



SHRI  
DHARMASTHALA  
MANJUNATHESHWARA  
UNIVERSITY

ORDINANCE GOVERNING  
B.SC. IN ALLIED HEALTH SCIENCES  
**B.Sc. Respiratory Therapy**  
2023-2024

**SHRI DHARMASTHALA MANJUNATHESHWARA UNIVERSITY**

(A State Private University established under the Shri Dharmasthala Manjunatheshwara University Act No 19 of 2018 of Government of Karnataka and Notification No. ED 261 URC-2018 dated 19th December 2018)

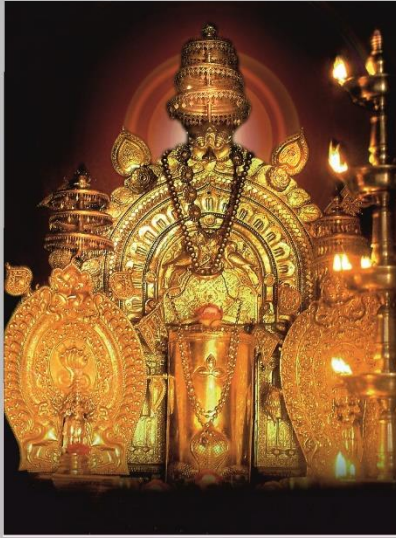
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|| Om Shri Manjunathaya Namaha ||



Shree Kshethra Dharmasthala

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**Published by  
Registrar**

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## THE LOGO

Poojya Dr D. Veerendra Heggade, Hon'ble Chancellor of the University, while searching for an appropriate Logo for the University, saw a photograph picked from Temple Architecture showing Wings of a Bird, sculpted in Indian style and wanted it to be incorporated in the logo for the University, as the Wings symbolize 'Spreading of Knowledge beyond Boundaries'. Further it was felt that the Central theme of the logo should be 'Rudra' (The Linga) with three wings on each side. In this way, the logo of the University was conceptualized.

Hence:

1. The central part represents **Rudra** who Demolishes Darkness.
2. The Three **horizontal lines on The Linga** stand for Samyak Darshan (Right Belief), Samyak Gyan (Right Knowledge) and Samyak Charitra (Right Conduct).
3. The **Wings** symbolize spreading of Knowledge across the boundaries.
4. Base line "**Truth Liberates**" highlights the Purpose of Education: to liberate oneself unconditionally. It shows that it is not discipline, nor knowledge nor the efforts to freedom that liberate but Truth is what liberates you from all your conditioning and ignorance.

The overall significance of Shri Dharmasthala Manjunatheshwara University's Logo is:

**Darkness of ignorance is destroyed by the flow of knowledge to bring Liberty to everyone, by realizing the truth. And, it should spread globally without the**



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## VISION

Shri Dharmasthala Manjunatheshwara University will set the highest standards of teaching and learning by awakening the intelligence of the students and nurturing the creativity hidden in them by creating an environment where the ancient wisdom blends with modern science, to transform them into whole human beings to face the

## MISSION

- ▶ To ensure that the journey of education is inspiring, pleasant and enjoyable.
- ▶ Attract the best of teachers and students.
- ▶ Achieve high principles of trust, love and spirituality in the students.
- ▶ Create a collaborative, diverse and exclusive community.
- ▶ Transform the student of today to be a leader of tomorrow and a better human being.
- ▶ Produce passionate teachers.
- ▶ Evolve innovative teaching techniques.
- ▶ Create a peaceful environment.
- ▶ Prepare the student to face the social challenges.
- ▶ Create a University of which the Nation is proud of.
- ▶ Be an effective partner in Nation Building.
- ▶ Create an Eco-friendly University.
- ▶ Create a University based on the principles of beauty, love and justice.



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SDMU/Notif-123/F-90/731/2023

Date: 30.12.2023

## NOTIFICATION

### Ordinance Governing the Curricula of B.Sc. in Respiratory Therapy

Ref: 1. Minutes of the 8<sup>th</sup> Meeting of the Academic Council held on 10<sup>th</sup> November 2023

In exercise of the powers conferred under Statutes 1.4 (Powers and functions - Para ix & x) of Shri Dharmasthala Manjunatheshwara University, the Academic Council is pleased to approve and notify the Ordinance governing the Curricula of **B.Sc. in Respiratory Therapy**.

The ordinance shall be effective for the students joining the courses during the academic year 2023-24 and onwards.

Dr. Chidendra M. Shettar

REGISTRAR  
REGISTRAR,

Shri Dharmasthala Manjunatheshwara  
University, Dharwad

To: 1. The Principal, SDM College of Medical Sciences & Hospital  
2. Coordinator - Medical Allied Health Sciences, SDM College of Medical Sciences & Hospital,  
Dharwad

**Copy for kind information to:**

1. Hon'ble Vice Chancellor - Shri Dharmasthala Manjunatheshwara University
2. Pro Vice Chancellor (Academics) - Shri Dharmasthala Manjunatheshwara University
3. Controller of Examinations - Shri Dharmasthala Manjunatheshwara University
4. Office of the Registrar
5. University Office for Records File & Website



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# **B.Sc RESPIRATORY THERAPY**

## **INTRODUCTION:**

Respiratory Therapist plays significant role in managing patients with acute and chronic Respiratory problems like, diagnosis and management of respiratory disorder needing Intensive care unit (ICU) and Pulmonary Rehabilitation.

It will be 4-year course with 3 years (6 semesters) of course work and one year of internship.

## **AIM**

To enable students to achieve the high personal, professional and academic standard required to become competent respiratory therapist with the ability to meet the needs of patients and adapt to the changing context of health and social care provision.

## **OBJECTIVE**

The objective is to impart the basic knowledge in critical care services and anaesthesia; and to provide robust training to ensure attainment of competent technical skills and confidence required to support the health care system.



## DEFINITIONS OF KEY WORDS

- i. **Letter Grade:** It is an index of the performance of students in a said course. Grades are denoted by letters A, B, C, D, E and F.
- ii. **Grade Point:** It is a numerical weightage allotted to each letter grade on a 10-point scale.
- iii. **Credit:** A unit by which the course work is measured. It determines the number of hours of instructions required per week over the duration of a semester (minimum 15 weeks). Examples - One credit is equivalent to one hour of teaching (lecture or tutorial) or two hours of practical work/field work per week.
- iv. **Credit Point:** It is the product of grade point and number of credits for a course.
- v. **Semester Grade Point Average (SGPA):** It is a measure of academic performance of student/s in a semester. It is the 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.
- vi. **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 earned 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.

## **PART I - GENERAL GUIDELINES**

- 1. NAME OF THE COURSE: BSc RESPIRATORY THERAPY**
- 2. SCHEME: CHOICE BASED CREDIT SYSTEM(CBCS)**
- 3. MODE OF STUDY:** Full time Semester program
- 4. DURATION OF THE COURSE:** 4 (Four) years  
3(Three) years course work (6 semesters) and 01 (One) year of Internship
- 5. MEDIUM OF INSTRUCTION:** English
- 6. INTAKE:** 5 seats per year
- 7. ELIGIBILITY FOR ADMISSION:**
  - a. A candidate seeking admission to the Bachelor of Science Degree Courses in the Allied Health Sciences, shall have studied English as one of the principal subjects during the tenure of the pre university course.  
**Regular entry:**
    - b. Two-year Pre-University examination or equivalent as recognized by Pre-University Board or equivalent authority with, Physics, Chemistry and Biology as principal subjects of study with pass percentage of 45% in PCB.  
OR  
Any equivalent examination recognized by the SDM University for the above purpose with Physics, Chemistry and Biology as principal subjects of study with pass percentage of 45% in PCB.
  - Lateral entry:**
    - c. Candidates with two years diploma after PUC 2 (10+2) from a recognized Government Board in a subject for which the candidate desires to enrol, in the respective Allied Health Sciences course mentioned shall have passed PUC 2 [10+2] with Physics, Chemistry and

Biology, as principal subjects, and as recognized by SDM University. Such candidates are eligible for Lateral entry to second year for Allied Health Science courses fulfilling the conditions specified above, only in the same subject/stream studied during Diploma. This will be applicable to only those courses which are having diploma degrees.

