BLDE
(DEEMED TO BE UNIVERSITY)

Competency Based Medical Education
(CBME)

PG CURRICULUM
2019-20
M.D. Anaesthesiology

Published by
BLDE
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Declared as Deemed to be University u/s 3 of UGC Act, 1956

The Constituent College
SHRI B. M. PATIL MEDICAL COLLEGE, HOSPITAL & RESEARCH CENTRE, VIJAYAPURA
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BLDE(DU)/REG/PG-Curr/2019-20/268 May 06, 2019

NOTIFICATION

Sub: Competency Based Medical Education (CBME) based Revision of Post Graduate Curriculum

Ref: 1. Medical Council of India Regulation on Graduate Medical Education, 1997 and subsequent amendments of the same from time to time.
2. Minutes of the 28th meeting Academic Council of the University held on April 26, 2019.
3. Minutes of the 47th meeting Board of Management held on May 04, 2019.

The Board of Management of the University is pleased to approve the CBME based Revised Curriculum for Post Graduate Degree Course at in its 47th meeting held on May 04, 2019.

The Revised Curriculum shall be effective, from the Academic Session 2020-21 onwards, for Post Graduate Degree Course in the Constituent College of the University viz. Shri B. M. Patil Medical College, Hospital and Research Centre, Vijayapura.

REGISTRAR

REGISTRAR
BLDE (Deemed to be University)
Vijayapura-586103. Karnataka.

To,
The Dean, Faculty of Medicine and Principal
Shri B. M. Patil Medical College,
Hospital and Research Centre,
Vijayapura

Copy to:
- The Secretary, UGC, New Delhi
- The Secretary, MCI
- The Controller of Examinations
- The Vice Principal
- The Vice Principal (Academics)
- The Prof. & HODs Pre, Para and Clinical Departments
- The Co-ordinator, IQAC
- PS to the Hon'ble Chancellor
- PS to the Hon'ble Vice-Chancellor

Our Vision

"To be a Leader and be recognized as an Institution striving for maintenance and enhancement of Quality Medical Education and Healthcare"

Our Mission

- To be committed to promote sustainable development of higher education including Health science education, consistent with the statutory and regulatory requirements.
- Reflect the needs of changing technology and make use of the academic autonomy to identify the academic programs that are dynamic.
- Adopt global concepts in education in the healthcare sector.

Section - I

Goals and General Objectives of Postgraduate Medical Education Program

Goal

The goal of postgraduate medical education shall be to produce a competent specialist and / or a medical teacher as stated in the Post Graduate Medical Education Regulations 2000 and its amendments thereof [May2018]

(i) Who shall recognize the health needs of the community, and carry out professional obligations ethically and in keeping with the objectives of the national health policy.
(ii) Who shall have mastered most of the competencies, pertaining to the specialty, that are required to be practiced at the secondary and the tertiary levels of the health care delivery system.
(iii) Who shall be aware of the contemporary advances and developments in the discipline concerned.
(iv) Who shall have acquired a spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology, and
(v) Who shall have acquired the basic skills in teaching of the medical and paramedical professionals.

General Objectives

At the end of the postgraduate training in the discipline concerned the student shall be able to:

(i) Recognize the importance of the concerned specialty in the context of the health need of the community and the national priorities in the health sector.
(ii) Practice the specialty concerned ethically and in step with the principles of primary health care.
(iii) Demonstrate sufficient understanding of the basic sciences relevant to the concerned specialty.
(iv) Identify social, economic, environmental, biological and emotional determinants of health in a given case, and take them into account while planning therapeutic, rehabilitative, preventive and promotive measures/strategies.
(v) Diagnose and manage majority of the conditions in the specialty concerned on the basis of clinical assessment, and appropriately selected and conducted investigations.
(vi) Plan and advice measures for the prevention and rehabilitation of patients suffering from disease and disability related to the specialty.
(vii) Demonstrate skills in documentation of individual case details as well as morbidity and mortality data relevant to the assigned situation.
(viii) Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behavior in accordance with the societal norms and expectations.

(ix) Play the assigned role in the implementation of national health programs, effectively and responsibly.
(x) Organize and supervise the chosen/assigned health care services demonstrating adequate managerial skills in the clinic/hospital or the field situation.
(xi) Develop skills as a self-directed learner; recognize continuing educational needs, select and use appropriate learning resources.
(xii) Demonstrate competence in basic concept of research methodology and epidemiology, and be able to critically analyse relevant published research literature.
(xiii) Develop skills in using educational methods and techniques as applicable to the teaching of medical/nursing students, general physicians and paramedical health workers.
(xiv) Function as an effective leader of a team engaged in health care, research or training.

Statement of the Competencies

Keeping in view the general objectives of postgraduate training, each discipline shall aim at development of specific competencies, which shall be defined and spelt out in clear terms. Each department shall produce a statement and bring it to the notice of the trainees in the beginning of the program so that he or she can direct the efforts towards the attainment of these competencies.

Components of the PG Curriculum

The major components of the PG curriculum shall be:

- Theoretical knowledge
- Practical/clinical Skills
- Training in writing thesis/research articles
- Attitudes, including communication.
- Training in research methodology, medical ethics & medicolegal aspects
- Teaching skills to the undergraduates, juniors and support teams

Source: Medical Council of India, Regulations on Postgraduate Medical Education, 2000. [amended upto May 2018]

Eligibility for Admission:

1. Post graduate degree course:

   The candidate seeking admission should have passed MBBS from a college recognized by Medical Council of India.

As per requisites of statutory bodies & as laid out in Post graduate regulations of MCI & its amendments thereof, the minimum percentage of marks obtained in the entrance test

conducted by competent authority shall be as per MCI regulations & its amendments as applicable time to time.

Eligibility for Foreign / PIO / NRI students will be based on qualifying examination marks and MCI amendments as applicable at the time of selection and admission process.

Candidates seeking admission to superspeciality [M.Ch]
The candidate seeking admission to superspeciality course should have passed MS/MD in concerned subjects (As per MCI regulations & its amendments thereof) or passed DNB in concerned broad specialities & should fulfill requirements of MCI regulations.

2. As per requisites of statutory bodies & as laid out in Post graduate regulations of MCI & its amendments thereof, the minimum percentage of marks obtained in the entrance test conducted by competent authority shall be as per MCI regulations & its amendments as applicable time to time.

   Eligibility for Foreign / PIO / NRI students will be based on qualifying examination marks and MCI amendments as applicable at the time of selection and admission process.

