction and shock (in brief)

Unit 5: Diseases of the Immune System

(8 Hours)

- Introduction to immune system
- Hypersensitivity reactions (brief)
- Autoimmune diseases and systemic lupus erythematosus (in brief)
- Acquired immunodeficiency syndrome

Unit 6: Neoplasia

(8 Hours)

- Nomenclature of neoplasms and characteristics of benign and malignant neoplasms
- Metastasis and spread of tumors
- Etiology of cancer (carcinogenic agents)
- Laboratory diagnosis of cancer, staging grading and prognosis

Unit 7: Genetic Disorders

(2 Hours)

- Introduction of genetic disease and classification of genetic disorders

Unit 8: Nutritional Disorders

(4 Hours)

- Common vitamin deficiencies -Fat-soluble vitamins
- Water-soluble vitamins—vitamin B complex

Course Outcome:

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

- Understand how body reacts to cellular responses and injuries.
- Have a basic knowledge about various laboratory tests and its application on various disorders.
- Define the medical terms, define and classify disease and understand the concepts of the disease.

Recommended Books

- Nayak R, Rai S, Gupta A. Essentials in hematology and clinical pathology. New Delhi: Jaypee Brothers Medical Publishers; 2012.
- Mohan H. Textbook of pathology. 8th ed. New Delhi, India: Jaypee Brothers Medical; 2018

MICROBIOLOGY

Course : core **No of Hours: 60**

Credits: 4

Course Objectives:

- To become familiar with the foundation concepts of history of Microbiology & General Bacteriology.
- To understand the key concepts in Immunology.
- To gain the knowledge of common bacterial infections.
- To understand and implement biomedical waste management and tackle infections.

COURSE CONTENT:

Unit 1: General Bacteriology **8 hours**

Introduction & History of Microbiology, Classification & Morphology of Bacteria, Growth & Nutrition, Culture Media & Methods, Sterilization & Disinfection, Fundamental aspects of antibacterial agents and antimicrobial susceptibility testing.

Unit 2: Immunology **11 hours**

Infection, Immunity, Immunization schedule, applications of antigen antibody reactions, Hypersensitivity, Tumor & Transplantation Immunology.

Unit 3: Systematic Bacteriology **13 hours**

Common bacterial infections, Mycobacteria, Spirochaetes

Unit – 4: Virology **10 hours**

Introduction to virology, viral hepatitis, poliomyelitis, Rabies, Human immunodeficiency virus.

Unit 5: Mycology & Parasitology **12 hours**

Introduction to mycology, pathogenic yeasts & fungi, Introduction to parasitology, Amoebiasis, Malaria, Helminthic infections.

Unit 6 : Applied Microbiology **6 hours**

Hospital acquired infections, Biomedical waste management.

Course Outcome:

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

- Understand how the bacteria grow and how sterilization & disinfection works.
- Have a basic knowledge about Immunization schedules and bacterial infections.
- Define terms in virology, mycology and parasitology.

Recommended Books

- Baveja C. Textbook of microbiology. 1st ed. New Delhi: Arya Publications; 2005.

Introduction to A&OTT

Course : core **Total hours: Theory 45 hours,**

Practical 120 Hours

Credits:4

Course Objectives:

1. Brief History of General and Regional Anaesthesia and Few Pioneers of Anaesthesia
2. Basic applied Anatomy and physiology of Respiratory, Cardiovascular, Renal, Hepatic and Neuromuscular system relevant to Anaesthetists
3. Layout of the Operation Theatre.
4. Appropriate operation room attire
5. Monitoring a patient and documentation of Vital Parameters
6. Identification of few Common Surgical Instruments

Unit 1 – Introduction to Anaesthesia 5 hours

History of General anaesthesia; First successful clinical demonstration: Pioneers of Anaesthesia, WTG Morton, Horace Wells, Arthur Guedel , EvanMagill , HEG Boyle, John Snow.

History of Regional Anaesthesia ; Cal Koehller, August Beir Components of General Anaesthesia, Balanced Anaesthesia. Types of Regional Anaesthesia.

Unit II. Applied Anatomy and Physiology. (24 hours)

Respiratory System : Breathing; Passage of air from atmosphere to the lungs, Function of Nose, Parts of the Respiratory passage

Anatomy of Tracheobronchial tree, Inspired , Alveolar and Expired gases, Oxygen Cascade.

Functions of Lung, Normal Respiratory Movement, Respiratory Rate Measurement, Normal Range

Oxygen Transport in the Blood. Oxygen Content of Blood, Oxygen Flux Hypoxia Definition, Different types of Hypoxia with Example
Measurement of Partial Pressure and Oxygen Saturation in the Blood. What is SpO2. Normal Value, method of measurement

Cardio Vascular System.

Anatomy of the Heart. Cardiac Chambers and Valves, Blood supply to theHeart,

Cardiac Cycle, Systole, Diastole, Cardiac output

Oxygen requirement of the Heart. Factors increasing the Demand of Oxygen,Factors Reducing the Supply of oxygen

Arterial Pulse : Definition, Normal Pulse Rate, Palpation of Pulse, Rhythm, Volume and Character. Normal Range, Causes of Increase and Decrease in Pulse Rate. Various Arteries and location, which can be palpated to assess pulse. Causes of Absence of Pulse

Blood Pressure: Definition, Measurement of Blood Pressure using Sphygmomanometer. Normal Range, Causes of Increase and Decrease in Blood Pressure

Hepatic System : Anatomy of Liver, Functions of Liver

Kidney: Anatomy of Kidney, Functions of Kidney

Nervous System : Classification, Neurons, Classification of Nerve Fibre, Conduction of Impulse across nerve Fibre

Muscle :Anatomy of Neuromuscular Junction. Mechanism of Contraction of Skeletal Muscle

Unit III. Introduction to Operation Theatre **10 Hours**

Physical layout of the surgical suite: Operation Theatre Complex Layout

Zones of the Operation Theatre: Protective zone, Clean zone, Sterile zone and Disposal zone.

Appropriate operation room attire:

Definition, Purpose, Consideration for appropriate attire, Components of appropriate attire,

Hand Washing, When and How, Personal Protective Equipment

Surgical Team, Role of Anaesthesia and OT Technologist in the Operation Theatre room and Recovery Room

Unit IV: Monitoring and Documentation: 4 hours

Documentation of Temperature, Pulse, Blood Pressure and Respiratory Rate

Unit V :Common Surgical Instruments 2 hours

Artery Forceps (Haemostat), Alli's Tissue Holding Forceps, Sponge Holding Forceps, Scissors, Needle Holder, Forceps, Towel Clipp, Bark- Parker (BP) Handle, Different Blades, Identification and Uses

Practical **(120 Hours)**

Visit to Anaesthesia Museum to understand History of Anaesthesia Measurement of Vital Parameters and Documentation

Hand washing and personal protective equipments Operation Room Attire Demonstration

Identification and use of Basic Surgical Instruments

Course outcome:

- Students at the end of the course should have knowledge about the following aspects of Basics of Anaesthesia and Operation Theatre
- Management Brief History of General and Regional Anaesthesia and Few Pioneers of Anaesthesia
- Basic applied Anatomy and physiology of Respiratory, Cardiovascular, Renal, Hepatic and Neuromuscular system relevant to Anaesthetists
- Layout of the Operation Theatre.
- Appropriate operation room attire
- Monitoring a patient and documentation of Vital Parameters
- Identification of few Common Surgical Instruments

Recommended Books:

1. Ajay Yadav Short Textbook of Anaesthesia: 6th Edition.
2. Ahanatha Pillai Manual of Anaesthesia for Operation Theatre Technicians: First Edition.
3. M.M Kapur Introduction to Surgical Instruments & Procedure for UnderGraduate.

ENVIRONMENTAL STUDIES

Course: AECC

Credit: 02 hours **Number of hours: 30 hours**

Course Objectives:

- Students will be able to learn about environment, factors affecting it, environmental ethics and its protection.
- Students will be able to Describe a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- Students will be able to Critically analyze technical subject matter (written or oral) for scientific merit apply learned environmental knowledge and understanding to solve technical /research problems in new contexts

COURSE CONTENT

Unit 1: Multidisciplinary nature of Environmental Studies (1hour)

- Multidisciplinary nature of Environmental Studies
- Concept of sustainability and sustainable development

Unit 2: Ecosystems (4 hours)

- What is an ecosystem? Structure and function of an ecosystem; Energy flow in the ecosystem; Food chains, food webs and ecological succession. Case studies of the following ecosystems:

a. Forest ecosystem

b. Grassland ecosystem

c. Desert ecosystem

d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

- History of ecosystem ecology
- Ecosystem services

Unit 3: Natural Resources (5 hours)

Renewable and Non-renewable resources

- Land resources and land use change; Land degradation, soil erosion and desertification.
- Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations.
- Water: Use and over-exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter-state).
- Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs, case studies.

Unit 4: Biodiversity and its conservation 6 hours

- Levels of biological diversity: genetic, species and ecosystem diversity; Bio geographic zones of India; Biodiversity patterns and global biodiversity hotspots
- India as a mega-biodiversity nation; Endangered and endemic species of India
- Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions; Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.
- Ecosystem and biodiversity services: ecological, economic, social, ethical, aesthetic and informational value.
- Nature Reserves, tribal populations and rights, Human wildlife conflicts in Indian context

Unit 5: Environmental Pollution (6 hours)

Definition

- Cause, effects and control measures of: -

    a. Air pollution

b. Water pollution

c. Soil pollution

d. Light pollution

e. Noise pollution

f. Thermal pollution

g. Nuclear hazards

- Climate change, Greenhouse effect, Global warming, Acid rain, Ozone layer depletion.
- Solid waste Management: control measures of urban and industrial wastes.
- Pollution case studies.

Unit 6 Environmental Policies & Practices **(3 hours)**

- Environmental Laws: Environment Protection Act.
- Air (Prevention and Control of Pollution) Act.
- Water (Prevention and control of Pollution) Act
- Wildlife Protection Act
- Forest Conservation Act
- International Agreements: Montreal protocol, Kyoto protocol, Convention on Biological Diversity (CBD)
- Environmental Impact Assessment
- Carbon footprint
- Sustainable Development Goals

Unit 7: Human communities and the environment **(3 hours)**

- Human Population growth – impacts on environment
- Resettlement and rehabilitation of project affected persons: case studies
- Disaster management – floods, earthquake, cyclone and landslides
- Environmental movements: Chipko, Silent Valley, Bishnois of Rajasthan
- Environmental ethics
- Consumerism and Environment
- Environmental communication and public awareness, case studies.

Unit 8: Field work (2 **hours)**

- Visit to a local area to document environmental assets river/ forest/grassland/hill/mountain

- Visit to a local polluted site-Urban/Rural/Industrial/Agricultural
- Study of common plants, insects, birds. Study of simple ecosystems-pond, river, hill slopes, etc.

Course Outcomes:

- Students learn to knowledge on Echo systems, biodiversity and environmental policies and practices.

