

**Regulations and curriculum for  
Master of Science in Anaesthesia and Operation Theatre Technology  
M. Sc. (A&OTT)  
(Semester Scheme)  
2018-2019**



(Deemed to be University under Section 3 of UGC Act, 1956)  
(Placed under Category 'A' by MHRD, Govt. of India, Accredited with 'A' Grade by NAAC)  
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## **VISION**

*To build a humane society through excellence in education and healthcare*

## **MISSION**

*To develop*

*Nitte (Deemed to be University)*

*As a centre of excellence imparting quality education, generating competent, skilled manpower to face the scientific and social challenges with a high degree of credibility, integrity, ethical standards and social concern*



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**No. F.9-13/2007-U.3 (A)**  
**Government of India**  
**Ministry of Human Resource Development**  
**(Department of Higher Education)**  
**U.3(A) Section**

Shastri Bhawan, New Delhi,  
Dated the 4<sup>th</sup> June, 2008

**NOTIFICATION**

1. Whereas the Central Government is empowered under Section 3 of the University Grants Commission (UGC) Act, 1956 to declare, on the advice of the UGC, an institution of higher learning as a deemed-to-be-university;
2. And whereas, a proposal was received in February, 2007 from Nitte Education Trust, Mangalore, Karnataka seeking grant of status of deemed-to-be-university in the name of Nitte University under Section 3 of the UGC Act, 1956;
3. And whereas, the University Grants Commission has examined the said proposal and vide its communication bearing No. F.26-10/2007(CPP-I/ DU) dated the 10th March, 2008 has recommended conferment of status of 'deemed-to-be-university' in the name and style of Nitte University, Mangalore, Karnataka, comprising A.B. Shetty Memorial Institute of Dental Sciences, Mangalore;
4. Now, therefore, in exercise of the powers conferred by section 3 of the UGC Act, 1956, the central Government, on the advice of the University Grants Commission (UGC), hereby declare that Nitte University, Mangalore, Karnataka, comprising A.B. Shetty Memorial Institute of Dental Sciences, Deralakatte, Mangalore, shall be deemed to be a University for the Purposes of the aforesaid Act.

Sd/  
**(Sunil Kumar)**  
**Joint Secretary to the Government of India**

(True Extract of the Notification)







**UNIVERSITY GRANTS COMMISSION .**  
**BAHADUR SHAH ZAFAR MARG**  
**NEW DELHI - 110002**

No. F.26-5/2008(CPP-1)

Dated: 24th March, 2009

**OFFICE MEMORANDUM**

1. Whereas the Government of India, Ministry of Human Resource Development, Department of Higher Education vide Notification No. F.9-13/2007-U.3(A) dated 4th June, 2008 declared Nitte University, Mangalore, Karnataka comprising A.B. Shetty Memorial Institute of Dental Sciences, Deralakatte, Mangalore as Deemed to be University under Section 3 of UGC Act, 1956.
2. And whereas now, the University Grants Commission, on the recommendation of an Expert Committee constituted by the Chairman, UGC has agreed for bringing (i) K.S. Hegde Medical Academy, Deralakatte, Mangalore, (ii) Nitte Usha Institute of Nursing Sciences, Deralakatte, Mangalore, (iii) Nitte Gulabi Shetty Memorial Institute of Pharmaceutical Sciences, Deralakatte, Mangalore, (iv) Nitte Institute of Physiotherapy, Deralakatte, Mangalore under the ambit of Nitte University, Deralakatte, Mangalore.

Sd/  
**(K.P. Singh)**  
**Joint Secretary**  
**University Grants Commission**

(True Extract of the Notification)



## **NOTIFICATION**

**Sub: Proposal to start three new PG programs M.Sc. in Medical Laboratory Technology, M.Sc. in Anaesthesia and Operation Theatre Technology and M.Sc. in Medical Imaging Technology.**

In exercise of the powers conferred under Rule No. R.9 of the MOA, the Academic Council in its 34<sup>th</sup> meeting held on 26-02-2018 under the agenda item no. AC/7-34/18 has been pleased to approve the start of three new programs namely M.Sc. in Medical Laboratory Technology, M.Sc. in Anaesthesia and Operation Theatre Technology and M.Sc. in Medical Imaging Technology with an intake of 10 (Ten) each from the Academic Year 2018-19 and to accept the Regulations and Curriculum for the same.

By Order,

**REGISTRAR**

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Mangaluru, Karnataka, India

**Regulations and Curriculum for  
Master of Science in Anaesthesia & Operation Theatre Technology  
M.Sc. (A & OTT)  
(Semester Scheme)  
2018-2019**

**Chapter I**

**Preamble:**

K. S. Hegde Medical Academy established in 1999 has been imparting graduate (MBBS), B.Sc. (MIT) and B.Sc. (A & OTT) and post graduate (MD/MS) education. From the academic year 2009-10, K. S. Hegde Medical Academy became a constituent college of Nitte (Deemed to be University). From the academic year 2009-10, the College has started the Bachelor of Science in Anaesthesia & Operation Theatre Technology, B.Sc. (A & OTT) program and from the academic year 2018-19, the college has started the master's program. Regulations for the program are formulated as under:

**1. Introduction:**

- 1.1 These regulations shall be called Nitte(Deemed to be University) Regulations for M.Sc. – Anaesthesia & Operation Theatre Technology program and govern the policies and procedures including selection, admission, imparting of instructions, conduct of examinations, evaluation and certification of candidate's performance and all amendments there to, leading to the award of M.Sc. – Anaesthesia & Operation Theatre Technology degree. The regulations shall come into effect from the academic year 2018-19.
- 1.2 This set of regulations shall be binding on all the candidates undergoing the said degree programs.
- 1.3 These regulations may be modified from time to time as mandated by the statutes of the University.
- 1.4 This set of regulations may evolve and get refined or updated or amended or modified or changed through appropriate approvals from the Academic Council or the Board of Management from time to time and shall be binding on all parties concerned including the candidates, faculty, staff, departments and institute authorities.
- 1.5 All disputes arising from this set of regulations shall be addressed to the Board of Management. The decision of the Board of Management is final and binding on all parties concerned. Further, any legal disputes arising out of this set of regulations shall be limited to jurisdiction of Courts of Mangaluru only.

**2. Definitions:**

Unless the context otherwise requires:

- *BoM* means Board of Management of Nitte (Deemed to be University).
- *BoS* means Board of Studies (UG and PG) in Allied Health Sciences under faculty of medicine.
- *Course Co-ordinator/ Head of the Department / Director* means a full-time faculty appointed/nominated by the University for managing the Department/Institute and authorized to and responsible for the implementation of the rules and procedures pertaining to the Department/ Institute.
- *Department/Institute* means an academic and administrative unit under the ambit of the Nitte (Deemed to be University).
- *He/him/his/himself* includes all genders as the case may be.
- *Regulations* means this set of academic regulations.
- *Teaching Hospital* means Justice K S Hegde Charitable Hospital or any other Hospital owned by or under the management of Nitte (Deemed to be University).
- *University* means Nitte (Deemed to be University).

**3. Duration of the program:**

The duration of M.Sc. (Anaesthesia & Operation Theatre Technology) shall be two academic years (4 semesters).

**4. Medium of instruction and examinations:**

The medium of instruction and examination shall be in English.

**5. Maximum period for completion of the program:**

The maximum period for completion of M.Sc. (Anaesthesia & Operation Theatre Technology) program is four years. If a candidate does not complete the program in four years he has to reregister.

**6. Eligibility for admissions:**

A candidate seeking admission to M.Sc. Anaesthesia & Operation Theatre Technology program must have passed bachelor's degree minimum of 3year & 6 months duration in Anaesthesia & Operation Theatre Technology, recognized as equivalent by Nitte (Deemed to be University), with not less than 50% marks in aggregate.

For candidates belonging to SC/ST, the minimum percentage of marks shall be 45% in degree or its equivalent examination.

Foreign Nationals and candidates who have qualified from a Foreign University/Board should obtain prior permission from Nitte (Deemed to be University) for equivalence of the qualification.

**7. Selection of eligible candidates:**

Selection to the M.Sc. (Anaesthesia & Operation Theatre Technology), program shall be on the performance in written exams / interview conducted by Nitte (Deemed to be University).

