



**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**

**BACHELOR OF SCIENCE PHYSICIAN ASSISTANT**

**(CURRICULUM - EFFECTIVE FROM 2020-21)**

**Structure of the program clearly indicating courses, credits/Electives**

**Ref. Page No. 10, 11, 12, 13, 23-29**

**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 38<sup>th</sup> meeting held on 27.04.2020, vide agenda - 23

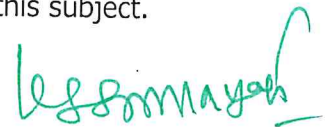
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The Academic Council at its 38<sup>th</sup> meeting held on 27.04.2020 and subsequently the Board of Management at its 49<sup>th</sup> meeting held on 30.04.2020 have resolved to approve the revised curricula and regulations of existing 08 B.Sc. Technology 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. Physician Assistant 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 healthcare sector & in accordance with the Ministry of Human Resource Development (HRD), Govt. of India, has initiated number of reforms ) in our country to bring out reforms in Indian education system. In accordance with this, to match our education system with the international educational pattern we are introducing choice based credit system from academic year 2020- 21 onwards.

PAs (physician associates/physician assistants) are medical professionals who diagnose illness, develop and manage treatment plans, prescribe medications, and often serve as a patient's principal healthcare provider. With thousands of hours of medical training, PAs are versatile and collaborative. Physician assistants work in all areas of medicine, including primary care and family medicine, emergency medicine, and psychiatry. Physician assistants, also known as PAs, practice medicine on teams with physicians, surgeons, and other healthcare workers. They examine, diagnose, and treat patients. They work with patients of all ages in virtually all specialty and primary care areas, diagnosing and treating common illnesses and working with minor procedures.

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 would have developed a broad knowledge in the field of General Medicine& all other departments in evaluating, diagnosing & treating patients.

In particular they will:

PO 1.Gather essential and accurate information about patients through history-taking, physical examination, and diagnostic studies to provide patient-centered care

PO 2. Synthesize and critically evaluate the most current scientific evidence and the stories of individual patients to develop and implement patient management plans, provide preventative care, and promote individual wellbeing

PO 3. Provide life support and perform emergency evaluation/care and initiate therapeutic procedures in life-threatening events jointly with or in the absence of a physician or other health professionals.

PO 4 Learn to develop and implement patient management plans

PO 5. Formulate a differential diagnosis and prepare a problem list based on the assessment of the patient

PO 6 Record and present pertinent patient data, including interpretive recommendations, in a manner meaningful to the physician and members of the healthcare team

PO 7. Promote health and wellness; instruct and counsel patients regarding physical and mental health, including proper diet, disease prevention, normal growth and development, family planning, lifestyle risks, situational adjustment reactions and other health care matters.

PO 8. Demonstrate critical and creative thinking skills, informed value judgments and possess an educational foundation for continued growth and life-long learning.

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

PO9: Formulate a differential diagnosis based on the assessment of the patient.

PO 10 Effectively interact with different types of medical practice and delivery systems.

PO11. Partner with supervising physicians, health care managers, and other health care providers to assess, coordinate, and improve the delivery and effectiveness of health care and patient outcomes

PO 12. Apply medical information and clinical data systems to provide effective, efficient patient care

PO 13. Perform medical and surgical procedures essential to their area of practice.

PO 14. Use information technology to support patient care decisions and patient education.

PO 15 . Maintain patient records and provide documentation for insurance companies

PO 16 . Order tests to ascertain the nature and extent of illnesses and injuries.

### **3. .Duration of the Programme:**

The duration of the programme shall extend over 8 semesters (three academic years with one year internship) of 15 weeks or more each with a minimum of 90 actual working days of instructions in each semester and 2 – 3 weeks of examinations. The successful completion will lead to Bachelor of Science in Physician Assistant .

### **4. Semester:**

An academic year shall consist of two semesters;

Odd Semester 1 <sup>st</sup> , 3 <sup>rd</sup> , 5 <sup>th</sup> & 7 <sup>th</sup>	July/August to December/January
Even semester 2 <sup>nd</sup> , 4 <sup>th</sup> , 6 <sup>th</sup> & 8 <sup>th</sup>	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..Physician Assistant, 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:

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

**8.2 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 , soft skill courses).

**8.3 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.

**8.4 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 orpractical/three hours of clinical rotation, field work/posting. All courses need not carry the same credits.

	<b>Lecture- l</b>	<b>Tutorial-T</b>	<b>Practical- P</b>	<b>Clinical Training/ Rotation CT/CR</b>
1 Credit	1Hour	1Hour	2Hours	3-5Hours



- 8.5 Programs:** An educational program leading to award of a degree, diploma or certificate.
- 8.6 Grade Point:** It is a numerical weight allotted to each letter grade on a 10-point scale.
- 8.7 Credit Point:** It is the product of grade point and number of credits for a course.
- 8.8 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.
- 8.9 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,and AB.
- 8.10 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.
- 8.11 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
- 8.12 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 corerequirement to complete the program of study in a saiddiscipline.

**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 25th March, 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 one's 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.

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- The credits assigned to the course is indicated as L: T:P format. For example, for a 4 credit course format could be: 4:0:0 or 1:2:1 or 3:1:0 or 0:0:4etc

## 11. Assigning Total Credits for a Program

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 programs. In conformation with this notification, at Yenepoya (Deemed to be University), for the UG program with duration of 3years study period or 6 Semesters, The total credits shall be a maximum of 140and for the UG programme with the duration of 4 years study period or 8 semesters, The total credits shall be maximum of 161 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 Coursecode 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, 1C3,1C4,C1AECC1, 1AECC2, GE1/SE1/SL1 etc.

2nd SEM: 2C1, 2C2,2C3,2AECC1, 2AECC2,2AECC3,2AECC4 GE2/SE2/SL2, , etc.

3rd SEM: 3C1, 3C2, 3C3,3C4,3C5,3C6,,3AECC1, GE3/SE3/SL3, 3P1, etc.

4th SEM: 4C1, 4C2, 4C3,4C4,4C5,4AECC1,4AECC2, GE4/SE4/SL4 ,4P1etc.

5th SEM: 5C1, 5C2,5C3,5C4,5C5, 5GE1/5SE1, 5P1, , , GE5/SE5/SL5etc.

6th SEM: 6C1, 6C2,6C3,6C4, 6GE1/6SE1, 6P1, GE6/SE6/SL6etc.

7th SEM: 7C1 (Internship)

8th SEM: 8C1 (Internship)

### **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 Two Internal Assessment tests, Assignment and 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 & SEE added together.

**14.5** There shall be examinations at the end of each semester ordinarily during December/January for odd (1<sup>st</sup> & 3<sup>rd</sup>) semesters and during June/July for even (2<sup>nd</sup> & 4<sup>th</sup>) semesters. The SEE for 5<sup>th</sup> & 6<sup>th</sup> semester will be held during December/Jan & 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)**

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

First Internal assessment shall be held in the 6<sup>th</sup> week of the semester and the second Internal Assessment will be held one month before the semester end university examination.

**Question Paper Pattern for Core course SEE**

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

### Question Paper Pattern for AECC SEE

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

#### Practical examination

<b>SLNO</b>	<b>Components</b>	<b>Marks</b>
1	Spotters	20
2	Case scenario/Stations	20
3	Viva Voice	20
Total Marks		60

#### 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:

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

### 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:

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

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	444	B	8	32 32
	Course 2	444	B	8	32
	Course 3	444	O	10	40
	Course 4	244	C	7	14
	Course 5	242	A	9	18
	Total	1616	-	-	136

1st Semester GPA = Total Grade Points / Total Credits = 136 / 16 = 8.5 2nd Semester

#### 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 endsemester 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<sup>th</sup>(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 student 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 is 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 125 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 the 12 months of mandatory internship.

## **20. Maximum Period for Completion of Program:**

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 program 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.

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

## 22. Re-Entry after Break of the study:

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

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

**22.2**All re-admissions of candidates are subject to the approval of the Vice Chancellor

## 23. Program Structure

### Semester 1

Sl. No	Category	Course Name	Max Marks		Total Marks	Hours Per week			Credits
			IA	SEE		L	T	P	
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	Basics of Medicine (History, Examination and Pharmacology)	40	60	100	3	1	-	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 processes, 20 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	
1	Core	General pathology	40	60	100	4	-	-	4
2	Core	Microbiology	40	60	100	4	-	-	4
3	Core	Patient Care and Basic Nursing	40	60	100	3	1	-	4
4	AECC	Environmental Studies	10	40	50	2	-	-	2
5	AECC	Healthcare	10	40	50	2	-	-	2
	AECC	Medical Ethics	10	40	50	1	-	-	1
6	AECC	Sociology	10	40	50	1	-	-	1
Total					500				18

Note: Of the total available 36 hours per week for teaching learning processes, 16 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	
1	Core	Systemic Pathology	40	60	100	2	-	2	3
2	Core	Applied Microbiology	40	60	100	2	-	2	3
3	Core	General Pharmacology	40	60	100	4	-	-	4
4	Core	Surgery/Equipments/ Anaesthesiology	40	60	100	3	1	-	4
5	Core	Basic diagnostic tests and Blood Biochemistry	40	60	100	3		-	3
6	Core	Clinical Medicine I	40	60	100	-	-	8	4
7	AECC	Kannada	10	40	50	2	-	-	2
Total					650				23

Note: Of the total available 36 hours per week for teaching learning processes, 29 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	
1	Core	Basics of Medical Disorders	40	60	100	4	-	-	4
2	Core	Obstetrics And Gynecology	40	60	100	4	-		4
3	Core	Pediatrics And Geriatrics	40	60	100	3	1	-	4
4	Core	Clinical Medicine II	40	60	100	-	-	8	4
5	AECC	Human Rights & Gender Equity	10	40	50	2	-	-	2
6	AECC	Biostatistics	10	40	50	2	-	-	2
Total					600				20

Note: Of the total available 36 hours per week for teaching learning processes, 28 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	
1	Core	Gastroenterology & Orthopaedics	40	60	100	4	-	-	4
2	Core	Nephrology and Pulmonology	40	60	100	4	-	-	4
3	Core	Neurology	40	60	100	4	-	-	4
4	Core	Clinical Medicine III	40	60	100	-	-	8	4
Total					500				16

Note: Of the total available 36 hours per week for teaching learning processes, 20 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	
1	Core	Basics of Thoracic Surgery and Blood Components	40	60	100	4	-	-	4
2	Core	Cardiology And Cardiac Surgery	40	60	100	4	-	-	4
3	Core	Basic Intensive Care	40	60	100	4	-	-	4
4	Core	Clinical Medicine IV	40	60	100			8	4
Total					500				16

Note: Of the total available 36 hours per week for teaching learning processes, 20 hours per week is dedicated to Core and AECC courses. Remaining Hours are available for Electives/Value added courses/Extracurricular activities etc.