Recommended Books:

1. Agarwal, K.C. 2001 Environmental Biology, Nidi Publ. Ltd. Bikaner.
2. Brunner R.C., 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p
3. Clark R.S., Marine Pollution, Clanderson Press Oxford (TB)
4. Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T. 2001, Environmental Encyclopedia, Jaico Publ. House, Mumabai, 1196p
5. De A.K., Environmental Chemistry, Wiley Eastern Ltd.
6. Gleick, H.P. 1993. Water in crisis, Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute Oxford Univ. Press. 473p
7. Hawkins R.E., Encyclopedia of Indian Natural History, Bombay Natural History Society, Bombay (R)
8. Heywood, V.H &Waston, R.T. 1995. Global Biodiversity Assessment. Cambridge Univ. Press 1140p.

HEALTH CARE

Course: AECC

Credit: 02 **Number of Hours: 30**

Course Objectives:

COURSE CONTENT

Introduction to Health: **(3 hours)**

- Definition of Health, determinants of Health, Health Indicators of India, Health Team Concept. National Health Policy.
- National Health Programmes (Briefly Objectives and scope) Population of India and Family welfare programme in India

1. **Introduction to Nursing:** **(3 hours)**

- What is Nursing? Nursing principles. Inter- Personnel relationships.

2. **Bandaging**:**(3 hours)**

- Basic turns; Bandaging extremities; Triangular Bandages and their application. Nursing Position, Bed making, prone, lateral, dorsal, dorsal re-cumbent, Fowler's positions, comfort measures, Aids and rest and sleep.

4. **Lifting And Transporting Patients:(4 hours)**

Lifting patients up in the bed. Transferring from bed to wheel chair. Transferring from bed to stretcher.

5. **Bed Side Management:(4 hours)**

Giving and taking Bed pan, Urinal: Observation of stools, urine. Observation of sputum, understand use and care of catheters, enema giving.

6. **Methods of Giving Nourishment:** Feeding, Tube feeding, drips, transfusion Care of Rubber Goods **(3 hours)**

7. **Vital Parameter Recording:** Recording of body temperature, respiration and pulse,

8. **Asepsis:** **(3 hours)**

Simple aseptic technique, sterilization and disinfection. Surgical Dressing: Observation of dressing procedures

9. **First Aid** **(3 hours)**

Course Outcomes:

- Describe the concepts of health,illness and national health policy various welfare programmes
- in India.
- Explain the concepts of Nursing
- Explain the basic,special needs of the patient,bandaging and first aid for common emergencies
- Explain infection control

Recommended Books:

1. Hari S. Essentials of Management for Healthcare Professionals. Productivity Press; 2017 Dec 15.

SOCIOLOGY

Course:AECC

Credit :01 **Number of Hours: 15**

Course objectives:

- To develop the abilities of students to analyse the sociological concepts and their relationship with social work practice.
- To understand Indian social problems and its impact on social development.
- To develop skills for social analysis.
- To develop an understanding of emerging issues of social concern and their impact on society.
- To develop basic understanding of health perspectives and their practice in social work

Unit 1:Introduction to Sociology **(3 hours)**

- Meaning, definitions and scope of sociology.
- Importance of its study with special reference to health care professionals.
- Methods of Sociological investigations - Case study, social survey, questionnaire, interview and

opinion poll methods.

Unit 2: Society, Family, Community and Socialization (4 hours)

- Concept of society: Definition and characteristics.
- The family: Meaning, definitions and functions of family.
- Role of family on individual's health and nutrition,
- Meaning, definitions and types of communities: Rural, Urban and Tribal community
- Socialization: Meaning and characteristics, Process of socialization, Agencies of socialization and their role –Family, School, peer group, religion, media.

Unit 3: Social Problems, Social Change, Social Planning, Social Work and Social security measures (5 hours)

- Social Problems: Meaning, characteristics and their influence on health.
- Social Change**:** Meaning, definitions and characteristics.
- Social Planning: The role of social planning in the improvement of health and rehabilitation
- Social Work **-**Basic concepts of social work, definitions, objectives, values and basic methods. Role of social worker in health settings.
- Social Security: Social Security schemes for the disadvantaged sections in the society.

Unit 4: Socio-cultural factors in Health and Disease (3 hours)

- Health: Concept, definitions and dimensions
- Meaning of social factors and role of social factors in health and disease.
- Culture and its influence on health and disease.

Course outcome:

- Able to understand the meaning of sociology, it relationship with other disciplines and also to gain knowledge on the sociological methods of investigations
- Able to understand social factors and its role in health and disease
- Able to understand the meaning, importance and agencies of socialization
- Able to understand the concept and role of social groups in health, sickness and rehabilitation
- Able to understand the meaning of family and its role in health, nutrition and sickness among members
- Able to understand the meaning, features and health hazards of rural and urban communities

- Able to understand the concept of culture and health and their relationship
- Able to understand the meaning of social change, factors of social change, social change and stress , social change and health
- Able to understand the meaning of social problems and types of social problems in the society
- Gain knowledge on the social security and social legislation measures for the disabled
- Able to understand the meaning of social work and role of medical social worker

Recommended Books:

1. Vidya Bhushan, D R Sachdeva, An Introduction to Sociology, Kitabmahal- Allahabad
2. Roshni Jain, An Introduction to Sociology, AITBS publishers - New Delhi, First edition., 2012
3. Krishna Gowda, Sociology for Nurses, CBS Publishers & amp; Distributors Pvt Ltd- New Delhi, Sixth edition., 2010
4. Ram Ahuja, Social problems in India, Prem Rawat for Rawat Publication, third edition., 2014
5. Mohammed Akram, Sociology of Health, PremRawat for Rawat Publication-Jaipur, 2016

MEDICAL ETHICS

Course: AECC

Credit: 01 **Number of hours: 15**

Course objectives:

- To understand the about the ethical importance in medicine
- Knowledge regarding ethical concepts and teaching/learning experience
- Understand the importance of informed consent and ethical issues in health care.

COURSE CONTENT

Introduction

Medical ethics is a systematic effort to work with in the ethos of medicine, which has traditionally been service to sick.

- **Objectives:** Identify underlying ethical issues and problem in medical practice

Unit 1: Introduction to medical ethics **(1 hour)**

What is ethics, what are values and norms, freedom and personal responsibility?

Unit 2: Definition of medical ethics **(2 hour)**

Major principles of medic ethics.

Unit 3: Perspective of medical ethics **(2 hour)**

The Hippocratic oath, The Declaration of Helsinki, The WHO Declaration of Geneva, International code of Medical Ethics (1993), Medical Council of India Code of Ethics (2002).

Unit 4: Ethics of the individual **(2 hour)**

Truth and confidentiality, the concept of disease, health and healing, the Rightto health.

Unit 5: The ethics of human life **(2 hour)**

Prenatal sex determination.

Unit 6: The family and society in medical ethics **(2 hour)**

Euthanasia, cancer and terminal care.

Unit 7: Death and dying **(2 hour)**

Use of life-support systems, the right to die with dignity, suicide–the Ethical outlook.

Unit 8: Professional Ethics **(2 hour)**

Contract and confidentiality, malpractice and negligence.

Course Outcomes:

- Increasing the awareness and knowledge of students of the value dimensions of interactions with the patients, colleagues, relations and public.
- Fostering the development of skills of analysis, decision making and judgment.
- Making the students aware of the need to respect the rights of the patient.
- Duties and responsibilities of the technologists.

Recommended Books:

1. Tsai DF. The WMA medical ethics manual. Journal of Medical Ethics. 2006 Mar 1;32(3):163.

THIRD SEMESTER

SYSTEMIC PATHOLOGY

Course: Core

Credits: 04 **Number of hours: 60 hours**

Course Objectives:

To be able to define the medical terms, define and classify disease and understand the concepts of the disease. (K,A)

Able to describe the causes and mechanism of kidney diseases that occur during the routine work and also changes seen in different individuals(K,S,A)

COURSE CONTENT

Unit 1: Cardiovascular System: (14hours)

1. Atherosclerosis-definition, risk factors, pathogenesis, morphology and complications

2. Ischemic heart disease: Myocardial infarction-definition, pathogenesis, morphology and complications

3. Hypertension- Benign and malignant hypertension: pathogenesis,pathology and complications

4. Aneurysms–Definition, classification, pathology and complications

5. Heart failure-Right and left heart failure: causes, pathophysiology, and morphology

6. Valvular heart disease–causes, pathology, & complication. Complications of arterial valves

7. Rheumatic heart disease and infectious endocarditis-definition,etiopathogenesis, morphology and complications

8. Congenital heart disease-Types and atrial septal defect; aneurysms- types and morphology; cardiomyopathies in brief

9. Pericardial effusion –causes, effects and diagnosis **10.** Cardiomyopathy–
Definition, types, causes, and significance Infective endocarditis Myocarditis

Unit 2: Haematology: (5hours)

1. Anemia –definition, morphological types and diagnosis of anaemia

Brief concept about Haemolytic anaemia and polycythaemia.

2. Leukocyte disorder – briefly leukaemia, leuco cytosis, agranulocytosisetc.

3.Bleeding disorders–definition, classification, causes, &effects of important types of bleeding disorders.Briefly various laboratory tests used to diagnose bleeding disorders

Unit 3: Respiratory System: (7hours)

1. Atelectasis-types, Adult respiratory distress syndrome- causes, pathogenesis and morphology

2. Pulmonary edema-classification, causes and morphology

3.Chronic obstructive pulmonary disease- Chronic bronchitis, emphysema, asthma, **4**.Bronchiectasis:Definition, etiopathogenesis and morphology

5.Restrictive pulmonary diseases-Definition, categories, pathogenesis and morphology

6.Pneumoconiosis-types, asbestosis, coal workers pneumoconiosis- etiopathogenesis and morphology

7.Pleural effusion –causes, effects and diagnosis

8.Pulmonary embolism, infarction, pulmonary hypertension-Definition, etiopathogenesis and morphology

Unit 4: Renal System: (4hours)

Clinical manifestations of renal diseases. Briefly causes, mechanisms, effects and laboratory diagnosis of ARF & CRF. Briefly Glomerulonephritis and pyelonephritis

End stage renal disease–definition, causes, effects and role of dialysis and renal transplantation and its management

Brief concept about obstructive uropathy

Practicals: **(30hours)**

1. Urine examination: physical, chemical, microscopy

2. Blood grouping & Rhtyping

3. Hemoglobin estimation, packed cell volume (PCV),erythrocyte sedimentation rate (ESR),estimation of bleeding & clotting time

4. Charts–Urine chart,ARF,CRF,Acuteglomerulonephritis

5. Specimens

- Atherosclerosis
- Pneumonia
- Tuberculosis
- Infarct-lung
- Contractedkidney
- Hydronephrosis

Course outcome:

at the end of this course students should

be able to define the medical terms, define and classify disease and understand the concepts of the disease. (K,A)

Able to describe the causes and mechanism of kidney diseases that occur during the routine work and also changes seen in different individuals(K,S,A)

Recomonded Books:

1.RamadasNayak,Sharada Rai.EssentialsInHematologyAndClinical Pathology.2ndEditionJaypee MedicalPublisher.2017

2.HarshMohan.Textbookof PATHOLOGY. 8thedition. JaypeeMedical Publisher.2018

3.RamadasNayak. HistopathologyTechniquesanditsManagement.Jaypee MedicalPublisher.2018

4.P.Chakraborty,GargiChakrabort.PracticalPathology.IndiaKolkataNew CentralBookAgency,

5.Hand-Bookof MedicalLaboratoryTechnologyCMCVellore

APPLIED MICROBIOLOGY

Course: Core

Credits: 04 **Number of hours: 60 hours**

Course objectives:

- To understand urinary tract and bloodstream infections
- To study viral infections of importance
- To learn infection control measures and to understand methods of sterilization and disinfection

COURSE CONTENT:

UNIT 1. Microbiology of UTI.