The MCI norms to qualify for Admissions

Candidates seeking admission to these Post Graduate Degree courses should have passed M.B.B.S. recognized by Medical Council of India or equivalent qualification and should have obtained permanent Registration from the Medical Council of India or any of the State/ Medical council or candidate should register the same within one month from the date of admission, failing which the admission of the candidate shall be cancelled. Provided that in the case of a foreign national, the MCI may on the payment of prescribed fee for the registration, grant temporary registration for the duration of post graduate training restricted to the medical college/ institute to which the applicant is admitted for the time being exclusively for post graduate studies; provided further, that temporary registration to such foreign national shall be subjected to the condition that such person is duly registered with appropriate registering authority in his /her country wherefrom he has obtained his basic medical qualification ,and is duly recognized by the corresponding Medical Council or concerned authority.

If the candidate fails to fulfill the relevant eligibility requirements as mentioned above he/she will not be considered eligible for admission for Medical Postgraduate Degree Courses even if he/she is placed in the merit list of statutory authority and BLDE (Deemed to be University).

Obtaining Eligibility Certificate by the University before making Admission

Candidate shall not be admitted for any postgraduate degree course unless he/she has obtained and produced the eligibility certificate used by the University. The candidate has to make an application to the University with the following documents along with the prescribed fee:

1. MBBS pass/degree certificate issued by the University.
2. Marks cards of all the university examinations passed MBBS course.
3. Attempt Certificate issued by the Principal
4. Certificate regarding the recognition of the Medical College by the Medical Council of India.
5. Completion of internship certificate.
6. In case internship was done in a non-teaching hospital, a certificate from the Medical Council of India that the hospital has been recognized for internship.
7. Registration by any State Medical council and
8. Proof of SC/ST or OBC or physically handicapped status, as the case may be.

In addition to the above mentioned documents, candidate applying for admission to superspeciality courses has to produce degree/pass certificate of MD/MS/DNB degree with prescribed fee.

Intake of Students

The intake of students to each course shall be in accordance with the ordinance in this behalf.

Course Duration

a. M.D. / M.S. Degree Courses:
The course of study shall be for a period of 3 completed years including examinations. (MCI PG REG 2000 10:1)

b. D.M/M Ch Degree Courses; (MCI PG REG 2000, 10:2)
The duration of these courses shall be for a period of 3 completed years including examinations.

Training Method

The postgraduate training for degree shall be of residency pattern. The post graduate shall be trained with graded responsibilities in the management and treatment of patients entrusted to his/her care. The participation of the students in all facets of educational process is essential. Every candidate should take part in seminars, group discussions grand rounds, case

demonstration, clinics, journal review meetings, CPC and clinical meetings. Every candidate should be required to participate in the teaching and training program of undergraduate students. Training should include involvement in laboratory and experimental work, and research studies. Basic medical sciences students should be posted to allied and relevant clinical departments or institutions. Exposure to applied aspects of their learning should be addressed. Similarly, clinical subjects' students should be posted to basic medical sciences and allied specialty departments or institutions.

Training of superspeciality [M.Ch] should follow similar pattern. In addition, they have to be trained in advanced techniques of diagnosis and treatment pertaining to their specialty, participate actively in surgical operations as well.

Attendance, Progress and Conduct

A candidate pursuing degree course should work in the concerned department of the institution for the full period as a full time student. No candidate is permitted to run a clinic/laboratory/nursing home while studying postgraduate course

Each year shall be taken as a unit for the purpose of calculating attendance. Every student shall attend symposia, seminars, conferences, journal review meetings, grand rounds, CPC, case presentation, clinics and lectures during each year as prescribed by the department and not absent himself / herself from work without valid reasons. Every Candidate is required to attend a minimum of 80% of the training during each academic year of the post graduate course. This shall include assignments, assessment of full time responsibilities and participation in all facets of educational process. Provided further, leave of any kind shall not be counted as part of academic term without prejudice to minimum 80% attendance of training period every year. Leave benefits shall be as per university rules.

A post graduate student pursuing degree course in broad specialties, MD, MS and superspeciality courses DM, M.Ch would be required to present one poster presentation, read one paper in national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him/her to be eligible to appear at the university degree examinations. (MCI, PG 2000, 13.9)

Any student who fails to complete the course in the manner stated above shall not be permitted to appear for the University Examinations.

Monitoring Progress of Studies

The learning process of students should be monitored through continuous appraisal and regular assessment. It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring is done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment done by using checklists that assess various aspects.

The learning out comes to be assessed include:

- Personal Attitudes,
- Acquisition of Knowledge,
- Clinical and operative skills, skills of performing necessary tests/experiments
- Teaching skills.
- Documentation skills

Personal Attitudes:

The essential items are:

- Caring attitude, empathy
- Initiative in work and accepting responsibilities
- Organizational ability
- Potential to cope with stressful situations and undertake graded responsibility
- Trust worthiness and reliability
- To understand and communicate intelligibly with patients and others
- To behave in a manner which establishes professional relationships with patients and colleagues
- Ability to work in team
- A critical enquiring approach to the acquisition of knowledge

The Methods used mainly consist of observation. Any appropriate methods can be used to assess these. It is appreciated that these items require a degree of subjective assessment by the guide, supervisors and peers. However every attempt should be made to minimize subjectivity.

Acquisition of Knowledge:

Lectures: Lectures/theory classes as necessary may be conducted. It is preferable to have one class per week if possible. They may, be employed for teaching certain topics. Lectures may be didactic or integrated.

The following selected common topics for post graduate students of all specialties to be covered are suggested here. These topics can be addressed in general with appropriate teaching-learning methods centrally or at departmental level.

- History of medicine with special reference to ancient Indian medicine
- Basics of health economics and health insurance
- Medical sociology, Doctor –Patient relationship, role of family in disease
- Professionalism & Medical code of Conduct and Medical Ethics
- Research Methods, Bio-statistics
- Use of library, literature search ,use of various software and databases

- Responsible conduct of research
- How to write an article, publication ethics and Plagiarism
- Journal review and evidence based medicine
- Use of computers &Appropriate use of AV aids
- Rational drug therapy
- National Health and Disease Control Programmes
- Roles of specialist in system based practice
- Communication skills.
- Bio medical waste management
- Patient safety, medical errors and health hazards
- Patient's rights for health information and patient charter.

These topics may preferably taken up in the first few weeks of the 1st year commonly for all new postgraduates and later in 2nd year or 3rd year as required during their progression of the programme. The specialty wise topics can be planned and conducted at departmental level.

a) Integrated teaching: These are recommended to be taken by multidisciplinary teams for selected topics, eg. Jaundice, Diabetes mellitus, thyroid diseases etc. They should be planned well in advance and conducted.

Journal Review Meeting (Journal club):

The ability to do literature search, in depth study, presentation skills, use of audio – visual aids, understanding and applying evidence based medicine are to be focused and assessed. The assessment is made by faculty members and peers attending the meeting using a checklist

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.