- d. Selection of the candidates and admission process will be as per the SDM university rules and regulations

**Note:**

- a. The candidate shall have passed individually in each of the principal subjects.
- b. Candidates who have completed diploma or vocational course through correspondence shall not be eligible for any of the courses mentioned above.

## **8. CREDIT DISTRIBUTION IN CBCS**

Each semester shall get a minimum of 20 weeks duration, in which minimum 15 weeks shall be available for conduct of academics, excluding sessional exams, study leave, university exams, semester break, declared holidays & non-academic events.

**Credits are distributed as below-**

Lectures (L)	: 1 Hr /week = 1 credit
Tutorial (T)	: 1 Hr /week = 1 credit
Practical (P)	: 2 Hrs/week = 1 credit
Clinical postings (CL)	: 3 Hrs/week = 1 credit

## 9. DISTRIBUTION OF TEACHING HOURS AND CREDITS

### SEMESTER – I (Total Credits – 20)

Course code	Course Title	Theory		Practical		Tutorial	
		Credit	Hour	Credit	Hour	Credit	Hour
DSC1 & DSC1(P)	Anatomy-I	3	45	1	30	-	-
DSC2	Physiology-I	3	45	-	-	1	15
DSCR3 & DSCR3(P)	Respiratory Care I Equipment & Medical Terminology	4	60	1	30	1	15
AEC1	English & Communication	2	30	-	-	-	-
VAC1	Environmental Science (EVS) and Indian Constitution	2	30	-	-	-	-
DSECR1(P)	Clinical-1 (Postings)	-	-	2	90		
	Total	14	210	4	150	2	30

### SEMESTER – II (Total Credits – 20)

Course code	Course Title	Theory		Practical		Tutorial	
		Credit	Hour	Credit	Hour	Credit	Hour
DSC4	Biochemistry	3	45	-	-	1	15
DSCR5 & DSCR5(P)	Anatomy II	2	30	1	30	-	-
DSCR6 & DSCR6(P)	Physiology II	2	30	1	30	-	-
DSCR7 & DSCR7(P)	Respiratory care II Clinical examination	2	30	-	-	1	15
AEC2	Health care system and Nursing care	2	30	-	-	-	-
VAC2	Sociology	3	45	-	-	-	-
DSECR2(P)	Clinical-2 (Postings)	-	-	2	90	-	-
	Total	14	210	4	150	2	30

**Course codes:** DSC – Discipline specific core subject; (P) – is the subject code indicating practical or postings; DSCR – Discipline specific core Respiratory therapy; AEC – Ability enhancement course; VAC – Value added course; DSECR – Discipline specific Skill enhancement course respiratory therapy

In each semester, 80 hours will be allotted for internal assessment components and 80 hours for student engagement in mentorship, feedback and peer assisted/ self-directed learning sessions, library and museum sessions, group activities etc.

## 10. SCHEME OF EXAMINATIONS:

### i. Internal assessment components (IAC):

IAC for all discipline specific core subjects shall be computed on the basis of a continuous evaluation of the student in mid semester exam, class participation, assignments and seminars.

Theory IA components			Practical IA components		
1	Mid semester exam (01)	50 marks	1	Mid semester exam (01)	20 marks
2	Class test	20 marks	2	Skill acquisition (day to day assessment by direct observation)	20 marks
3	Assignment/Seminars	20 marks	3	Logbooks/Practical record book	10 marks
4	Attendance	10 marks			
	<b>Total</b>	<b>100 marks</b>		<b>Total</b>	<b>50 marks</b>
	<b>It shall be reduced to 30 marks</b>			<b>It shall be given for 50 marks</b>	

Internal assessment for Ability enhancement courses (AEC) and Value added courses (VAC) shall be considered in the form of assignment or regular assessments for 10 marks.

### ii. End semester University examinations (ESE):

- The University shall conduct examination for the core subjects at the end of each semester. The candidates, who satisfy the requirement of attendance and internal assessment, shall be eligible to appear for the University examination. The head of the institution shall verify the same before forwarding the applications to the University within stipulated time along with the prescribed fee.

- All the odd semester university regular exams will be conducted in January. All the even semester regular exams will be conducted in July. However, the exact month of exam will depend on the date of admission of the student and completion of 20 weeks of academic training from the date of admission.

- Question paper pattern for End semester University theory examinations (70 marks)

- I. Long Answer Questions (Answer 2 out of 3) : 2 x 10 marks = **20 marks**
  - II. Short Essay Questions (Answer 6 out of 8) : 6 x 5 marks = **30 marks**
  - III. Short Answer Questions (Answer all 10) : 10 x 2 marks = **20 marks**
- Total = 70 marks**

- **Study holidays** - 6 days holiday shall be given for preparations before end semester examination

**iii. Non-University examinations (NUE):**

- Examination for Languages, Allied subjects, Skill enhancement and Elective subjects shall be conducted by the college and the marks obtained shall be submitted to the University along with the IA marks of the core subjects at least 15 days before the commencement of the University examination. The marks of non-core subjects shall be incorporated in the marks card issued by the University.

- Question paper pattern for Non-University examinations (40 marks)

- I. Long Answer Questions (Answer 1 out of 2) : 1 x 10 marks = **10 marks**
  - II. Short Essay Questions (Answer 6 out of 8) : 6 x 5 marks = **30 marks**
- Total = 40 marks**

**iv. Resit Examination (RE):**

A resit examination shall be conducted every six months along with the End semester examination (ESE) of the next semester to clear the subjects in which the student has secured 'F' grade. The students who are absent in the main examination he/she will be appearing under the term as the "**SUPPLEMENTARY**" examination.

**v. Practical/Clinical Exams**

Practical/Clinical examination shall conducted for 50 marks which will include 40 marks practical / clinical plus 10 marks viva – voce.

**11. MARKS DISTRIBUTION:**

**SEMESTER I**

Course code	Course Title	THEORY			PRACTICAL		
		IAC	ESE	NUE	IAC	ESE	NUE
DSC1 & DSC1(P)	Anatomy – I	30	70	-	50	50	-
DSC2	Physiology-I	30	70	-	-	-	-
DSCR3 & DSCR3(P)	Respiratory Care I Equipment & Medical terminology	30	70	-	50	50	-
AEC1	English and Communication	10	-	40	-	-	-
VAC1	Environmental Science and Indian Constitution	10	-	40	-	-	-
DSECR1(P)	Clinical 1 (postings)	-	-	-	-	-	50

**SEMESTER II**

Course code	Course Title	Theory			Practical		
		IAC	ESE	NUE	IAC	ESE	NUE
DSC4	Biochemistry	30	70	-	-	-	-
DSCR5 & DSCR5(P)	Anatomy II	30	70	-	50	50	-
DSCR6 & DSCR6(P)	Physiology II	30	70	-	50	50	-
DSCR7 & DSCR7(P)	Respiratory care Clinical examination	-	-	-	-	-	50
AEC2	Health care system and Nursing care	10	-	40	-	-	-
VAC2	Sociology	10	-	40	-	-	-
DSECR2(P)	Clinical 2 (postings)	-	-	-	-	-	50

**Course codes:** DSC – Discipline specific core subject; (P) – is the subject code indicating practical or postings; DSCR – Discipline specific core Respiratory therapy; AEC – Ability enhancement course; VAC – Value added course; DSECR – Discipline specific Skill enhancement course respiratory therapy

## 12. EXAMINERS

- a. **Appointment of Examiners:** Examiners shall be appointed by the University to conduct the end semester University practical examinations, from the panel of examiners approved by the Board of Studies/Board of appointment of examiners. For Practical examinations, there shall be one external examiner and one internal examiner. Theory paper shall be valued by both the examiners.
- b. **Qualification and Experience of Examiners:** (Internal and External examiner)

Post graduation MSc in the respective field with two years of teaching experience. Relaxation can be done in case of non-availability of examiners and with the approval of board of appointment of examiners.