2. Hepatotrophic viruses in detail – mode of transfusion universal precautions, vaccinations.

3. HIV- Mode of transfusion, universal precautions.

4. Opportunistic infections.

5. Microbiology of vascular access infection – Femoral, jugular, subclavian catheters. (Bacterial infection).

6. Sampling methodologies for culture & sensitivity.

7. Vancomycin resistant enterococci & other antimicrobial – resistant bacteria (Drug, resistant micro- organisms).

8. Infections through contaminated HD equipments or dialysate or errors in reprocessing.

9. Non infections agents in HD pts

9.1. Endotoxin

9.2. Endotoxin A

9.3. Other biological toxins

10. Infection control precautions for Dialysis units

11. Sterilization and disinfection

11.1. Sterilization and disinfection classification, principle, methods

11.2. Central sterile supply department

Course outcome: at the end of this course students should be able

- To understand urinary tract and bloodstream infections
- To study viral infections of importance
- To learn infection control measures and to understand methods of sterilization and disinfection

Reference Books:

1. Anathanarayana & Panikar Medical Microbiology - University Press
2. Text book of Medical Microbiology for MLT students – C P Baveja
3. Hospital Infection Control Manual, YMCH

GENERAL PHARMACOLOGY

Course: Core

Credits: 04 **Number of hours: 60 hours**

Course objectives:

- Know the basics of Pharmacology like, sources of drugs, routes of drug administration and general principles
- Describe the principles of pharmacokinetics and pharmacodynamics
- To appreciate various adverse drug reactions
- To have a basic knowledge of drugs affecting various body systems
-

COURSE CONTENT:

Unit 1: General Pharmacology **8 Hours**

- Introduction to Pharmacology
- Routes of drug Administration
- Absorption & Distribution
- Metabolism
- Excretion
- Pharmacodynamics - Mechanism of drug action- receptors
- Factors modifying drug actions
- Adverse drug reactions

Unit 2: Autonomic Nervous System drugs **6 Hours**

- Sympathomimetics
- Alpha blockers
- Beta-blockers
- Cholinomimetics
- Anticholinergics
- Skeletal muscle relaxants

Unit 3: Central Nervous System **11 Hours**

- Opioid analgesics
- Non-opioid analgesics (Prostaglandins)
- NSAIDs
- Ethyl alcohol
- Sedative hypnotics
- Antiepileptic drugs
- Local anesthetics-1
- Local anesthetics-2
- General anesthetics- I
- G A – II (PAM)
- CNS stimulants

Unit 4 : Cardio Vascular System Drugs **9 Hours**

- Diuretics
- Vasodilators (CCB's, Drugs acting on RAS)
- Antihypertensives
- Antianginal drugs

- Pharmacotherapy of shocks
- Cardiac glycosides
- Cardioplegic drugs
- Antiarrhythmic drugs
- Primary solutions

Unit 5: Blood **6 Hours**

- Anaemia, erythropoietin
- Anticoagulants
- Anti platelet drugs
- Fibrinolytics,
- Lipid lowering drugs
- Vit.D and calcium, folic acid, phosphate binders

Unit 6: Endocrines **1 Hour**

- Corticosteroids

Unit 7: Chemotherapy **9 Hours**

- General Principles of Chemotherapy
- Sulfonamides
- Penicillins
- Cephalosporins
- Broad spectrum antibiotics
- Macrolides
- Aminoglycosides
- Chemotherapy of UTI
- Drug Therapy of Tuberculosis

Unit 8: Miscellaneous topics **10 Hours**

- Antihistamines
- Antiemetics
- Drugs used in bronchial asthma-1
- Drugs used in bronchial asthma-2
- Cough
- Inhalational gases and emergency drugs

- I V fluids
- Metabolic and electrolyte imbalance
- Immunosuppressants
- Antiseptics and disinfectants

Course Outcomes:

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

- Define and describe the principles of pharmacology and pharmacotherapeutics
- Define absorption, distribution, metabolism and excretion of drugs
- Define, identify and describe the adverse drug reactions
- Define and describe the pharmacological actions and therapeutic uses of drugs affecting systems- autonomic nervous system, cardiovascular system, blood, endocrine etc.
- To have a basic knowledge of drugs used in the treatment of various infections
- To have a basic knowledge on miscellaneous drugs

Recommended Books:

- Udaykumar P. Textbook of Pharmacology for Dental and Allied Sciences.

  Jaypee Brothers Publishers; 2008.

ANAESTHESIA EQUIPMENTS II

Course: Core **Total Hours: Theory 45 Hours**
Practical 90 Hours

Credits: 4

Course Objectives : At the end of Third Semester Student should have

- Knowledge of Anaesthesia Workstation and AnaesthesiaMachine : Checking The Workstation / Machine
- Understanding of Various Components of Anaesthesia Gas Delivery System, Vaporisers, CO2 Absorbent System, Anaesthesia Ventilator, Suction Equipments
- Knowledge of Safety features to prevent the administration of Hypoxic gas mIxture, Detection of Leak in the system, Filling and Draining the Vaporiser Liquid, Mounting the Vaporizer, Change of Soda Lime.
- Cleaning, Disinfection and Sterilisation of Various Components used in Airway Management

Course content

Unit 1:The Anaesthesia Machine and Anaesthesia
WorkstationComponents
Safety features
Checking the Anaesthesia Machine, Workstation and breathing system

Vaporizers Physical Principles, Classification of Vaporizers, Safety features, Filling and Draining of Vaporisers, Vaporizers Mounting devices, Maintenance of Vaporizers, Hazards of Vaporizers

Unit 2:The Breathing System:

General Principles, Common Components, andClassifications

Mapelson Breathing Systems : Components, Functional Analysis

The Circle System: Different Components, CO2 Absorbents and Indicators
Manual Resuscitators
Humidification Equipment, Heat and Moisture Exchanger

Unit 3:Anaesthesia Ventilators:

Factors That Affect the Delivered Tidal Volume,Ventilatory Modes

Causes and Prevention of Barotrauma

Cleaning and Sterilization of Anaesthesia Machine, Breathing system, Anaesthesia Ventilator

Hazards of Anaesthesia Machines and Breathing SystemsControlling
Trace Gas Levels

Unit 4:Airway Equipment:

Face Masks and Airways, Laryngoscopes

Supraglottic Airway Devices, Tracheal Tubes and Associated EquipmentLung Isolation Devices
Devices for Managing the Difficult Airway

Unit 5: Monitoring:

Gas monitoring :Capnography, Different Wave Forms

Pulse Oximetry, Electrocardiogram, Temperature Monitoring, Noninvasive Blood Pressure Monitors

Neuromuscular Transmission Monitoring, Ultrasound,

Principle and Components of Invasive Pressure Monitoring System

Equipment for the Magnetic Resonance Imaging Environment

Operating Room Fires and Personnel Injuries Related to Sources of Ignition
Temperature Control Equipment

Anaesthesia Apparatus Checkout Recommendations,

Daily Checks before Beginning Anaesthesia

Equipment Care, maintenance, Cleaning and Sterilisation;

Course Outcome : At the end of Third Semester Student should have

- Knowledge of Anaesthesia Workstation and AnaesthesiaMachine : Checking The Workstation / Machine
- Understanding of Various Components of Anaesthesia Gas Delivery System, Vaporisers, CO2 Absorbent System, Anaesthesia Ventilator, Suction Equipments
- Knowledge of Safety features to prevent the administration of Hypoxic gas mIxture, Detection of Leak in the system, Filling and Draining the Vaporiser Liquid, Mounting the Vaporizer, Change of Soda Lime.
- Cleaning, Disinfection and Sterilisation of Various Components used in Airway Management

Recommended Books:

1. Jerry A.Dorsch& Susan E. Dorsch, Understanding Anaesthesia Equipments: 5th Edition .
2. Ajay Yadav. Short Textbook for Anaesthesia: 6th Edition.
3. Ahanatha Pillai, Manual of Anaesthesia for Operation Theatre Technicians: FirstEdition.

BASICS OF A&OTT

Course: Core

Credits: 4 **Total Hours :Theory 30 Hours, Practical 105 hours**

Course Objective:

- The role of A&OT Technologist in the Operating and Post operative areas. How to ensure safety of the patient in perioperative environment
- Preparation of the Operation Theatre for Various Types of Anaesthesia andSurgery
- Standard precautions to Prevent Infection and Prevention of Infection in the Operation theatre
- Biomedical Waste Management.

UNIT 1

Role of Anaesthesia and OT Technologist in the Operation Theatre, Recovery Room and CSSD.

Preparation for the Administration of Anaesthesia.
Checking Anaesthesia workstation and Breathing system
Checking the Monitoring Equipment
Checking the equipment used for Anaesthesia and Resuscitation

Unit 2

Preparation for the Surgery. Operation Table and Various position used for Surgery and Anaesthesia

Standards for cleanliness in the surgical environment, establishing the surgical Environment.

Prevention of infection in OT: Transportation of the patient to OT, Sources of infections, Prevention

of infection, Handling Sterile items in OT. Preparation of Instrument sets for Surgery. Checking the

sets for Proper Sterilisation.

Unit 3

Preparation of the patient for Anaesthesia and Surgery
Assessment by Surgeon and Surgical Care Plan
Pre Anaesthetic Evaluation and Premedication
Informed Consent for Surgery and Anaesthesia
Preoperative Fasting Guideline
Re Assessment of Patient in the Patient Holding Area

Unit 4

Technique :

Application of Pre Induction Monitors, Documentation of Basal Parameters

Setting up Peripheral Intravenous line: Aseptic precautions, Choice of IV Cannula , Scalp Vein Set, IV infusion sets, IV Fluids, Securing the Cannula. Syringes and Needles. Loading a drug in the Syringe, Dilution of Medicine, Multi dose Vial Policy. Calculation of Fluid Requirement

Unit 5

Safety Aspects

Surgical Safety Checklist
Biomedical Waste Management
Universal Precautions. (Standard Precautions) Needle
Stick Injury : Prevention and ManagementApplied
Pharmacology

Analgesics: Opioid and Nonopioids

IV Induction Agents

Neuromuscular Blocking Agents : Depolarising and NondepolarisingReversal of Neuromuscular Blockade

Semester 3 Practical

Checking the Anaesthesia machine, workstation and Circuits

Identification and use of Anaesthesia Equipment

Face Mask, Oropharyngeal airway, Nasopharyngeal Airway, Laryngoscope, Stillette, Intiubation Catheter, Endotracheal tubes, Supra Glottic Airway Device

IV Cannula, Infusion Set , Extension tubing, three way connector

Various IV Fluids, Induction Agents, Analgesics, NMB, Reversal agents of NMB

Pre operative Checklist, Antibiotic Prophylaxis , Monitoring a Patient

Surgical Safety Checklist, , Universal Precautions. (Standard Precautions), Hand Washing, Scrubbing for a sterile Procedure, Gowning and Gloving, Biomedical Waste Management , Needle Stick Injury : Prevention and Management.Sterilistaion Indicator

Setting a Minor Surgical set, General Surgical Set, Laparotomy Set

Course outcome:

- At the end of this course Student should Know:
- The role of A&OT Technologist in the Operating and Post operative areas. How to ensure safety of the patient in perioperative environment
- Preparation of the Operation Theatre for Various Types of Anaesthesia

andSurgery

- Standard precautions to Prevent Infection and Prevention of Infection in the Operation theatre
- Biomedical Waste Management.