Semester 7

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

Semester 8

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

<b>Total credit</b>		<b>113</b>
<b>Elective</b>		<b>12</b>
<b>Internship</b>		<b>36</b>
<b>Total Credit of the program</b>		<b>161</b>

# SEMESTER I

## ANATOMY

**Course: Core**

**Number of hours: 60 hours**

**Credits: 04**

### **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 I: 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 II: 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 III: 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 IV: 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 V: 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 VI: Peritoneum****1 hour**

- Description in brief. Demonstration of reflections.

**Unit VII: 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 VIII: 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 IX: Endocrine glands****2 hours**

- Endocrine glands: pituitary gland, thyroid gland, parathyroid gland, suprarenal gland (Gross & Histology).
- Demonstration of the glands. Histology of pituitary, thyroid, parathyroid, suprarenal glands.

**Unit X: Nervous system****12 hours**

- Neuron, classification of nervous system, cerebrum, cerebellum, midbrain, pons, medulla oblongata, spinal cord with spinal nerve (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 XI: 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 XII: 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**

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

# PHYSIOLOGY

**Course : Core**

**Theory classes: 60 hours**

**Credit: 4**

## **Course objective:**

- 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:**

### **Unit 1: General Physiology**

**2 hours**

- Introduction to physiology
- Homeostasis: Definition, Positive feedback, negative feedback.
- Body Fluid Compartments *Transport mechanisms (brief)*

### **Unit 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*

### **Unit 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*

### **Unit 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.

### **Unit 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 Breur reflexes. Hypoxia: Definition, Classification, Description (in brief). Cyanosis, Asphyxia, Dyspnea, Dysbarism, Artificial Respiration, Apnoea. (Definition Only)

## **Unit 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

## **Unit 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.

## **Unit 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*

## **Unit 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. *Physiological anatomy 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*

#### **Unit 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

#### **Unit 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).

## Unit 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.

### Course Outcome:

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

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

### Recommended Books

- 1) Guyton (Arthur): Text Book of Physiology. Latest Ed. Prism publishers.
- 2) Ganong WF. Review of m
- 3) edical physiology. 18th ed. Stamford, CT: Appleton & Lange; 1997.
- 4) Chatterjee CC: Human Physiology Latest Ed. Vol-1, Medical AlliedAgency.ChoudharySujith K: Concise Medical Physiology Latest Ed. New CentralBook.

# BIOCHEMISTRY

**Course: Core  
hours**

**Number of hours: 60**

**Credit:4**

## **Course objective**

- To classify various biomolecules like carbohydrates, lipids, proteins, nucleic acids vitamins and minerals
- To know about specimen collection and various other safety measures.
- To learn how to prepare various types of dilutions in the laboratory.
- To know about various terms used in quality control like specificity and sensitivity etc.
- A brief idea about acid base balance and biomedical waste management.

## **Course Contents:**

**Unit I: Introduction and scope of Biochemistry** **2 hours**

**Unit II: Specimen collection:** **4 hours**

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

**Unit III: Safety measurements, Conventional and SI units** **2 hours**

**Unit IV: Dilutions** **2 hours**

- Diluting solutions: e.g. preparation of 0.1 N NaCl from 1 N NaCl & from 2N NaCl 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

**Unit V : Carbohydrate chemistry** **4 hours**

- Classification, Isomerism, General reactions of carbohydrates

**Unit VI: Lipids** **4 hours**

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

**Unit VII: Protein chemistry, structure** **4 hours**

**Unit VIII: Plasma Proteins** **2 hours**

- Concentration, biochemical changes in disease, interpretation

**Unit IX : Enzymes** **6 hours**

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

**Unit X: Vitamins** **6 hours**

- Definition, classification, sources, functions, deficiency disorders

**Unit XI: Minerals** **6 hours**

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

**Unit XII: 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.

**Unit XIII: Quality control** **2 hours**

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



**Unit XIV: Special Investigations****11 hours**

- Serum electrophoresis, immunoglobulins, drugs: digitoxin, theophylline's, regulation of acid base status, Henderson Hasselbach 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,

**Unit XV: 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

**Reference book:**

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, Calcutta – 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, Harcourt (India) Ltd, 7<sup>th</sup> Ed, 20154.

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# **BASICS OF MEDICINE ( HISTORY ,EXAMINATION AND PHARMACOLOGY)**

**Course: Core**

**Credits: 04**

**Number of hours: 60 hours**

## **Course Objectives:**

- To learn how to communicate with patient in the hospital, Recording Vital Parameters.
- To know various Medical Terminologies,
- To know the different systems of the body and their ailment, to know about basic biochemical and radiological Investigations,
- To know the basic pharmacology of commonly used drugs approach to a Patient in OPD

## **Course Contents:**

### **UNIT I**

**10 hours**

- History Taking, Documentation of Vital Parameters Documentation of Patient Details
- Introduction to medical terminology

### **UNIT II**

**20 hours**

- Examinations of Systems of Body
- Cardiovascular system –heart, blood and blood vessels – disorders, diagnosis and treatment Respiratory system – air passages, lungs, diaphragm - disorders, diagnosis and treatment Integumentary system – skin, hair and nails – disorders, diagnosis and treatment
- Immune and lymphatic system – disorders, diagnosis and treatment

### **UNIT III**

**20 hours**

- Skeletal system – Bones and ligaments – disorders, diagnosis and treatment
- Muscular system – skeletal, smooth and cardiac muscles – disorders, diagnosis and treatment
- Nervous system – brain, spinal cord, peripheral nerves, sense organs – disorders ,diagnosis and treatment

- Endocrine system
- Diagnosis and treatment Diagnostic includes – blood work, X-ray and imaging Treatment includes – medical and surgical
- Digestive system – mouth, throat, stomach, intestine, liver, gallbladder, pancreas – disorders, diagnosis and treatment
- Urinary system – kidneys, ureters, bladder, urethra- disorders, diagnosis and treatment  
Reproductive system – male and female – disorders, diagnosis and treatment  
Emergency medicine / Medical ethics

**Unit 1V :**

**20 hours**

- Basic Pharmacology:- Basic drug effect, classification of drugs acting on nerves, heart , blood pressure, respiratory system, gastrointestinal system, kidneys, hormones, musculoskeletal system

**Course outcome:**

- Learns how to communicate with patient in the hospital, Recording Vital Parameters,
- Gets familiar with all the various Medical Terminologies and gets to know the different systems of the body and their ailment
- Understand the basic pharmacology of commonly used drugs approach to a Patient in OPD

**Recommended Books :**

1. SWARTZ, MARK, AND SCHMITT, WILLIAM, EDS. Textbook of Physical Diagnosis History and Examination. Philadelphia:Saunders
2. LEWKE, GILLIAN ET AL. Physician Assistant: Pearls of Wisdom. Lincoln, NE: Boston MedicalPublishers
3. FERRI,FREDF.PracticalGuidetotheCareoftheMedicalPatient.4thed.St.Louis:Mosby,
4. FIHN,STEPHAND.,ANDDEWITT,DAWNE.Outpatient Medicine.2ded.Philadelphia: Saunders
5. Physician Assistant Prescribing and Dispensing. Alexandria, VA: American Academy of PhysicianAssistants
6. RUDZINSKI, MICHAEL J., AND BENNES, J. FRED. Drug Information Handbook for Physician Assistants. Hudson, OH: Lexi Comp,Inc

## **ENGLISH AND COMMUNICATION**

**Course: AECC**

**Credits: 2**

**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 – I: PHONETICS**

**4 Hours**

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

### **UNIT – II: Difference between American & British English**

**2 Hours**

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

### **UNIT – III: 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 – IV: 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 – V : 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-VI: 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:**

1. Raymond Murphy. English Grammar in Use. Cambridge University. 2012.
2. 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:**By the end of this course, a student will

- 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 – Lok Sabha, Rajya Sabha- Organizations and Powers



**Unit 4: State Government** **4 hours**

- The Governor
- Chief Minister and Council of Ministers
- State Legislature Vidhana Sabha, Vidhana Parishad – 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 – Organization, 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 Burgentel, West Nutshell Publisher; London; 2005.
- Parvathy Appaiah, Constitution of India, Mangalore DivyaDeepa Publication; 2005
- ParvathyAppaiah, Human Rights. DivyaDeepa Publication Mangalore; 2016
- RajRam. M, Constitution of India Himalaya Publication, New Delhi; 1999

## **SEMESTER II**

### **GENERAL PATHOLOGY**

**Core: General Pathology**

**No of Hours: 60 Hours**

**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 e.g.: urine, blood, body fluids and its application on various diseases.

#### **Course Content:**

##### **UnitI: Introduction**

**8 hours**

##### **Unit II: 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 III: 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 IV: Hemodynamic Disorders, Thromboembolism and Shock** **6 Hours**

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

**Unit V: 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 VI: 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 VII: Genetic Disorders** **2 hours**

- Introduction of genetic disease and classification of genetic disorders

**Unit VIII: 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

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

### **Recommended Books**

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

## **MICROBIOLOGY**

**Core 2: General Microbiology**

**No of Hours: 60 hours**

**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, Tumour & 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**

- Baweja C. Textbook of microbiology. 1st ed. New Delhi: Arya Publications; 2005.
- Textbook of Medical Laboratory technology, RamnikSood, 4th edition, Jaypee Publications.
- Allied Health Sciences Laboratory Technology

# **PATIENT CARE & BASIC NURSING**

**Course:core**

**No of Hours: 60 Hours**

**Credits: 4**

## **Course Objectives:**

- To learn about patient care and basics of nursing activities, communication and documentation, infection control, medication administration and wound care.