Post MD/MS/PhD – can be appointed as examiners after completion of their MD/MS/PhD

## 13. ATTENDANCE CRITERIA

- a. Every candidate should have attended **minimum 75%** of the total number of classes conducted in a semester from the date of commencement of the term to the last working day as notified by university, in each of the subjects prescribed for that Semester **separately in theory and practical**. Only such candidates are eligible to appear for the university examinations in their first attempt.
- b. Every candidate should have minimum **75% attendance in clinical postings**. The same shall be considered towards practical attendance.
- c. Candidates having less than 75% attendance in any subject course (Theory and Practical separately) will be considered to have **Shortage of attendance and hence will not be permitted to appear for the End-semester exam** of the respective subject course (including both theory and practical of that subject).
- d. No leverage will be given after the above provision for the attendance shortage even for medical reasons



#### **14. INTERNAL ASSESSMENT CRITERIA**

- a. Candidates should score a minimum of 'E' grade (40%) separately in Theory and Practical IAC for all the discipline specific core subjects to be eligible to appear for End semester university examination
- b. If a candidate is **absent** for any of the IA examinations due to genuine reasons, such a candidate may be given a re-examination, within a fortnight. This will be with the approval of Principal for each individual candidate.
- c. IAC will be included in Theory and Practical components of End semester university exams for declaration of results. Student should get a minimum of 40% marks including ESE and IAC (Grade E) in Theory and Practical separately to be declared as PASS in that subject.
- d. Remedial/Improvement examination (Theory and practical separately)**
  - i. Remedial exam will be conducted for mid semester exam component of IAC only for those candidates who have failed to secure minimum of "E" grade (40%) in IAC for a course (either in Theory or practical IAC). It will be conducted before the ESE and also before Resit examination.
  - ii. Improvement exam will be conducted for candidates who have failed in resit examination. They can attend the mid semester exam of the subsequent batch if they wish to improve their mid semester exam marks.
  - iii. Candidate has to pay the exam fee for improvement exam as prescribed by the Institute/University.
  - iv. The marks obtained in other components of IAC may be carried forward without reassessment.

## 15. EVALUATION AND GRADING

- a. The final evaluation and grading for each course shall be based on Internal Assessment Components (IAC) and the End-semester examinations (ESE).

**b. Letter grade and Grade point allocation:**

Letter grades are given from A to E for each subject in ESE. Based on the performances, each student shall be awarded a final letter grade at the end of the semester for each course. The letter grades and their corresponding grade points are given in Table below.

**Letter grades and grade points equivalent to percentage of marks obtained:**

Percentage of Marks obtained	Letter Grade	Grade Point	Performance
90.00 - 100	O	10	Outstanding
80.00 - 89.99	A	09	Excellent
70.00 - 79.99	B	08	Good
60.00 - 69.99	C	07	Fair
50.00 - 59.99	D	06	Satisfactory
40.00 - 49.99	E	05	Average
Less than 40	F	0	Fail
Absent	AB	0	Fail

F-Fail; AB – Absent; DT - Detained/Attendance shortage

- c. The candidate will have to get a minimum of E grade (grade point 5 which is minimum of 40%) separately in all the courses to be declared as 'PASS' and Grade F is considered as FAIL.
- d. To be eligible for a grade E or above for a course, the pass criteria mentioned in point no. 16 is applicable.
- e. A candidate who remains absent for any end semester examination shall be assigned a letter grade of 'AB' and a corresponding grade point of 'zero'. He/she should reappear for the said evaluation/examination in due course. This shall be considered as an attempt.

f. **The overall performance of a student in each semester is indicated by the Semester Grade Point Average (SGPA). The overall performance of the student for the entire programme is indicated by the Cumulative Grade Point Average (CGPA).**

g. **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 courses (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:

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

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 learner has a F or ABS grade in course 4, the SGPA shall then be computed as:

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

h. **Cumulative Grade Point Average (CGPA):**

The CGPA is calculated with the SGPA of all the semesters to two decimal points and is indicated in final grade report card/final transcript showing the grades of all VIII 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 course(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,.... etc.

## 16. CRITERIA FOR PASS

- a. **Discipline specific Core Subjects:** Passing in Theory and Practical will be considered separately.

**Theory** - Candidates are declared to have passed in a subject, if they secure minimum 40% marks in End semester examination (ESE) and 40% marks in internal assessment components (IAC) separately and a minimum 40% when both ESE+ IAC are added together.

**Practical** - Candidates are declared to have passed in a subject, if they secure minimum 40% marks in End semester examination (ESE) and 40% marks in internal assessment components (IAC) separately and a minimum 40% when both ESE+ IAC are added together.

- b. If a candidate passes in practical examination but fails in theory paper, such candidate should reappear for practical and theory paper both of that failed subject AND vice versa.
- c. **Clinicals:** Candidate must secure 40% of the maximum marks in Non-university examination (NUE) to be considered as Pass.
- d. **Ability enhancement courses and Value added courses:** For Language papers, allied papers, skill enhancement and elective papers, the minimum prescribed marks for a pass shall be 40% of the maximum marks prescribed for a subject including Non university exam and Internal assessment marks (NUE+IA) added together.
- e. **Provision of Grace marks:** If the student has failed in only one subject and has passed in all the other subjects of a particular semester and Grace marks of up to 5 marks to theory marks can be added for one course/subject only, provided that by such an addition the student passes the semester examination

## **17. DECLARATION OF CLASS**

The class shall be awarded on the basis of CGPA as follows:

- First Class with Distinction = CGPA of 7.50 and above
- First Class = CGPA of 6.00 to 7.49
- Second Class = CGPA of 5.00 to 5.99
- Pass Class = CGPA of 4.00 to 4.99

## **18. PROGRESSION CRITERIA**

- a. A candidate must have passed 50% of discipline specific core subjects of first and second semester to appear for end semester exams of fourth semester.
- b. A candidate must have passed 50% of discipline specific core subjects of third and fourth semester to appear for end semester exams of fifth semester.
- c. A candidate must have passed all the subjects (core/language/skill enhancement/ allied/elective) of first and second semester to appear for end semester exams of fifth semester.
- d. A candidate must have passed all the previous subjects from first to fifth semester (core/language/skill enhancement/ allied/elective) to appear for end semester exams of sixth semester.
- e. A candidate must pass in all the subjects in all six semesters before starting the internship.

Candidates shall continue to attend course curriculum of all semesters with their regular batch throughout the course.

## **19. INTERNSHIP**

Twelve months (one year) internship shall be mandatory after successful completion of sixth semester examination. The 'Internship Completion Certificate' shall be issued by the college and copy of same is submitted to the University.

## **Required skills for successful completion of the BSc Respiratory therapy**

By the end of the program, graduate should be able to demonstrate the following skills as per the prescribed protocols and standard operating protocols. The same needs to be evaluated at the end on Internship.

- i. Respiratory care manoeuvres including but not restricted to controlled oxygen therapy.
- ii. Humidification and administration of aerosols such as bronchodilators, mucolytics, mucokinetics and steroids using small volume nebulisers, ultrasonic nebulisers and metered dose inhalers.
- iii. Postural drainage, chest physiotherapy and clearance of pulmonary secretions.
- iv. Instructions for breathing exercises
- v. Performance and interpretation of pulmonary function tests (including arterial blood gas sampling)
- vi. Continuous cardiac and respiratory monitoring of critically ill patients in the ICU
- vii. Initiation, maintenance and weaning off ventilatory support in adults, older children and neonates
- viii. Institution of non-invasive ventilation using well-fitting nasal and full-face masks
- ix. Monitored transport of patients
- x. Assisting at clinical procedures such as endotracheal intubation, tracheostomy, bronchoscopy, insertion of central venous pressure lines, pulmonary artery catheters, etc.
- xi. Care of patients on long-term artificial airways such as nasotracheal/oro tracheal tubes, care of tracheostomised patients (including decannulation procedures)
- xii. Preoperative and postoperative care of surgical patients (such as those with restrictive lung disorders e.g., scoliosis) needing instruction and assistance at performing breathing exercises
- xiii. Pulmonary Rehabilitation
- xiv. Attending emergency calls for cardiopulmonary resuscitation

Successful completion of program will enable the student to be awarded a Bachelor of Respiratory therapy.