Recommended Books:

1. Ajay Yadav Short textbook of Anaesthesia: Sixth Edition .
2. PramilaBhalla, Textbook for Operation Room Technicians: Second Edition.
3. Rajgopal Shenoy K.&Anitha Nileshwar, Manipal Manual of Instruments.
4. Ronald D. Miller ,Miller's Anaesthesia: 8th Edition.

KANNADA

Course: AECC

Credits: 02 **Number of hours: 30**

Course Objectives

- Enable students to learn alphabet, words and simple sentences in Kannada.
- Enable students to enhance speaking and writing communicative skills in Kannada and learn technical words related to medical science

COURSE CONTENT:

Unit I: Kannada Letters (vowels, Consonant)

Unit II: Words, Phrases, formation of sentences, Letter Writing, Essay Writing. Treatment related Kannada words (from English to Kannada)

Unit III:

1) Possible communication in kannada between Patients and Doctors.
2) Advising sentences to the possible questions of patients.
3) Some important sentences which enable to communicate with doctors and colleagues.

Course Outcome

- Allied health science students will be able to attend health issues of native Kannada speaking patients more effectively.
- They can also act as a bridge between doctors and patients.

Recommended Books

- Kannada Vyakarana – (8th ,9th and 10th Karnataka government text books)
- HSK, Vyavarahika Kannada

Semester 4

DISINFECTION, STERILISATION AND INFECTION CONTROL

Course: Core **No. of Hours:45**

Credits: 3

Course Objective:

- Disinfection, Sterilisation and infection control
- Different methods of physical and chemical Sterilization.
- Sterilization methods used for various equipment used in Surgery and Anaesthesia.
- A brief idea about the Central sterile supply department: the areas associated, various indicators used to check the efficiency of sterilization.
- Sample collection for Microbiology culture from OT, ICU and post-operative ward.
- Precautions to be taken by a health professional while caring a patient. Biomedical waste management.

Course content:

Unit:1 Decontamination, disinfection and Sterilization.

Methods of Sterilisation: Physical Method , Chemical Method
Description of Various Methods and Chemical Agents
Sterilisation of Various types of Equipment Used for Surgery and Anaesthesia

Unit:2 Daily terminal cleaning:

In the operation room, Outside the operating room,weekly or monthly cleaning, Cart system Clean up,

Mechanical washing, Ultrasonic cleaner, Sterilization of endoscopic instruments, Care of microsurgical instruments;

Assembly of instrument sets, Components of Various sets, Packinginstruments & other items for sterilization

Unit:3 Central Sterile supply department:

Different areas and the floor plan.Loading and Removal of the sets in Different Steriliser
Indicator to Test the efficiency of Sterilisation

Handling Sterile items in OT. Preparation of Instrument sets for Surgery. Checking the sets for Proper Sterilisation

Unit:4 Disinfection of the patient care unit and Large Equipment

Taking Samples for Microorganism culture from Operation theatre, ICU and Post Op Ward. Disinfection/Sterilization of the Operation Theatre, Intensive Care Unit/ Post op ward

Disinfection of the Anaesthesia Workstation, Ventilators, Robot, Microscope,C Arm, OT table Disinfection of HBV-, HCV-, HIV- or TB- contaminated Devices andOperation theatre

Air Disinfection, Surface Disinfection:

Reprocessing of Endoscopes, Laparoscopes and Arthroscopes;

Safe Injection Practices , Prevention and Management of Needle Stick Injury

Standard Precautions, Hand washing, Personal Protective Equipments

Respiratory hygiene (cough etiquette) and transmission-based precautions (contact, droplet, and airborne.)

Unit:5 Biomedical waste Management

Course Outcomes:

- At the end of the course student should have the knowledge aboutFollowing aspects of Disinfection, Sterilisation and infection control
- Different methods of physical and chemical Sterilization.
- Sterilization methods used for various equipment used in Surgery and Anaesthesia.
- A brief idea about the Central sterile supply department: the areas associated, various indicators used to check the efficiency of sterilization.
- Sample collection for Microbiology culture from OT, ICU and post-operative ward.
- Precautions to be taken by a health professional while caring a patient. Biomedical waste management.

Recommended Books:

1. PramilaBhalla,Textbook for Operation room technicians: Second Edition
2. Ahanatha Pillai, Manual of Anaesthesia for Operation Room Technicians: First Edition.
3. M.M Kapur, Introduction to Surgical Instruments and Procedures for UnderGraduate.
4. Ananthanarayan & Paniker,Edited by Arti Kapil Textbook of Microbiology: 9th Edition.

MEDICINE RELEVANT TO ANAESTHESIA& OT TECHNOLOGY

Course: Core **No. of hours: 45**

Credits: 2

Course Objectives:

- Basic knowledge of clinical examination of patients.
- Understanding of common medical diseases like Diabetes Mellitus, Hypertension, Ischemic Heart Disease, Anaemia, Chronic obstructive pulmonary disease, Chronic liver and kidney diseases.
- Physiological changes in pregnancy and common problems associated with pregnancy and child birth, Teratogenicity
- Anesthetic Implications, types and clinical features of Obesity
- Anesthetic considerations in elderly patient, cerebrovascular accident and Epilepsy

Course content:

Unit:1 Introduction:

Clinical examination of patients: History, General physicalexamination, Systemic examination, Investigations.

Assessment of Airway

Unit:2 Medical comorbidities.

- **Diabetes mellitus**: Types, Clinical features, Diagnosis, Investigations, Treatment, Complications of Diabetes Mellitus, Measurement of blood sugar.

Applied Pharmacology: Oral Hypoglycemic Agents, Insulin

- **Hypertension**: Definition, Clinical features, Measurement of Blood pressure,Investigations Complications of Hypertension.

Applied Pharmacology :Anti Hypertensive Drugs classification with examples Parenteral Preparation of Antihypertensive Drugs, Preparation of Infusion

- **Ischemic heart disease**: Blood Supply to the Heart, Functions of Heart , RiskFactors for Ischemic Heart Disease. Factors affecting the Oxygen supply to the Heart. Factors Determining Oxygen Demand of the Heart.

Clinical features of Ischemic Heart Disease, Angina Pectoris, Unstable Angina and Myocardial Infarction. Diagnosis of Ischaemic Heart Disease,

Investigations : Normal ECG, Echocardiogram, TMT, Coronary Angiogram Treatment of Ischaemic Heart Disease.

- **Deep Vein Thrombosis** : Definition, Causes, Prevention and Treatment **Pulmonary Embolism** :Causes, Clinical features Prevention and **Treatment Applied Pharmacology**: Antiplatelet Drugs, Oral Anticoagulants, Heparin Tests of Coagulation
- **Obesity**: Definition, Clinical features, Obstructive Sleep Apnoea, Types of Obesity, Anaesthetic implications of obesity, Airway management in Obesepatients.
- **COPD & bronchial asthma:** Clinical features, Treatment, Lung Volumes andCapacities, Functions of Lung, Assessment of Lung function.

Applied Pharmacology : Bronchodilators : Classification and Preparations , Routes of Administration

Unit:3 Changes in pregnancy

Pregnancy, Physiological Changes in Pregnancy, Supine hypotension syndrome, and common problems associated with pregnancy and childbirth. Teratogenicity, Drugs to be avoided in Pregnancy.

Assessment and Care of the Newborn.

Unit: 4 Kidney

- **Functions of Kidney, Acute renal failure, Chronic renal failure:,** Causes ofrenal failure, Renal Function Tests, Complications of Renal failure, Treatment. Drugs to be avoided in renal failure,
- **Anaemia:** Function of Haemoglobin, Meaning of Anaemia, Types of Anaemia,Symptoms and Signs, Diagnosis of Anaemia, Complete Blood Count, Peripheral Smear, Bone marrow Aspiration, Treatment of Nutritional Anaemia, Megaloblastic Anaemia

Applied Pharmacology: Oral and Parenteral Haematenics

Unit: 5 Blood groups

- **Blood Group and Rh Types, Components of Blood, Storage of Blood, Bloodtransfusion**: Precaution and Monitoring during Blood Transfusion, complication of Blood Transfusion and management. Transfusion of BloodComponents

Unit: 6 Liver

- **Functions of Liver, Chronic liver disease/failure: Hepatitis** – types & treatment. Meaning of Fatty liver, Cirrhosis, Jaundice, Types Investigations:liver function tests,.
- Precautions in a Patient with Hepatitis,

Unit: 7 Epilepsy

- Meaning of Convulsion, Epilepsy and Stroke, Causes, Treatment, Statusepilepticus, Drugs

Unit:8 Elderly patient:

Definition, Physiology and Pathophysiology of Aging,Anaesthetic Considerations in the elderly patient.

Applied Pharmacology

Vasodilators

Adrenergic Antagonist Drugs

Diueretics

Adrenergic Agonist Drugs

Vasopressor and Ionotropes

Anticholinergic Drugs

Antiplatelet Drugs

Anticoagulants

Heparin Types and Uses

Oral Hypoglycemic Agents, Insulin

Anti Hypertensive Drugs classification with examples

Oral and Parenteral Haematenics

BronchodilatorsCorticosteroids

Course Outcome:

- Students at the end of the semester should have knowledge about the following aspects of Medicine
- Basic knowledge of clinical examination of patients
- Understanding of common medical diseases like Diabetes Mellitus, Hypertension, Ischemic Heart Disease, Anaemia, Chronic obstructive pulmonary disease, Chronic liver and kidney diseases.
- Physiological changes in pregnancy and common problems associated with pregnancy and child birth, Teratogenicity
- Anesthetic Implications, types and clinical features of Obesity
- Anesthetic considerations in elderly patient, cerebrovascular accident and Epilepsy

Recommended Books:

1. Jaypee Brothers, Editedby TK Datta, Fundamentals of Operation Theatre Services
2. Ajay Yadav, Short Textbook for Anaesthesia: Fifth Edition .
3. Ronald D. Miller, Miller's Anaesthesia: 2nd Volume, 9th Edition .
4. K. GeorgeMathew, Medicine Manual for Under Graduates: 4th Edition.