## **Course Content:**

### **Unit I**

**12hours**

- Introduction, Communication and Documentation
- Introduction to PatientCare:
- Principles of patient care
- Types of patients (gender, age, diseases, severity of illness,triage)
- Communication &Documentation:
- Communication with doctors, colleagues and other staffs.
- Non-verbal communication, Inter-personnelrelationships.
- patient contact techniques, communication with patients and theirrelatives
- Documentation:
- Importance ofdocumentation,
- initial and follow upnotes;
- documentation of therapy, procedures andcommunication



**Unit II -****12 hours**

- Universal Precautions and Infection Control
- Universal Precautions and Infection Control:
- Hand washing and hygiene.
- Injuries and Personal protection, Insulation and safety procedures.
- Aseptic techniques, sterilization and disinfection.
- Disinfection and Sterilization of devices and equipment
- Central sterilization and supply department
- Biomedical Medical waste management

**Unit III -****12 hours**

- Medication Administration and Transport of patient
- Medication Administration:
- Oral / Parenteral route
- Parenteral medication administration: Intra venous, intra muscular, subcutaneous, intradermal routes, Intra venous Infusion
- Aerosol medication administration, Oxygen therapy
- Intravenous fluids,
- Blood and blood component transfusion
- Position and Transport of patient:
- Patient position, prone, lateral, dorsal, dorsal recumbent, Fowler's positions, comfort measures, bed making, rest and sleep.
- Lifting and transporting patients: lifting patients up in the bed, transferring from bed to wheel chair, transferring from bed to stretcher.
- Transport of ill patients (intubated / ventilated patients)

#### **Unit IV -**

**12 hours**

- Bedside care and monitoring
- Methods of giving nourishment: feeding, tube feeding, drips, transfusion.
- Recording of Bedside care:
  - pulse, blood pressure, respiration, saturation and temperature.
  - Bed side management: giving and taking bed pan, urine container.
  - Observation of stools, urine, sputum, drains
  - Use and care of catheters and rubber goods.
  - Care of immobile/bed ridden patients, bed sore and aspiration prevention
- Monitoring of Patient:
  - Pulse, ECG (Cardiac Monitor), Oxygen Saturation, Blood Pressure,
    - Multi parameter monitors, Capnography and End Tidal CO<sub>2</sub>(ETCO<sub>2</sub>)
  - Hydration, intake and output monitoring
  - Monitoring ventilator parameters: Respiratory Rate, Volumes, Pressures, Compliance, Resistance

#### **Unit V**

**12 hours**

- Wound care and first aid
- Dressing and wound care:
  - Bandaging: basic turns, bandaging extremities, triangular bandages and their application.
  - Surgical dressing: observation of dressing procedures.
  - Suture materials and suturing techniques
  - Splinting
  - Basic care of patient with burns
  - First Aid and Basic Life Support(BLS)

**Course Outcome:**

- Learns how to communicate with patient in the hospital, Recording Vital Parameters,
- Gets familiar with all the various Medical Terminologies and gets to know the different systems of the and their ailment
- Understand the basic pharmacology of commonly used drugs approach to a Patient in OPD

**Recommended Books:**

1. Ballweg, Ruth et al. Physician Assistant: A Guide to Clinical Practice. 2d ed. Philadelphia:Saunders,
2. Chester, Gail. Modern Medical Assisting. Philadelphia:Saunders
3. Rahr, Richard R. et al. Appleton & Lange's Quick Review: Physician Assistant. 4th ed. Stamford,CT:
4. Appleton ,Lange.Physician Assistant Prescribing and Dispensing. Alexandria,VA: American Academy of PhysicianAssistants
5. Thresyamma CP. Basic Nursing Procedure Manual And Essentials .Athithi Medical BookPublisher
6. Sr Nancy .Stephanie's Principles and practice of Nursing .6<sup>th</sup>ed.
7. Mary Lou Sole. Introduction to Critical Care Nursing
8. First Aid - Redcrosssocietyguidelines
9. Basic Life Support (BLS) - American Heart Association guidelines
10. Pfenninger, John L., Fowler, GrantC. Procedures for Primary Care Physicians. St.Louis: Mosby
11. Physician Assistant's Clinical Companion. Springhouse, PA: SpringhousePublishing Company.

# 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**

**1 hour**

- 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, Clarendon 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.

# HEALTHCARE

**Course: AECC**

**Credit: 02 hours**

**Number of hours: 30 hours**

## **Course Objectives:**

- To be able to describe the concepts of health, illness and national health policy various welfare programs in India.
- To be able to Explain the concepts of Nursing
- To be able to Explain the basic, special needs of the patient, bandaging and first aid for common emergencies.
- To be able to Explain infection control

## **Unit I: 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

## **Unit II: Introduction to Nursing:**

**3 hours**

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

## **Unit III: 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.



**Unit IV: Lifting And Transporting Patients:**

**3 hours**

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

**Unit V: Bed Side Management:**

**3 hours**

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

**Unit VI:**

**3 hours**

**Methods of Giving Nourishment:**

- Feeding, Tube feeding, drips, transfusion Care of Rubber Goods

**Unit VII: Vital Parameter Recording:**

**3 hours**

- Recording of body temperature, respiration and pulse,

**Unit VIII: Asepsis:**

**3 hours**

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

**Unit IX: First Aid.**

**3 hours**

**Course Objectives:**

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

- Describe the concept of health, illness and national health policy various welfare programs in India.
- Explain the basic, special needs of the patient, bandaging and first aid for common emergencies.

## **Recommended Books:**

1. Singh H. Essentials of management for healthcare professionals. 1st ed. Hari S, editor. Boca Raton : Taylor & Francis, a CRC title, part of the Taylor & Francis imprint, a member of the Taylor & Francis Group, the academic division of T&F Informaplc, 2018.: Productivity Press; 2017.

## **MEDICAL ETHICS**

**Course: AECC**

**Credit: 01**

**Number of hours: 15 hours**

### **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 I: Introduction to medical ethics(3 Hours)**

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

### **Unit II: Definition of medical ethics**

**2Hours**

Major principle of medic ethics.

**Unit III: Perspective of medical ethics** **4 Hours**

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 IV: Ethics of the individual** **2 Hours**

Truth and confidentiality, the concept of disease, health and healing, the Right to health.

**Unit V: The ethics of human life** **1 Hour**

Prenatal sex determination.

**Unit VI: The family and society in medical ethics** **1 Hour**

Euthanasia, cancer and terminal care.

**Unit VII: Death and dying** **1 Hour**

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

**Unit VIII: Professional Ethics** **1 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.

# SOCIOLOGY

**Core: AECC**

**Credits: 2**

**No of hours: 15 hours**

## **Course Objective**

- 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

## **Course Content:**

### **Unit I: 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 II: 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 III: 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 IV: 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, its 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. VidyaBhushan, D R Sachdeva. An Introduction to Sociology, Kitabmahal- Allahabad
2. Roshni Jain, 2012. An Introduction to Sociology, First edition AITBS publishers- New Delhi
3. Krishna Gowda, 2010. Sociology for Nurses, Sixth edition. CBS Publishers & Distributors Pvt Ltd- New Delhi
4. Ram Ahuja .Social problems in India, third edition, 2014. PremRawat for Rawat Publication.
5. Mohammed Akram, Sociology of Health, 2014. PremRawat for Rawat Publication-Jaipur

# **SEMESTER III**

## **SYSTEMIC PATHOLOGY**

**Course: Core**

**Credits: 04**

**Number of hours:**

**60 hours**

### **Course Objectives:**

- Acquire the detailed knowledge about the fundamentals and advances of the Systemic Pathology
- Demonstrate understanding of basic sciences relevant to Systemic Pathology.

### **Course Content:**

#### **Unit I**

#### **Cardiovascular System:**

**14 hours**

- Atherosclerosis-definition,riskfactors,pathogenesis,morphologyand complications
- Ischemic heart disease: Myocardial infarction-definition, pathogenesis, morphology and complications
- Hypertension- Benign and malignant hypertension: pathogenesis, pathology and complications
- Aneurysms–Definition, classification, pathology and complications
- Heartfailure-Right and left heart failure: causes, pathophysiology and morphology
- Valvular heart disease–causes, pathology,& complication.Complications of arterial valves

- Rheumatic heart disease and infectious endocarditis-definition, etiopathogenesis, morphology and complications
- Congenital heart disease-Types and a trial septal defect; aneurysms- types and morphology; cardio myopathies in brief
- Pericardial effusion –causes,effects and diagnosis Cardiomyopathy– Definition,types,causes,and significance Infective endocarditis
- Myocarditis

## **Unit II**

### **Haematology:**

**5hours**

- Anaemia –definition,morphologicaltypes anddiagnosisofanaemia
- Brief concept about Haemolytic anaemia and polycythaemia.
- Leukocyte disorder –brieflyleukaemia, leucocytosis,agranulocytosisetc.
- Bleeding disorders – definition,classification,causes, & effects of important types of bleeding disorders. Briefly various laboratory tests used to diagnose bleeding disorders

## **Unit III**

### **Respiratory System:**

**7hours**

- Atelectasis-types,Adult respiratory distress syndrome- causes,patho genesis and morphology
- Pulmonaryedema-classification, causes and morphology
- Chronic obstructive pulmonary disease- Chronicbronchitis,emphysema,asthma, bronchiectasis:Definition,etiopathogenesis and morphology
- Restrictive pulmonary diseases- Definition,categories,pathogenesis and morphology



- Pneumoconiosis-types,asbestosis,coal workers pneumoconiosis- etiopathogenesis and morphology
- Pleural effusion –causes,effects and diagnosis
- Pulmonaryembolism,infarction, pulmonary hypertension-Definition, etiopathogenesis and morphology

#### **Unit IV**

##### **RenalSystem:**

**4hours**

- Clinical manifestations of renal diseases. Briefly causes, mechanisms, effects and laboratory diagnosis of ARF & CRF. Briefly Glomerulo nephritis and pyelonephritis
- Endstagerenal disease–definition,causes, effects and role of dialysis and renal transplantation and its management
- Brief concept about obstructive uropathy

##### **Practical's:**

**30hours**

- Urine examination:physical,chemical,microscopy
- Blood grouping & Rhtyping
- Haemoglobin estimation, packed cell volume (PCV), erythrocytosedimentationrate (ESR), estimation of bleeding & clotting time
- Charts–Urine chart,ARF,CRF,Acute glomerulonephritis
- Specimens

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

**Course content:**

- To train students e so as to ensure higher competence in both general and special area of interest and prepare him/her for a career in teaching, research and specialty practice
  