Clinico-Pathological conferences:

This should be a multidisciplinary case study of an interesting case to train the candidate to solve diagnostic and therapeutic problems by using an analytical approach. The presenter(s) are to be assessed using a check list similar to that used for seminar.

Medical Audit: Periodic morbidity and mortality meeting be held. Attendance and participation in these must be insisted upon. This may not be included in assessment.

Clinical Skills: Day to Day Work: Skills in outpatient and ward work should be assessed periodically. The assessment should include the candidates' sincerity and punctuality, analytical ability and communication skills

Clinical Meetings:

Candidates should periodically present cases to his peers and faculty members. This should be assessed using a check list.

Group discussions: Group discussions are one of the means to train and assess the student's ability to analyse the given problem or situation, apply the knowledge and make appropriate decisions. This method can be adopted to train and assess the competency of students in analyzing and applying knowledge.

Death review meetings/Mortality meetings: Death review meetings is important method for reflective learning. A well conducted morbidity and mortality meetings bring about significant reduction in complications, improve patient care and hospital services. They also address system related issues. Monthly meetings should be conducted with active participation of faculty and students. Combined death review meetings may be required wherever necessary.

Clinical and Procedural Skills:

The candidate should be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by direct observation. Particulars are recorded by the student in the log book.

Teaching Skills:

Candidates should be encouraged to teach undergraduate medical students and paramedical students, if any. This performance should be based on assessment by the faculty members of the department and from feedback from the undergraduate students

Attitude and Communication skills:

Candidates should be trained in proper communication skills towards interaction and communication with patients, attendees and society in general. There should be appropriate training in obtaining proper written informed consent, discussion and documentation of the proceedings. Structured training in various areas like consent, briefing regarding progress and breaking bad news are essential in developing competencies.

Variety of teaching –learning methods like Role play, video based training, standardized patient scenarios, reflective learning and assisting the team leader in all these areas will improve the skills. Assessment can be done using OSCE simulated scenarios and narratives or any appropriate means. Training to work as team member, lead the team whenever situation demands is essential. Mock drills to train and assess the readiness are very helpful.

Work diary / Log Book:

Every candidate shall maintain a Work Diary/Log Book and record his/her participation in the training programs 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 clinical or laboratory procedures, conducted by the candidate. A well written and validated Log Book reflects the competencies attained by the learner and points to the gap which needs address. This Log Book shall be scrutinized by concerned teachers periodically and certified, by the Head of Department and Head of the Institution, and presented during University Practical / Clinical examination.

Periodic tests:

In case of degree courses of three years duration (MD/MS, DM, M.Ch), the concerned departments may conduct three tests, two of them be annual tests, one at the end of first year and the other in the second year. The third test may be held three months before the final examination. The tests may include written papers, practical / clinical and viva voce.
One of these practical/clinical tests should be conducted by OSPE (objective structured practical examination or OSCE (objective structured clinical examination) method.
Records and marks obtained in such tests will be maintained by the Head of Department and sent to the University, when called for,

Assessment

Assessment should be comprehensive & objective. It should address the stated competencies of the course. The assessment needs to be spread over the duration of the course.

FORMATIVE ASSESSMENT, ie., assessment during the training would include:
Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system.

General Principles
Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning: it should also cover professionalism and communication skills. The Internal Assessment should be conducted in theory and clinical examination.

Quarterly assessment during the Postgraduate training course should be based on following educational activities:

1. Journal based/recent advances learning
2. Patient based/Laboratory or Skill based learning
3. Self directed learning and teaching
4. Departmental and interdepartmental learning activity
5. External and outreach Activities/CMEs

Records: Records and marks obtained in tests will be maintained by the Head of the Departments and will be made available to the University or MCI.

Procedure for defaulter:

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 she/he fails to fulfill the requirements in spite of being given adequate chances to set himself or herself right.

Dissertation: Every candidate pursuing MD/MS degree course is required to carry out work on a selected research project under the guidance of a recognized post graduate teacher. The results of such a work shall be submitted in the form of a dissertation.

The dissertation is aimed to train a post graduate student in research methods and techniques. It includes identification of a problem, formulation of hypothesis, search and 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.

Every candidate shall submit to the Registrar (Academic) of the University in the prescribed proforma, a synopsis containing particulars of proposed dissertation work within six months from the date of commencement of the course on or before the dates notified by the University. The synopsis shall be sent through the proper channel.

Such synopsis will be reviewed and the dissertation topic will be registered by the University. No change in the dissertation topic or guide shall be made without prior approval of the University.

The dissertation shall be written under the following headings:

1. Introduction
2. Aims or Objectives of study
3. Review of Literature
4. Material and Methods
5. Results

6. Discussion
7. Conclusion
8. Summary
9. References
10. Tables
11. Annexure

The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires and other annexure. It should be neatly typed in double line spacing on one side of paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. The dissertation shall be certified by the guide, head of the department and head of the Institution.

Adequate number of copies as per norms and a soft copy of dissertation thus prepared shall be submitted to the Controller of Examinations six months before final examination on or before the dates notified by the University.

The dissertation shall be valued by examiners appointed by the university. Acceptance of dissertation work is an essential precondition for a candidate to appear in the University examination.

Guide:

The academic qualification and teaching experience required for recognition by this University as a guide for dissertation work is as per Medical Council of India Minimum Qualifications for Teachers in Medical Institutions Regulations, 1998 and its amendments thereof. Teachers in a medical college/institution having a total of eight years teaching experience out of which at least five years teaching experience as Lecturer or Assistant Professor gained after obtaining post graduate degree shall be recognized as post graduate teachers.

A Co-guide may be included provided the work requires substantial contribution from a sister department or from another medical institution recognized for teaching/training by this University / Medical Council of India. The co-guide shall be a recognized post graduate teacher of BLDE (Deemed to be University).

Change of guide:

In the event of a registered guide leaving the college for any reason or in the event of death of guide, guide may be changed with prior permission from the University.

Schedule of Examination:

The examination for M.D. /M.S and DM/M.Ch courses shall be held at the end of three academic years. The university shall conduct two examinations in a year at an interval of four to six months between the two examinations. Not more than two examinations shall be conducted in an academic year.

Scheme of Examination

M.D. /M.S. Degree

M.D. / M.S. Degree examinations in any subject shall consist of dissertation, written papers (Theory), Practical/Clinical and Viva Voce.

Dissertation:

Every candidate shall carryout work and submit a Dissertation as indicated above. Acceptance of dissertation shall be a precondition for the candidate to appear for the final examination.