APPLIED ANAESTHESIA AND OT TECHNOLOGY

Course: core **no.of hour: 60**

Credits: 4

Course Objective:

- The preoperative management of the patient: Pre Anaesthetic Evaluation, receiving the patient in the operation theatre, transportation of patient inside the OT, Recording the Vital Parameters before induction of Anaesthesia , checking the surgical safety checklist
- Preparation for the administration of anaesthesia to the patient. Checking the Anaesthesia workstation, insertion of various Cannula for the patient.
- Preparation for Endotracheal intubation, Nasogastric tube insertion, Urinary Catheterization, intercostal drain insertion, pleural fluid aspiration.
- Positioning of the patient for various surgeries, Securing the patient in that position, the complications of positioning and prevention
- Assisting a sterile procedure , Principles, procedure and the material for draping.
- The various parameters monitored during the surgeries.
- Post-operative care and wound management.
- Equipment used during surgical procedures like Diathermy, Tourniquet, Ultrasound machine, Defibrillator , laser, Irrigation fluids
- Basic Surgical Instruments and Suture materials,

Course content

Unit:1 Pre operative Assessment

- Preoperative Management , The perioperative environment: Preoperative Checklist

Unit:2 The perioperative Patient Care Team:

- Non sterile team members; Sterile team members
- Transporting the Patient to Operation Theatre
- , Surgical Safety Checklist Implementation
- Setting up IV access and Monitors, Administering Anaesthesia to the Patient

- Keeping the Assorted Sizes of Anaesthesia Equipments, Cannulas, Needles and Catheters

Unit:2 Criteria for surgical attire:

- Appropriate operation room attire: Definition, Purpose,
- Consideration for appropriate attire, Components of appropriate attire.

Unit:3 Preparation of the patient for the Surgery Positioning & draping the patient:

- Preliminary considerations, Equipment for positioning
- Principles of patient skin preparation; Antiseptic preparation of the patient's skin;
- Surgical skin cleansing fundamentals; Antiseptic solutions; Skin preparation for specific anatomic areas; Draping; Draping materials; Principles of draping; Procedures for draping the patient;
- Positioning The Patient For Surgery, Various Surgical Positions and their physiologic Implications

Unit:4 Intra Operative Monitoring, Parameters Monitored during Surgery

- Pulse, SpO2, HR, Rhythm, NIBP, IBP, Capnograph, Temperature, Urine output, CVP

Unit:5 Recovery

- Recovery of Patient and Recovery Position.
- Room turnover between patient, Room turnover activities by the scrub person, Room, turnover Activities by team, Getting room ready for the next patient, Environmental responsibility;
- PACU (Recovery Room and Post operative Room): Monitoring the patient in Recovery Room
- Assessment of Patient and Post operative complication in Recovery Room
- Criteria to Send the patient home after Day Care Surgery

Unit:6 Oxygen Therapy :

- Indication and Equipments, Fixed Performance and Variable performance devices

Unit:7 Basic life support:

- Diagnosis of Cardiac arrest, Basic Life Support, Use of Defibrillator
- Various Surgical Instruments, Surgical Sutures

Unit:8 Wound healing:

- Mechanism of wound healing; Types of wounds; Factors influencing wound healing;
- Wound management; Complications of wound healing; Post operative wound infections; Basic wound care

Unit:9 powered surgical equipments:

Tourniquets : Principle, precautions , technique of Application, Setting the Inflation Pressure and Duration, Hazards of Tourniquet Application.

Electro Cautery : Principle, Types, Precautions and Hazard

LASER : Uses in the OT and Precautions when laser is Used

Use of C arm and Radiation Safety in the Operational Theater

Ultrasound Machine : Uses in OT and care of the machine

Course outcomes:

- At the end of the fourth semester students should have knowledge about the following aspects of Applied Anaesthesia and OT technology
- The preoperative management of the patient: Pre Anaesthetic Evaluation, receiving the patient in the operation theatre, transportation of patient inside the OT, Recording the Vital Parameters before induction of Anaesthesia , checking the surgical safety checklist
- Preparation for the administration of anaesthesia to the patient. Checking the Anaesthesia workstation, insertion of various Cannula for the patient.
- Preparation for Endotracheal intubation, Nasogastric tube insertion, Urinary Catheterization, intercostal drain insertion, pleural fluid aspiration.
- Positioning of the patient for various surgeries, Securing the patient in that position, the complications of positioning and prevention
- Assisting a sterile procedure , Principles, procedure and the material for draping.
- The various parameters monitored during the surgeries.
- Post-operative care and wound management.
- Equipment used during surgical procedures like Diathermy, Tourniquet, Ultrasound machine, Defibrillator , laser, Irrigation fluids
- Basic Surgical Instruments and Suture materials,

Recommended Books:

1. Pramila Bhalla,Textbook for Operation room Technicians: Second Edition
2. Ahanatha Pillai, Manual of Anaesthesia for Operation room Technicians: First Edition S.
3. MM Kapur, Introduction to Surgical Instruments and Procedures for Under Graduates:
4. Ananthanarayan & Paniker, Edited by Arti Kapil Textbook of Microbiology: 9th Edition.
5. Ronald D. Miller, Miller's Anaesthesia: 8th Edition.

PRACTICAL APPLIED ANAESTHESIA & OT TECHNOLOGY

Course: core **no. of hours:540**

Credits: 4

Course objectives:

- Should learn the sterilization of equipments in details.
- Principle of autoclaving and quality control of sterilization.
- Preparation for administration of Anaesthesia.

Course contents:

Unit:1 Principles of autoclaving & quality control of Sterilization.

Cleaning, Drying and Packing of Various Surgical Equipments and Loading to Autoclave Machine, ETO machine and Plasma Steriliser

Chemical Disinfectant / Steriliser used in our hospital and their Contact time

Collection of specimen from outpatient units, inpatient units, minor operation theater and major operation theater for sterility testing.

The various methods employed for sterility testing.

Interpretation of results of sterility testing.

Disinfection of Operation Theatre, ICU.

Unit:2 Preparation for the Administration of Anaesthesia.

Checking Anaesthesia workstation, Breathing system and the Monitoring Equipment

Checking the equipment used for Anaesthesia and Resuscitation

Identification, description and use of Anaesthesia Equipment

Face Mask, Oropharyngeal airway, Nasopharyngeal Airway, Laryngoscope, Stillette, Intiubation Catheter, Endotracheal tubes, Supra Glottic Airway Device

IV Cannula, IV Fluids, Infusion Set , Extension tubing, three way connector, Breathing Circuit, CO2 absorbants, Vaporiser

Spinal anaesthesia tray, Spinal Needle, Epidural Kit, Catheters

Methods of Sterilisation: Physical Method , Chemical Method

Description of Various Methods and Chemical Agents

Surgical Instruments, Diathermy, Tourniquet

Drugs : Administration of Induction agent, Analgesics, Sedatives, Anticholinergic agents, Neuromuscular Blocking Drugs, Reversal Agents, Vasopressors, Ionoptropes, Antihypertensives, Anti Dysrhythmics, Anticoagulants, Vasodilators, Adrenergic Antagonist , Diueretics, Adrenergic Agonist Drugs, Antiplatelet Drugs, Anticoagulants, Heparin, Oral Hypoglycemic Agents, Insulin, Oral and Parenteral Haematenics, Bronchodilators, Corticosteroids

Course outcomes : at the end of this course students

- Should learn the sterilization of equipment in details.
- Principle of autoclaving and quality control of sterilization.
- Preparation for administration of Anaesthesia.

Recommended Books

1. Pramila Bhalla, Textbook for Operation room Technicians: Second Edition.
2. S Ahanatha Pillai, Manual of Anaesthesia for Operation room Technicians: First Edition.
3. MM Kapur, Introduction to Surgical Instruments and Procedures for Under Graduates:
4. Ananthanarayan & Paniker, Edited by Arti Kapil.Textbook of Microbiology: 9th Edition.
5. Pramila Bajaj,Drugs in Clinical Anaesthesia.
6. Ronald D. Miller Miller's Anaesthesia: 8th Edition.

HUMAN RIGHTS AND GENDER EQUITY

Course: AECC **Number of Hours: 30 Hours**

Credits: 02

Course Objectives:

- To make the student understand the human rights as citizens of India.

COURSE CONTENT:

Unit 1: Human Rights (5 Hours)

- Human Rights- Meaning
- Universal declaration of Human rights

Unit 2: Human Rights Advocacy (5 Hours)

- Global Advocacy of human rights amnesty international and other organizations
- Peoples union for Civil Liberty (PUCL)
- Human Rights Commission in India
- Minority Commission in India
- Remedies against Violation of Human rights in India

Unit 3 : Gender Equity (5 Hours)

- Key Concepts- Gender and sex- Masculinity and Feminity, Partriarchy- Matriarchy, Gender roles and attributes, Gender division or labour, Gender Bias, Gender Stereotypes, Need for Gender Sensitization.

Unit 4: Woman Status in India **(**5 Hours)

- Important indicators- Six Ratio, Education, Health, Nutrition, Material and Infant Mortality, Work Participation rate, Political Participation.

Unit 5: Contemporary Women's Issues (5 Hours)

- Discrimination against Girl child
- Violence against women
- Problems of health and nutrition
- Women's education gender bias in education
- Trafficking in Women
- Globalization and Impact on Women

Unit 6: State Initiatives on Gender Issues (5 Hours)

- Constitutional Rights of Women
- Laws Pertaining to Women
- The National Commission for Women

Course Outcome:

- Basic Knowledge of Human Rights and its function and authorities in society and industry women's status, issues and gender equity.

Recommended Books:

1. Parvathy Appaiah, Human Rights, Gender Equity and Environmental Studies, Shivam Books publishers, 2012.
2. Parvathy Appaiah, Human Rights, Gender Equity and Environmental Studies, Jai Bharath Prakashan publishers, 2016.
3. Parvathy Appaiah,Human Rights, Gender Equity and Environmental Studies, Jai Bharath Prakashan publishers, 2018-19.

BIOSTATISTICS

Course: AECC

Credit: 02 **Number of Hours: 30**

Course Objectives:

- Understands statistical terms.
- Possesses knowledge and skill in the use of basic statistical methods.

COURSE CONTENT:

Unit 1: Introduction **(3 hours)**

- Meaning, definition of statistics.
- Importance of the study of statistics.
- Branches of statistics.
- Statistics and health science including nursing.

- Parameters and estimates.
- Descriptive and inferential statistics.
- Variables and their types.
- Measurement scales

Unit 2 : Tabulation of Data (3 hours)

- Raw data, the array, frequency distribution
    - Basic principles of graphical representation

    - Types of diagrams - histograms, frequency polygons, smooth frequency polygon, commulative frequency curve, ogive.
    - Normal probability curve.

Unit 3: Measure of Central Tendency (4 hours)

- Need for measures of central tendency
- Definition and calculation of mean - ungrouped and grouped
- Meaning, interpretation and calculation of median ungrouped and grouped
- Meaning and calculation of mode.
- Comparison of the mean, and mode.

Unit 4: Measure of Variability (6 hours)

- Need for measure of dispersion. The range, the average deviation.
- The variance and standard deviation.
- Calculation of variance and standard deviation ungrouped and grouped.
- Properties and uses of variance

Unit 5: Probability and Standard Distributions (6 hours)

- Meaning of probability of standard distribution.
- The Binominal distribution.
- The normal distribution.
- Divergence from normality - skewness, kurtosis.

Unit 6: Sampling Techniques **(5 hours)**

- Need for sampling - Criteria for good samples.
- Various sampling designs.
- Procedures of sampling and sampling designs errors.
- Sampling variation.
- Tests of significance.

Unit 7: Health Indicator **(3 hours)**

- Importance of health Indicator.
- Indicators of population, morbidity, mortality, health services.
- Calculation of rates and rations of health.

Course Outcomes

- Gains Knowledge in application of statistics in medical field and research.
- Possesses knowledge and skill in the use of basic statistical methods.

Recommended Books.