**8. Withdrawal -temporary and permanent:****8.1 Temporary:**

8.1.1 A candidate who has been admitted to the program may be permitted to withdraw temporarily for a period of six months or more up to one year on the grounds of prolonged illness, grave calamity in the family etc. provided:

- a. He applies stating the reason of withdrawal with supporting documents and endorsement by parent/guardian.
- b. The University is satisfied that without counting the period of withdrawal candidate is likely to complete his requirement of the degree within maximum time specified.
- c. There are no outstanding dues or demands with the department, library, hostel and Institute / University.

8.1.2 The tuition fee for the subsequent year may be collected in advance based on the severity of the case before giving approval for any such temporary withdrawal.

8.1.3 Scholarship holders are bound by the appropriate rules applicable.

8.1.4 The decision of the Institute/University regarding withdrawal of a candidate is final and binding.

**8.2 Permanent withdrawal:**

8.2.1 A candidate who withdraws admission before closing date of admission for the academic session is eligible for the refund of the deposit only. The fees once paid will not be refunded on any account.

8.2.2 Once the admission for the year is closed and if a candidate wants to leave the Institute, he will be permitted to do so and take the Transfer Certificate from the Institute/University, if required only after remitting all the tuition fees for the remaining years.

8.2.3 Those candidates who have received any scholarship/stipend/other forms of assistance from the Institute/University shall repay all such amounts in addition to those mentioned in the clause above.

8.2.4 The decision of the Institute/University regarding withdrawal of a student is final and binding.

**9. Conduct and Discipline:**

9.1 Candidates shall conduct themselves within and outside premises of the Institute in a manner befitting a professional institution.

9.2 As per the order of Honorable Supreme Court of India, ragging in any form is considered as a criminal offence and is banned. Any form of ragging will be severely dealt with.

- 9.3 The following acts of omission and /or commission shall constitute gross violation of code of conduct and are liable to invoke disciplinary measures:
- 9.3.1 Ragging as defined and described by the Supreme Court/Government.
  - 9.3.2 Lack of courtesy and decorum, indecent behavior anywhere within or outside the campus.
  - 9.3.3 Willful damage or stealthy removal of any property/belongings of the Institute/hostel or of fellow students/citizens.
  - 9.3.4 Possession, consumption or distribution of alcoholic drinks or any kind of hallucinogenic drugs.
  - 9.3.5 Mutilation or unauthorized possession of library books.
  - 9.3.6 Noisy or unruly behavior, disturbing studies of fellow students.
  - 9.3.7 Hacking in computer systems (such as entering into other person's domain without prior permission, manipulation and/or damage to the computer hardware and software or any other cyber-crime etc.)
  - 9.3.8 Plagiarism of any nature.
  - 9.3.9 Any other act of gross indiscipline as decided by the Board of Management from time to time.
- 9.4 Commensurate with the gravity of offence, the punishment may be: reprimand, fine, expulsion from the hostel, debarment from an examination, disallowing the use of certain facilities of the institute, rustication for a specific period or even outright expulsion from the Institute, or even handing over the case to appropriate law enforcement authorities or the judiciary as required by the circumstances.
- 9.5 For any offence committed in hostel, department, class room, and elsewhere, the Chief Warden, the Head of the Department/Course Co-ordinator and the Asst. Director (Student Affairs)/ authorities of the University respectively, shall have the authority to reprimand or impose fine.
- 9.6 All cases involving punishment other than reprimand or fine shall be reported to the Vice-Chancellor.
- 9.7 Cases of adoption of unfair means and/or any malpractice in an examination shall be reported to the Controller of Examinations for taking the appropriate action.

#### **10. Graduation requirements:**

Candidate shall be declared eligible for the award of the degree if he has:

- Fulfilled degree requirement.
- No dues to the University, Institute, departments, hostels, library etc.
- No disciplinary action pending against him.

The award of degree must be recommended by the Board of Management.

#### **11. Convocation:**

Degrees will be awarded in person to all eligible students who have graduated during preceding academic year at the annual convocation. For eligible students who are unable to attend the convocation, degree certificates will be sent by post. Students are required to apply for the convocation along with prescribed fee within the specified date, after having satisfactorily completed all degree requirements.



**12. Subjects of study and training:**

Subject Code.	Subject	Teaching Hour Distribution				Total
		Theory		Practical		
		hours/week	Total	hours/ week	Total	
<b>SEMESTER I</b>						
18AHOT11	Review of Applied Sciences	4	64	---	---	64
18AHOT12	Anaesthetic Equipments & Procedures	3	48	12	192	240
18AHOT13	Pharmacology of Anaesthetics	3	48	12	192	240
<b>Grand Total</b>						<b>544</b>
<b>SEMESTER II</b>						
18AHOT21	Advanced Anaesthesia Techniques	3	48	13	208	256
18AHOT22	Applied Surgical Technology	3	48	12	192	240
18AHOT23	Health Care Education Technology	3	48	---	---	48
<b>Grand Total</b>						<b>544</b>
<b>SEMESTER III</b>						
18AHOT31	Sub Speciality Surgical Techniques	3	48	24	384	432
18AHOT32	Biostatistics & Research Methodology	4	64	---	---	64
18AHOT33	Health Care Management	3	48	---	---	48
<b>Grand Total</b>						<b>544</b>
<b>SEMESTER IV</b>						
18AHOT41	Disaster Management	3	48	9	144	192
18AHOT42	Sub Speciality Anaesthesia & Technique	3	48	8	128	176
18AHOT43	Anaesthesia & Critical Care	3	48	8	128	176
<b>Grand Total</b>						<b>544</b>

**13. Attendance and monitoring progress of studies:**

- 13.1. A candidate shall study in concerned department of the Institute for the entire period as a full time student. No candidate is permitted to work in any other laboratory/college/ hospital/pharmacy etc., while studying. No candidate should join any other course of study or appear for any other degree examination conducted by this University or any other University in India or abroad during the period of registration.
- 13.2. Each semester shall be taken as a unit for the purpose of calculating attendance.
- 13.3. A candidate who has put in a minimum of 80% of attendance in theory and practical separately and who has fulfilled other requirements of the course shall be permitted to appear for University examination.
- 13.4. A candidate having shortage of attendance shall repeat the semester when it is offered next.

**14. Examination:**

There shall be a University examination at the end of each semester. Evaluation is based on formative evaluation (Internal Assessment) and summative evaluation (University examination).

**14.1 Internal assessment (IA):**

The internal assessment for theory and practicals shall be 20 marks each.

Internal assessment for theory shall be calculated as average of two sessional examinations, seminars, assignments etc. The internal assessment for practicals shall be calculated on the basis of the records of the practicals maintained and examinations.

A Candidate must secure at least 40% of total marks fixed for internal assessment in a particular subject in order to be eligible to appear in the university examination of that subject. If candidate is having inadequate internal assessment marks shall appear for internal assessment in the next semester.

**14.2 University examination:**

A candidate who satisfies the requirements of attendance, progress and conduct shall be eligible to appear for the university examinations. There shall be a university examination at the end of each semester.

To be eligible to appear for University examination a candidate should fulfil all the following conditions:

- a. Undergone satisfactorily the approved course of study in the subject/subjects for the prescribed duration as certified by course Co-ordinator/HOD.
- b. 80% attendance separately in theory and practical/hospital postings, in each subject.
- c. Secure at least 40% of total marks fixed for internal assessment in a particular subject in theory and practicals separately.

- d. Submit dissertation in the prescribed format, as per the stipulated schedule in IV semester.
- e. Fulfilled any other requirement that may be prescribed by the university from time to time.