- **Reference Books**
  1. Basic Pathology Robbins Saunders, an imprint of Elsevier Inc., Philadelphia, USA
  2. Text book of Pathology Harsha Mohan Jaypee Brothers, New Delhi
  3. Practical Pathology P. Chakraborty, GargiChakraborty New Central Book Agency, Kolkata
  4. Text Book of Haematology Dr. Tejinder Singh Arya Publications, Sirmour (H.P)
  5. Text Book of Medical Laboratory Technology PrafulGodkarBhalani Publication House, Mumbai
  6. Text Book of Medical Laboratory Technology RamanikSood
  7. Practical Haematology Sir John Dacie Churchill Livingstone,London.
  8. Todd & Sanford, Clinical Diagnosis & Management by Laboratory Methods John Bernard Henry

# APPLIED MICROBIOLOGY

**Course: Core**

**Credits: 04**

**Number of hours: 30 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

## **UNIT I:Healthcare associated infections and antimicrobial resistance Infection &**

### **Multidrug resistant organisms**

**15 hours**

- Must know Topics: Definitions of various types of infections, Source of infection, modes of transmission, Drug resistant pathogens-methicillin resistant Staphylococcus aureus
- Desirable to know: Clostridium difficile, Vancomycin resistant enterococci

### **Hospital acquired infections**

- Must know Topics: Definitions, criteria for diagnosis in brief and causative agents – catheter related blood stream infections, ventilator associated pneumonia, surgical site infections

### **Microbiology of urinary tract infections**

- Must know Topics: Definition, Causative agents, Transmission, Predisposing factors, Pathogenesis, Lab diagnosis in detail significant bacteriuria, catheter related urinary tract infections

## **Healthcare personnel in hospital setup**

- Must know Topics: Disease communicable to hospital personnel and preventive measures to combat the spread of these infections by monitoring and control- tuberculosis, HIV, hepatitis B, hepatitis C, salmonella
- Desirable to know: Respiratory route (varicella- zoster, respiratory syncytial virus etc), Blood borne transmission (cytomegalovirus, Ebola virus etc), orofaecal route (hepatitis A etc), direct contact
- (Herpes simplex virus etc),

## **Microbiological surveillance**

- Must know Topics: Definitions, Methods & sampling techniques
- Desirable to know: To know the hospital flora and to assess the antimicrobial
- resistance

## **Opportunistic infections**

- Must know Topics: In brief- opportunistic pathogens seen in Immuno compromised patients- Candida, Cryptococcus
- Desirable to know: Parasites, viruses & bacteria as opportunistic pathogens

## **UNIT II: Sterilization and disinfection**

**15 hours**

### **Sterilization**

Must to Know: Definition, Classification of methods, Principles of Dry heat,

- moist heat, Autoclaving in detail- Preparation of materials for
- autoclaving: packing of different types of materials, loading, holding time
- and unloading.
- Desirable to Know: Hot air oven

## **Disinfection,antiseptics**

- Must to Know: Disinfection of instruments used in patient care: classification, different methods, advantages and disadvantages of the various methods. Disinfection of the patient care unit. Infection control measures for ICU's.
- Desirable to Know: Disinfectant efficacy testing

## **Sterilization–applied aspects**

- Must to Know: Rooms: gaseous sterilization, Equipments: classification of the instruments and appropriate methods of sterilization. Central supply department: the zoning and the floor plan for instrument cleaning, High-level disinfecting and sterilizing critical areas.
- Desirable to Know: Quality control in CSSD

## **Bacteriological analysis of water**

- Must to Know: Different sampling techniques for potable water, RO water, dialysate.
- Desirable to Know: Endotoxin testing

## **PRATICAL:30 hours**

- Practicals will be carried out using charts and practical exercises

## **Principles of auto claving & quality control of sterilization.10 hours**

- Principles of autoclaving & quality control of sterilization. Definition, Classification of methods, Principles of Dry heat, moist heat,
- In detail autoclaving Preparation of materials for autoclaving: packing of different types of materials, loading, holding time and unloading. Dry heat/Moist heat: Temperature recording charts interpretation, Color change indicators interpretation

## **Disinfection of wards, OT and laboratory**

**5 hours**

- Disinfection of instruments used in patient care classification, different methods, advantages and disadvantages of the various methods. Disinfection of the patient care unit. Infection control measures for ICU's

## **Collection of specimen for sterility testing**

**5 hours**

- Collection of specimen from outpatient units, inpatient units, minor operation theatre and major operation theatre for sterility testing Air sampling culture plates, interpretation of colony forming units based on air flow rate and sampling time

## **Methods employed for sterility testing & Interpretation of results of sterility testing.**

- Rooms: gaseous sterilization, Equipments: classification of the instruments and appropriate methods of sterilization. Central supply department: the four areas and the floor plan for instrument cleaning, high-level disinfecting and sterilizing areas. Interpretation of sterility of hemodialysis water/distilled water/ de ionized water, based on growth of colonies in BHIA gartobere ported as X CFU/ unit

## **Course Outcome:**

- To understand health care associated infections and antimicrobial resistance
- To acquire knowledge of the principles of sterilization and disinfection

## **Recommended Books:**

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

# GENERAL PHARMACOLOGY

**Course: Core**

**Credits: 04**  
**hours**

**Number of hours: 60**

## **Course objectives:**

At the end of the program in Pharmacology the student is expected to:

- 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 I: 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 II: Autonomic Nervous System drugs**

**6 Hours**

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

## **Unit II: 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 IV: 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 V: Blood**

**6 Hours**

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



**Unit VI: Endocrines****1 Hour**

- Corticosteroids

**Unit VII: Chemotherapy****9 Hours**

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

**Unit VIII: 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:**

- Uday Kumar P. Textbook of Pharmacology for Dental and Allied Sciences. Jaypee Brothers *Publishers*; 2008.

# **SURGERY/EQUIPMENTS & ANAESTHESIOLOGY**

**Course: Core**

**Credits: 04**

**Number of hours: 60 hours**

## **Course objectives:**

- To become familiar with various surgical procedures and know their expected outcomes & complications.
- Demonstrate an understanding of surgical procedures and know their expected outcomes and complications
- Evaluate and assess the patients in with surgical diseases

## **Course content**

### **Unit 1**

**5 hours**

- History of surgery, role of surgeon, importance of team work, stresses arising during operative procedure ,
- surgical terminology, types of incision and their indications, internal & external haemorrhage – signs and symptoms, management ,
- Tourniquets – use and duration of application and dangers of use. Sutures and surgical instruments

### **Unit 11**

**5 hours**

- Pathogenesis, causes, epidemiology, clinical presentation, investigations and management of diseases of the following system
- Skin – ulcers, wounds, burns, skin infections (boil, carbuncle, abscess,)

### **Unit III**

**10 hours**

- Cysts (epidermoid,ggdermoid) tumors (basal cell, squamous cell carcinoma and melanoma)
- Head and neck region – congenital anomalies (cleft lip, cleft palate, branchial cyst and fistula, thyroglossal cyst),

- parotid and submandibular glands, oral ulcers, Leukoplakia, jaw tumors,
- squamous carcinoma of oral cavity, pharynx and larynx.
- Thyroid and lymph nodes swelling

#### **Unit 1V**

**5 hours**

- Arteries – limb ischemia, non-invasive vascular diagnostic tests, atheromatous disease, aneurysm,
- Raynaud’s syndrome, emboli,
- Veins – Varicose veins, deep vein thrombosis and pulmonary embolism

#### **Unit V**

**15 hours**

- Breast – mastalgia, fibroadenoma, cyst, breast abscess, cancer
- Oesophagus – dysphagia, reflux, hiatus hernia, benign and malignant tumors Stomach and duodenum – peptic ulcer, carcinoma , pyloric stenosis
- Small intestine – small bowel obstruction, intestinal tuberculosis
- Colon and rectum – amoebic colitis, ulcerative colitis, colorectal cancer Appendix – acute appendicitis , acute abdomen
- Anus – Haemorrhoids, prurritisani, fissure and fistula-in-ano, anorectal abscesses, cancer

#### **Unit VI**

**10 hours**

- Peritoneum and intraperitoneal abscesses, liver – trauma, abscess, cancer
- Biliary tract – gall stone disease and carcinoma, pancreas – pancreatitis, carcinoma Hernias of abdominal wall- Inguinal, femoral, umbilical and epigastric
- Urology- diagnostic studies, urinary calculi, urinary infection, prostatic hyperplasia, tumors Epididymoorchitis, hydrocele, carcinoma of testicle and penis
- Neurology – diagnosis, treatment and rehabilitation of disorders of entire nervous system Various procedures like microdiscectomy and laminectomy etc.

## **Unit VI**

**10 hours**

- Common equipments /anaesthesiology
- Personal cleanliness and aseptic techniques / dressing techniques / wound care Pre-operative and post-operative care of the surgical patient
- Emergency procedure – endotracheal intubation, tracheotomy
- Central line placement, IV cannulation, Ambu bag ventilation, CPR, Basic Life Support

### **Course Outcomes:**

- Diagnose common surgical conditions both acute and chronic, in adult and children. Describe common malignancies in the country and their management including prevention.
- Plan various laboratory tests for surgical conditions and interpret the results.
- Identify and manage patients of haemorrhagic; septicaemic and other types of shock. Define indications and methods for fluid and electrolyte replacement therapy including blood transfusion.
- Define asepsis, disinfection and sterilization and recommend judicious use of antibiotics.

### **Recommended Books**

1. Jerry A. Dorsch , Susan E. Dorsch : Understanding Anesthesia Equipment , Lippincott Williams and Wilkins
2. ShenoyK. R: Manipal Manual Of Surgery, CBSPublisher
3. Ajay Kumar Agrawal : A Practical Guide to Surgical Instruments X-Rays and Operative Interventions , Jaypee Brothers Medical Publisher

# **BASIC DIAGNOSTIC TESTS & BLOOD BIOCHEMISTRY**

**Course: Core**

**Credits: 04**

**Number of hours: 40 hours**

## **Course objectives:**

- To understand interpretation of non invasive tests ECG , Echo Cardio Graphy , Tread Mill,Doppler ultrasound
- To. Understand and analyse the basic blood Biochemistry , Urine analysis etc.