## **20. REVALUATION AND RETOTALLING OF ANSWER PAPERS**

There is **NO PROVISION** for revaluation or retotalling of the answer papers in any examination.

## **21. MAXIMUM DURATION FOR COMPLETION OF COURSE**

A candidate shall complete the course within **six years from date of admission** (excluding internship), failing, which candidate shall re-register for the course.

## **22. AWARD OF DEGREE**

A candidate who has passed in all the subjects (core/language/allied/skill enhancement/elective papers) of all the semesters and has successfully completed the internship shall be eligible for award of degree.

## **23. AWARD OF RANKS/MEDALS**

Ranks and Medals shall be awarded on the basis of final CGPA. However, candidates who fail in one or more subject during the course shall not be eligible for award of ranks.

**COURSE CONTENTS**  
**SEMESTER I**  
**SUBJECT – ANATOMY**

**Sub Code – DSC1**

**Credit distribution:**

**Theory : 3 Credits (Teaching hours – 45)**

**Practical:1 Credit (Teaching hours – 30)**

**Total Teaching Hours: 75 Hrs**

**Course contents:**

**General Anatomy (7 Hrs)**

- Anatomical position and Anatomical terms
- Epithelium – types and functions
- Connective tissue – fibers and cells
- Cartilage – types, structure and function
- Bone – types, structure and blood supply
- Muscle – classification, structure and function
- Neurons- types and structure, typical spinal nerve
- Blood vessels – arteries, veins, lymph vessels, lymph nodes, structure of lymph node
- Joints: Classification, examples, structure of a typical synovial joint, Classification of synovial joints.

**Musculoskeletal System**

**Upper Extremity (13 Hrs)**

- Detailed study of the muscles of the pectoral region, back of the trunk, shoulder region, front and back of the arm, front and back of the forearm and hand
- Detailed study of the joints of upper limb
- Detailed study of the nerves of the upper limb
- Detailed study of the blood vessels of the upper limb
- Detailed study of lymph nodes and lymph vessels of the upper limb
- Detailed study of bones of the upper limb.



### **Lower Extremity (12Hrs)**

- Detailed study of muscles of the front, medial side and back of the thigh
- Detailed study of muscles of the gluteal region
- Detailed study of muscles of the muscles of lateral, anterior and posterior compartments the leg, dorsum and sole of the foot
- Detailed study of joints of the lower limb
- Detailed study of arches of the foot
- Detailed study of nerves of the lower limb
- Detailed study of blood vessels of the lower limb
- Detailed study of lymph nodes and lymph vessels of the lower limb
- Detailed study of bones of the lower limb

### **Vertebral column (2 Hrs)**

- Detailed study of vertebrae and vertebral column

### **Head and Neck (3 Hrs)**

- Detailed study of muscles of facial expression
- Detailed study of sternocleidomastoid muscle

### **Systemic Anatomy**

#### **Respiratory system: (5 Hrs)**

- Nasal cavity: Boundaries, Lateral wall – features, blood supply, nerve supply and lymphatic drainage
- Nasal septum: Formation, blood supply, nerve supply, lymphatic drainage and applied anatomy
- Paranasal air sinuses and their function
- Larynx: Cartilaginous framework and ligaments, ii. Cavity of larynx, blood supply, nerve supply iii. Vocal cords and their movements iv. Rima glottidis
- Names of the intrinsic muscles of the larynx, their nerve supply and actions
- Trachea: Extent, Structure and nerve supply
- Thoracic cage: thoracic wall, intercostal spaces and their contents
- Diaphragm – attachments, nerve supply and actions

- Pleura- parts, pleural cavity, pleural recesses, pulmonary ligament
- Lungs- gross anatomy, roots of the lungs, surface marking of pleura and lungs

### **Cardiovascular system (4 Hrs)**

- Mediastinum - boundaries and contents
- Pericardium - parts, blood supply, nerve supply and function
- Heart - position, external features, chambers- right and left atria, right and left ventricles and their internal features
- Blood supply and nerve supply of the heart
- Blood vessels in the thorax:
  - Arteries - pulmonary trunk, ascending aorta, arch of aorta and descending thoracic aorta (extent course and branches)
  - Veins - brachiocephalic veins, superior vena cava, azygos system of veins (Formation, course and termination)
- Thoracic duct: formation, course and termination
- Major arteries and veins of head and neck (name and positions)
- Major arteries and veins of abdomen and pelvis

### **Gastrointestinal system (6 Hrs)**

- Tongue - gross anatomy, blood supply and nerve supply
- Salivary glands
- Pharynx - extent, parts- nasopharynx, oropharynx and laryngopharynx internal features
- Oesophagus - extent, parts, constrictions, blood supply, nerve supply and lymphatic drainage
- Stomach - position, relations, blood supply, nerve supply and lymphatic drainage
- Small intestine - parts- duodenum, jejunum and ileum- blood supply and nerve supply
- Large intestine - parts, position of each of the parts, extent, blood supply and nerve supply
- Rectum and anal canal-position, blood supply, nerve supply and lymphatic drainage
- Differences between jejunum and ileum

- Differences between small intestine and large intestine
- Liver- position, anatomical and physiological lobes, surfaces, relations, porta hepatis, blood supply and nerve supply
- Extrahepatic biliary apparatus - gall bladder and bile duct
- Pancreas - position, parts, important relations, blood supply and nerve supply

### **Urinary system (2 Hrs)**

- Kidneys: position, external features, capsules, relations, macroscopic structure, blood supply and nerve supply
- Ureter- length, constrictions and blood supply
- Urinary bladder- position, external features, blood supply and nerve supply
- Urethra- female urethra, male urethra- parts

### **Male reproductive system (2 Hrs)**

- Testes- position, coverings, gross structure, blood supply, nerve supply and lymphatic drainage
- Spermatic cord- constituents and coverings
- Vas deferens- commencement, course and termination
- Prostate - position, external features, lobes and structure
- Seminal vesicles and ejaculatory ducts

### **Female reproductive system (2 Hrs)**

- Uterus- position, parts, external features, relations, blood supply and lymphatic drainage
- Uterine tube- parts, blood supply and nerve supply
- Ovary - position and structure

### **Endocrine glands (2 Hrs)**

- Pituitary gland (Hypophysis cerebri)- position, parts, blood supply
- Thyroid gland- position, parts, blood supply and lymphatic drainage
- Parathyroid glands- position and blood supply
- suprarenal glands- position, relations, parts, blood supply and lymphatic drainage

## **Nervous system (12 Hrs)**

### **Central nervous system:**

- Spinal cord- position, external features, internal structure, brief note on important ascending and descending tracts
- Brain – parts of the hind brain
- External features of medulla oblongata, pons (Internal structure- briefly)
- Cerebellum- functional lobes of the cerebellum and its functions
- Attachments of cranial nerves to the brain stem
- Mid brain- external features and internal structure – in brief
- Diencephalon- Thalamus and hypothalamus-position and functions
- Corpus striatum – parts and functions
- Cerebral hemispheres – lobes, important sulci and functional areas
- Fiber system of the brain – corpus callosum and internal capsule
- Blood supply of the brain
- Ventricles: lateral, third and fourth ventricles, position and communications
- CSF production and circulation

### **Special senses (3 Hrs)**

- Gross anatomy of the eye
- Gross anatomy of external, middle and internal ear Skin

### **Recommended books:**

- Quick Review of Human Anatomy, 2nd Edition, Dr. Vidya C S, Dr. Asha Rani S K, Dr. Ravi Shankar M .V.
- Basics in Human Anatomy For B.Sc. Para medical courses 2nd Edition, Dr. Priya Ranganath, Dr. Leelavati
- Manipal Manual of Anatomy for Allied health science courses 3rd Edition, Dr. Sampath Madhyastha

## **SUBJECT – PHYSIOLOGY**

**Sub Code – DSC2**

**Credit distribution:**

**Theory : 3 Credits (Teaching hours – 45)**

**Tutorial:1 Credit (Teaching hours – 15)**

**Total Teaching Hours: 60 Hrs**

**Course contents:**

**General physiology (3 Hrs)**

- Transport across cell membrane: Passive transport- diffusion, facilitated diffusion, osmosis;
- Active transport-primary and secondary active transport
- Body fluids: Distribution of total body water, ionic composition of body fluids
- Homeostasis & Feedback Mechanisms

**Nerve and Muscle physiology (4 Hrs)**

- Neuron: Differences in structure and function of myelinated and unmyelinated nerve fibres, properties of nerve fibre.
- Resting membrane potential and Action potential
- Muscle: Classification, characteristic features of skeletal, cardiac and smooth muscles
- Skeletal muscle: Structure, types of muscle fibers, neuromuscular transmission, excitation contraction coupling, rigor mortis, muscle fatigue.