### 14.3 Scheme of examination

Subject Code.	Subject	Marks Distribution							Total
		Theory			Practical				
		Univ. Exam	IA	Total	Univ. Exam		IA	Total	
					Exercises	Viva Voce			
<b>SEMESTER I</b>									
18AHOT11	Review of Applied Sciences	80	20	100	---	---	---	---	100
18AHOT12	Anaesthetic Equipments & Procedures	80	20	100	60	20	20	100	200
18AHOT13	Pharmacology of Anaesthetics	80	20	100	60	20	20	100	200
<b>Grand Total</b>									<b>500</b>
<b>SEMESTER II</b>									
18AHOT21	Advanced Anaesthesia Techniques	80	20	100	60	20	20	100	200
18AHOT22	Applied Surgical Technology	80	20	100	60	20	20	100	200
18AHOT23	Health Care Education Technology	80	20	100	---	---	---	---	100
<b>Grand Total</b>									<b>500</b>
<b>SEMESTER III</b>									
18AHOT31	Sub Speciality Surgical Techniques	80	20	100	60	20	20	100	200
18AHOT32	Biostatistics & Research Methodology	80	20	100	---	---	---	---	100
18AHOT33	Health Care Management	80	20	100	---	---	---	---	100
<b>Grand Total</b>									<b>400</b>

<b>SEMESTER IV</b>									
18AHOT41	Disaster Management	80	20	100	---	---	---	---	100
18AHOT42	Sub Speciality Anaesthesia & Technique	80	20	100	60	20	20	100	200
18AHOT43	Anaesthesia & Critical Care	80	20	100	60	20	20	100	200
18AHOT44	Dissertation evaluation				100	---	---	---	100
<b>Grand Total</b>									<b>600</b>

### 15. Dissertation:

A candidate is required to carry out research study in a select area of his subject, under the supervision of a faculty guide. The results of such a study shall be submitted to the University in the form a dissertation as per the prescribed format and within the date stipulated by the University.

The dissertation work is aimed at training a postgraduate candidate in research methodology and techniques. It includes identification of the problem, formulation of a hypothesis, review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, and comparison of results and drawing conclusions.

#### 15.1 Guide:

A Guide shall be a post MD or M.Sc. (A & OTT) with at least two years of teaching experience. Each Guide can take up a maximum of 2 students per academic year. However, a Co-guide can be opted wherever required with prior permission of the Institute and University. The Co-guide shall also be a postgraduate teacher recognized by the University as a guide.

Candidate shall submit synopsis to the University through the Guide and Head of the Institute, on or before one month of second semester, or within the date notified by the University, whichever is earlier.

Once the synopsis is approved and registered by the University no change in the topic or Guide shall be made without the prior approval of the University.

In the event of registered Guide leaving the Institute or in the event of the death of the guide, a change of Guide shall be permitted by the University, on the specific recommendation of the Institute.

## **15.2 Schedule**

The following procedure and schedule shall be strictly followed:

### **15.2.1 Ethical clearance**

Ethical clearance should be obtained for a study involving any procedure on human subjects. The candidate should apply for the certificate to the Ethics Committee of the Institute/University, through the Guide and present the study before the Committee for clearance. A copy of the certificate should be attached along with the synopsis forwarded at the time of submission of synopsis. All such clearance should be sought within one month of commencement of II semester.

### **15.2.2 Submission of synopsis**

Synopsis should be vetted by guide, HOD and departmental curriculum development cell and approved by the institutional ethics committee before submission to the university. The synopsis should be submitted as per the format, on or before one month of second semester, or within the date notified by the University, whichever is earlier. Once the synopsis is approved and registered by the university no change in the topic or Guide shall be made without the prior approval of the University.

### **15.2.3 Final submission of the dissertation**

The dissertation complete in all respects and duly certified by the Guide/Co-guide, Course Co-ordinator/ HOD/ Director should be submitted it to the Controller of Examinations as per the date specified by the University, generally three months before commencement of University examination.

## **15.3 Preparation of dissertation**

The written text of dissertation shall be as per the format, shall not exceed 100 pages (cover to cover). It should be neatly typed with 1.5 line spacing on one side of the paper (A4 size: 8.27" x 11.69") and properly bound. Spiral binding should be avoided. E-submission of the dissertation is mandatory.

## **15.4 Scheme of evaluation**

Dissertation shall be evaluated at the time of university examination of 4<sup>th</sup> semester by the panel of examiners (internal & external) appointed by the university. He should obtain a score of 50% aggregate to be declared pass in IV semester examination.

**16. Criteria for Pass:**

A candidate is declared to have passed the examination in a subject if he secures minimum 40% of marks separately in theory and practical excluding internal assessment marks and overall 50% marks separately in theory and practical including internal assessment marks.

A candidate who fails in any subject shall have to appear only in that subject in subsequent examination.

**16.1 Carry over benefit:**

A candidate shall appear for all the subjects of that particular semester in the University examinations but failed in that semester can avail this benefit provided:

- a) A candidate who fails in I semester is allowed to move to II semester. The candidates with back log subjects shall take both I semester backlog subjects as well as II semester subjects. Candidate should clear I semester subjects to go to III semester.
- b) Candidates should clear I and II semester subjects to go to IV semester.
- c) The candidate is permitted to appear for the IV semester examination along with the backlog subjects of III semesters and should pass all the subjects, including the backlog subjects to be declared as having completed the course.

**16.2 Re-totaling:**

Re-totaling of marks is permitted only for theory papers. The University, on application within the stipulated time and remittance of a prescribed fee, shall permit a re-totaling of marks for the subject(s) applied. The marks obtained after re-totaling will be the final marks awarded.

**16.3 Declaration of Results and Classification:**

Class will be awarded only to those candidates who pass the entire examination in first attempt within the minimum stipulated time. Class shall be declared on the basis of aggregate of marks scored in individual semester.

75% and above – First class with Distinction

65% and above but less than 75%- First class

50% and above but less than 65% - second class

Candidates who pass the examinations in more than one attempt shall be declared as passed in (“Pass” class) irrespective of the percentage of marks secured.

- An attempt means the appearance of a candidate for one or more courses either in part or full in a particular examination.
- A candidate who fails in main examination and passes one or more subjects or all subjects in the supplementary examination is not eligible for award of class or distinction. Passing in supplementary examination by such candidates shall be considered as attempt.

- If a candidate submits application for appearing for the regular examination but does not appear for any of the courses/subjects in the regular University examination, he can appear for supplementary examination provided other conditions such as attendance requirement, internal assessment marks, etc. are fulfilled and his appearing in the supplementary examination shall be considered as the first attempt.
- Candidates who pass the subjects in the supplementary examinations are not eligible for the award of Gold Medal or Merit Certificate.

**16.4 Award of merit certificates\*:**

Merit certificate in each course will be awarded on the basis of aggregate marks exceeding 75% in Ito IV semester examinations. Further, only those candidates who have completed the course and fulfilled all the requirements in minimum number of years prescribed (i.e. two years) and also who have passed each semester in the first attempt are eligible for the award of merit certificate.

\*\*\*\*\*

**Programme Outcomes:**

*At the end of the program, graduates will be able to...*

- PO1:** Teach and train students of the future in the same specialty.
- PO2:** Plan, setting up, maintaining and managing the Operation Theatre.
- PO3:** Discuss the pathophysiology of common conditions requiring surgery, medical interventions and intensive care management.
- PO4:** Operate equipments and monitors inside the operation theatre and also in the endoscopy suite, MRI suite and casualty.
- PO5:** Ability to identify and address treat the associated risk factors according to evidence based guidelines and be a member of the treating team.
- PO6:** Understand the pharmacological effects, uses and adverse reactions of drugs, fluids and blood used in anaesthesia.
- PO7:** Understand appropriate measures to protect self and the patient during patient transfer.
- PO8:** Describe the application of technology to health care education and innovative strategies in teaching.
- PO9:** Know various surgical procedures and requirements for these procedures.
- PO10:** Apply statistical methods for research data, statistical analysis and reporting of study results.
- PO11:** Understand and participate as manager of the health care system.
- PO12:** Describe the anaesthetic and surgical requirements for different procedures.
- PO13:** Work as member of rescue team and provide services such as Cardio Pulmonary Resuscitation, Code Blue, etc.



**Syllabus****SEMESTER I  
REVIEW OF APPLIED SCIENCES****Theory: 64 hours****Objectives:****At the end of the first semester students should be able to**

1. Illustrate the anatomical structure of the bronchi and their subdivisions.
2. Identify and describe the digestive secretions and functions of the liver, gallbladder and pancreas.
3. Explain how the blood transports oxygen and carbon dioxide.
4. Describe gas exchange in the pulmonary and systemic circuits.
5. Understand the clinical physiology of ANS and  $\alpha$  and  $\beta$  receptors
  - a. Uses and side effects of major drugs in each category.
  - b. Clinical circumstances where these agents may be beneficial.
6. Ability to identify, address and treat the associated risk factors according to evidence based guidelines.