## **Course Content:**

### **Unit I**

**10 hours**

- Documentation of Vital Parameters Cardio vascular Diagnostic procedures
- Pulse , SpO<sub>2</sub>, ECG and Blood Pressure Measurement

### **Unit I I**

**10 hours**

- Recording a 12 lead ECG
- Echocardiogram
- Tread Mill Testing
- Coronary Angiography Pulmonary Function tests
- Spirometry

### **Unit III**

**10 hours**

- Basic Blood Biochemistry
- Measurement of Blood Sugar by Glucometer Interpretation of Complete Blood Count Urine Analysis

## **Unit I V**

**10 hours**

- Liver Function Tests Coagulation Tests Kidney
- Basic Radiology Tests
- Nerve Conduction Studies
- Testing the Vision

### **Course Outcomes:**

- Performance / interpretation of non invasive tests ECG , Echo GardioGraphy , Tread Mill, Doppler ultrasound
- Provide appropriate information to referring Physicians. Understand and analyse the basic blood Biochemistry , Urine analysis
- Learn basic principles and techniques of standard intervention therapeutic tests.

- Recommended Books

1. Ed. Lord, Richard S Laboratory Evaluations for Integrative and Functional Medicine 2nd Edition, Metamatrix Institute
2. Dicken Weather by , Blood Chemistry and CBC Analysis: Clinical Laboratory Testing from a Functional Perspective
3. Dicken Weather by. Signs and Symptoms Analysis from a Functional Perspective 2nd Edition

# CLINICAL MEDICINE - I

**Course: Core**

**Credits: 04**

**Number of hours: 120 hours**

## **Course Objective:**

- To interact with the patients and collect basic information about them and to administer medicines.
- To understand the blood work, and analysis of Biochemical parameters.

## **Course Content:**

### **UNIT I:**

**20 hours**

- History collection of patient,vital signs monitoring,
- Physical assessment of patient ,using comfort devices,
- Iv infusions ,Blood transfusions, Shifting of patients
- Administration of Medications;
- Oral
- IM
- IV
- Subcutaneous
- Oxygen administration:mask,nasalprones,venturi mask
- Nebulisation
- ECG monitoring
- Monitoring IO char



## **UNIT II**

**20 hours**

- Types of drains
- Assessment of Post operative patients
- Blood Collection
- Admission procedure
- Discharge procedure
- Starting IV Cannula

## **UNIT III**

**20 hours**

- Phlebotomy, collection of blood sample and storage
- Urine Collection / analysis / normal and abnormal values significance
- Biochemical parameters and their normal and abnormal values
- Culture methods / techniques / swab etc
- CBC – Interpretation
- Pregnancy test
- Blood counts and ESR
- Mantoux test and its significance
- Entering the data into the computer system
- Giving a scenario – ask to interpret to the doctor and to the patient

## **UNIT V**

**20 hours**

- Musculoskeletal assessment
- Neurological assessment
- Cardiovascular assessment
- Respiratory assessment
- Gastro intestinal assessment
- Genito Urinary assessment
- ABG – Arterial Blood Gas
- Ryle's tube insertion
- Foleys catheter
- POP application and removal

- ROM ( Range of motion )
- Case History : Medical, Surgical, Neuro, Ortho, Cardiac, Respiratory, Integumentary, Gastrointestinal, Genitourinary
- Chest Physiotherapy

## UNIT VI

**20 hours**

- SURGICAL WARD & OT :
- Surgical equipments
- Assisting with Anesthesia
  - General
  - Regional
  - Intravenous
- Surgical dressing
  - Pre operative preparation
- Post operative preparation
- ET intubation
- Central line insertion
- IV cannula insertion
- Suture removal
- Care of different types of wounds
- Care of ICD
- Care of Drains

### **Course Outcome:**

- Describe operative and non operative treatments for surgical patients.
- Demonstrate basic technical skills such as: Suturing & Surgical dressing.

# 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:**

- Possible communication in kannada between Patients and Doctors.
- Advising sentences to the possible questions of patients.
- 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 IV**  
**BASICS OF MEDICAL DISORDERS**

**Course: Core**

**Credits: 04**

**Number of hours: 60 hours**

**Course objectives:**

- To learn about basic concepts of common medical disorders and its therapeutic options.

**Course Content:**

**Unit I**

**6 hours**

- Cardiac and Respiratory diseases
- Cardio vascular diseases
- Hypertension, Ischemic heart diseases, Myocardial Infarction, arrhythmias
- Heart failure, shock - types,causes

**Unit II**

**6 hours**

- Respiratory diseases
- Pneumonia,tuberculosis,

**Unit III**

**6 hours**

- Chronic obstructive pulmonary disease,asthma
- Pleural effusion,pneumothorax
- Interstitial lungdisease

**Unit IV**

**6 hours**

- Renal Diseases
- Acute kidney injury

- Chronic Kidney Disease

#### **Unit V**

**6 hours**

- Gastro intestinal and Liver Diseases
- Gastritis / APD, pepticulcer
- Acute gastroenteritis
- Hepatitis, Hepatic failure, alcoholic liverdisease
- Infectious diseases: Dengue, malaria,leptospirosis

#### **Unit VI**

**6 hours**

- Blood, fluid, electrolyte and acid base abnormalities
- Blood
- Fluid Electrolyte imbalance and corrective methods
- Acid Base abnormalities and corrective methods

#### **Unit VII**

**6 hours**

- Pulmonary Oedema, Sepsis and MODS
- Pulmonary Oedema, Acute Lung Injury and Acute Respiratory Distress Syndrome 61
- Sepsis, multi-organ failure, Multi-organ dysfunctionsyndrome

#### **Unit VIII**

**6 hours**

- Health problems in Specific conditions and Toxicology
- Health problems in specific conditions
- Pregnancy - antenatal care, disorders in pregnancy
- Children and newborn
- Obesity
- Diabetesmellitus

- Fluid Electrolyte imbalance and corrective methods
- Acid Base abnormalities and corrective methods

### **Unit IX**

**6 hours**

- Pulmonary Oedema, Sepsis and MODS
- Pulmonary Oedema, Acute Lung Injury and Acute Respiratory Distress Syndrome 61
- Sepsis, multi-organ failure, Multi-organ dysfunction syndrome
- Health problems in Specific conditions and Toxicology
- Health problems in specific conditions
- Pregnancy - antenatal care, disorders in pregnancy
- Children and newborn
- Obesity
- Diabetes mellitus

### **Unit X**

**6 hours**

- HIV infections and AIDS
- Elderly courses and disability
- Brief mention about endocrine disorders
- Poisoning and drug overdosing
- Classification of poisons
- Principles of treatment of poisoning and Primarycare
- Poisons and drug over dosing requiring ventilation
- Miscellaneous
- Drowning
- Hanging

**Course outcome:**

- Knowledge in basic concepts of common medical disorders and it's the rapeutic options.
- Learns the art of history Taking and clinical examination, monitoring of patient.
- Therapeutic options for various diseases and conditions

**Recommended Books**

1. Ferri, Fred F. Practical Guide to the Care of the Medical Patient. 4th ed. St.Louis: Mosby,
2. Fihn, Stephan D,Dewitt, Dawn E. Outpatient Medicine. 2d ed. Philadelphia:Saunders
3. Swartz, Mark, Schmitt, Williams. Textbook of Physical Diagnosis History and Examination. Philadelphia:Saunders
4. Salyer, Steven W. The Physician Assistant Emergency Medicine Handbook. Philadelphia:Saunders
5. Lewkw, Gillian et al. Physician Assistant: Pearls of Wisdom. Lincoln, NE: Boston Medical Publishers
6. Pfenniniger, John L, fowler, Grant C. Procedures for Primary Care Physicians. St. Louis: Mosby,
7. Physician Assistant's Clinical Companion. Springhouse, PA: Springhouse Publishing Company
8. Jane Rice .Principles of Pharmacology for Medical Assisting 6th Edition,Cengage Learning
9. Rudzinski, Michale J., BennesJ. Fred. Drug Information Handbook for Physician Assistants. Hudson, OH:LexiComp,
- 10.Goroll, Allan H. et al. Primary Care Medicine: Office Evaluation and Management of the Adult Patient. 3d ed. Philadelphia: Lippincott Williams &Wilkins,
- 11.Davidson's Principles and Practice of Medicine – Elsevier Publications
- 12.Harrison's Principle of Internal Medicine

# **OBSTETRICS AND GYNAECOLOGY**

**Course: Core**

**Credits: 04**

**Number of hours: 60 hours**

## **Course objectives:**

- To know the effects of common medical problems on pregnancy and delivery.
- To gain knowledge of early pregnancy complications/high risk pregnancies including IUGR, advanced maternal

## **Unit I**

**12 hours**

- Bony pelvis – important land marks of obstetrics significance, foetal skull Physiological changes in pregnancy / menopause
- Conception, abortions , gestational trophoblasticdiseases Vulva – cyst, inflammation, neoplasia , dystrophy Vagina – cytology, infection, inflammation,neoplasia
- Uterus –endometriosis, adenomyosis , hyperplasia, atrophy, carcinoma Cervix – erosion, infections, malignancy
- Infections – STD, genital TB, HIV, TORCH, vertical transmission of HIV



## **Unit II**

**12 hours**

- Obstetrics- Diagnosis of pregnancy, antenatal care and foetal surveillance, first trimester bleeding, normal and abnormal presentations and positions, dystocia due to bony pelvis, soft tissue, high risk pregnancies, IUGR, IUD, preterm labour, premature rupture of membranes, poly and oligo-hydramnios, post dated delivery,

## **Unit III**

**12 hours**

- Prolonged labour, obstructed labour, rupture uterus, previous LSCS, third trimester bleeding
- preeclampsia and eclampsia , medical disorders complicating pregnancy, surgical emergencies in obstetrics, Rh iso immunization, partogram, ultra sound in obstetrics, foetal monitoring ,
- active management of labour, neonatal resuscitation, analgesia and anaesthesia in obstetrics, instrumental deliveries,
- LSCS, third stage complications, normal and abnormal puerperium , morbidity and mortality, medical auditing in obstetrics

## **Unit IV**

**12 hours**

- Gynecology: - Mal-development, injuries, infections, cysts ,tumours of female genital tract. Vulva – inflammation, ulcers, atrophy, dystrophies, cysts, neoplasm
- Vagina – leucorrhoea, infections, carcinoma Cervix – erosion, ulcer, dysplasia, carcinoma
- Uterus – prolapse, displacements (inversion and retroversion), endometriosis
- abnormal uterine bleeding / post menopausal bleeding, endometrial hyperplasia, benign and malignant tumours. Primary and secondary amenorrhoea, infertility,
- PCOD, assisted reproductive techniques, choriocarcinoma

## **Unit V**

**12 hours**

- Urinary system – Stress incontinence, pelvic pain, low back ache Cancer screening for genital malignancy and breast / Pap smear

### **Course Outcome:**

- Understanding the effects of common medical problems on pregnancy and delivery.
- knowledge of early pregnancy complications/high risk pregnancies including IUGR, advanced maternal
- To know the indications for the use of fetal monitors.