**Blood (10 Hrs)**

- Composition and functions of blood
- Plasma proteins and their functions
- Red Blood Cells: Erythropoiesis- Stages and regulation
- Anaemia: Classification
- Hemoglobin: Normal values, variations and functions
- Blood Indices, MCV, MCH, MCHC
- ESR, PCV

- White Blood Cells: Types, normal values and functions
- Functions of lymph, Immune System, Cellular, humoral autoimmune
- Platelets: Normal range, functions, purpura
- Coagulation or clotting of blood: Clotting factors, Intrinsic and extrinsic mechanisms, hemophilia
- Anticoagulants: Classification and examples
- Blood groups: ABO and Rh systems, importance of blood grouping, hazards of blood transfusion, erythroblastosis fetalis

### **Cardiovascular system (6 Hrs)**

- Structure and Innervation of heart and blood vessels
- Cardiac muscle: Properties, transmission of cardiac impulse
- Cardiac cycle
- Heart sounds: Differences between first and second heart sounds
- Electrocardiogram (ECG): waves, intervals and uses
- Heart rate: Normal value, variations, regulation
- Cardiac output: Definition, normal value, variations and regulation, role of heart rate, stroke volume and myocardial contractility, muscular exercise and cardiac output
- Blood pressure: Definition, normal value, factors influencing BP, short-term regulation, long term regulation
- Special circulation-Coronary, Cerebral

### **Respiratory system (5 Hrs)**

- Organization: air passages, lungs, respiratory membrane
- Mechanism of breathing: Inspiration, expiration, pulmonary ventilation, alveolar ventilation
- Graphical representation of pressure changes during respiration
- Lung volume and capacities
- Oxygen transport: Forms, oxygen dissociation curve
- Carbon dioxide transport: Forms of transport, mechanism
- Regulation of respiration: neural and chemical regulation
- Cyanosis, hypoxia-types, types of hypoxia in which cyanosis occurs
- Definitions of apnea, dyspnea, asphyxia

### **Gastrointestinal physiology (5 Hrs)**

- Salivary secretion: Composition, functions and regulation
- Deglutition: Definition, stages
- Stomach: Functions, gastric juice- Composition, mechanism and regulation of secretion, gastric motility and emptying
- Pancreatic secretion: daily secretion and pH, regulation
- Functions of liver
- Composition and functions of bile
- Functions of gall bladder
- Digestion and absorption of carbohydrates, proteins and fats
- Small intestine: types of movements
- Large intestine: Functions
- Physiology of Defecation

### **Endocrinology (6 Hrs)**

- Definition, Classification of Endocrine glands & their Hormones. Properties of Hormones.
- Thyroid gland hormone - Physiological function, regulation of secretion. Disorders – hypo and hyper secretion of hormone
- Adrenal cortex- Physiologic anatomy of Adrenal cortex, cortical hormones – functions and regulation
- Adrenal medulla – Hormones, regulation and secretion.
- Pituitary hormones – Anterior and posterior pituitary hormones, secretion, function , regulation and applied aspect.
- Pancreas – Hormones of pancreas. Insulin – secretion, regulation, function and action.
- Diabetes mellitus – Regulation of blood glucose level.
- Parathyroid gland – function, action, regulation of secretion of parathyroid hormone.

### **Reproductive system (3 Hrs)**

- Male reproductive system: Parts, testis-structure and functions, spermatogenesis, endocrine functions of testis-actions of testosterone, regulation of secretion of testosterone
- Female reproductive system: Parts, menstrual cycle- ovarian and uterine cycles, hormonal control

- Indicators of ovulation
- Physiology of pregnancy and lactation: functions of placenta and milk ejection reflex Contraception

### **Renal physiology (5 Hrs)**

- Functions of kidneys, structure of nephron, Juxtaglomerular apparatus, renal blood flow
- Glomerular Filtration: Glomerular Filtration Rate (GFR)-Factors affecting, determination of GFR
- Renal threshold, Tubular/Transport maximum: Definition
- Reabsorption and secretion in renal tubules
- Concentration of urine: counter-current multiplier and counter-current exchanger
- Micturition reflex, Innervation of bladder, cystometrogram
- Diuretics, artificial kidney, renal function test

### **Central Nervous system (8 Hrs)**

- Organization of nervous system - Autonomic nervous system, Cerebral Cortex function
- Sensory receptors: Classification and properties
- Synapse: Mechanism of synaptic transmission
- Reflex: Definition, components of basic reflex arc, stretch reflex,
- Thalamus, Basal ganglia, cerebellum, Hypothalamus Functions
- Ascending and descending tracts
- Cerebro spinal fluid – compositions and functions

### **Special senses (4 Hrs)**

- Vision: Physiological and anatomical eye
- Functions of aqueous humor
- Visual pathway, light reflex, visual field defects
- Accommodation to near vision, refractory errors of the eye
- Hearing: Structure and functions of external, middle and inner ear
- Mechanism of hearing
- Physiology of taste and smell



### **Integrated physiology (1hrs)**

- Skin: Structure and function, regulation of body temperature

Demonstration practical only

- Erythrocyte sedimentation rate (ESR)
- Calculation of Blood indices
- Pulse and Blood Pressure recording
- Auscultation of Heart sounds
- Basic life support
- Artificial Respiration

### **Recommended books:**

- A.K Jain for B.Sc MLT for Physiology Avinchal Publishing company
- Basic and applied anatomy and physiology by Ashalata N, Wolters Kluwer publishers

## **SUBJECT – RESPIRATORY CARE EQUIPMENT AND MEDICAL TERMINOLOGY**

**Sub Code – DSCR3**

**Credit distribution:**

**Theory : 4 Credits (Teaching hours – 60)**

**Practical: 1 Credit (Teaching hours – 30)**

**Tutorial:1 Credit (Teaching hours – 15)**

**Total Teaching Hours: 105 Hrs**

**Course contents:**

### **Section A: Respiratory care equipment (60 hours)**

**Description:**

This course is an introduction to the respiratory therapy student on the physics, procedures and equipment 's involved in respiratory care.

**Objectives:**

The students will learn the fundamentals behind the devices that are used in respiratory care and how does it contribute to the selection of the equipment or a particular procedure. The topics covered in this course include basic physics, infection control, storage, transport and administration of medical gases, selection of artificial airways, assessment of cardiovascular system, sleep diagnostics and the introduction to mechanical ventilators. Presentation of these topics in this course includes lecture and tutorials.