**COURSE OUTCOMES:***At the end of the course, students will be able to...***CO1:** Discuss the anatomical aspects of respiratory and cardiovascular system.**CO2:** Describe the Hepatobiliary system and tissue perfusion.**CO3:** Record and interpret the lung function tests.**CO4:** Explain the homeostasis and haemostasis**CO5:** Describe the pharmacology of Adrenergic and Cholinergic drugs and their blockers.**CO6:** Explain the pharmacology of skeletal muscle relaxants and reversal agents.**CO7:** Understand common medical diseases like, Ischemic Heart Disease, COPD, Chronic liver diseases.**CO8:** Explain principles of management of shock, sepsis and common medical emergencies.**Unit-I: Applied Anatomy****13 hours**

- Broncho pulmonary segments and alveoli
- Systemic and pulmonary circulation
- Coronary circulation
- Conducting system of the heart
- Neuro muscular junction
- Hepatobiliary system
- Blood pressure & tissue perfusion

**Unit- II: Applied Physiology****13 hours**

- Respiratory physiology-
  - Spirometry
  - Lung function tests
  - Oxygen transport & CO<sub>2</sub> transport
- Coagulation and its disorders
- Platelets & its disorders
- Acid base physiology
- Hepatobiliary physiology

**Unit- III: Pharmacology****14 hours**

- Drugs acting on autonomic nervous system
  - Adrenergic drugs & blockers
  - Cholinergic drugs & blockers
- Skeletal muscle relaxants
- Reversal of neuromuscular blockade

**Unit-IV: Medicine****24 hours**

- Ischemic heart disease
  - Etiopathology
  - Clinical features
  - Investigations
  - Management
  - Complications
- Special emphasis on
  - ECG
  - TMT
  - Echocardiography
- Shock
  - Definition
  - Types
  - Pathophysiology
  - Treatment
  - Details of each type
  - Inotropes
  - Fluids and electrolytes
- COPD& bronchial asthma
  - Pathophysiology
  - Clinical features
  - Smoking and its implications

- Treatment
- Lung Function Tests
- Chronic liver disease/failure
  - Hepatitis – Types & treatment
  - Cirrhosis: Pathophysiology and complications
  - Investigations: Liver function tests
  - Obstructive jaundice

**Scheme of Theory Examination:**

There shall be one theory paper of **three** hours duration carrying **80** marks. Distribution of type of questions and marks for **Review of applied sciences** shall be as given under.

Type of questions	No. of questions	Marks	Total
Long Essay(LE)	02	15	30
Short Essay(SE)	10	05	50
<b>Grand Total</b>			<b>80</b>

Theory Internal Assessment-20 marks

**There shall be no practical examination**

**Reference books:**

1. Essentials of medical pharmacology (Latest edition) – KD Tripathi
2. Textbook of Pharmacology for Dental and Allied Health Sciences (Latest edition)- Padmaja Uday Kumar
3. Essentials of internal medicine (Latest edition)- Ardhendu Sinha Ray, Abhishek Sinha Ray
4. Text book of Medical Physiology – Indu Khurana
5. Manipal manual of Anatomy for Allied Health Sciences Courses- Sampath Madhyastha
6. BD Chaurasia's Human Anatomy – volume1

**SEMESTER I**  
**ANAESTHETIC EQUIPMENTS & PROCEDURES**

**Theory: 48 hours**

**Objectives:**

**At the end of the first semester students should be able to**

1. Check adequacy of gas supplies, indent for required supplies, and ensure safe storage and commissioning of gas supplies.
2. Perform routine and periodic checks of
  - a. Anaesthesia workstation
  - b. Gases supply system
  - c. Scavenging system
3. Trouble shoot problems in gas supply, anaesthesia workstation and scavenging system.
4. Ensure availability of standard monitors and their proper functioning. Able to trouble shoot minor complications. Periodic check and suitability of monitoring. Competency in basic interpretation of monitored values.

**COURSE OUTCOMES:**

*At the end of the course students will be able to...*

**CO1:** Describe the modern integrated anaesthesia workstation.

**CO2:** Describe and operate the anaesthetic monitoring devices.

**CO3:** Prepare for management of difficult airway under the leadership of anaesthesiologists.

**CO4:** Set up for the haemodynamic monitoring and troubleshoot its errors.

**CO5:** Practice the maintenance of anaesthetic gadgets.

**CO6:** Discuss the role of simulation in anaesthesia and train future students in it.

**Unit-1**

**12 hours**

- Medical Gases and Distribution System
  - Medical gas supply, storage and safety
- The modern integrated Anaesthesia workstation
  - Anaesthesia machine & its components
  - Fail safe system
  - Safety check of anaesthesia machine
  - Scavenger system

**Unit-2****15 hours**

- Monitoring Equipment
  - Respiratory gas monitoring and minimum alveolar concentration
  - Equipments to measure depth of anaesthesia
    - Bispectral index
    - Entropy
  - Neuromuscular block monitoring equipments
  - Cardiac output monitors
  - Equipment for central neuraxial and regional blocks
    - Needles
    - Catheters
    - Nerve locators
    - Ultrasound device
  - Anesthesia equipment for magnetic resonance imaging
  - Equipment for anaesthesia in remote locations
  - How to Interpret X-rays, CT Scan, and MRI in clinical anaesthesia practice

**Unit-3****12 hours**

- Airway gadgets and their accessories
  - Surgical airway equipments
  - Percutaneous airway equipments
  - Optical laryngoscopes
  - Airway introducers
  - Alternative to intubation
- Gadgets for difficult airway

**Unit-4****9 hours**

- Hemodynamic monitoring
  - Pressure transducers: resonance
  - Damping
  - Invasive & non-invasive blood pressure measurement
  - Oscillometry
- Pre-use check of anaesthesia equipments
- Sterilization and maintenance of anaesthesia equipments
- Simulation in anaesthesia

**Scheme of Theory Examination:**

There shall be one theory paper of **three** hours duration carrying **80** marks. Distribution of type of questions and marks for **Anaesthetic Equipments & Procedures** shall be as given under.

Type of questions	No. of questions	Marks	Total
Long Essay(LE)	02	15	30
Short Essay(SE)	10	05	50
<b>Grand Total</b>			<b>80</b>

Theory internal assessment-20 marks

**Practical examination-100 marks**

**Marks pattern for practical exams:-**

Practical exercises	Viva- Voce	Internal assessment
60	20	20
<b>Grand Total- 100</b>		

**Reference books:**

1. A practical approach to anaesthesia equipment- Jerry A Dorsch & Susan E Dorsch

**Books Recommended:**

1. Anaesthesia equipment simplified- Gregory Rose & J Thomas Mclarney
2. Understanding anaesthetic equipments and procedures A practical approach Dwarakadas K Baheti & Vandana V Laheri

**SEMESTER I**  
**PHARMACOLOGY OF ANAESTHETICS**

**Theory: 48 hours**

**Objectives:**

**At the end of the semester students should be able to**

1. Preparation, strength, dose, dilution and storage of commonly used drugs during anaesthesia and resuscitation.
2. Common indications and main pharmacological effects of drugs, fluid and blood used in anaesthesia.
3. Common side effects of the drugs.
4. Identification and immediate treatment of common side effects.

**COURSE OUTCOMES:**

*At the end of the course students will be able to...*

**CO1:** Explain the pharmacology of core drugs used in anaesthesia.

**CO2:** Know the preparation, strength, dose, dilution and storage of drugs used in anaesthesia.

**CO3:** Identify the adverse drug reactions and its immediate management.

**CO4:** Understand fluid management and blood transfusion.

**Unit-1**

**10 hours**

- Core drugs in anaesthetic practice
  - General anaesthetic agents
    - Intravenous anaesthetic agents and opioids
    - Volatile anaesthetic agents
  - Local anaesthetics
  - Muscle relaxants and anticholinesterases
  - Benzodiazepines
  - Analgesics

**Unit-2**

**11 hours**

- Cardiovascular drugs
  - Sympathomemmetics
  - Anti-arrhythmics
  - Vasodilators
  - Antihypertensives
- Anti-inflammatory drugs
- Anticoagulants

**Unit-3**
**12 hours**

- Other important drugs
  - Central nervous system
  - Antiemetics and related drugs
  - Electrolytes
  - Diuretics
  - Antimicrobials
  - Drugs affecting coagulation
  - Drugs used in Diabetes
  - Corticosteroids and other hormone preparations

**Unit-4**
**15 hours**

- Fluid therapy and transfusion
  - Distribution of body fluids
  - Crystalloids and colloids
  - Fluid infusion and effect on body fluid compartments
  - Blood components
  - Blood transfusion
  - Transfusion hazards

**Scheme of Theory Examination:**

There shall be one theory paper of **three** hours duration carrying **80** marks. Distribution of type of questions and marks for **Pharmacology of Anaesthetics** shall be as given under.