Written Examination (Theory):

Written examination shall consist of **four** question papers, each of **three** hours duration. Each paper shall carry 100 marks. Out of the **four** papers, the 1st paper in clinical subjects will be on applied aspects of basic medical sciences and 4th paper on Recent advances, which may be asked in any or all the papers. In basic medical subjects and para-clinical -subjects, questions on applied clinical aspects should also be asked.

Practical / Clinical Examination:

In case of practical examination, it should be aimed at assessing competence and skills of techniques and procedures as well as testing students ability to make relevant and valid observations, interpretations and inference of laboratory or experimental work relating to his/her subject.

In case of clinical examination, it should aim at examining clinical skills and competence of candidates for undertaking independent work as a specialist. Each candidate should examine at least one long case and two short cases minimum. However additional assessment methods can be adopted which will test the necessary competencies reasonably well.

The total marks for Practical / Clinical examination shall be 300.

Viva Voce:

Examination shall aim at assessing depth of knowledge, logical reasoning, confidence and oral communication skills.

The total marks shall be 100:

- 80 Marks, for examination of all components of syllabus
- 20 Marks for Pedagogy

Examiners:

There shall be at least four examiners in each subject. Out of them two shall be external examiners and two shall be internal examiners. The qualification and teaching experience for appointment as an examiner shall be as laid down by the Medical Council of India.

Criteria for pass & distinction: Criteria for declaring as pass in University Examination: A candidate shall secure not less than 50% marks in each head of passing which shall include (1) Theory, (2) Practical/clinical and (3) viva voce examination. The candidate should pass independently in practical/clinical examination and Viva Voce: vide MCI pg 2000 Reg no 14(4) (Ciii)

Obtaining a minimum of 40% marks in each theory paper and not less than 50% cumulatively in all the four papers for degree examinations. Obtaining of 50% marks in Practical examination shall be mandatory for passing the examination as a whole in the said degree examination as the case may be.[amendment of MCI PG Regulations clause 14 dated 5.4.2018]

A candidate securing less than 50% of marks as described above shall be declared to have failed in the examination. Failed candidate may appear in any subsequent examination upon payment of fresh fee to the Controller of Examinations.

Declaration of distinction: A successful candidate passing the University examination in first attempt will be declared to have passed the examination with distinction, if the grand total aggregate of marks is 75 percent and above.
Distinction will not be awarded for candidates passing the examination in more than one attempt.

D.M/M.Ch Degree

DM/M.Ch Degree examinations in any subject shall consist of written theory papers (theory), practical/clinical and Viva voce.

Written Examination (Theory):

Written examination shall consist of **four** question papers, each of **three** hours duration. Each paper shall carry 100 marks. Out of the **four** papers, the 1st paper in clinical subjects will be on applied aspects of basic medical sciences. Recent advances may be asked in any or all the papers. In basic medical subjects and para-clinical -subjects, questions on applied clinical aspects should also be asked.

Practical / Clinical Examination:

In case of practical examination, it should be aimed at assessing competence and skills of techniques and procedures as well as testing students ability to make relevant and valid observations, interpretations and inference of laboratory or experimental work relating to his/her subject.

In case of clinical examination, it should aim at examining clinical skills, competence of candidates for undertaking independent work as a specialist. Each candidate should examine at least one long case and two short cases.

The total marks for Practical / clinical examination shall be 300.

Viva Voce:

Examination shall aim at assessing depth of knowledge, logical reasoning, confidence and oral communication skills.

The total marks shall be 100:

- 80 Marks, for examination of all components of syllabus
- 20 Marks for Pedagogy

Examiners: There shall be at least four examiners in each subject. Out of them two shall be external examiners and two shall be internal examiners. The qualification and teaching experience for appointment as an examiner shall be as laid down by the Medical Council of India.

Criteria for passing and distinction: Criteria for declaring as pass in University Examination: A candidate shall secure not less than 50% marks in each head of passing which shall include (1) Theory, (2) Practical including clinical and (3) viva voce examination. The candidate should pass independently in practical/clinical examination vide: MCI pg 2000 Reg no 144-c (iii).

Obtaining a minimum of 40% marks in each theory paper and not less than 50% cumulatively in all the four papers for degree examinations. Obtaining of 50% marks in Practical examination shall be mandatory for passing the examination as a whole in the said degree examination as the case may be.[amendment of MCI PG Regulations clause 14 dated 5.4.2018]

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Declaration of distinction: A successful candidate passing the University examination in first attempt will be declared to have passed the examination with distinction, if the grand total aggregate of marks is 75 percent and above.
Distinction will not be awarded for candidates passing the examination in more than one attempt.

Number of candidates per day: The maximum number of candidates for practical / clinical and viva-voce examination shall be as under:

MD / MS Courses: Maximum of 8 per day
DM/M.Ch Maximum of 3 per day

Additional annexure to be included in all curricula

Postgraduate Students Appraisal Form
Pre/Para/Clinical Disciplines

Name of Department/Unit :
Name of the PG Student :
Period of Training : FROM…… TO……..

Sr. No	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
		1 2 3	4 5 6	7 8 9	
1	Journal based/recent advances learning				
2	Patient based /Laboratory or Skill based learning				
3	Self directed learning and teaching				
4	Departmental and interdepartmental learning activity				
5	External and Outreach Activities/CMEs				
6	Thesis/Research work				
7	Log Book Maintenance				

Publications Yes/No

Remarks* ……..
…….
…….
……

*Remarks: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.

SIGNATURE OF ASSESSEE SIGNATURE OF GUIDE

SIGNATURE OF HOD SIGNATURE OF UNIT CHIEF

SECTION - II

Post Graduate Degree Course (MD) in Anaesthesiology

Goal:

The postgraduate course, M.D. (Anaesthesiology) should enable a medical graduate to become a competent specialist, acquire knowledge and skills in educational technology for teaching medical, dental and health sciences and conduct research in bio-medical science.

The MD course in Anaesthesiology is a three year integrated course. After satisfactory completion of the course, the candidate shall be fully conversant with theory and practical aspects of anaesthesiology and be able to practice anaesthesiology comprehensively, confidently and safely in the community that he/she serves.

Objectives

1) He/She shall recognize the health needs of the community, and carry out professional obligations ethically and in keeping with the objectives of the national health policy.
2) He/She shall have mastered most of the competencies, that are required to be practiced at the secondary and the tertiary levels of the health care delivery system.
3) He/She shall be aware of the contemporary advances and developments in anaesthesiology.
4) He/She shall have acquired a spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology:
5) He/She shall have acquired the basic skills in teaching the medical and paramedical students.
6) He/She continue to evince keen interest in learning and teaching Anaesthesiology whether he is in a teaching institution or is a practicing anaesthesiologist.