1. Mahajan BK, Gupta MC. Textbook of preventive and social medicine. Jaypee Brothers; 1995.

SEMESTER V

ANAESTHESIA TECHNIQUES I

Course: core **Number of hours: 60**

Credits: 04

Course objective:

- The types of Anaesthesia choices available for the patient
- Preparation of the patient for general anaesthesia and Induction of General Anaesthesia.
- Maintenance of anaesthesia, Monitoring, Documentation and Complications during maintenance of Anaesthesia.
- Recovery from Anaesthesia and Complications during Recovery
- PACU (Recovery Room/Post-operative ward) :Equipment required in PACU and Care of patient after Anaesthesia and Surgery

Course contents

Unit 1 Types of Anaesthesia, Components, Balanced Anaesthesia

Unit 2 General Anaesthesia Indications, Types, Preparation of Patient for General Anaesthesia

Unit 3 Pre Anaesthetic-Evaluation, Premedication, Informed Consent

Unit 4 Preoperative Fasting Guidelines, Transferring the patient to the Patient Holding area, Pre-operative Checklist

Unit 5 Preparation for the Administration of Anaesthesia. Keeping assorted

equipment for airway management. Checking Anaesthesia workstation and Breathing system, Checking the Monitoring Equipment. Checking the equipment used for anaesthesia and resuscitation Pre-induction Monitors

Setting up Intravenous line Pre-induction Monitors, Setting up IV line

Unit 6 Types of Induction of Anaesthesia,

Positioning the Patient for Intubation

Induction, Pre-oxygenation , Mask Ventilation, Laryngoscopy and Intubation

Checking the Proper position of Endotracheal Tube, Securing the Tube

Additional Equipment to assist Mask Ventilation, Intubation, Various typesof Mask, Airways, Endotracheal Tubes, Intubation catheter, Stillette, Forceps

Post Induction Monitors, Insertion of Nasogastric tube, Urinary Catheter

Monitoring, documentation , Maintenance of Anaesthesia.

Assessment of Blood loss, Fluid requirement, Prevention of Hypothermia

Recovery from Anaesthesia

Preparation for Extubation, Monitoring during and Immediate Post extubation period

Unit 7

PACU (Post Anaesthesia Care Unit) Recovery Room/ Post-operative Room.

Shifting the Patient to Recovery Room/ PACU

Keeping the PACU ready to receive a Patient after Anaesthesia and Surgery.

Monitoring the Patient in Recovery Room/ Post-operative Room.Complications During General Anaesthesia

Diagnosis and management of Difficult Airway Complications during Induction of Anaesthesia

Differenttial Diagnosis for Desaturation after securing the airway, Tight bagafter intubation, Increased airway pressure.

Unit 8 Definition of Difficult airway. Management of Difficult airway/ Cannot Intubate Cannot Oxygenate

Intra operative Complications and Management, Assessment of blood losssduring surgery

Complications during Recovery, Complications in the Recovery Room/ Post-Operative ward.

Pharmacology

Induction Agents, Neuromuscular Blocking Agents, Reversal of Neuro muscular Blockade, Volatile Anaesthetic Agents, Sedatives, Analgesic Drugs Opioid and Non-opioid Drugs) , Anticholinergic drugs, Anti emetics drugs, Prokinetic drugs and Drugs which reduce gastric pH and Gastric Volume

Course outcome:

Student at the end of this course should have the following knowledge in relation to General Anaesthesia –

- The types of Anaesthesia choices available for the patient
- Preparation of the patient for general anaesthesia and Induction of General Anaesthesia.
- Maintenance of anaesthesia, Monitoring, Documentation and Complications during maintenance of Anaesthesia.
- Recovery from Anaesthesia and Complications during Recovery
- PACU (Recovery Room/Post-operative ward) :Equipment required in PACU and Care of patient after Anaesthesia and Surgery

Recommended Books:

1. Ajay Yadav Short Textbook of Anaesthesia Fifth Edition
2. Pramila Bhalla: Textbook for Operation room Technicians: Second Edition
3. Ronald D. Miller :Miller's Anaesthesia: 8th Edition
4. Casey D. Blitt : Monitoring in Anaesthesia and Intensive care Medicine
5. Pramila Bajaj :Drugs used in Clinical Anaesthesia

CLINICAL ANAESTHESIA TECHNIQUES I

(GENERAL ANAESTHESIA)

Course core **Number of hours: 120**

Credits: 04

Course objective

- Preparation of the Operation theatre for the Administration of Anaesthesia
- Checking the Various equipments required for the the Administration of General Anaesthesia
- Checking the Various equipments required for the the Administration of Regional Anaesthesia

- Applying Various Monitors to the Patient
- Securing Venous access in a patient
- sterilisation and disinfection
- Mechanism of Conduction across nerve and Action of Local anaesthetic agents

- Identifying and Injecting drugs for Sub Arachnoid Block, Epidural Anaesthesia/analgesia, Caudal Anaesthesia/Analgesia, Plexus block and peripheral nerve block
- Various local anaesthetic agents, their concentration and Additives used for various blocks.

- Indications, technique, complications, contraindications of Varios regional Anaesthesia Techniques

Course contents

Unit 1 Administration of General Anaesthesia: Preparation of Patient, Preparing the Anaesthesia Machine,

Unit 2 Pre Induction Monitors, Setting IV Access, Keeping Assorted sizes of Cannula, IV infusion devices,

Unit 3 Face Mask, Airway, Laryngeal Mask Airway, Endotracheal Tubes, Devices to assist endotracheal

Unit 4 Intubation, Confirmation of Position of Endotracheal tube, Securing the Endotracheal tube/LMA,

Unit 5 Suctioning the throat, Insertion of NG tube, Insertion of Urinary catheter.

Unit 6 Monitoring , Recognition and Management of Complications. Setting up Infusion of Various Drugs.

Unit 7 Preparation in PACU, Monitoring in PACU

Unit 8 Setting up Difficult airway Cart

Course outcome

At the end of this course students should able to do the;

- Preparation of the Operation theatre for the Administration of Anaesthesia
- Checking the Various equipments required for the the Administration of General Anaesthesia
- Checking the Various equipments required for the the Administration of Regional Anaesthesia

- Applying Various Monitors to the Patient
- Securing Venous access in a patient
- sterilization and disinfection
- Mechanism of Conduction across nerve and Action of Local anaesthetic agents

- Identifying and Injecting drugs for Sub Arachnoid Block, Epidural Anaesthesia/analgesia, Caudal Anaesthesia/Analgesia, Plexus block and peripheral nerve block
- Various local anaesthetic agents, their concentration and Additives used for various blocks.

- Indications, technique, complications, contraindications of Varios regional Anaesthesia Techniques

Recommended Books

1. Pramila Bhalla: Textbook for Operation room Technicians Second Edition.
2. S ahanatha pillai :Manual of Anaesthesia for Operation room Technicians First edition.
3. MM Kapur: Introduction to Surgical Instruments and Procedures for Under Graduates
4. Ananthanarayan & Paniker, Edited by Arti Kapil:text book of microbiology 9th Edition
5. Pramila bajaj : Drugs in Clinical Anaesthesia
6. Ronald D. Miller :Miller's Anaesthesia_8th Edition

ANAESTHESIA TECHNIQUES II (REGIONAL ANAESTHESIA)

Course: core **number of hours:60**

Credits :04

Course Objectives:

- Types of regional/local anaesthesia
- Preparation of the patient for Regional Anaesthesia
- Checking equipment, monitors, workstation and equipments used for resuscitation.
- Aseptic precautions before administering regional anaesthesia.
- Anatomy of vertebral column, spinal cord, spinal covering, spinal nerves, Cerebrospinal Fluid production, circulation and absorption.
- Mechanism of Conduction across nerve and Action of Local anaesthetic agents
- Identifying and Injecting drugs for Sub Arachnoid Block, Epidural Anaesthesia/analgesia, Caudal Anaesthesia/Analgesia, Plexus block and peripheral nerve block.
- Various local anaesthetic agents, their concentration and Additives used for various blocks.
- Indications, technique, complications, contraindications of Varios regional Anaesthesia Techniques

course contents

unit 1 History of Local Anaesthesia/ Regional Anaesthesia, Types of Regional Anaesthesia

unit 2 Preparing a Patient for Regional Anaesthesia, Pre Anaesthetic Evaluation,Premedication, Informed Consent ,Preoperative Fasting

Guidelines, Transferring the patient to the PatientHolding area, Pre operative Checklist. Preparation for the Administration of Regional Anaesthsia. Checking Anaesthesia workstation and Breathing system checking the Monitoring Equipment. Checking the equipment used for Resuscitation. Pre Induction Monitors, Setting up Intravenous line. Preparing the Equipment Required for Regional Anaesthesia Importance of Aseptic precautions during Regional AnaesthesiaCentral

unit 3 Neuraxial Blockade

Anatomy of Vertebral Column, Spinal Cord, Coverings, Spinal Nerves, Cerebrospinal Fluid Production, Circulation and Absorption Difference between Paediatric and Adult patients

Sub Arachnoid Block

Indications and Contra Indications, Preparation of the patient

Preparation of Spinal Anaesthesia Set, Components, Spinal Anesthesia Needles, Types, size

Technique of Sub Arachnoid Block, Drugs and Additive used for Sub Arachnoid Block

Sub Arachnoid Block : Complications Immediately after the Procedure and Delayed Complications

Prevention and Management of the Complications

Epidural Anaesthesia

Indications and Contra Indications, Different types of Epidural Anaesthesia/ Analgesia

Preparation of the patient, Preparation of Epidural Anaesthesia Set, Components

Preparation of the patient, Preparation of Epidural Anaesthesia Set, Components

Epidural Anaesthesia Needles, Catheters, Types, Size, Fixing devices

Drugs and Additive used for Epidural Anaesthesia

Technique of Epidural , Continuous Epidural Anaesthesia/ Analgesia, Maintaining Epidural Infusion Epidural Anaesthesia : Immediate Complications and Delayed Complications

Prevention and Management of the Complications Peripheral nerve block, Plexus block, Nerve block Preparation for Nerve Stimulator Guided Nerve BlockPreparation for Ultrasound Guided Nerve Block

Various Upper Limb and Lower limb Nerve Block Technique

Head and Neck, Thoracic and Abdominal Wall Nerve Block

Complications of Peripheral Nerve Block, Recognition and Management

Pharmacology

Unit 4.Local Anesthetic Drugs : Classification, Examples, Mechanism of ActionMetabolism and Adverse effects of Local Anaesthetic Agents

Different Preparation of Local Anaesthetic Anaesthetic Drugs and Indications for their use

Additives Used : Purpose of Additive Agents

Local Anesthetic Systemic Toxicity. Clinical features and Management

Course Outcomes:

Student at the end of this course should have the following knowledge in relation to regional anaesthesia-

- Types of regional/local anaesthesia
- Preparation of the patient for Regional Anaesthesia
- Checking equipment, monitors, workstation and equipments used for resuscitation.
- Aseptic precautions before administering regional anaesthesia.
- Anatomy of vertebral column, spinal cord, spinal covering, spinal nerves, Cerebrospinal Fluid production, circulation and absorption.
- Mechanism of Conduction across nerve and Action of Local anaesthetic agents
- Identifying and Injecting drugs for Sub Arachnoid Block, Epidural

Anaesthesia/analgesia,Caudal Anaesthesia/Analgesia, Plexus block and peripheral nerve block.