Type of questions	No. of questions	Marks	Total
Long Essay(LE)	02	15	30
Short Essay(SE)	10	05	50
<b>Grand Total</b>			<b>80</b>

Theory Internal Assessment-20 marks

**Practical examination-100 marks**
**Marks pattern for practical exams:-**

Practical Exercises	Viva- Voce	Internal assessment
60	20	20
<b>Grand Total- 100</b>		



**Books Recommended:**

1. Comparative Pharmacology for Anaesthetist: Armeen Ahmed, Vipin Dhama, Nitin Garg
2. A Primer of Anesthesia- Rajeshwari Subramaniam

**Reference books:**

1. Drugs in anaesthesia & intensive care- Edward Scarth& Susan Smith

**SEMESTER II**  
**ADVANCED ANAESTHESIA TECHNIQUES**

**Theory: 48 hours**

**Objectives:**

**At the end of the second semester student is expected to understand**

1. Common procedures performed in anaesthesia, intensive care unit, and emergency department.
2. Physics and technology involved in the functioning of special equipment used to aid the procedures.
3. Using the special equipment and trouble shoot

**COURSE OUTCOMES:**

*At the end of the course students will be able to...*

**CO1:** Explain the different techniques of regional anaesthesia.

**CO2:** Recognize modern technologies in anaesthesia practice.

**CO3:** Describe the technique of general anaesthesia and management of its complications.

**CO4:** Understand and apply the guidelines and protocols in anaesthesia.

**CO5:** Discuss the anaesthetic emergencies and their management.

**CO6:** Understand the deliver of anaesthesia for emergency surgery.

**Unit- I****12 hours**

- Vascular cannulation
- Central neuraxial blockade
  - Potential benefits of central neuraxial block
  - Mechanism of action, spread, uptake & elimination
  - Ultrasound for central neuraxial blockade
- Peripheral nerve blocks
- Post anaesthesia care
- Ultrasound in ICU
  - FAST
  - Volume assessment
  - Thoracic ultrasound

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

- Review of modern technology in anaesthesia
  - Ultrasound
  - Fiberoptics
  - X-ray

- Smart Pumps and Computer-Controlled Drug Infusion Delivery
- Anaesthesia information management systems
- Clinical information systems in critical care
- Decision support system

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

- General anaesthesia
  - Types and techniques
  - Awareness during anaesthesia
  - Complications
  - The long term effects of general anaesthesia
  - Management of general anaesthesia
  - Anaesthesia and children

**Unit- IV**
**12 hours**

- Emergency anaesthesia guidelines
  - Incidence and risk factor
- Anaesthetic emergencies
  - Airway emergencies
  - Anaphylaxis
  - Local anaesthetic toxicity
  - Malignant hyperthermia
- The principles and conduct of anaesthesia for emergency surgery
  - Choice of anaesthetic technique
  - Management and protection of the airway including pulmonary aspiration
  - The rapid sequence induction: evolution over time
  - Management of ventilation
  - Maintenance of anaesthesia

**Scheme of Theory Examination:**

There shall be one theory paper of **three** hours duration carrying **80** marks. Distribution of type of questions and marks for **Advanced Anaesthesia Techniques** shall be as given under.

Type of questions	No. of questions	Marks	Total
Long Essay(LE)	02	15	30
Short Essay(SE)	10	05	50
<b>Grand Total</b>			<b>80</b>

Theory Internal Assessment-20 marks

**Practical examination-100 marks**

**Marks pattern for practical exams:-**

<b>Practical Exercises</b>	<b>Viva- Voce</b>	<b>Internal assessment</b>
60	20	20
<b>Grand Total- 100</b>		

**Books Recommended:**

1. Text book of anaesthesia for post graduates- T.K. Agasthi
2. Step by step practical aspects of emergency anaesthesia- Arun Kumar Paul

**Reference books:**

1. Anaesthesiology updates for postgraduates- Sampa Dutta Gupta

**SEMESTER II**  
**APPLIED SURGICAL TECHNOLOGY****Theory: 48 hours****Objectives:****At the end of the second semester students should understand**

1. The surgical diagnosis and procedure to
  - a) Prepare the operation theatre including specific monitors and equipment.
  - b) Follow appropriate measures to protect self and the patient while transferring, intraoperative and postoperative period.
  - c) Manage the equipments required

**COURSE OUTCOMES:***At the end of the course students will be able to ...***CO1:** Develop a surgical diagnosis**CO2:** Demonstrate adequate knowledge of asepsis and aseptic technique, presurgical preparation of patient, surgical infection and prevention, universal precautions, surgical incisions and homeostasis**CO3:** Discuss decontamination, debridement and edema control, nutrition, suture techniques, anastomoses and abdominal drainage and surgical and perioperative consideration**CO4:** Demonstrate adequate knowledge of patient safety and surgical instrumentation.**Unit-1****10 hours**

- Developing a surgical diagnosis
  - Complete and thorough history
  - Physical Examination
    - Radiographic findings
    - Laboratory investigations
    - Record keeping
    - Differential diagnosis
- Basic necessities for surgery

**Unit-2****14 hours**

- Aseptic technique
  - Medical asepsis
  - Surgical asepsis
- Pre surgical preparation of the patient

- Surgical Infection
  - Factors for wound infection
  - Management of abscess
  - Antibiotic prophylaxis
- Infection prevention and universal precautions
- Surgical Incisions
- Hemostasis
  - Means of promoting wound Hemostasis
  - Dead space management

**Unit-3****10 hours**

- Decontamination and debridement
- Edema control
- Patient general health and nutrition
- Wound management
  - Prevention of wound infections
- Suture techniques
- Anastomoses
- Abdominal drainage
- Basic surgical and perioperative considerations
  - Antibiotic prophylaxis
  - Prevention of infection in postoperative period

**Unit-4****14 hours**

- Patient Safety
  - Admission Procedure
  - Procedure for Safely Transferring the Patient to the Operating Table.
  - Positioning
- Surgical Instrumentation
  - Functioning
  - Uses
  - Maintenance
  - Risks and precautions
    - Electrocautery
    - Harmonica
    - Lasers
    - Surgical bio-microscopes
    - X-ray
    - Endoscopes

**Scheme of Theory Examination:**

There shall be one theory paper of **three** hours duration carrying **80** marks. Distribution of type of questions and marks for **Applied surgical technology** shall be as given under.

Type of questions	No. of questions	Marks	Total
Long Essay(LE)	02	15	30
Short Essay(SE)	10	05	50
<b>Grand Total</b>			<b>80</b>

Theory Internal Assessment-20 marks

**There shall be no practical examination**

**Books Recommended:**

1. Basic surgical skills and techniques- Sudhir Kumar Jain, David L Stoker & Raman Tanwar
2. Berry & Kohn's Operating Room Technique(Latest edition)

**Reference books:**

1. Pocket guide to the Operating Room- Jaypee Latest edition

**SEMESTER II**  
**HEALTH CARE EDUCATION TECHNOLOGY****Theory: 48 hours****Objectives:****At the end of the second semester students should be able to**

1. Document of learner behaviour and outcomes.
2. Describe the application of technology to healthcare education, with examples of uses.
3. Evaluate the application of innovative strategies to health care education.
4. Identify resources available to educators to use and implement technology and innovative strategies in teaching.