Specific Learning Objectives:

The specific learning objectives of postgraduate training course in Anaesthesiology would be to train a MBBS doctor who will:

1. Practice independently the art and science of anaesthesiology, backed by scientific knowledge and skill based approach.
2. Undertake responsibilities in critical care, trauma, and respiratory therapy and resuscitation of unconscious patients.
3. Become skilled in acute and chronic pain management.
4. Know the principles of research methodology and modes of consulting library.
5. Exercise empathy and a caring attitude and maintain high ethical standards.
6. Be a motivated' teacher'- defined as an Anaesthesiologist, keen to share his knowledge and skills with a colleague or a junior or any learner.

The objectives may be considered under the following headings.

A. Knowledge
B. Skills
C. Human values, ethical practice and communication abilities
D. Research activities.

At the end of the training the candidate must be able to:

A. Knowledge: Cognitive domain

- Demonstrate understanding of basic sciences relevant to anaesthesia.
- Describe the anaesthetic management of common and uncommon surgical ailments belonging to various branches of surgery, of all ages, requiring operative interventions with a basic knowledge of the aetiology, pathophysiology and the surgical treatment of the conditions.
- Describe the underlying theoretical background of mechanism of pain, pain perception and pain management.
- Describe the theory of the underlying aetiology, mechanism and management of the conditions requiring resuscitation.
- Demonstrate understanding of the theoretical basis of polytrauma and the science of resuscitation.
- Recognize the conditions that may be outside the area of his competence and refer them to an appropriate specialist prior to anesthetizing them.
- Update himself/herself by self-study and by attending continuing medical education courses, conferences and seminars relevant to anaesthesia.
- Demonstrate understanding of medico-legal aspects of anaesthesia.
- Undertake audit, use information technology, tools and carry out research, both basic and clinical with the aim of publishing his work and presenting his work at various scientific fora.
- Describe anaesthesia for laser surgeries
- Describe outpatient anaesthesia and anaesthesia at high altitudes.

B. Skills: **Practical / Clinical - Psychomotor domain**

- Perform 'pre-anaesthetic evaluation' of patients undergoing surgery by taking, proper clinical history, examining the patient, ordering relevant investigations and interpreting them to have additional information about the surgical condition, and / or the associated medical condition, which warrant the modification of the proposed anaesthetic management.
- Administer anaesthesia (general and or regional) to common surgical operations independently and to allied specializations like cardiac surgery, neurosurgery.
- Provide Basic Life Support (BLS) and Advanced Cardiac Life Support (ACLS).
- Manage airway and perform ventilatory care of unconscious and polytrauma cases as a member of trauma team and critical care unit team.
- Undertake complete clinical monitoring of the patients during preoperative, intraoperative post operative periods and also of the patients who are on ventilators in ICU& CCU.
- Perform acute and chronic pain management.

C. Human values, ethical practice and communication abilities - Affective domain

- Adopt ethical principles in all aspects of anaesthetic practice. Professional honesty and integrity are to be fostered. Anaesthesia care is to be delivered to all in need, irrespective of the social status, caste, creed or religion of the patient.
- Develop communication skills, in particular the skill to explain the various options available in the anaesthetic management, critical care, pain management and to obtain written informed consent from the patient.
- Provide leadership and get the, best out of his team in a congenial working atmosphere.
- Apply high moral and ethical standards while carrying out human or animal research.
- Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed.

- Respect patient's rights and privileges including patients right to information and right to seek a second opinion. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient **and relatives** and the clinician or other colleagues to provide the best possible diagnosis or opinion.
- Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.
- Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

D. Research activities

- Student will be encouraged to have research activities other than dissertation and publish at least one article during the course of the study.

E. Teaching: The student should learn the basic methodology of teaching and develop competence in teaching medical/paramedical students. The student should be familiar with the latest teaching (computer and power point presentation) modes including simulators training and evidence based medical education.

III. COURSE CONTENTS:

Theory (Cognitive Domain)

It includes topics not only of Anaesthesiology but also those aspects of all the other branches of medicine relevant to Anaesthesia viz., Medicine and its allied subjects, Surgery and its allied branches, Pediatrics, Anatomy, Physiology, Pharmacology, Biochemistry. It is intended as a guide to the candidates and it is not comprehensive. As and when there is a newer development, it becomes eligible for inclusion. Hence, the candidates should be familiar themselves with the current content of the scientific journals and reviews of major topics in Anaesthesia.

1. History of Anaesthesiology.
2. Basic Sciences related to Anaesthesia including Anatomy, Physiology, Pharmacology, Biochemistry

A. Demonstrate knowledge of Anatomy related to;

- Diaphragm, upper and lower airway, heart and coronary circulation ,
- Nervous System- Central Nervous System , Autonomic Nervous System Pain pathways, Circle of Willis and Musculoskeletal system.
- Regional anaesthesia - field block, central neuraxial, blockade, block for acute pain states
- Procedures like -Intramuscular injections, arterial and venous cannulations and Patient Positioning under anaesthesia.

B. Demonstrate knowledge of Physiology;

- Various systems (respiratory, cardiovascular, hepatobiliary, renal, endocrine, pregnancy, haematological, neuromuscular, regulation of temperature and metabolism, stress response, cerebral blood flow and ICP, central, autonomic and peripheral nervous systems, metabolic response to stress and trauma) in detail and translate its application in a problem solving manner.
- Application of the knowledge of Distribution of blood volume to different organs and systems and their control. Microcirculation. Venous system, venous pressure, its influence on various functions. Regulation of blood pressure.

- Application of the knowledge of physiology of valvular disease, coronary arteries and their territories. Pulmonary circulation, coronary circulation, cerebral circulation, visceral circulation.

C. Demonstrate knowledge of Biochemistry:
Relevant to fluid balance and blood transfusion, perioperative fluid therapy, acid base homeostasis in health and diseases. Demonstrate abilities to manage Electrolyte and acid base derangements; osmolarity and osmolality.

D. Demonstrate knowledge of Pharmacology:
Commonly used drugs in anaesthesia practice (premedication, preinduction agents, Intra-venous and inhalational, neuromuscular blocking agents and reversal of muscle relaxants, Local Anaesthetics and opioids) – general principles, concepts of pharmacokinetics and pharmacodynamics, drug interactions with the other drugs taken concomitantly by the patient and anaphylactoid reactions.

E. Demonstrate knowledge of Physics :

Gas laws, medical gas supply system, fluidics, electricity, diathermy and oxygen therapy and Hyperbaric oxygen.

Demonstrate knowledge of 'principles of physics' that govern functions of basic anaesthesia delivery equipment, airway devices – (laryngoscopes, airways etc),breathing systems and monitors, fiber optics, Lasers, Pacemakers and defibrillators, monitoring equipments (used for assessment of cardiac functions, temperature, respiratory functions, blood gases, intracranial pressure, depth of anaesthesia and neuromuscular block). Manufacture, filling and transport of gases and liquid oxygen. etc.