- Various local anaesthetic agents, their concentration and Additives used for various blocks.
- Indications, technique, complications, contraindications of Varios regional Anaesthesia Techniques

Recommended Books:

1. Ajay Yadav : Short Textbook of Anaesthesia: 5th Edition
2. Pramila Bhalla. Textbook for Operation room Technicians 2nd Edition.
3. Ronald D. Miller :Miller's Anaesthesia, 2nd volume, 9th Edition
4. P. Prithvi Raj :Textbook of Regional Anaesthesia

CLINICAL ANAESTHESIA TECHNIQUES II(REGIONAL ANAESTHESIA)

Corse core **number of hours:120**

Credits :3

Course objective

- Receiving the Patient for Surgery and Shifting the Patient to Operation Theatre.

- Preparation of the Operation theatre for the Administration of Anaesthesia.
- Checking the Various equipments required for the the Administration of General Anaesthesia.

- Checking the Various equipments required for the Administration of Regional
- Anaesthesia.
- Applying Various Monitors to the Patient.

- Securing Venous access in a patient.
- Setting of Invasive Pressure Monitoring.

Course contents

Unit 1 Preparing the Operation theatre for Regional Anaesthesia

Preparation of Spinal set, Epidural set, Set for Peripheral Nerve Block, Positioning the Patient for Spinal, Epidural and Peripheral Nerve Block, Demonstration of Various needle and catheter used for Spinal, Epidural and peripheral Nerve Block. Identification of Epidural Space and Test dose Demonstration

Unit 2 Clinical Monitoring and Use of Multipara Monitor, Monitoring the Patient. Interpretation of Pulse Rate, SpO2, Plethysmograph, ECG, Heart Rate, Rhythm, Blood Pressure and Interpretation of Capnograph

Unit 3 Preparation for Arterial Cannulation, Assisting Arterial Cannulation and Setting up Arterial Pressure Monitoring equipment

Unit 4 Different types of central Venous Cannula, Preparing a set for central venous cannulation, Assisting Central Venous line Insertion and CVP monitoring.

Unit 5 Insertion of Temperature Monitoring Probe, use of patient warming devices

Unit 6 Neuromuscular monitoring Demonstration

Unit 7 Interpretation of ABG report

Course outcome:

At the end of this course students should know the following:

- Receiving the Patient for Surgery and Shifting the Patient to Operation Theatre.

- Preparation of the Operation theatre for the Administration of Anaesthesia.
- Checking the Various equipments required for the the Administration of General Anaesthesia.

- Checking the Various equipments required for the Administration of Regional
- Anaesthesia.
- Applying Various Monitors to the Patient.

- Securing Venous access in a patient.
- Setting of Invasive Pressure Monitoring.

Recommended Books

1. Pramila Bhalla.: Textbook Operation room Technicians Second Edition
2. S Ahanatha Pillai. Manual of Anaesthesia for Operation room Technicians First Edition
3. MM Kapur. Introduction to Surgical Instruments and Procedures for Under Graduates

ANAESTHESIA TECHNIQUES III (MONITORING)

Corse core **number of hours: 60**

Credits :

Course Objective:

Minimum mandatory monitoring during anaesthesiaPre
Induction and Post Induction Monitors
ECG, SpO2, Capnograph, Temperature, Respiration MonitoringNon
Invasive Monitoring and Interpretation of Values.
Setting up of Arterial Blood Pressure Monitoring
Setting up CVP Monitoring

Course contents

Unit 1 What is Monitoring

History of Monitoring During Anaesthesia,
Unit 2 Monitoring oxygenation & ventilation
Unit 3 Monitoring the Respiration, Pulse Oximetry , Capnometry and Capnograph :MAC, Agent Monitoring During Anaesthesia
Airway Pressure Monitoring,

Unit 4 Settings of Anaesthesia Ventilator

Unit 5 ABG : Components of Arterial Blood Gas Report

Unit 6 Cardiovascular Monitoring

Pulse , ECG and Blood Pressure Measurement : NIBP and Direct Arterial

Pressure monitoring

Transesophageal Echocardiogram

Unit 7

Volume Status Monitoring
Central Venous Pressure Monitoring
Urine Output Monitoring
Neuromuscular Monitoring;
Temperature Monitoring: Prevention of Heat loss,
Hypothermia/Hyperthermia

Course Outcome:

At the end of this course, the student should have following knowledge about monitoring:

Minimum mandatory monitoring during anaesthesiaPre
Induction and Post Induction Monitors
ECG, SpO2, Capnograph, Temperature, Respiration MonitoringNon
Invasive Monitoring and Interpretation of Values.
Setting up of Arterial Blood Pressure Monitoring
Setting up CVP Monitoring

Recommended Books:

1. Ajay Yadav: Short Textbook of Anaesthesia: 5th Edition.
2. PramilaBhalla : Textbook for Operation room Technicians2nd Edition
3. Ronald D. Miller. Miller's Anaesthesia 8th Edition
4. Casey D. Blitt :Monitoring in Anaesthesia and Intensive care Medicine

Sixth semester

SPECIALITY ANAESTHESIA I

Course: core **number of hours: 60**

Credits:04

Course objective

- Preparation and Conduct of General surgery Procedure in the Operation Theatre
- Additional Considerations in Emergency surgeries.
- Preparation and Conduct of pediatric surgery Procedure in the Operation Theatre
- Preparation and Conduct of laparoscopic surgery Procedure in the Operation Theatre
- Preparation and Conduct of bariatric surgery Procedure in the Operation Theatre
- Preparation and Conduct of oncosurgery Procedure in the Operation Theatre
- Preparation and Conduct of urology surgery Procedure in the Operation Theatre
- Preparation and Conduct of robotic surgery Procedure in the Operation Theatre

Course content

Unit 1 General Surgery Procedures : Preparation of Operation theatre for Electiveand Emergency general Surgical Procedure, positioning the patient for Anaesthesia and Surgery

Unit 2 Paediatric Surgery: Additional Considerations in surgical procedures in achild, infant and Neonate

Unit 3 Laparoscopic Surgery : Setting up Laparoscopy equipment and Gas for pneumoperitoneum

Unit 4 Bariatric Surgery : Additional Considerations in Bariatric Surgeries

Unit 5 Oncosurgery : Setting the Operation Theater for various Surgical OncologyProcedures.

Unit 6 Urology Surgery : Additional considerations in Urology Operation Theatre,Use of Irrigation Fluids, Positioning the patient, Use of C arm, Radiation Safety during the procedure, Use of LASER, Contrast material used

Unit 7 Robotic Surgery : Preparing the Operation theatre for Robot assistedprocedures, Additional Considerations in Positioning the patient andMonitoring.

Unit 8 Plastic , Reconstructive Surgery , Vascular Surgery, Maxillofacial and Craniofacial Surgery: Preparing the Operation theatre Elective and Emergency Surgeries from these Departments, Various Endotracheal usedand Management of Difficult airway

Unit 9 Thoracic Surgery Additional Considerations for Anaesthesia and Surgery,Use of Double Lumen Tubes, Positioning the Patient.

Unit 10 Cardiac Surgery: Additional Considerations

Unit 11 Emergency Surgery : Additional Considerations in Emergency Surgeries

Course outcome

At the end of this course should know

- Preparation and Conduct of General surgery Procedure in the Operation Theatre
- Additional Considerations in Emergency surgeries.
- Preparation and Conduct of pediatric surgery Procedure in the Operation Theatre
- Preparation and Conduct of laparoscopic surgery Procedure in the Operation Theatre
- Preparation and Conduct of bariatric surgery Procedure in the Operation Theatre
- Preparation and Conduct of oncosurgery Procedure in the Operation Theatre

- Preparation and Conduct of urology surgery Procedure in the Operation Theatre

- Preparation and Conduct of robotic surgery Procedure in the Operation Theatre

Recommended Books:

1. Ajay Yadav :Short Textbook of Anaesthesia: 5th Edition.
2. PramilaBhalla :Textbook for Operation room Technicians 2nd Edition by
3. P. Reed & FrancineS: Clinical Cases in Anaesthesia 4th Edition by Allan
4. Pramila Bhalla. Textbook for Operation room Technicians Second Edition by
5. Pramila Bajaj Drugs in Clinical Anaesthesia
6. Ronald D. Miller: Miller's Anaesthesia 8th Edition

CLINICAL SPECIALITY ANAESTHESIA I

Course: core **number of hours: 60**

Credits:03

Course objective

- Preparation and Conduct of General surgery Procedure in the Operation Theatre
- Additional Considerations in Emergency surgeries.

- Preparation and Conduct of pediatric surgery Procedure in the Operation Theatre

- Preparation and Conduct of laparoscopic surgery Procedure in the Operation Theatre

- Preparation and Conduct of bariatric surgery Procedure in the Operation Theatre
- Preparation and Conduct of oncosurgery Procedure in the Operation Theatre
- Preparation and Conduct of urology surgery Procedure in the Operation Theatre
- Preparation and Conduct of robotic surgery Procedure in the Operation Theatre

Course content

Unit 1 General Surgery Procedures : Preparation of Operation theatre for Electiveand Emergency general Surgical Procedure, positioning the patient for Anaesthesia and Surgery

Unit 2 Paediatric Surgery: Additional Considerations in surgical procedures in achild, infant and Neonate

Unit 3 Laparoscopic Surgery : Setting up Laparoscopy equipment and Gas for pneumoperitoneum

Unit 4 Bariatric Surgery : Additional Considerations in Bariatric Surgeries

Unit 5 Oncosurgery : Setting the Operation Theater for various Surgical OncologyProcedures.

Unit 6 Urology Surgery : Additional considerations in Urology Operation Theatre,Use of Irrigation Fluids, Positioning the patient, Use of C arm, Radiation Safety during the procedure, Use of LASER, Contrast material used

Unit 7 Robotic Surgery : Preparing the Operation theatre for Robot assistedprocedures, Additional Considerations in Positioning the patient andMonitoring.

Unit 8 Plastic , Reconstructive Surgery , Vascular Surgery, Maxillofacial and Craniofacial Surgery: Preparing the Operation theatre Elective and Emergency Surgeries from these Departments, Various Endotracheal usedand

Management of Difficult airway

Unit 9 Thoracic Surgery Additional Considerations for Anaesthesia and Surgery,Use of Double Lumen Tubes, Positioning the Patient.

Unit 10 Cardiac Surgery: Additional Considerations

Unit 11 Emergency Surgery : Additional Considerations in Emergency Surgeries

Course Outcome:

Students should know the preparation of the operation theatre for anaesthesia and surgery in the following specialties .