**Unit- I****15 hours**

- Educational Technology
  - State the meaning of educational technology
  - Define educational technology
  - Narrate the nature and characteristics of educational technology
  - Recognize the scope of educational technology
  - Explain the functions of educational technology
  - Appreciate the division and sources of educational technology
  - Appreciate the contribution of educational technology
- Interpersonal Relations
  - Define therapeutic communication
  - Describe the development of interpersonal relationship
  - State the dimensions of interpersonal relationship
  - Explain the phases of interpersonal relationship
  - Appreciate cultural influences in therapeutic relationship
  - Relate the role of transactional analysis with interpersonal communication

**Unit- 2****15 hours**

- Educational Objectives
  - Define educational objectives
  - State the purposes of educational objectives
  - Appreciate the data sources for formulation of educational objectives
  - List the characteristics of educational objectives
  - Identify types of educational objectives
  - Explain selection and statement of objectives
  - Categorize behavioural changes



- Health care careers
  - Health Care Systems
  - Careers in Health Care
  - Personal and Professional Qualities of a Health Care Worker
  - Legal and Ethical Responsibilities
- Basics of health care
  - Promotion of Safety
  - Infection Control
  - Vital Signs
  - First Aid

**Unit- 3****18 hours**

- Methods of Clinical Teaching
  - Write philosophy of clinical teaching
  - Realize the outcomes of clinical teaching
  - Describe clinical teaching models
  - Identify factors influencing clinical teaching
  - State the purposes of clinical teaching
  - Enumerate the preparation and execution of clinical teaching session and apply
    - in their practice
  - Explain case method and perform in clinical practice
  - Outline the steps involved in process recording and apply in practice
  - Recognize patient care assignment as a method of clinical teaching
- Information, Education and Communication for Health
  - Define health education.
  - Recognize the scope of health education.
  - Narrate the aims and objectives of health education.
  - Describe the models of health education.
  - Explain the principles of health education.
  - Specify patient education and their goals.
  - Enumerate on patient education process.
  - Identify the strategies of communicating health messages.
  - Describe health communication.

**Scheme of Theory Examination:**

There shall be one theory paper of **three** hours duration carrying **80** marks. Distribution of type of questions and marks for **Health care education technology** shall be as given under.

Type of questions	No. of questions	Marks	Total
Long Essay(LE)	02	15	30
Short Essay(SE)	10	05	50
<b>Grand Total</b>			<b>80</b>

Theory Internal Assessment-20 marks

**There shall be no practical examination**

**Recommended books:**

1. Educational Technologies in Medical and Health Sciences Education  
Editors: Bridges, Susan, Chan, Lap Ki, Hmelo-Silver, Cindy E. (Eds.)
2. Nursing Communication and Educational Technology by R Pramila

**SEMESTER III**  
**SUB SPECIALITY SURGICAL TECHNIQUES**

**Theory: 48 hours**

**Objectives:**

**At the end of the third semester students should understand**

1. Various sub speciality surgical procedures.
2. Different requirement for each of these procedures.
3. Preparation of patient, equipment, operation theatre for these surgical procedures

**COURSE OUTCOMES:**

*At the end of the course students will be able to...*

**CO1:** Discuss principles of laparoscopic and robotic surgery.

**CO2:** Assess and discuss management of neck and spine trauma.

**CO3:** Diagnose and manage facial trauma, plastic and reconstructive surgery and elective orthopaedics

**CO4:** Discuss elective neurosurgery and cardiac surgery

**CO5:** Discuss thoracic pathology, vascular surgery and organ transplantation

**Unit- I**

**12 hours**

- Principles of laparoscopic surgery
  - Advantages and disadvantages
  - Safety issues and indications
  - Postoperative care
- Principles of robotic surgery
  - Advantages and disadvantages
  - Safety issues and indications
  - Postoperative care
- Neck and spine
  - The accurate assessment of spinal cord injuries
  - The basic management of spinal trauma and major pitfalls

**Unit- II**

**12 hours**

- Trauma to the face and mouth
  - Classification of facial fractures
  - Diagnosis and management of fractures
- Plastic and reconstructive surgery
  - The spectrum of plastic surgical techniques
  - The various skin grafts
  - The principles and use of flaps
  - Plastic surgery to manage difficult and complex tissue loss

- Elective orthopaedics
  - Upper limb – pathology, assessment and management
  - Hip and knee
  - Foot and ankle
  - Paediatric orthopaedics

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

- Elective neurosurgery
  - Head injury
  - Investigation and treatment for intracranial infection
  - Treatment for hydrocephalus
  - Management of intracranial haemorrhage
  - Management of epilepsy
  - Understanding the principles involved in brain death
- Cardiac surgery
  - The role of investigation in planning of surgery
  - The management of coronary heart disease
  - The role of surgery in valvular heart disease
  - Special role of surgery in congenital heart disease
  - The management of aortic vascular and pericardial disease

**Unit- IV****12 hours**

- The thorax
  - Investigation of chest pathology
  - Surgical oncology as applied to chest surgery
- Vascular surgery
  - Investigation for vascular surgery
  - Management technique of vascular surgery
    - Direct repair by stenting
    - Endarterectomy
    - Bypass
- Organ Transplantation
  - What is organ transplantation
  - The transplant process
  - Timeline of medical and legal advances in organ transplantation
  - Cadaveric organ donation
  - Living organ donation
  - Alternative organs
  - The impact of transplantation

**Scheme of Theory Examination:**

There shall be one theory paper of **three** hours duration carrying **80** marks. Distribution of type of questions and marks for **Sub Speciality surgical techniques** shall be as given under.

<b>Type of questions</b>	<b>No. of questions</b>	<b>Marks</b>	<b>Total</b>
Long Essay(LE)	02	15	30
Short Essay(SE)	10	05	50
<b>Grand Total</b>			<b>80</b>

Theory Internal Assessment-20 marks

**Practical examination-100 marks**

**Marks pattern for practical exams:-**

<b>Practical Exercises</b>	<b>Viva- Voce</b>	<b>Internal assessment</b>
60	20	20
<b>Grand Total- 100</b>		

**Books Recommended:**

1. Bailey & Loves Short Textbook of Surgery
2. Text book of surgery – S. Das

**Reference books:**

- 1 Manipal manual of surgery-K. Rajgopal Shenoy & Anitha Shenoy
- 2 Short text book of surgery – Himasu Roy

**SEMESTER III**  
**BIOSTATISTICS AND RESEARCH METHODOLOGY**

**Theory: 64 hours**

**Objectives:**

**At the end of the semester students should be able to**

1. Understand and apply statistical methods for the design of biomedical research and analysis of biomedical research data;
2. Learn to participate in a research team in study design, data coordination and management, and statistical analysis and reporting of study results

**COURSE OUTCOMES:**

*At the end of the course students will be able to...*

**CO1:** Identify different types of data and ways of presenting the data

**CO2:** Describe various measures of central tendency and dispersion

**CO3:** Understand the basic concept of probability distributions- Normal distribution, Binomial distribution, Poisson distribution

**CO4:** Identify and apply different sampling techniques

**CO5:** Differentiate structure of research protocol and thesis

**CO6:** Calculate the sample size for estimating means, proportions, testing of means, proportions between two groups

**CO7:** Identify different statistical tests and when to apply it

**Unit 1:****10 hours****Introduction**

Introduction to biostatistics & research methodology, types of variables & scales of measurements, measure of central tendency & dispersion, rate, ratio, proportion, incidence & prevalence

**Unit 2:****6 hours****Sampling**

Random and non-random sampling, Different sampling techniques – simple random, stratified, systematic, cluster & multi-stage. Sampling and non-sampling errors and methods of minimizing these errors

**Unit 3:****8 hours**

Sampling distribution. Statistics and parameter. Standard error. Basic probability distributions- Normal, Poisson and Binomial distributions with their application in biological sciences. Skewness & Kurtosis.

**Unit 4: 12 hours****Tests of significance**

Basics of testing of hypothesis – Null & Alternative hypothesis, type 1 and type II errors, level of significance & power of the tests, p value. Different Parametric Tests – T test (paired & unpaired), & Test for proportion, One way analysis of variance. Repeated measures analysis of variance. Non-Parametric Tests of significance Chi square test– Mann – Whitney U Test, Wilcoxon Test, Kruskal – Wallis Analysis of variance by ranks, Friedman's test.

**Unit 5: 8 hours****Correlation and regression**

Linear correlation by Karl Pearson and Rank order correlation due to Spearman. Testing the significance of correlation. Linear and Multiple regression.

**Unit 6: 2 hours****Sample size determination**

General concept. Sample size for estimating means and proportion, testing of difference in means and proportions of two groups.

**Unit 7: 6 hours****Study designs**

Descriptive epidemiological methods – case series analysis and prevalence studies . Analytical epidemiological methods – case control and cohort studies. Clinical trials / intervention studies, odds ratio and relative risk, stratified analysis

**Unit 8: 4 hours****Multivariate analysis**

Concept of multivariate analysis, introduction to logistic regression and survival analysis

**Unit 9: 2 hours**

Reliability and validity of diagnostic tests

**Unit 10: 6 hours****Scientific documentations**

Structure of research protocols, structure of thesis/research report, formats of reporting in scientific journals. Systematic review and meta analysis.