3. Medicine applied to Anaesthesiology
4. Electronics and Computers related to Anaesthesiology. Internet / Medline and its uses and applications.
5.

i. Principles and Practice of Anaesthesiology including pre-operative , perioperative and post operative care of patients belonging to General Surgery, Obstetrics and Gynecology, ENT, Ophthalmology, Orthopedics, and other superspecialities like Cardio thoracic Surgery, Neurosurgery, Plastic Surgery and Surgical Endocrinology, Surgical Oncology, Pediatric, Urology, Dental Surgery, Laparoscopic Surgery, Organ transplantation, one lung anesthesia and high altitude anesthesia etc.
ii. Demonstrate knowledge of basic life support, advanced cardiac, trauma life support, and neonatal resuscitation according to latest guidelines.
iii. Demonstrate knowledge of principles of sterilization and universal precautions-such as maintenance and sterilization of anaesthesia and related equipment and the operation theatre, infection control, cross contamination in OT and ICU.
iv. Blood transfusion-Fluid and Electrolyte balance, - Acid Base Balance.
v. Demonstrate ability to interpret ECG, blood gas analysis and other relevant biochemical values. Interpret various organ function tests and basics of measurement techniques.
vi. Explain blood coagulation mechanism, and their disturbances, rational use of blood and blood components.
vii. Different methods of anaesthetic techniques.
Regional Anaesthesia- Spinal Anaesthesia, Epidural anaesthesia, Caudal block, Brachial plexus block, Hernia block.
Local anaesthesia, Brachial plexus and Nerve block procedures using Ultrasound machine.
Demonstrate knowledge of post-operative care in the post-anaesthesia recovery room, in terms of management of

- Post-operative pain: various modalities
- Nausea and vomiting
- Identified emergencies and postoperative complications

viii. Special precautions to be taken in specific surgical patients

ix. Fires and Explosion in operation theatre.

6. Pain Clinic organization and management. Understand pain pathway and management of acute and chronic pain. Demonstrate knowledge of acute pain management, chronic pain therapy &therapeutic nerve blocks, acupuncture, acupressure and other non-conventional methods of treatment.
7. Respiratory therapy and management of both acute and chronic respiratory insufficiencies and ventilator commitments in intensive care unit, surgical intensive care unit, medical intensive care unit, neuro surgical intensive care unit and trauma care.
8. Critical Care Anaesthesiology and Trauma Care Unit and Resuscitation.
   - Anaesthesia in abnormal environments like high altitude anaesthesia.
   - Anaesthesia for day care surgery.
   - Anaesthesia for diagnostic procedure like endoscopies, Computerized Tomographic Scan (C.T. Scan) Magnetic Resonance Imaging (M.R.I.)
9. Informed consent & medico-legal issues: Understanding the implications of acts of omission and commission in practice. Issues regarding consumer protection act. Implications in medico-legal cases.
10. Principles of anaesthesia audit, understanding the audit process and outcome; methods adopted for the same.
11. Principles of Evidence Based Medicine and its application in anaesthetic practice.
12. Record keeping: Ability to keep records as scientifically and as completely as possible.
13. Pharmacogenetics.
14. Occupational hazards.
15. Describe the development and history of anaesthesia as a specialty with knowledge of important personalities who have contributed towards it.
16. Demonstrate knowledge of research methodology and basics of biostatistics relevant to data collection, analysis, comparison and estimation of significance.
17. Demonstrate knowledge pertaining to special anaesthetic techniques as relevant to Outpatient anaesthesia, hypotensive anaesthesia, anaesthesia in abnormal environments including rural area and calamitous situations.
    - Geriatric and pediatric anaesthesia, Emergency, ENT, orthopedic, ophthalmology, obstetrics, dental, radio-diagnosis and radiotherapy.
    - Induced hypothermia, incidental, environmental safety of patient.
    - Malignant hyperthermia, myasthenia gravis, GB syndrome and other neuromuscular diseases, obesity, COPD, Diabetes mellitus, bronchial asthma and hypertensive crises.
    - Principles of anaesthetic management of neuro/cardiac/thoracic/vascular/ transplantation/burns and plastic surgery.
    - Anaesthesia for patients with severe cardiac, respiratory, renal and hepatobiliary disorder posted for unrelated surgery
    - Shock, types, pathogenesis and management of patients in shock, renal failure, critically ill and/or on ventilator, Multiple organ failure.
18. Demonstrate knowledge pertaining to care of terminally ill, Hospices management, Do not resuscitate orders.
19. Demonstrate knowledge of general principles of Critical incident reporting.
20. Demonstrate knowledge of Hospital, ICU and OT design and planning.
21. Demonstrate knowledge of Medical education including evidence based medical education technology.
22. Demonstrate knowledge of principles of human resources and material management

Clinical / Practical Training (Psychomotor domain and Affective domain)

At the end of the course, the student should acquire skills in the following broad areas and be able to:

Demonstrate ability **as a perioperative physician**, in terms of

- Acquiring mastery in careful and relevant history taking, physical examination in clinical evaluation of the patient preoperatively.
- Collecting and synthesizing preoperative data from parent hospital and other sources and to develop a rational strategy for the peri-operative care of the patient.
- Thorough and systematic approach to preoperative evaluation of patients with and without systemic diseases, undergoing different types of operations.
- Prioritizing problems, present cases clearly and systematically to attending consultants.

Demonstrate ability in performing

- Pre-operative equipment check
- selection of drugs
- Preparation of work table, etc.

  Identify conditions like difficult airway by following difficult airway algorithms.
  Demonstrate ability to establish topical airway anaesthesia for awake intubation
  Demonstrate management of a Failed intubation drill on a Mannequin according to latest guidelines.
  Demonstrate ability to monitor and assess depth of anaesthesia
  Demonstrate acquisition of skills to initiate mechanical ventilation; select appropriate type and mode of ventilator; and monitor proper functioning of ventilator.
  Identify the need to perform intra-operative laboratory tests, blood gases, coagulation profile and interpret the results with clinical co relation
  Demonstrate ability to perform cannulation of arteries, central and peripheral

veins.

Demonstrate ability in using and interpreting the following routine non-invasive and invasive monitors intra-operatively:

a. Electrocardiogram with ST-segment analysis
b. Noninvasive blood pressure
c. Capnograph: values and changes in values and waveform.
d. Pulse oximetry: values and changes in values
e. Neuromuscular blockade monitor
f. Invasive arterial pressure: values,waveform and changes in the waveform
g. Central venous pressure: values and waveform
h. Pulmonary artery pressure: Values and waveforms, pulmonary capillary wedge tracing.

i) Cardiac output
ii) Mixed venous oxygen saturation
iii) Evoked potential
iv) Transesophageal echocardiography: basic understanding.