- Preparation and Conduct of General surgery Procedure in the Operation Theatre
- Additional Considerations in Emergency surgeries.
- Preparation and Conduct of pediatric surgery Procedure in the Operation Theatre
- Preparation and Conduct of laparoscopic surgery Procedure in the Operation Theatre
- Preparation and Conduct of bariatric surgery Procedure in the Operation Theatre
- Preparation and Conduct of oncosurgery Procedure in the Operation Theatre
- Preparation and Conduct of urology surgery Procedure in the Operation Theatre
- Preparation and Conduct of robotic surgery Procedure in the Operation Theatre

Recommended Books:

7. Ajay Yadav :Short Textbook of Anaesthesia: 5th Edition.
8. PramilaBhalla :Textbook for Operation room Technicians 2nd Edition by
9. P. Reed & FrancineS: Clinical Cases in Anaesthesia 4th Edition by Allan
10. Pramila Bhalla. Textbook for Operation room Technicians Second Edition by
11. Pramila Bajaj Drugs in Clinical Anaesthesia
12. Ronald D. Miller: Miller's Anaesthesia 8th Edition

SPECIALITY ANAESTHESIA II

Course: core **number of hours: 60**

Credits: 04

Course objectives:

Know the preparation of the operation theatre for anaesthesia and surgery (both Elective and Emergency Surgery) in Obstetrics and Gynecology

Know the preparation of the operation theatre for anaesthesia and surgery (both Elective and Emergency Surgery) in Orthopedics

Know the preparation of the operation theatre for anaesthesia and surgery (both Elective and Emergency Surgery) in ENT and Head and Neck Procedure.

Know the preparation of the operation theatre for anaesthesia and surgery (both Elective and Emergency Surgery) in ENT and Head and Neck Procedure.

Course contents

Unit 1 Obstetric Operation Theatre : Preparation of the Operation Theatre for Elective and Emergency Caesarian Section, Other procedures associatedwith Pregnancy and Child Birth

Unit 2 Labour Analgesia : Preparation in the Labour Room for administration ofLabour Analgesia

Unit 3 Gynecology OT : Preparing the Operation theatre for Open gynecology procedure, Laparoscopic and Hysteroscopic procedures.

Unit 4 Orthopedic Surgery : Preparing the Operation Theatre for Elective andEmergency Orthopedic Procedures. Use of Fracture Table and Various attachments, Positioning the patient for Surgery, Radiation safety in Orthopaedics OT

Unit 5 Joint Replacement Surgery : Additional Considerations
Arthroscopic Surgery: Additional Considerations
Unit 6 ENT , Head and Neck Surgery : Preparation of Operation Theatre for ENT.Head and Neck Procedures

Unit 7 Various types of Endotracheal tubes,

Unit 8 Neurosurgery : Additional Considerations in Positioning the patient and Monitoring

Unit 9 Preparing the Ophthalmology Operation Theatre for procedures

unit 10 Use of Various Drilling equipment, Saw, Tourniquet, Diathermy and Microscope. Precaution and Care of these equipments

unit 11 Anaesthesia for Procedures at Remote Locations :Anaesthesia for Diagnostic/ Therapeutic Radiological Procedures, Anaesthesia for Diagnostic/ Therapeutic Gastro Intestinal Endoscopic Procedures, Anaesthesia for diagnostic and Therapeutic Bronchoscopy procedure

unit 12 Emergency Surgery : Additional Considerations in Emergency

unit 13 SurgeriesDay care Anaesthesia

unit 14 Monitored Anaesthesia Care

Course outcome:

Students should know the preparation of the operation theatre for anaesthesia and surgery (both Elective and Emergency Surgery) in thefollowing specialties .

Know the preparation of the operation theatre for anaesthesia and surgery (both Elective and Emergency Surgery) in Obstetrics and Gynecology

Know the preparation of the operation theatre for anaesthesia and surgery (both Elective and Emergency Surgery) in Orthopedics

Know the preparation of the operation theatre for anaesthesia and surgery (both Elective and Emergency Surgery) in ENT and Head and Neck Procedure.

Know the preparation of the operation theatre for anaesthesia and surgery (both Elective and Emergenc Surgery) in ENT and Head and Neck Procedure

Recommended Books:

1. Ajay Yadav Short Textbook of Anaesthesia: 5th Edition
2. PramilaBhalla. Textbook for Operation room Technicians: 2nd Edition
3. Jaypee Brothers and Edited by TK Dutta : Fundamentals of Operation Theatre Services
4. Allan P. Reed & FrancineS: Clinical Cases in Anaesthesia: 4th Edition
5. Pramila Bajaj Drugs in Clinical Anaesthesia
6. Ronald D. Miller: Miller'sAnaesthesia: 8th Edition

CLINICAL SPECIALITY ANAESTHESIA II

Course: core **number of hours: 60**

Credits: 03

Course objectives:

Know the preparation of the operation theatre for anaesthesia and surgery (both Elective and Emergency Surgery) in Obstetrics and Gynecology

Know the preparation of the operation theatre for anaesthesia and surgery (both Elective and Emergency Surgery) in Orthopedics

Know the preparation of the operation theatre for anaesthesia and surgery (both Elective and Emergency Surgery) in ENT and Head and Neck Procedure.

Know the preparation of the operation theatre for anaesthesia and surgery (both Elective and Emergency Surgery) in ENT and Head and Neck Procedure.

Course contents

Unit 1 Obstetric Operation Theatre: Preparation of the Operation Theatre for Elective and Emergency Caesarian Section, Other procedures associatedwith Pregnancy and Child Birth

Unit 2 Labour Analgesia : Preparation in the Labour Room for administration ofLabour Analgesia

Unit 3 Gynecology OT : Preparing the Operation theatre for Open gynecology procedure, Laparoscopic and Hysteroscopic procedures.

Unit 4 Orthopedic Surgery : Preparing the Operation Theatre for Elective andEmergency Orthopedic Procedures. Use of Fracture Table and Various attachments, Positioning the patient for Surgery, Radiation safety in Orthopedics OT

Unit 5 Joint Replacement Surgery : Additional Considerations
Arthroscopic Surgery: Additional Considerations
Unit 6 ENT , Head and Neck Surgery : Preparation of Operation Theatre for ENT.Head and Neck Procedures

Unit 7 Various types of Endotracheal tubes,

Unit 8 Neurosurgery : Additional Considerations in Positioning the patient and Monitoring

Unit 9 Preparing the Ophthalmology Operation Theatre for procedures

unit 10 Use of Various Drilling equipment, Saw, Tourniquet, Diathermy and Microscope. Precaution and Care of these equipments

unit 11 Anaesthesia for Procedures at Remote Locations :Anaesthesia for Diagnostic/ Therapeutic Radiological Procedures, Anaesthesia for Diagnostic/ Therapeutic Gastro Intestinal Endoscopic Procedures, Anaesthesia for diagnostic and Therapeutic Bronchoscopy procedure

unit 12 Emergency Surgery : Additional Considerations in Emergency

unit 13 SurgeriesDay care Anaesthesia
unit 14 Monitored Anaesthesia Care

Course outcome:

Students should know the preparation of the operation theatre for anaesthesia and surgery (both Elective and Emergency Surgery) in thefollowing specialties .

Know the preparation of the operation theatre for anaesthesia and surgery (both Elective and Emergency Surgery) in Obstetrics and Gynecology

Know the preparation of the operation theatre for anaesthesia and surgery (both Elective and Emergency Surgery) in Orthopedics

Know the preparation of the operation theatre for anaesthesia and surgery (both Elective and Emergency Surgery) in ENT and Head and Neck Procedure.

Know the preparation of the operation theatre for anaesthesia and surgery (both Elective and Emergency Surgery) in ENT and Head and Neck Procedure

Recommended Books:

7. Ajay Yadav Short Textbook of Anaesthesia: 5th Edition
8. PramilaBhalla. Textbook for Operation room Technicians: 2nd Edition
9. Jaypee Brothers and Edited by TK Dutta : Fundamentals of Operation Theatre Services
10. Allan P. Reed & FrancineS: Clinical Cases in Anaesthesia: 4th Edition
11. Pramila Bajaj Drugs in Clinical Anaesthesia
12. Ronald D. Miller: Miller'sAnaesthesia: 8th Edition

INTENSIVE CARE AND EMERGENCY MEDICINE

Course: core **total hours60 hours**

Credits:4

Course Objective:

- General care of the ICU patients and Methods to prevent infection in an ICU.Monitoring in ICU
- Connecting the patient to Ventilator, Ventilator setting and Weaning the patient from the ventilator.
- Types of shock; the causes and management of each type of shock. Assessment of patient at the Emergency medicine department and Triage.Basic Life Support

Course contents:

Unit: 1 Introduction to Intensive care

Introduction/general concepts:

General care of the patient in ICU and Care of mechanically ventilatedpatients,

Prevention of Infection in ICU, Communication with Patient and Patient Relatives

Monitoring the patient in ICU:

Preparation for Insertion of Peripheral Venous Cannula, Central Venous Cannula, Arterial Cannula, Venous Cut Down, Dialysis Catheter,

Preparation for Infusion using IV Infusion Set, Micro Infusion Set, Volumetric Infusion pump, Syringe Infusion Pump, Use of Vascular Extension Tubing

Preparation for Endotracheal Intubation, Percutaneous Tracheostomy, Nasogastric tube Insertion, Urinary Catheterisation, Intercostal Drain, Pleural Fluid Aspiration, Ascitis Tapping

Unit: 2 ventilators

Connecting the Patient to Ventilator, Modes of Ventilation, Routine Care ofthe Ventilated Patient

Weaning from Ventilation, Modes of Weaning

Unit:3 airway assessment

Care of Endotracheal Tube, Tracheostomy, Venous Cannula, Arterial Line, Central Venous line, Dialysis Catheter, AV Fistula, Nasogastric Tube, Intercostal Drain and Other Drains after Surgery, Urinary Catheter.

Transporting an ICU patient to Radiology Department for MRI Scan or CT scan

Unit:4 Oxygen Therapy :

Meaning and Indications and Equipment

Unit: 5 Shock :

Definition, Eitiology, Pathophysiology, Classification, ManagementComplications in ICU Prevention , Recognition and Management

Deep Vein Thrombus , Pulmonary Embolism, ,Bed Sore (Decubitus Ulcer), Aspiration of Gastric Contents, Pulmonary Barotrauma, Tension Pneumothorax, Acute Kidney Injury, Central Line Associated Blood Stream

Infection, Catheter Associated Urinary Tract Infection, Ventilator Associated Pneumonia

Interpretation of Blood and Body Fluid Investigation Report

Do not Resuscitate Order, Death Care of Patient, Breaking the Bad news

Unit:6 Basics of Emergency Medicine

Receiving a Patient in Emergency Medicine Department and Triage
Assessment of Unconscious Patient, Initial Assessment of Trauma Patient,
Patient with Chest pain, Patient with Convulsions
Investigations for a Patient in Emergency Medicine Department
Basic Life Support.
Triaging an Emergency Medicine Department
Meaning of Code Blue , Code Red and Code yellow

Course Outcome:

- Students at the end of this course should have the knowledge about Basic Intensive care and Emergency Medicine-
- General care of the ICU patients and Methods to prevent infection in an ICU.Monitoring in ICU
- Connecting the patient to Ventilator, Ventilator setting and Weaning the patient from the ventilator.
- Types of shock; the causes and management of each type of shock. Assessment of patient at the Emergency medicine department and Triage.Basic Life Support

Recommended Books:

1. Prem Kumar, ICU Manual:
2. Prakash S. Shastri, Published by JaypeeBrothers,ICU Manual for Nurses.
3. Pramila Bajaj Drugs in Clinical Anaesthesia.
4. Ronald D. Miller ,Miller's Anaesthesia: 8th Edition.