**Scheme of Theory Examination:**

There shall be one theory paper of **three** hours duration carrying **80** marks. Distribution of type of questions and marks for **Biostatistics and research methodology** shall be as given under.

Type of questions	No. of questions	Marks	Total
Long Essay(LE)	02	15	30
Short Essay(SE)	10	05	50
<b>Grand Total</b>			<b>80</b>

Theory Internal Assessment-20 marks

**There shall be no practical examination**

**Recommended books:**

1. ABC of research methodology and applied biostatistics by MN Parick & Nithya Gogtay.
2. Introduction to biostatistics and research methods by P.S.S. Sundar Rao & J. Richard

**Reference books:**

1. Research methodology & Biostatistics- A comprehensive guide for health care professionals-Suresh K. Sharma
2. Guide to research methodology and Biostatistics-KMK Masthan



**SEMESTER III**  
**HEALTH CARE MANAGEMENT****Theory: 48 hours****Objectives:****At the end of the third semester students should be able to**

1. Discuss the role of the manager in healthcare and how organisations and people work within the healthcare system.
2. Effectively manage people, finances and organisational resources.
3. Complete an organisational development project, reflect on the learning gained and evaluate the project from a leadership and healthcare management perspective.

**COURSE OUTCOMES:***At the end of the course students will be able to...***CO1:** Describe the evolution of management through different theories.**CO2:** Explain the role of manager at various levels in an organization**CO3:** Apply the functions of management in management processes**CO4:** Describe the roles and functions of HR in an organization**CO5:** Explain the significance and steps involved in various functions carried out in HR department.**CO6:** Explain the importance of material management, its need and objectives.**CO7:** Describe the stages involved in equipment management in a healthcare setting**CO8:** Identify and implement some of the inventory management techniques for better management**Unit-I****8 hours****➤ Management concepts and theories**

- Management and organizations
- Management role
- Levels of managers and management skills
- Classical school
- Behaviour school
- Management science school

**➤ Management functions and process**

- Planning
- Organizing
- Staffing
- Directing
- Controlling

**Unit- II****8 hours**➤ **Basics of HRM and sourcing**

- Introduction and relationship between HRM and HRD
- Objectives of HRM
- HR planning: short term and long term
- Productivity analysis in healthcare
- HR policy and procedure
- Recruitment
- Selection
- Placement
- Induction / Orientation

➤ **Training and development**

- Staff training and development
- Career growth and development
- Management development

**Unit- III****9 hours**➤ **Materials management**

- Introduction
- Definition and function
- Goals and objectives of materials management
- Problems and issues in hospitals

➤ **Equipment purchase and maintenance**

- Planning and selection of equipment
- Import of equipment
- Equipment utilization and operation
- Equipment repair and maintenance
- Equipment audit

**Unit- IV****7 hours**➤ **Scientific inventory management**

- Codification and standardization
- Value analysis
- Inventory control
- Lead time, safety stock and reorder level
- Economic order quantity (EOQ)
- Selective controls
- Case studies on inventory control
- The biomedical waste (management and handling) rules

**Scheme of Theory Examination:**

There shall be one theory paper of **three** hours duration carrying **80** marks. Distribution of type of questions and marks for **Health care management** shall be as given under.

Type of questions	No. of questions	Marks	Total
Long Essay(LE)	02	15	30
Short Essay(SE)	10	05	50
<b>Grand Total</b>			<b>80</b>

Theory Internal Assessment-20 marks

**There shall be no practical examination**

**Recommended books:**

1. Introduction to health care management by Sharoon B & Nancy H

**Reference books:**

1. Foundations of health care management – Bernard J Healy & Marc C Marchese
2. Dunn & Haimann's Health Care Management

**SEMESTER IV**  
**DISASTER MANAGEMENT****Theory: 48 hours****Objectives:****At the end of the fourth semester students should be able to**

1. Understand the emergency/ disaster management cycle
2. Develop a basic knowledge of prevention, mitigation, preparedness, response and recovery in disaster
3. Have a basic understanding emergency management.
4. Resuscitation and triage skills

**COURSE OUTCOMES:***At the end of the course students will be able to...***CO1:** Set up and respond for the management of hospital disaster.**CO2:** Understand the basic knowledge to manage the emergencies.**CO3:** Participate in triage and trauma management.**CO4:** Perform Basic Life Support and Advanced Cardiac Life Support.**Unit-1****15 hours**

- Hospital disaster preparedness and response
  - Scope
  - Coordination and management
  - Planning, training
  - Information, communication and documentation
  - Medico legal concerns
  - Safety and security
  - Human resources
  - Triage
  - Post disaster recovery
  - Patient handling
  - Volunteer involvement and management
  - Coordination and collaboration with wider disaster preparedness initiatives

**Unit-2****18 hours**

- First aid for unconsciousness
  - Aims , principles & rules of first aid
  - First aid box
- Trauma management
  - Guidelines, protocols, initial assessment
  - Trauma management in emergency department
- Wound management in emergency practice
  - Management of internal and external bleeding
- Chemical injury
- Management of drowning
- Burn care
  - Prehospital treatment
  - Initial emergency department treatment
  - Airway and respiratory care
  - Fluid resuscitation
- Electrical injury management
  - Pre hospital management
  - Basic life support
  - Further treatment and transfer

**Unit-3****15 hours**

## Cardio pulmonary resuscitation

- Basic life support
  - Algorithm
  - Mouth to mouth ventilation
  - External cardiac compression
- ACLS
  - Defibrillation
  - Vascular access
  - Definitive airway
  - Foreign body obstruction
  - Drugs
- CPR in infants and children
- Complications of BLS

**Scheme of Theory Examination:**

There shall be one theory paper of **three** hours duration carrying **80** marks. Distribution of type of questions and marks for **Disaster management** shall be as given under.

Type of questions	No. of questions	Marks	Total
Long Essay(LE)	02	15	30
Short Essay(SE)	10	05	50
<b>Grand Total</b>			<b>80</b>

Theory Internal Assessment-20 marks

**There shall be no practical examination**

**Books recommended:**

1. Disaster management for health care professionals- Joshi Sonopant G

**SEMESTER IV**  
**SUB SPECIALITY ANAESTHESIA & TECHNIQUE**

**Theory: 48 hours**

**Objectives:**

**Upon completion of this semester, students will achieve knowledge and level of expertise & proficiency in:**

1. Anaesthetic and surgical requirement for different subspeciality procedures in terms of equipment and monitoring.
2. Basic legal ethical issues in organ transplant
3. Functioning and procedures of pain clinic.

**COURSE OUTCOMES:**

*At the end of the course students will be able to...*

**CO1:** Discuss and arrange for the anaesthetic and surgical requirement for the subspeciality surgical procedures in Paediatric , Neuro, Plastic and Reconstructive surgery, Cardiothoracic and vascular surgery, Head and Neck surgery, Ophthalmic procedures, Genitourinary surgeries, Orthopaedic surgeries and Obstetrics and Gynecological procedures.

**CO2:** Describe the anaesthetic consideration in organ donation and transplant procedures.

**CO3:** Understand the medico legal aspects of anaesthesia.

**CO4:** Understand the management of pain and evaluate the treatment.

**Unit-1** **12 hours**

- Paediatric anaesthesia
- Neurosurgical anaesthesia
- Anaesthesia for plastic and reconstructive surgery

**Unit-2** **12 hours**

- Anaesthesia for cardiothoracic and vascular surgery
- Anaesthesia for head and neck surgeries
- Anaesthesia for ophthalmic procedures

**Unit-3** **12 hours**

- Anaesthesia for genitourinary surgeries
- Anaesthesia for orthopaedic surgeries
- Anaesthesia for obstetrics and gynaecological procedures

**Unit-4**
**12 hours**

- Anaesthetic considerations in organ donation and transplant procedures
- Pain management
- Legal aspects of anaesthesia

**Scheme of Theory Examination:**

There shall be one theory paper of **three** hours duration carrying **80** marks. Distribution of type of questions and marks for **Subspeciality anaesthesia & technique** shall be as given under.