Demonstrate ability to train medical and paramedical staff in BLS and ALS.
Demonstrate mastery in common procedures like vascular access, use of latest invasive and non-invasive monitoring equipments.
Demonstrate ability to administer general anaesthesia and regional anaesthesia for ASA I to V, under supervision.
Demonstrate ability to give extradural block (EDB) lumbar and thoracic, Spinal Block, and Peripheral Nerve Blocks under supervision.
Demonstrate ability to use ultrasound machine for giving blocks and venous cannulation.
Demonstrate ability to plan and administer anaesthesia to all emergency patients under supervision including patients for Cardiac, Neurosurgery, Pediatric surgery and for all major surgeries, able to manage critically ill patients and treat intractable pain.

Demonstrate following abilities in Emergency Anaesthesia, Trauma and Resuscitation:

- Organize resources in case of mass casualty.
- Perform triage.
- Assess, transport and manage mass casualties / disaster management and camp anaesthesia.
- Manage massive haemorrhage and massive blood transfusion.
- Transport critically ill patient.
- Manage patients with severe burns rapidly progressing spinal compression, massive haemoptysis and lobectomy, peritonitis from various suspected causes, bowel obstruction, septicaemic shock, acute upper airway obstruction such as foreign body, epiglottitis, infections, cardiac tamponade rupture aneurysm of abdominal aorta
- Demonstrate ability to provide sedation /anaesthesia in special situations requirements outside operating Room, eg Radiology: for CT, MRI Onco radiotherapy, Modified electroconvulsive shock therapy, (modified ECT. non-invasive cardio-radiologic procedures including balloon angioplasty and cardiac catheterization, non-invasive neuro-radiologic procedures, lithotripsy etc.
- Demonstrate ability to analyze data and write a thesis, present scientific data, participate in anaesthesia audit.
- Demonstrate ability to review and acquire relevant knowledge from the journals about the new development in the specialty.
- Demonstrate following abilities in the **Post Anaesthesia Care Unit (PACU)** Assess the patient's recovery and condition for a safe discharge or transfer. Observe, recognize and treat the commonly occurring problems likely to arise in the Post-anaesthsia Care Unit (PACU) especially those in relation to cardio-respiratory systems:
    1. Airway integrity and compromise
    2. Arrhythmia
    3. Hypertension
    4. Hypotension
    5. Pain prevention and pain relief
    6. Nausea and vomiting
    7. Decreased urine output

8. Emergence delirium
9. Delayed emergence from anaesthesia
10. Shivering
11. Post-obstructive pulmonary edema.
12. Assess patient recovery and the parameters for transfer from the PACU to the ward, ICU, home.
13. Score the patient's condition according to the Aldrete system, including fast tracking after out-patient surgery.

Demonstration of following abilities in **Intensive Care Unit & Casualty**

- Understanding the spectrum of critical illnesses requiring admission to ICU.
- Recognizing the critically ill patient who needs intensive care -Trauma, burns, all types of shock, Sepsis, SIRS and ARDS, Poisoning, infectious patient (HIV, Hepatitis) and patients with metabolic disturbances
- Monitoring progress of patients by physiological scoring systems
- Practicing infection control practices and control of nosocomial infections.
- Inserting central venous lines, arterial lines using ultrasound and interpreting the data.
- Managing cardiovascular instability, respiratory failure and postoperative pulmonary complications
- Understanding of the operation of mechanical ventilators including different ventilatory modalities non-invasive ventilation, complications and modes of weaning.
- Principles and application of Oxygen Therapy
- Glycemic control in the critically ill patient
- Practice of Hypothermia and prevention of cerebral injury after cardiac arrest
- Delivering appropriate nutritional support - enteral and parenteral.
- Proper use of sedative/hypnotic drugs in the ICU.
- Practicing ethical and legal aspects of critical care

Demonstration of following abilities in Acute and Chronic Pain Management

- Assessment of patients with pain including: history taking, physical examination, and interpretation of investigations.
- Classify types of pain – acute, chronic, traumatic, cancer pain, etc. with the knowledge of Pain pathways in detail.
- Practice the different modalities of physical therapy that may relieve both acute and chronic pain
- Practice the acute pain, cancer pain guidelines and WHO treatment ladder.
- Practice routes of administration and risk/benefits of drugs used for acute and chronic pain relief, patient controlled analgesia and treat the common pain syndromes.
- Demonstrate practice of pain management in patients with drug dependency and addiction and identify the parameters for referral to a pain medicine specialist.
- Demonstrate organization of acute pain service and role of acute pain nurse for pain assessment in various groups of patients. physiological changes secondary to pain, practice different modalities of pain control, pharmacology and side effects of opioid

analgesia and non-opioid analgesia, principle of patient-controlled analgesia and assessment of its efficacy, Neurological assessment of epidural blockade and management of failed block. Management of regional blockade – brachial plexus, para-vertebral and intra-pleural block. Pain control in concurrent medical diseases – COAD, IHD, bleeding tendency, burns patients. Pain control in trauma patients included multiple rib fracture

- Management of **Chronic Pain** Practice different modalities of chronic pain management - physical therapy, psychotherapy, (including cognitive behavioural approaches), neuro-ablation, neuro-augmentation, spinal opioid, interventional neuro-blockade, non-opioid analgesia.
- Anatomy, indication, technique and complication of chemical sympathectomy (lumbar sympathectomy, stellate ganglion block, celiac plexus block).
- Practice principles of management of cancer pain, principle of management of non-cancer neuropathic pain - phantom limb pain, post-herpetic neuralgia, complex regional pain syndrome, trigeminal neuralgia. Principle of management of non-cancer nociceptive pain - myofascial pain, lower back pain, intractable angina, burns, chronic pancreatitis, PVD.
- Practice Epidural steroid injection (all levels) and long-term epidural catheterization.
- Observe and practice following blocks: Infra-orbital nerve, Intercostal nerve.
- Recognize complications associated with each blocks and know appropriate treatment of each
- Know the indications for stimulation techniques such as transcutaneous electrical nerve stimulation (TENS), dorsal column stimulation, and deep brain stimulation.
- Mechanisms and side effects of other therapies used for treating pain.
- The principles of pain management in special patient groups including the elderly, children, disabled, intellectually handicapped and those unable to communicate.
- Awareness of the principles for insertion and management of implantable drug delivery pumps.
- Awareness of the basic principles of palliative care.