### **Recommended Books**

1. Curtis, MichaleG,Hopkins, Michale P. Glass' Office Gynaecology. 5th ed.Philadelphia: Lippincott Williams & Wilkins,
2. Seltzer, Vicki, Pearse Warren H. Women's Primary Health Care: Office Practice and Procedures. 2d ed. New York: McGrawHil

# PAEDIATRICS AND GERIATRICS

**Course: Core**

**Credits: 04**

**Number of hours: 60 hours**

## **Course objectives:**

- To understand the behavior and child development, and its impact on health and illness.
- To achieve skills necessary to perform a complete and accurate pediatric history including prenatal, birth, developmental, dietary, immunization, and psychosocial histories.

## **Unit 1**

**8 hours**

- Definition, population, morbidity and mortality in children ,maternal , perinatal , neonatal , infant and preschool mortality rates, current National Programmes like ICDS, RCH, Vitamin A prophylaxis,
- UIP, IMCI, Pulse Polio, AFP . ARI. Diarrhoea control programmes.

## **Unit II**

**13 hours**

- Growth and development – anthropometry – Measurement and interpretation of weight, length/height, head circumference, mid-arm circumference. Use of weighing machines, infant meter, interpretation of Growth

- Charts: Road to health card and percentile growth curves, abnormal growth patterns- failure to thrive, short stature, growth pattern of different organ systems like lymphoid, brain and sex organs, normal pattern of teeth eruption.
- Important milestones in infancy and early childhood in areas of gross motor, fine motor, language and personal – social development, psychological and behavioural problems
- Measurement and interpretation of sitting height, US: LS ratio and arm span Age-independent antropometric measurement – principles and application

### **Unit III**

**13 hours**

- Nutrition - normal requirements of carbohydrates, protein, fats, minerals and vitamins for newborn,
- children, pregnant and lactating mother. Common food sources.
- Breast feeding – colostrum and composition of breast milk, initiation and technique of feeding, hazards and demerits of prelacteal feed, top milk and bottle – feeding. Feeding of LBW babies. Infant feeding /weaning foods, methods of weaning. Assessment of nutritional status of child based on history and physical examination.
- Characteristics of transitional and mature milk (foremilk and Hind milk)
- Protein energy malnutrition-definition, classification, features, causes and management.
- Vitamins –etio-pathogenesis, clinical feature, biochemical and radiological findings, differential diagnosis and management of nutritional disorders.
- Definition, causes and management of obesity
- Immunization :- National immunization programme, vaccine preservation and cold-chain.
- Vaccination types, contents, efficacy, storage, dose, site, route, contraindications and adverse reactionsBCG, DPT, OPV, Measles, MMR and Typhoid.
- Pulse Polio Immunization, AFP (Acute flaccid paralysis) surveillance
- Special vaccines – Hepatitis B, H influenza B, Pneumococcal , Hepatitis A, Chicken Pox, Meningococcal, and Rabies.

## **Unit IV**

**13 hours**

- Disorders of respiratory system, gastro intestinal tract, central nervous system, cardiovascular system, genitor-urinary system and haematological disorder
- Infectious disease – epidemiology, basic pathology, symptoms, signs, complications, investigations,
- differential diagnosis , management and prevention of common bacterial , viral and parasitic infections
- Special reference to vaccine – preventable disease – Diarrhoea, LRTI, TB, Polio, meningitis, diphtheria, whooping cough, tetanus , measles, mumps, rubella, typhoid, viral hepatitis , cholera, chicken pox, giardiasis, amoebiasis, intestinal helminthiasis, malaria, dengue fever, AIDs , Kala azar , leprosy , chlamydia infection.
- Paediatric emergencies – status epilepticus, status asthmaticus / acute severe asthma, shock and
- anaphylaxis, burns, hypertensive emergencies, gastrointestinal bleed, comatose child, congestive cardiac failure, acute renal failure.
- Genetics- principles of inheritance and diagnosis of genetic disorders – Down’s syndrome

## **Unit V**

**13 hours**

- Geriatrics- physiological and psychological fundamentals of aging process Diet for the aged and management of nutritional disorders
- Disorders of major geriatric ailments and management -
- Medical – infections, dehydration, acute confusional state, osteoporosis,
- Degenerative joint diseases, effects of immobility – prevention of contracture and bedsores. Economic and psychosocial needs of the aged. Role of various health care providers including family.

### **Course Outcome:**

- Understanding of behavior and child development, and its impact on health and illness.
- Demonstrate the skills necessary to perform a complete and accurate pediatric history including prenatal, birth, developmental, dietary, immunization, and psychosocial histories.
- Recognize common diseases which present differently in elders. And Understanding of particular factors including diet exercise and sleep which affect older people's adjustments to life.

### **Recommended Books**

1. BERGMAN, ABRAHAM B. 20 Common Problems in Pediatrics. New York: McGraw- Hill
2. HOEKELMAN, ROBERT A. Primary Pediatric Care. 3d ed. St. Louis: Mosby,
3. PARKER, STEVEN, AND ZUCKERMAN, BARRY S., EDS. Behavioral and Developmental Pediatrics: A Handbook for Primary Care. New York: Little, Brown and Company
4. ADELMAN, ALAN M., AND DALY, MEL P., EDS. 20 Common Problems in Geriatrics. New York: McGraw-Hill,

## CLINICAL MEDICINE – II

**Course: Core**

**Credits: 04**

**Number of hours: 120 hours**

### **Course Objective:**

- Understanding the concepts of obstetrics and gynecology.
- To know the growth charts and stages of New born, Infant & Toddler.
- To have a basic knowledge of old aged people and their vaccination schedules.

### **Course content:**

#### **Unit 1 – OBG**

**30 hours**

- Normal Pelvis, fetal Skull, Diagnosis of pregnancy
- Ultra sound in obstructs, stages of labor
- Fetal monitoring
- Management of labor
- Management of third stage and complications
- Pap smear
- Neonatology
- Management of birth injuries
- Immunization of Newborn
- Kangaroo care
- Case history – Gynecology
- Case history – obstructs

#### **Unit II – Pediatrics**

**30 hours**

- History Taking & health Assessment of
- Newborn ,infant, toddler ,preschooler ,schooler ,adolescent
- Growth & developmental Assessment
- Newborn ,infant, toddler ,preschooler ,schooler ,adolescent
- Nutritional Assessment
- Newborn ,infant, toddler ,preschooler ,schooler ,adolescent

### **Unit III – Pediatrics**

**30 hours**

- Dehydration Assessment & management
- Immunization /Administration of vaccines
- BCG, Oral polio ,DPT, Measles, Hepatitis
- Care of neonates in:
  - Warmer,Incubator,Ventilator,Phototherapy

### **Unit IV – Geriatrics**

- Ward Rounds
- OPD
- Counseling for the elderly
- Diet for the aged
- Adult Immunization Schedule

### **Course Outcomes:**

- Understanding of behavior and child development, and its impact on health and illness.
- Understanding the effects of common medical problems on pregnancy and delivery.
- Recognize common diseases which present differently in elders. And Understanding of particular factors including diet exercise and sleep which affect older people's adjustments to life.



# 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 I: Human Rights**

**5 Hours**

- Human Rights- Meaning
- Universal declaration of Human rights

### **Unit II: 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 III :Gender Equity (5 Hours)**

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

### **Unit IV: Woman Status in India**

**5 Hours**

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

### **Unit V: 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 VI: 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. ParvathyAppaiah, Human Rights, Gender Equity and Environmental Studies, Shivam Books publishers, 2012.
2. ParvathyAppaiah, Human Rights, Gender Equity and Environmental Studies, Jai BharathPrakashan publishers, 2016.
3. ParvathyAppaiah, Human Rights, Gender Equity and Environmental Studies, Jai BharathPrakashan publishers, 2018-19.

# SEMESTER V

## GASTROENTEROLOGY & ORTHOPAEDICS

**Course: Core**

**60 hours**

**Credits: 04**

**Course objectives:**

- Understand the principles of treatment for common musculoskeletal & gastrointestinal conditions
- Assignment of limited co-management responsibilities under supervision  
Participation in clinic visits, daily patient rounds and conferences

**Course content:**

**Unit 1**

**6 hours**

**Clinical gastroenterology** – Basics, functions and physiology of defecation

- Preventive gastroenterology-
- obesity, , constipation, diarrhea and dysentery
- Surgical asepsis and hygienic endoscopy room
- preparation of sterile field – preparation of tables,

**Unit II**

**6 hours**

- equipments, instruments for the procedure,
- giving oral anaesthetic agent, transfer and positioning of the patient,
- care of the room before , during and after the endoscopy procedure,

### **Unit III**

**8 hours**

- special precautions in handling patients with sepsis,
- blood borne infection – Hepatitis B, HCV, HIV etc,
- cleaning and disinfection , terminal disinfection,
- Basic endoscopy unit – forward viewing, single channel and double channel endoscopy and specific
- instruments used in endoscopic and colonoscopic procedures.

### **Unit IV**

**10 hours**

- **Ortho:** - basics, ossification of bones of the limbs for age determination,
- X-rays of bones, process of repair of bone.
- Infections – osteomyelitis, tuberculosis, mycetoma.
- Metabolic diseases – rickets /osteomalacia, osteoporosis, hyperparathyroidism

### **Unit V**

**10 hours**

- Tumours- Primary – Osteosarcoma, Osteoclastoma,
- Ewing's sarcoma, chondrosarcoma and Secondary tumors
- Arthritis – Rheumatoid, osteo arthritis/ ankylosing spondylitis.

### **Unit VI**

**10 hours**

- Fracture – definition, classification, management, fracture healing, delayed union, open fractures, management of fracture clavicle, shaft of humerus and dislocation of shoulder.
- Classification of injuries around the elbow and management of supracondylar fracture and dislocation of elbow,
- Monteggia fracture dislocation and fracture of both bones of forearm,
- Volkamann's ischemic contracture, fracture lower end of radius,
- scaphoid and metacarpal fracture.

- Fracture of pelvis and dislocation of hip, fracture neck of femur, trochanter, shaft of femur tibia, fibula and metatarsal.