**Specific Objectives:**

- Explain the physics involved in respiratory care
- Describes the infection control practices
- Describes the storage of medical gases, transportation of gases
- Explains how to administer oxygen, humidity and aerosol therapy

- Identifies the types of artificial airways and devices used in airways management
- Discusses the diagnostic tools used for assessing pulmonary, cardiovascular and sleep disorder
- Explains the basis of positive pressure ventilation and defining a mechanical breath

#### **Unit I – Basic Sciences and Medical Gases (12 Hrs)**

- Basic Principles on Infection Prevention and Control
- Introduction To Medical Gases
- Administration Of Medical Gases

#### **Unit II- Airway Management and Patient Monitoring (20 Hrs)**

- Airway Management and Emergency Resuscitation Equipment
- Hyperbaric Oxygen Therapy
- Humidity, Aerosol Therapy and Associated Delivery Devices
- Hyperinflation Therapy and Its Devices
- Patient Monitors

#### **Unit III – Functional assessment (16 Hrs)**

- Pulmonary Function Assessment
- Cardiology Functional Assessment
- Blood Gas Analysis
- Sleep Apnea Devices

#### **Unit IV – Mechanical ventilation (16 Hrs)**

- Introduction
- Mechanical Ventilators – Understanding Ventilator Technology
- Intensive Care Ventilators
- Transport And Home Care Ventilatory Devices

#### **Recommended book(s):**

- Jones & Bartlett Learning- Equipment for respiratory care 2nd edition by Teresa A Volsko

## **Section B: Medical Terminology (45 Hrs)**

Uses foundational anatomical and medical terms and abbreviations in written and oral communication with colleagues and other health care professionals.

It is critical that you have a strong working knowledge of medical terminology. The language of medicine is primarily derived from Greek and Latin. Medical terminology is used in international language, and it is also necessary for communicating with other medical personnel. The wider your vocabulary base, the more competent you seem to the rest of the medical community and the better the patient care you will be able to provide. Understanding terminology involves breaking words down into their separate components of prefix, suffix, and root word and having a good working knowledge of those parts.

### **CONTENTS**

- Basic Elements of a Medical Word
- Suffixes
- Prefixes
- Body Structure
- Integumentary System
- Digestive System
- Respiratory System
- Cardiovascular System
- Blood, Lymph and Immune Systems
- Musculoskeletal System
- Urinary System
- Female Reproductive System
- Male Reproductive System
- Endocrine System
- Nervous System
- Special Senses

### **Recommended book(s):**

- Barbara. A Medical Terminology; A system Approach 7th edition ISBN-13: 978-0803629547, ISBN-10: 0803629540

## **SUBJECT – ENGLISH AND COMMUNICATION SKILLS**

**Sub Code – AEC1**

**Credit distribution:**

**Theory : 2 Credits (Teaching hours – 30)**

**Total Teaching Hours: 30 Hrs**

**Objectives:**

**At the end of this course learner should be able to -**

1. Speak and write proper English
2. Read, understand and comprehend English
3. Good in Letter writing, Note making, Essay writing, Report writing, etc.
4. Communicate in the right way

**Course contents:**

### **ENGLISH**

1. Functional English – Grammar – Parts of speech
2. Components of a sentence – Verb - Transformation of sentences – Voice - Reported speech - Positive/ negative -Statement/ Interrogative - Subject verb agreement - Common errors – Exercises
3. Paragraph writing – Structure and essential elements
4. Writing skills: Teaching the different methods of writing like Note making, Summarizing, Report writing, Letter writing, E-mails, Medical transcription - case study, collecting the patient data and report writing.
5. Reading: What is efficient and fast reading? - Awareness of existing reading habits - Tested techniques for improving speed - Improving concentration and comprehension through systematic study
6. Comprehension: Expansion of an idea - Exercises on reading passages and answering questions based on the passage, Review of selected materials and express oneself in one's words, Seminar for students on power point presentation and book review.

## **COMMUNICATION SKILLS**

1. Basic concepts & principles of good communication
2. Special characteristics of health communication
3. Types & process of communication
4. Barriers of communication & how to overcome
5. Communication Skills. With focus on speaking - Conversations, discussions, dialogues, short presentations, pronunciation
6. Speaking: Importance of speaking efficiently, Voice culture, Preparation of speech, secrets of good delivery, Presentation skills - Conference/Interview technique, body language, Audience psychology handling, Basics of nonverbal communication
7. Listening: Importance of listening - Self-awareness about listening - Action plan execution - Barriers in listening - Good and persuasive listening

## **SUBJECT – ENVIRONMENTAL SCIENCE (EVS) AND INDIAN CONSTITUTION**

**Sub Code – VAC1**

**Credit distribution:**

**Theory : 2 Credits (Teaching hours – 30)**

**Total Teaching Hours: 30 Hrs**

**Section A: ENVIRONMENTAL SCIENCE (EVS) (20 hours)**

**Objectives:**

1. To know various Environmental factors Health
2. To learn the modes of disease transmission and various control measures

**Course Contents:**

1. **Introduction to Environment and Health** - Health hazards and control of environmental pollution
2. **Water** - The concept of safe and wholesome water, requirements of sanitary sources of water, water Pollution – causes and effects on health
3. Understanding the methods of purification of water on small scale and large scale, household purification, Various biological standards, including WHO guidelines for third world countries, methods for assessing quality of water.
4. **Air** - Composition, Indices of Thermal Comfort, Air pollutants, Air Pollution – Health effects, Environmental Effects, Green-house effect, Social & Economic Effects, Monitoring, Prevention & Control.
5. **Light, Noise, Radiation** - Natural and Artificial light; Properties, sources, noise pollution and its control, types, sources, biological effects and protection, Radiation hazards
6. **Waste Disposal** - Disposal of Wastes - Solid Wastes, Health hazards, Methods of Disposal; Dumping, Controlled tipping/sanitary landfill, Incineration, Composting.
7. **Excreta Disposal** - Public health importance, Health hazards, sanitation barrier, Methods of excreta disposal, unsewered areas and sewerage areas, sewage, Modern Sewage Treatment.
8. Awareness of standards of housing and the effect of poor housing on health- Social goals of housing, Criteria for Healthful Housing by Expert Committee of the WHO, Housing standards- Environmental Hygiene

- Committee, Rural Housing Standards, Overcrowding, Indicators of Housing.
9. Role of arthropods in the causation of diseases, mode of transmission of arthropods borne diseases, methods of control

**Recommended Books:**

- Text Book of Environmental Studies for under graduate courses By Erach Bharucha Reprinted in 2006, Orient Longman Private Limited /Universities Press India Pvt. Ltd.
- Park K. Park's Textbook of Preventive and Social Medicine.

**Section B: INDIAN CONSTITUTION (10 hours)**

1. Meaning of the term 'Constitution' - Making of the Indian Constitution 1946-1950
2. The democratic institutions created by the constitution Bicameral system of Legislature at the Centre and in the States.
3. Fundamental Rights and Duties, their content and significance
4. Directive Principles of States Policies the need to balance Fundamental Rights with Directive Principles.
5. Special Rights created in the Constitution for: Dalits, Backwards, Women and Children and the Religious and Linguistic Minorities.
6. Doctrine of Separation of Powers legislative, Executive and Judicial and their functioning in India
7. The Election Commission and State Public Service commissions
8. Method of amending the Constitution
9. Enforcing rights through writs.
10. Right to information act, Consumer protection act
11. Constitution and sustainable development in India

**Recommended books:**

- J.C. Johari: The Constitution of India- A Politico-Legal Study-Sterling Publication, Pvt. Ltd. New Delhi.
- J.N. Pandey: Constitution Law of India, Allahbad, Central Law Agency, 1998.
- Granville Austin: The Indian Constitution – Corner Stone of a Nation-Oxford, New Delhi, 2000.