Type of questions	No. of questions	Marks	Total
Long Essay(LE)	02	15	30
Short Essay(SE)	10	05	50
<b>Grand Total</b>			<b>80</b>

Theory Internal Assessment-20 marks

**Practical examination-100 marks**
**Marks pattern for practical exams:-**

Practical Exercises	Viva- Voce	Internal assessment
60	20	20
<b>Grand Total- 100</b>		

**Books Recommended:**

1. Anaesthesiology updates for postgraduates- Sampa Dutta Gupta
2. Textbook of Anaesthesia- Alan R Aitkenhead, David J Rowbotham, Graham Smith

**Reference books:**

1. A basic textbook is essential - Fundamentals of Anaesthesia- Tim Smith, Colin Pinnock, Ted Lin, and Robert Jones



**SEMESTER IV**  
**ANAESTHESIA & CRITICAL CARE**

**Theory: 48 hours**

**Objectives:**

**At the end of the fourth semester students should be able to**

1. Aware of different monitoring modalities
2. Set up monitoring and trouble shoot monitoring systems.
3. Understand gross functioning of ventilators and ventilatory care
4. Manage equipment required ICU setup
5. Follow universal precautions and maintain asepsis

**COURSE OUTCOMES:**

*At the end of the course students will be able to...*

- CO1:** Setting up for different monitoring techniques and interpret the vital records, in particular to ICU.
- CO2:** Understand and organize the working principle of ventilator and different modes of mechanical ventilation.
- CO3:** Set up for the intubation and tracheostomy in ICU.
- CO4:** Measure the values of spirometry
- CO5:** Describe the lung injury and ARDS
- CO6:** Know the infusion and transfusion therapy.
- CO7:** Practice infection control in ICU.
- CO8:** Know the transport of critically ill patients.
- CO9:** Operate and manage the anaesthetic equipments.

**Unit-I**

**15 hours**

- Monitoring techniques in ICU practice
  - Invasive blood pressure (BP) monitoring
  - Transesophageal doppler (TED)
  - Measurement of central venous pressure (CVP)
  - Pulmonary artery catheterization
  - Arterial blood gas (ABG) analysis
  - Intracranial pressure (ICP) measurement
  - Intra-abdominal pressure (IAP) measurement

**Unit- II**
**18 hours**

- Ventilator Life Support in ICU
  - Working principles of ventilator in ICU
  - Types of ventilators
  - Mechanical ventilation modes and settings
  - Ventilator management
  - Ventilation induced lung injury
  - Ventilation monitoring
  - Non-conventional ventilation
  - Weaning from the ventilator

**Unit- III**
**10 hours**

- Intubation and tracheostomy
- Spirometry
- Data analysis
- Acute lung injury (ALI) and adult respiratory distress syndrome (ARDS)
- Fluid control and therapy
- Drug side effects

**Unit- IV**
**5 hours**

- Supportive care
  - Control of infection
  - Transport of critically ill
  - Investigations
- Maintenance of anaesthesia equipments

**Scheme of Theory Examination:**

There shall be one theory paper of **three** hours duration carrying **80** marks. Distribution of type of questions and marks for **Anaesthesia & Critical care** shall be as given under.

Type of questions	No. of questions	Marks	Total
Long Essay(LE)	02	15	30
Short Essay(SE)	10	05	50
<b>Grand Total</b>			<b>80</b>

Theory Internal Assessment-20 marks

**Practical examination-100 marks**

**Marks pattern for practical exams:-**

<b>Practical Exercises</b>	<b>Viva- Voce</b>	<b>Internal assessment</b>
60	20	20
<b>Grand Total- 100</b>		

**Books Recommended:**

1. Civetta, Taylor & Kirbey's Critical care
2. Critical care- Paul Marino

**Reference books:**

1. The ICU book-Schumacher
2. Text book for Operation Room Technicians- Pramila Bhalla

## ANNEXURES

### MONITORING LEARNING PROGRESS

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by staff of the department based on participation of students in various teaching/ learning activities. It may be structured and assessment shall be done using checklists that assess various aspects. Model checklists are given which may be copied and used.

The learning out comes to be assessed should include:

- a. Acquisition of knowledge: the methods used comprise of ‘Log Book’ which records participation in various teaching/ learning activities by the students. The number of activities attended and the number in which presentations are made are to be recorded. The log book should periodically be validated by the supervisors.  
Journal Review Meeting (Journal Club): the ability to do literature search, in depth study, presentation skills, and use of audio- visual aids are to be assessed. The assessment is made by faculty members and peers attending the meeting using a checklist (*see Model Checklist I*).  
Seminars/ symposia: the topics should be assigned to the student well in advance to facilitate in depth study. The ability to do literature search, in depth study, presentation skills and use of audio- visual aids are to be assessed using a checklist (*see Model Checklist II*).
- b. Teaching skills: candidates should be encouraged to teach undergraduate students. This performance should be based on assessment by the faculty members of the department and from feedback from the undergraduate students (*see Model Checklist III*).
- c. Work diary/ Log Book- every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of other activity.
- d. Records: records, log books and marks obtained in tests will be maintained by the Head of the Department and will be made available to the University.

#### **Log Book:**

The log book is a record of important activities of the candidates during his training, internal assessment should be based on the evaluation of log book. Collectively, log books are a tool for the evaluation of training programme of the institution by external agencies. The record includes academic activities as well as the presentations and procedures carried out by the candidate.

Procedure for defaulters: every department should have a committee to review such situations. The defaulting candidate is counseled by the guide and head of the department. In extreme cases of default the departmental committee may recommend that defaulting candidate be withheld from appearing the examination, if he fails to fulfill the requirements inspite of being given adequate chances to set himself right.

**Format of Model Checklists**
**Checklist- I: MODEL CHECKLIST FOR EVALUATION OF JOURNAL REVIEW PRESENTATIONS**

Name of the student:

Date:

Name of the faculty/ observer:

Title of the paper:

Journal Details:

Sl. No.	Points of observation during presentation	Poor 0	Below average 1	Average 2	Good 3	Very good 4
1	Article chosen was					
2	Extent of understanding of scope & objectives of the paper by the candidate					
3	Whether cross- references have been consulted					
4	Whether other relevant references have been consulted					
5	Ability to respond to questions on the paper/ subject					
6	Audio- visual aids used					
7	Ability to defend the paper					
8	Clarity of presentation					
9	Any other observation					
	<b>Total score</b>					

Remarks:

Name &amp; Signature of faculty:

### Checklist- II: MODEL CHECKLIST FOR THE EVALUATION OF THE SEMINAR PRESENTATIONS

Name of the student:

Date:

Name of the faculty/ observer:

Title of the seminar:

Sl. No.	Points of observation during presentation	Poor 0	Below average 1	Average 2	Good 3	Very good 4
1	Topic chosen was					
2	Extent of understanding of scope & objectives of the paper by the candidate					
3	Whether cross- references have been consulted					
4	Whether other relevant references have been consulted					
5	Ability to respond to questions on the paper/ subject					
6	Audio- visual aids used					
7	Ability to defend the topic					
8	Clarity of presentation					
9	Any other observation					
	<b>Total score</b>					

**Remarks:**
**Name & Signature of faculty:**

### Checklist – III: MODEL CHECKLIST FOR EVALUATION OF TEACHING SKILL

Name of the student:

Date:

Name of the faculty/ observer:

Topic:

Sl no.	Points to be observed during teaching	Strong Point	Weak Point
1	Communication of the purpose of the talk		
2	Evokes audience interest in the subject		
3	The introduction		
4	The sequence of ideas		
5	The use of practical examples and/or illustrations		
6	Speaking style (enjoyable, monotonous, etc., specify)		
7	Summary of the main points at the end		
8	Ask questions		
9	Answer questions asked by the audience		
10	Rapport of speaker with the audience		
11	Effectiveness of the talk		
12	Uses of AV aids appropriately		

**Remarks:**
**Name & Signature of faculty:**



**Checklist- IV: CONTINUOUS EVALUATION OF DISSERTATION WORK BY  
GUIDE/ CO- GUIDE**

Name of the student:

Date:

Name of the faculty/ observer:

<b>Sl. No</b>	<b>Points of observation during presentation</b>	<b>Poor 0</b>	<b>Below average 1</b>	<b>Average 2</b>	<b>Good 3</b>	<b>Very good 4</b>
1	Periodic consultation with guide/ co-guide					
2	Depth of Analysis/ Discussion					
3	Department presentation of findings					
4	Quality of Final Output					
5	Others					
	<b>Total score</b>					

**Remarks:**
**Name & Signature of faculty:**