## **Unit VII**

**10 hours**

- Internal derangements of knee,
- injuries of ankle and foot, amputations,
- Congenital malformations – CTEV, torticollis , CDH,
- pseudoarthrosis Disorders of hip- Coxavara, Perthes disease.
- Deformities and disorders of the spine
- Blood transfusion

### **Course outcome:**

- Understanding the principles of treatment for common musculoskeletal& gastrointestinal conditions
- Describe when blood tests and imaging methods are required for diagnosis, how to interpret them and how they influence management.
- Assignment of limited co-management responsibilities under supervision  
Participation in clinic visits, daily patient rounds and conferences

### **Recommended Books:**

1. Sara D RyndersMPA, Jennifer Hart -Orthopaedics for Physician Assistants: Expert Consult
2. FELDMAN, MARK, ED. Essential Atlas of Gastroenterology and Hepatologyfor Primary Care. New York: Churchill Livingstone

# NEPHROLOGY AND PULMONOLOGY

**Course: Core**

**Credits: 04**

**Number of hours: 60 hours**

## **Course objectives:**

- To achieve skills needed to assist with a physician or a surgeon to care for patients with kidney disease (including the management of dialysis and renal transplantation)
- Understanding the concepts of Genito-urinary system, Urinary tract pathology and clinical examination of kidney in detail.

## **Course content:**

### **Unit 1**

**15 hours**

#### **Genito- urinary system**

- basics, innervations of urinary bladder in detail, microscopic structure of the kidney,
- Juxtaglomerular apparatus, microcirculation of kidney, histopathology of kidney, ureters, urinary bladder and urethra.
- Renal haemo dynamics and glomerular filtration- renal function, renal function tests, micturition

### **Unit II**

**15 hours**

#### **Urinary tract pathology-** basis of impaired renal function, urine analysis.

- Glomerulonephritis – classification – primary ( proliferative and non-proliferative )
- Secondary glomerulonephritis – (SLE, purpura, polyarteritis, amyloidosis, diabetes, nephritic syndrome )
- Acute renal failure, progressive renal failure and end stage renal disease
- Pyelonephritis , reflux nephropathy, interstitial nephritis
- Renal and genitourinary tract tumours – renal cell carcinoma and nephroblastoma Renal vascular disorders,

- kidney changes in hypertension
- Urinary bladder – cystitis, carcinoma, urinary tract tuberculosis, urolithiasis and obstructive uropathy
- Congenital abnormalities of kidneys and urinary system

### **Unit III**

**15 hours**

- Clinical examination of kidney and genitourinary system- symptoms, signs and investigations. Major manifestations – dysuria, pyuria, urethral symptoms
- Disorders of urine volume,
- haematuria , proteinuria, oedema,
- Obstruction of urinary tract, incontinence, renal involvement in systemic disorders Drugs and kidney, renal replacement therapy

### **Unit IV**

**15 hours**

- Upper airway diseases- basic respiratory mechanics, causes and pathophysiology of hypoxia and hypercapnia.
- Respiratory failure –acute, chronic mechanism and management Allergy and bronchial asthma, chronic obstructive lung diseases
- Restrictive / interstitial lung diseases, pulmonary tuberculosis, occupational lung diseases Lung cancer – Primary and secondary, haemoptysis , pneumonia.
- Pleural diseases –Pneumothorax, Pleural effusion Cardiogenic and non-cardiogenic pulmonary odema Diseases of the Diaphragm and the chest wall

### **Course outcome:**

- The student will be able to demonstrate the knowledge, attitudes and skills needed to assist with a physician or a surgeon to care for patients with kidney disease (including the management of dialysis and renal transplantation
- Understanding the concepts of Genito-urinary system, Urinary tract pathology and clinical examination of kidney in detail.
- Will be able to deal with diagnosis ,treatment,and prevention of respiratory diseases and disorders related to respiratory tract

## **Recommended Books**

1. GREENBERG, ARTHUR. Primer on Kidney Diseases. 2d ed. San Diego:Academic Press
2. SCHRIER, ROBERT W. Renal and Electrolyte Disorders. 5th ed. Philadelphia: Lippincott Williams &Wilkins
3. KHAN, M. GABRIEL, AND LYNCH, JOSEPH P. Pulmonary Disease Diagnosis and Therapy: A Practical Approach. Lippincott Williams &Wilkins,
4. WEST, JOHN B. Pulmonary Pathophysiology: The Essentials, 5th ed. Lippincott Williams & Wilkins

## **NEUROLOGY**

**Course: Core**

**Credits: 04**

**Number of hours: 60 hours**

### **Course objectives:**

- Understanding the Nervous system in detail - About the brain and the spinal cord.
- Gets familiar with the neurological conditions and how to diagnose and investigate them accordingly.
- Recognize the indications and the information obtained from routine neurological tests such as lumbar puncture, electroencephalography, electromyography, computerized tomography and magnetic resonance imaging



**Course content :**

**UNIT I**

**15 hours**

- Nervous system – basics – neurotransmitters- general principles and common transmitters Cell membrane – physicochemical properties, permeability and transport, bioelectricity, Genesis of resting membrane potential, action potential, properties of nerve-fibres.
- Neuromuscular junction
- Muscle proteins, excitation – contraction coupling, injury and repair of nerves and muscles, work physiology

**UNIT II:**

**15 hours**

- Sensory system –Functional organization of sensory system, perception of sensory stimuli, coding,
- physiology of pain.
- Motor System – Functional organization of motor system, properties of reflexes, brain stem
- Stretch tendon reflexes, basal ganglia cerebellum and vestibular neck reflexes , maintenance of equilibrium
- ,localizing the level of lesion in neurological diseases
- Visceral and motivational system – autonomic nervous system, hypothalamus , limbic system, emotions, EEG , sleep and wakefulness, learning , memory and speech.

**UNIT III**

**15 hours**

- Neuropathology – Trauma
- Inflammatory disorders- pyogenic and tuberculousmeningitis,brain abscess, tuberculoma CSF and its disturbances – cerebral odema, raised intracranial pressure
- Cerebrovascular disease – atherosclerosis, thrombosis, embolism, aneurysm, hypoxia, infarction and haemorrhage.

- Neurological diseases: - Clinical examination of nervous system, investigations
- Major manifestations – headache, facial pain, raised intracranial tension, faintness, dizziness, syncope, vertigo

#### **UNIT IV**

**15 hours**

- Disorders of sleep and movement
- Sensory disturbances (numbness, tingling and sensory loss), acute confusional state, coma and brain death, Aphasia and focal cerebral disorders, disturbances of brain stem, vision and sphincter.
- Headaches – migraine, cluster and seizures
- Cerebrovascular disease-Dementia, meningitis, encephalitis , cranial nerve diseases, spinal cord diseases , tumours ( primary and secondary), Peripheral neuropathies and demyelinating disorders , multiple sclerosis, Parkinson’s disease, extrapyramidal disorders, cerebellar disorders.
- Motor neuron disease, diseases of muscles, neurological manifestations of systemic diseases, nutritional and metabolic diseases of the nervous system.

#### **Course outcome:**

- Get to know Nervous system in detail - About the brain and the spinal cord.
- Gets familiar with the neurological conditions and how to diagnose and investigate them accordingly.
- Recognize the indications and the information obtained from routine neurological tests such as lumbar puncture, electroencephalography, electromyography, computerized tomography and magnetic resonance imaging

#### **Recommended Books**

1. ROWLAND, LEWIS P. Merritt's Textbook of Neurology. 9th ed. Philadelphia: Lippincott Williams & Wilkins,
2. YOUNG, G. BRYAN ET AL., EDS. Coma and Impaired Consciousness: A Clinical Perspective. New York: McGraw-Hill

# CLINICAL MEDICINE - III

**Course: Core**

**Credits: 04**

**Number of hours: 120 hours**

• **Course objective:**

- Gain proficiency in performing a detailed GI related history & physical examination
- Develop expertise in synthesis of clinical data to formulate differential diagnosis for ortho related problems
- Able to demonstrate the knowledge attitude & skills needed to independently care for patient with kidney diseases,dialysis,renal transplantation
- Acquires the knowledge necessary for diagnosis & initial management of common acute and chronic neurological conditions.

**Course content:**

**UNIT I**

Gastroenterology & Orthopaedics

**40 hours**

Assesment of gastro & musculoskeletal system

- surgical asepsis
- Preparation for endoscopy
- Assisting for endoscopy
- Pre ,intra and post care of endoscopy
- Pre ,intra and post care of colonoscopy
- Intrepretation of x-rays of bones
- Care of pop ,
- pre and post care of orthopaedics surgery patients
- Blood transfusion
- Uses of comfort devices for orthopaedics patients

## UNIT II

### Nephrology and Pulmonology

**40 hours**

- Genitourinary urinary assessment
- Urine analysis
- Pulmonary assessment
- Pulmonary function test

## UNIT III

### Neurology

**40 hours**

- Neurological Assessment
- Pain assessment
- EEG
- GCS
- Sleep Lab
- CSF analysis
- Neurological Investigations
- History & Physical Examination

#### **Course outcome:**

- Gain proficiency in performing a detailed GI related history & physical examination
- Develop expertise in synthesis of clinical data to formulate differential diagnosis for ortho related problems
- Able to demonstrate the knowledge attitude & skills needed to independently care for patient with kidney diseases,dialysis ,renal transplantation

## **SEMESTER VI**

### **BASICS OF THORACIC SURGERY AND BLOOD COMPONENTS**

**Course: Core**

**Credits: 04**

**Number of hours: 60 hours**

**Course objectives:**

- Understand coronary artery bypass surgery, heart transplant, lung transplant and removal of parts of the lung affected by cancer.
- To gain Knowledge on blood grouping and cross matching and blood borne diseases

**Course content:**

#### **UNIT I**

**12 hours**

- Chest wall and Pleura, Chest Injuries, Flail chest, Rib fractures, Haemothorax, Pneumothorax Pleural effusion, Empyema, Tension pneumothorax, Indications and steps of pleurectomy Indications and the steps of Decortication
- Indications and the steps of Intercostal drain insertion Complications of intercostal drain insertion
- Basics of Video Assisted Thoracoscopic Surgery

#### **UNIT II**

**12 hours**

- Lung and its disorders, Causes, symptoms, diagnosis and management of Bronchial Asthma, COPD, Benign Tumours of the lungs, Lung cancer Bullae in the lung, Tracheobronchial injuries, Haemoptysis
- Indications and the steps of lobectomy, Indications and the steps of Pneumonectomy