**COURSE CONTENTS**  
**SEMESTER II**  
**SUBJECT – BIOCHEMISTRY**

**Sub Code – DSC4**

**Credit distribution:**

**Theory: 3 Credits (Teaching hours – 45)**

**Tutorial: 1 Credit (Teaching hours – 15)**

**Total Teaching Hours: 60 Hrs**

**Course contents:**

**UNIT I – Cell, Chemistry of carbohydrates, Lipids, Proteins and Nucleic acids (12 hours)**

1. **Cell** – Cell organelles, Membrane structure and composition, transport across cell membrane
2. **Carbohydrate Chemistry:** Definition, classification with examples, Composition, sources, functions of Monosaccharides, Disaccharides, Polysaccharides and Glycosaminoglycans.
3. **Lipid Chemistry:** Definition, classification of lipids and fatty acids, Essential fatty acids- Definition, example, functions, deficiency features & Significance. Functions of Cholesterol, products obtained from cholesterol, Phospholipids with examples.
4. **Amino acid and protein Chemistry:** Amino acids - Classification based on nutritional requirement, Biologically important peptides. Protein chemistry: Classification based on chemical nature and solubility, Functions of proteins, structural organization of proteins, Structure and functions of Collagen, Elastin, Albumin, Hemoglobin, Plasma proteins and Immunoglobulins – types and functions.
5. **Nucleic Acid Chemistry:** Nucleosides and Nucleotides with examples. Nucleic acid: DNA and RNA - structure, types and functions

**UNIT II – Vitamins, Minerals and Nutrition (12 hours)**

6. **Vitamins:** Sources, Coenzyme forms, functions, RDA, digestion,

absorption and transport, deficiency and toxicity of A, D, C in detail, Sources, function and deficiency features of E, K, B-complex vitamins (B1, B2, B3, B6, B12, Folic acid)

7. **Minerals:** Sources, RDA, Digestion, absorption, transport, excretion, functions, disorders of Individual minerals - Calcium, Phosphorous, Iron in detail with clinical significance; Functions and deficiency features of Copper, Zinc, iodine, magnesium, selenium.
8. **Nutrition:** Calorific values of foodstuffs, Respiratory quotient, Basal metabolic rate: Definition, Normal values, Factors affecting BMR, Specific dynamic action of food, Balanced Diet, Nutritional importance and Recommended intake of different carbohydrates, proteins and lipids in diet, Dietary fibres, Nutritional disorders – protein Energy Malnutrition – Kwashiorkar, marasmus, Obesity – BMI, Metabolic alterations.

### **UNIT III – Enzymes, Metabolism of Carbohydrates, Lipids and Proteins with clinical significance (14 hours)**

9. **Enzymes:** Definition, Classification with examples. Factors effecting enzyme activity, Active site, Coenzymes, and Isoenzymes with examples and clinical significance of isoenzymes of CK, LDH; Diagnostic enzymology - clinical significance of enzymes and isoenzymes - CK, CK-MB, LDH, AST, ALT, ALP, amylase, lipase.
10. **Carbohydrate Metabolism:** Digestion and absorption, glucose utilization by our body for energy (significance of glycolysis and TCA cycle), significance of glycogen metabolism, Regulation of blood glucose level in well fed state and starvation, Diabetes mellitus: Definition, types, signs and symptoms, lab diagnosis, causes and features of Hyperglycemia, hypoglycemia and Diabetic ketoacidosis.
11. **Lipid Metabolism:** Digestion and absorption, utilization of fatty acids (Triacylglycerol) by our body for energy (beta oxidation), Lipoproteins and ketone bodies with their functions and significance, Atherosclerosis, fatty liver.
12. **Protein Metabolism:** Digestion and absorption, Catabolism of amino acids - Transamination, deamination, Urea cycle. Specialized products formed from amino acids - glycine, methionine, phenylalanine, tyrosine,

tryptophan and their functions, transmethylation reactions.

### 13. **Electron transport chain and its inhibitors**

## **UNIT IV – Biophysical chemistry, Acid base and water and electrolyte balance (10 hours)**

14. **Water, Sodium and Potassium** - Water as a universal solvent, distribution of water, sodium and potassium in our body and functions, Maintenance of water and electrolyte balance, ECF volume - renin angiotensin, aldosterone mechanism, measurement of osmolality and its significance, causes and features of water excess and depletion, causes and features of hyponatremia, hypernatremia, hypokalemia, hyperkalemia.

15. **Solutions:** Definition, use, classification, preparation and storage of solutions/reagents.

Molar and Normal solution preparation, Preparation of percent solutions: w/w, v/v w/v (solids, liquids and acids). Conversion of a percent solution into a molar solution, Saturated and supersaturated solutions, Standard solutions - Technique for preparation and Storage.

Dilutions- Diluting Normal, Molar and percent solutions.

Part dilutions: Specimen dilutions, Serial dilutions, Reagent dilution, Dilution factors. Stock and working solutions. Preparing working standard from stock standard

16. **Biophysical chemistry:** Valency, Molecular weight and Equivalent weight of elements and compounds. Definition of Normality, Molarity, Molality with formula.

17. **Acid base balance:**

- Definitions of acid, base, pH and pKa, Henderson Hasselbalch equation
- Buffers - Buffer systems in the ECF/ ICF and urine. Role of buffers in maintaining acid base balance - Bicarbonate and phosphate buffer systems (pKa value, normal ratio of base/acid in the plasma)
- Role of respiratory system and kidneys in maintenance of acid base balance

- Acidosis & Alkalosis: Types, causes and biochemical findings

#### **UNIT IV – Clinical Biochemistry: (12 hours)**

18. Specimen collection: Collection of blood, CSF, urine & other fluids, Use of preservatives, Anticoagulants, Method of transport, packing and storing of specimens
19. Organ function tests –
  - Renal Function Tests – Clinical significance of Serum Urea, Uric acid, Creatinine, Clearance tests, plasma and urine osmolality;
  - Liver Function Tests - Clinical significance of Serum Bilirubin (total, direct, Indirect), Total protein, albumin, Enzymes (AST, ALT, ALP, GGT);
  - Thyroid function tests - Clinical significance of TSH, T3, T4, fT3, fT4.
20. Clinical significance of blood glucose, glycated hemoglobin
21. Detection of glycosuria, proteinuria, hematuria and their clinical significance
22. Lipid Profile - Clinical significance of Total Cholesterol, Triglycerides, LDL, HDL.
23. Arterial blood gas analysis, Blood gas analyser (Principle & Applications).
24. Electrolyte analysis, electrolyte analyser (Principle & Applications).
25. Point of care testing
26. Quality control in diagnostic biochemistry lab: Concept of IQC, EQC, pre analytical, analytical and post analytical errors.
27. Biomedical waste disposal

#### **Recommended books:**

- Essentials of Biochemistry by U. Satyanarayana
- Textbook of Biochemistry for Dental students by D.M. Vasudevan
- Textbook of Biochemistry by M.D Rafi
- Textbook of Biochemistry for Dental students by S.K Gupta
- Manipal manual of Clinical Biochemistry by Shivananda Nayak
- Clinical Biochemistry by William J Marshall

## **SUBJECT –ANATOMY II FOR RESPIRATORY CARE**

**Sub Code – DSCR5**

**Credit distribution:**

**Theory: 2 Credits (Teaching hours – 30)**

**Practical:1 Credit (Teaching hours – 30)**

**Total Teaching Hours: 60 Hrs**

**Description:**

This course is an introduction to the respiratory therapy student about the Anatomy and Physiology required for Respiratory care practice.

**Objectives:**

The students will learn the fundamentals of Anatomy and Physiology that will aid for the respiratory care practice. The topics covered in this course include Anatomy and physiology of Respiratory system, cardiovascular system and as well as the effect of environment, age and exercise on these systems. Presentation of these topics in this course includes lecture and assignments.

**Specific Objectives:**

- Explain the anatomy of thoracic wall
- Explain the anatomy of thoracic cavity
- Describe basic anatomy of brain
- Explain radiographic anatomy of thoracic wall, thoracic cavity and head and neck
- Explain Surface anatomy of cardio respiratory and head and neck.