### **UNIT III**

**12 hours**

- **Mediastinum and its disorders**, Types of thoracic incisions and their indications, Thymoma, Myasthenia gravis, Indications and Steps of sternotomy
- Indications and Steps of Thymectomy, Indications and Steps of Pericardectomy  
Mediastinal tumours, Pericardial effusion

### **UNIT IV**

**12 hours**

- **Blood components and blood borne diseases**, Blood grouping and Cross Matching PRBC, Whole blood, Platelets, FFP (Fresh Frozen Plasma), Cryoprecipitate
- HIV, HBV, HCV Post Exposure Prophylaxis

### **UNIT V**

**12 hours**

- Coagulation system, Platelet Disorders- Thrombocytopenia, Thrombophilia Coagulation pathway disorders - Von willibrands diseases, Haemophilia DIC- Disseminated intravascular coagulation
- Fibrinolytic system and its disorders Practical syllabus
- Chest x ray CT Thorax
- Indications and the steps of Decortication
- Indications and the steps of  
Intercostal drain insertion  
Indications and the steps of  
lobectomy
- Indications and the steps of  
Pneumonectomy  
Indications and Steps of  
Thymectomy

### **Course outcome:**

- Understanding the surgeries of coronary artery bypass surgery, heart transplant, lung transplant and removal of parts of the lung affected by cancer.
- Acquires a detailed knowledge in lungs and its disorders along with Thoracoscopic Surgery
- Knowledge on blood grouping and cross matching and blood borne diseases

### **Recommended Books**

1. SPRINGHOUSE CORPORATION. Physician Assistant's Clinical Companion. Springhouse, PA: Springhouse Publishing Company,
2. Lewke, Gillian et al. *Physician Assistant: Pearls of Wisdom*. Lincoln, NE: Boston Medical Publishers
3. LABUS, JAMES B. *The Physician Assistant Surgical Handbook*. Philadelphia: Saunders
4. Core Curriculum for Surgical First Assisting. Englewood, CO: Association of Surgical Technologists
5. GREENFIELD, LAZAR J. ET AL. *Essentials of Surgery: Scientific Principles and Practice*. Philadelphia: Lippincott Williams & Wilkins
6. RUDZINSKI, MICHAEL J., AND BENNES, J. FRED. *Drug Information Handbook for Physician Assistants*. Hudson, OH: LexiCo Core 20

# **CARDIOLOGY AND CARDIAC SURGERY**

**Course: Core**

**Credits: 04**

**Number of hours: 60 hours**

## **Course objectives:**

- To learn about Cardiovascular diseases and Cardiac Catheterisation.
- Basics of cardiac surgery and arterial line insertion.

## **Unit I**

**10 hours**

- Basics – structural basis of cardiovascular disease, embryology, chambers, heart valves, surface marking, great vessels, blood, cardiovascular disease, cardiac cycle, heart sounds, circulation of blood, cardiovascular responses to exercise, heart failure and compensatory mechanism, cardiac muscle action, coronary perfusion.

## **Unit II**

**10 hours**

- Cardiovascular diseases – symptoms and signs, pulse, BP, JVP Congenital heart disease – cyanotic and acyanotic heart diseases
- Hypertension- essential, malignant, systemic and pulmonary hypertensions Arterial diseases – atherosclerosis – risk factors, Burger’s disease
- Coronary, Rheumatic heart disease, heart failure, cardiac arrhythmias, cardiomyopathies Peripheral vascular disease, pulmonary thromboembolism,
- Systemic diseases affecting the heart, pregnancy and heart disease Pericardial diseases, Cardiac trauma, tumors of heart
- Prevention of heart diseases –Diagnostic tools – ECG, Chest X-ray, ECHO, TMT, Holter, 24 hour ambulatory BP monitoring, blood analysis., etc.
- Cardiac catheterization and coronary angiography- preparation of patient physically and mentally. Pre and post-operative care and rehabilitation programme. PPI
- Importance of life style modification measures.



### **Unit III**

**10 hours**

- Blood conservation techniques in Cardiac Surgery
- Blood conservation approach surgical and pharmacological
- Preoperative, Peri operative, Post operative, Cell saver

### **UNIT IV**

**10 hours**

- Care of surgical patient, Personal hygiene, Hand hygiene Aseptic techniques, Sternal Wound care, Thoracic wound care Leg wound care, Pre-operative care of the surgical patient Post-operative care of the surgical patient
- Pre op check list for cardiac surgery Pre op check list for thoracic surgery

### **UNIT V**

**10 hours**

- Indications , steps and Complications of Central line placement- Jugular, Subclavian and Femoral vein
- Arterial line insertion - Radial and Femoral artery Endotracheal intubation
- Ambubag, Tracheostomy, IV cannulation, Urinary catheterisation Tourniquets - use and duration of application and dangers of use Intra-aortic balloon pump insertion

### **Unit VI**

**10 hours**

- Cardiac surgery ;- Basics – Cardiopulmonary bypass – closed and open heart operation, PDA ligation,
- closed mitral valvotomy, pulmonary artery banding , block trussing shunt, pericardiectomy, shunt
- operations, ASD and VSD closure, Tetralogy of Fallot correction, valvular disease surgeries, surgery for transpositions, other corrective surgeries and coronary surgeries.

**Course Outcome:**

- In-depth knowledge in Cardiovascular diseases and Cardiac Catheterisation.
- Comprehend basics of cardiac surgery and arterial line insertion.
- Practical Assessment of Pre and Post operative care for Surgical patients.

**Recommended Books**

1. ALEXANDER, R. WAYNE ET AL., EDS. *Hurst's the Heart, Arteries and Veins*. 9th ed. New York: McGraw-Hill, 1998
2. BRANCH, WILLIAM T. ET AL. *Cardiology in Primary Care*. New York: McGraw-Hill,
3. Lewke, Gillian et al. *Physician Assistant: Pearls of Wisdom*. Lincoln, NE: Boston Medical Publishers
4. LABUS, JAMES B. *The Physician Assistant Surgical Handbook*. Philadelphia: Saunders
5. *Core Curriculum for Surgical First Assisting*. Englewood, CO: Association of Surgical Technologists
6. GREENFIELD, LAZAR J. ET AL. *Essentials of Surgery: Scientific Principles and Practice*. Philadelphia: Lippincott Williams & Wilkins
7. RUDZINSKI, MICHAEL J., AND BENNES, J. FRED. *Drug Information Handbook for Physician Assistants*. Hudson, OH: LexiComp, Inc

## **BASIC INTENSIVE CARE**

**Course: Core**

**Credits: 04**

**Number of hours: 60 hours**

### **Course objectives:**

- To learn about basic intensive care concepts by applying the knowledge of patient care, anatomy, physiology and medical disorders
- To gain knowledge to assess and manage head injury patients and also to use and monitor the ventilators.

### **Unit I -**

**12 hours**

#### **General ICU Care and Monitoring**

- General care and transport of ICU patient - eye, skin, bladder care, position, airways, drains, catheters. Transport of critically ill patient to and out of ICU, transport of patient with drains, airway, inotropes, mechanical ventilator.
- Monitoring in critical care: vital signs, drains, ECG, fluid intake & output, invasive hemodynamic and central venous pressure monitoring

### **Unit II -**

**12 hours**

- Infection Control and Nutrition in ICU -
- Infection control in ICU: prevention of cross infection, personal protection, antibiotics and policy.

- Nutrition and Fluid balance - total parenteral nutrition, nasogastric tube, gastic tube, jejunostomy tube care and feeding, IV Fluids.

### **Unit III -**

**12 hours**

#### Systemic Diseases and Care in ICU

- Cardiac care in ICU: hypertension, hypotension, arrhythmias, cardiac arrest, ACLS
- Respiratory care in ICU: airway care, tracheostomy care, endotracheal intubation, mechanical ventilation, care of ventilated patient, complications and weaning.
- Renal failure: types, etiology, complications, corrective measures
- Hepatic failure: types, etiology, complications, corrective measures

### **Unit IV -**

**12 hours**

- Head Injury and Trauma care in ICU
- Head injury and Trauma Care: Glasgow coma scale, care of head injury patient ,poly trauma patient
- Blood and bloodproducts transfusion:
- Transfusion reactions&complications,Massive transfusion

### **Unit V**

**12 hours**

- Basics of Ventilator management
- Modes of Ventilation

### **Course outcome**

- Understands the practical care given in the general ICU and close monitoring of the patients in ICU
- Acquires knowledge to assess and manage head injury patients and also to use and monitor the ventilators.

### **Recommended Books**

1. Paul L. Marino : The ICU Book , Lippincott Williams and Wilkins
2. Charles Gomersall Basic Assessment & Support in Intensive Chinese University of Hong Kong
3. Richard S. Irwin ,Craig M. Lilly , James M. Rippe Irwin &Rippe'sManual ofIntensive Care Medicine, 6<sup>th</sup> Edition; Lippincott Williams and Wilkins(2013)

# CLINICAL MEDICINE - IV

**Course: Core**

**Credits: 04**

**Number of hours: 120 hours**

## **Course Objective:**

- To learn about basic intensive care concepts by applying the knowledge of patient care, anatomy, physiology and medical disorders
- To learn about Cardiovascular diseases and Cardiac Catheterisation.

## **Course Content:**

- Pre-operative care of the surgical patient
- Post-operative care of the surgical ,patient,
- monitoring& interpretation of ECG,TMT &holter
- Assisting with CABG
- Pre op check list for cardiac surgery
- Central line placement- Jugular, Subclavian and Femoral
- Arterial line insertion - Radial and Femoral artery
- Endotracheal intubation, Tracheostomy,
- IV cannulation, Urinarycatheterization
- Rehabilitation of cardiac patient
- Basics of Ventilator management Modes of Ventilation

## **Course Outcome:**

- Acquires knowledge to assess and manage head injury patients and also to use and monitor the ventilators.
- Comprehend basics of cardiac surgery and arterial line insertion.

## **CLINICAL INTERNSHIP**

The internship time period provides the students the opportunity to continue to develop confidence and increased skill in diagnosis and management. Students will demonstrate competence in beginning, intermediate, and advanced procedures in above areas. Students will participate in advanced and specialized treatment procedures. The student will complete the clinical training by practicing all the skills learned in classroom and clinical instruction. The students are expected to work for minimum 6 hours per day and this may be more depending on the need and the healthcare setting.