**Course contents:**

- Basic anatomy of the thoracic wall
- Radiographic anatomy of the thoracic wall
- Surface anatomy of the thoracic wall
- Cervical rib, thoracic outlet syndrome, intercostal nerve block, rib fractures

and fail chest, needle thoracotomy, diaphragmatic palsy

- Basic anatomy of chest wall, mediastinum
- Basic anatomy of lung, pleurae, bronchi
- Basic anatomy of heart, pericardium, blood supply
- Radiographic anatomy of thoracic cavity
- Embryological notes of lung and pleura
- Embryological notes of development of heart
- Basic anatomy of head and neck
- Respiratory system in head and neck
- Radiographic anatomy of head and neck
- Surface anatomy of Head and neck
- Clinical cases in anatomy- pericardial effusion, myocardial infarction, pleural effusion, thyroid, pituitary, adrenals, nasogastric tube.

**Recommended book(s):**

- Snells Clinical anatomy by regions edition 2018

## **SUBJECT –PHYSIOLOGY II FOR RESPIRATORY CARE**

**Sub Code – DSCR6**

**Credit distribution:**

**Theory: 2 Credits (Teaching hours – 30)**

**Practical:1 Credit (Teaching hours – 30)**

**Total Teaching Hours: 60 Hrs**

**Course contents:**

- Structure and function – How the architecture of the lung subserves its function
- Ventilation - how gas gets to the alveoli
- Diffusion
- Blood flow and metabolism
- Ventilation perfusion relationships
- Gas transport by the blood
- Mechanics of breathing
- Control of ventilation
- Pulmonary function test
- Cardiac cycle
- Sleep physiology and its relationships to cardio pulmonary system
- Cardio pulmonary resuscitation
- Spirometry
- Haemodynamic measurements
- Electrocardiography and its interpretation

**Recommended books:**

- Respiratory physiology The Essentials, John B West 9th edition
- Cardio pulmonary Anatomy and Physiology
- Essentials of respiratory care by Terry Des Jardins 6th edition

## **SUBJECT –CLINICAL EXAMINATION IN RESPIRATORY CARE**

**Sub Code – DSCR7**

**Credit distribution:**

**Theory: 2 Credits (Teaching hours – 30)**

**Tutorial:1 Credit (Teaching hours – 15)**

**Total Teaching Hours: 45 Hrs**

**Description:**

This course is an introduction to the respiratory therapy student on the skills necessary for a respiratory therapist to evaluate an individual referred for respiratory care.

**Objectives:**

The students will learn the fundamentals behind the devices that are used in respiratory care and how does it contribute to the selection of the equipment or a particular procedure. The topics covered in this course include basic physics, infection control, storage, transport and administration of medical gases, selection of artificial airways, assessment of cardiovascular system, sleep diagnostics and the introduction to mechanical ventilators. Presentations of these topics in this course include lecture and tutorials.

**Specific Objectives:**

- Explain the physics involved in respiratory care
- Describes the infection control practices
- Describes the storage of medical gases, transportation of gases
- Explains how to administer oxygen, humidity and aerosol therapy
- Identifies the types of artificial airways and devices used in airways management
- Discusses the diagnostic tools used for assessing pulmonary, cardiovascular and sleep disorder
- Explains the basis of positive pressure ventilation and defining a mechanical breath



**Course contents:**

- Preparing for the patient encounter
- Medical History and the interview
- Cardiopulmonary symptoms
- Vital signs
- Fundamentals of physical examination
- Neurological assessment
- Clinical laboratory studies
- Interpretation of blood gases
- Pulmonary function testing
- Chest imaging
- Interpretation of electrocardiogram tracings
- Neonatal and pediatric assessments
- Older patient assessments
- Respiratory Monitoring in critical care
- Vascular pressure monitoring
- Cardiac output measurement
- Bronchoscopy
- Nutritional Assessment
- Sleep and Breathing Assessment
- Home Care Patient Assessment
- Documentation

**Recommended Books:**

- Clinical assessment in respiratory care Wilkins 9th edition

## **SUBJECT – HEALTH CARE SYSTEM AND NURSING CARE**

**Sub Code – AEC2**

**Credit distribution:**

**Theory: 2 Credits (Teaching hours – 30)**

**Total Teaching Hours:30Hrs**

**Objectives:**

1. To define Health and understand various concepts of Health
2. To know the Health care delivery system in India
3. To know various National Health Programmes of India
4. To know basic nursing care of patients and First Aid Principles and guidelines

**Course contents:**

### **1. Introduction to Health:**

Definition of Health, Determinants of Health, Health care delivery system in India, Health Indicators, Health Team Concept, National Health Policy, National Health Programmes (Briefly Objectives and scope), Population of India and Family welfare programme in India

### **2. Introduction to Nursing care of patients:**

- Nursing principles, Inter-Personnel relationships.
- Simple aseptic technique, sterilization and disinfection.
- Bandaging: Basic turns, Bandaging extremities; Triangular Bandages and their application.
- Bed making, Nursing Position, prone, lateral, dorsal, dorsal recumbent, Fowler's positions, comfort measures.
- Lifting and Transporting Patients: Lifting patients up in the bed. Transferring from bed to wheel chair. Transferring from bed to stretcher.
- Bed Side Management: Giving and taking Bed pan, Observation of stools, urine. understand use and care of catheters, enema giving.

- Methods of Giving Nourishment: Feeding, Tube feeding, drips, transfusion
- Recording of body temperature, respiration and pulse rate
- Surgical Dressing: Observation of dressing procedures.

### **3. First Aid:**

Syllabus as for Certificate Course of Red Cross Society of St. John's Ambulance Brigade.

#### **Reference Books:**

- Textbook of Preventive and Social Medicine by J.Park
- Counseling & Communicate skills for medical and health, Bayne- Orient Longman Pvt. Ltd.

## **SUBJECT – SOCIOLOGY**

**Sub Code – VAC2**

**Credit distribution:**

**Theory: 3 Credits (Teaching hours – 45)**

**Total Teaching Hours: 45Hrs**

**Objective:**

This course will introduce student to the basic sociology concepts, principles and social process, social institutions in relation to the individual, family and community and the various social factors affecting the family in rural and urban communities in India.

**Course contents:**

**1. Introduction:**

- Meaning – Definition and scope of sociology. Its relation to Anthropology, Psychology, Social Psychology
- Methods of Sociological investigations – Case study, social survey, questionnaire, interview and opinion poll methods.
- Importance of its study with special reference to health care professionals

**2. Social Factors in Health and Disease:**

- Meaning of social factors
- Role of social factors in health and illness

**3. Socialization:**

- Meaning and nature of socialization
- Primary, Secondary and Anticipatory socialization
- Agencies of socialization

**4. Social Groups:**

- Concepts of social groups influence of formal and informal groups on health and sickness. The role of peoples involved in the primary and secondary health care groups in the hospital and rehabilitation setup.

## **5. Family:**

- The family, meaning and definitions.
- Functions of types of family
- Changing family patterns
- Influence of family on the individuals health, family and nutrition, the effects of sickness in the family and psychosomatic disease and their importance to physiotherapy.

## **6. Community:**

- Rural community: Meaning and features – Health hazards to rural communities, health hazards to tribal community.
- Urban community: Meaning and features – Health hazards of urbanities

## **7. Culture and Health:**

- Concept of Health, Concept of culture
- Culture and Health, Culture and Health Disorders

## **8. Social Change:**

- Meaning of social changes.
- Factors of social changes.
- Human adaptation and social change
- Social change and stress.
- Social change and deviance.
- Social change and health programme
- The role of social planning in the improvement of health and rehabilitation.

## **9. Social Problems of disabled:** Consequences of the following social problems in relation to sickness and disability, remedies to prevent these problems.

- Population explosion
- Poverty and unemployment
- Beggary

- Juvenile delinquency
- Prostitution
- Alcoholism
- Problems of women in employment
- Geriatric problems
- Problems of underprivileged.

#### **10. Social Security:**

- Social Security and social legislation in relation to the disabled

#### **11. Social Work:**

- Meaning of Social Work
- The role of a Medical Social Worker

#### **Recommended Books:**

- Sachdeva & Vidya bhushan, Introduction to the study of sociology
- Indrani T.K., Text book of sociology for graduates' nurses and Physiotherapy students, JP Brothers, New Delhi 10 46



SDM College of Medical Sciences & Hospital



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Panoramic View of Campus