Demonstrate practice of Regional Anaesthesia

- Applying general principles of pharmacology of local anaesthetics and various adjuvants.
- Familiarizing with the relevant anatomy for regional techniques.
- Application of indications and contraindications to regional anesthetic technique including central neuraxial blocks, peripheral nerve blocks and sympathetic nerve blocks.
- Assessing adequacy of regional anaesthesia, and learn techniques of supplementation of inadequate blocks.
- Providing effective anxiolytics and sedation of patients by both pharmacologic and interpersonal technique.
- Performing the following regional anaesthesia techniques:

- Brachial plexus, cervical plexus, stellate ganglion block, lumbar plexus, lumbar sympathetic, Sciatic nerve block, Femoral nerve block, 3 in 1 block, Wrist block, Popliteal Nerve block, Trigeminal nerve block, Retro bulbar blocks, Paravertebral blocks, Intercostal blocks, Caudal block – adult and pediatric, Ankle block, Epidural block/Catheter, Subarachnoid block, Bier's block, All peripheral nerves of the upper and lower limbs.

Demonstrate practice of Thoracic Anaesthesia

- Pre-operative assessment of patients undergoing Thoracotomy (lung resection), thoracoscopy, video assisted thoracoscopy and mediastinoscopy
- Various approaches and their relevant equipments for lung isolation.
- Various double lumen tubes and their placement.
- Application of principles of chest drain.
- Management of one lung ventilation (OLV). Indications, contraindications and hazards of OLV.

Application of the knowledge of Anatomy to learn

- Lung and broncho-pulmonary segments.
- Techniques for intercostals nerve block and thoracic epidural. Management of thoracic epidural anaesthesia and analgesia
- Techniques and placement of paravertebral block/catheter.
- Post-operative care of patients after lung surgery.
- Peri-operative management of patients with myasthenia gravis.
- Peri-operative management of patients with mediastinal mass.
- Anaesthetic management of mediastinoscopy, major airway stenting.
- Lung volume reduction surgery and problems.

Demonstrate practice of Cardiovascular Anaesthesia:

- hypotensive anaesthesia.
- Anatomy and physiology of all operable congenital heart disease like ASD, VSD, PDA, TOF, transposition of great vessels.
- Application of the knowledge of anatomy and physiology of vascular heart disease like co-arctation of aorta.
- Assessment of cardiac patient with ischaemic heart, valvular heart diseases Understanding of cardiac catheterization, echocardiography, stress testing, and radio-nucleide imaging.
- Application of knowledge of principles and management of complication of cardiopulmonary bypass
- Application of Principle of trans-esophageal echocardiography
- Application of Principle of circulatory support: inotropes, IABP, pacing
- Coagulation and management of coagulopathy.
- Off pump bypass

- Intra-operative management of aortic surgery and major peripheral vascular surgery, aneurysm grafts, recanalisation procedures.
- Understanding of the adult patient with congenital heart disease and their management during anaesthesia.
- Postoperative cardiac critical care, including cardiovascular problems, analgesia.
- Insertion of invasive monitoring for arterial monitoring, central venous pressure monitoring, pulmonary artery catheter insertion and interpretation.
- Robotic cardiac surgery.

Demonstrate practice of Paediatric Anaesthesia

- Application of knowledge of anatomical in paediatric and neonates in comparison with adult.
- Application of knowledge of physiology and pharmacology in paediatric patient.
- Guideline for pre-operative fasting in children and pre-medication.
- Anaesthetic equipment: laryngoscopes, airways, endotracheal tubes, LMAs, PLMA and breathing circuit for children.
- Anaesthesia management for premature and newborn.
- Management of emotional problems of parent and child and principles of premedication. Importance of consent by parents and their presence during induction. To become skilled in communicating with children, parents and other relatives.
- Understanding problems of transporting a sick pediatric patient from the ward to the operating room and back with regard to temperature maintenance, cardiovascular stability, ventilation and oxygenation.
- Estimate preoperatively blood volume, hourly fluid requirements, fluid deficit, third space loss, acceptable blood loss and apply principles of fluid, electrolytes, and blood replacement in the perioperative period.
- Understand the benefits, risks and techniques of regional anaesthesia in children. Anatomy and techniques of caudal, dorsal penile and inguinal regional block, spinal and epidural block
- Learn to recognize and treat post anaesthesia complications like apnea, laryngospasm, acid-base and electrolyte disturbances, febrile and convulsing child and bleeding child.
- Understand common problems related to common congenital syndromes presenting for surgery. Learn anaesthetic management of a child with concurrent disease – Down’s, Pierre Robin syndrome, von Willebrand’s disease, Goldenhar’s, Sturge-Weber, Tracher-Colin, Prune-Belly, and cyanotic and non-cyanotic congenital heart disease.
- Learn paediatric resuscitation: drugs, doses and defibrillation of children of all ages, from the very premature neonates to those children with complex coexisting disease.

- Learn management of patients requiring paediatric intensive care, ventilatory management, and support of circulation.
- Learn resuscitation of neonates and children of all ages.
- Learn paediatric pain management
- Learn assessment of a child with URTI
- Learn anaesthetic management of a malignant hyperthermia susceptible child.
- Learn anaesthetic management of FB bronchus, oesophagus, Wilm's tumour, congenital diaphragmatic hernia, tracheo-oesophagus fistula, thoracotomy.
- Learn anaesthesia for Fetal Surgery.
- Learn sedation techniques including the selection, management and monitoring of children for diagnostic and therapeutic procedures, with particular attention to working in areas outside the theatre suite.

Demonstrate practice of Transplant anaesthesia

- Application of knowledge of basic pathophysiology of renal and liver failure. Principles of anesthetizing an immuno-compromised patient.
- Principles of anesthetizing patient with end stage renal/liver disease and patient with organ transplantation. Perioperative management.

Demonstrate practice of Neuroanaesthesia

- Application of basic knowledge of cerebral circulation and intra cranial pressure and its implications
- Anaesthesia to patients with neurologic disease, head injury undergoing neurologic or non-neurologic surgery and for diagnostic procedures requiring anaesthesia.
- Learn anesthetic implications of the most common neurosurgical procedures, transnasal, trans-sphenoidal pituitary surgery, posterior fossa surgery, surgery for supratentorial pathology.
- Application of basic concepts for electrophysiologic monitoring of the brain and spinal cord.
- Application of knowledge of general principles of positioning the patient for surgery and the advantages and disadvantages of each position.
- Learn effects of anaesthesia on the electroencephalogram (EEG) and evoked potentials.
- Learn differential diagnoses and treatment alternatives of intraoperative intracranial hypertension ("tight brain")
- Learn management of Head Trauma, and its anesthetic management and various protocols regarding their management and associated trauma.
- Learn monitoring: techniques for detection and management of air embolism.
- Learn lumbar puncture and CSF drainage.
- Learn non-surgical management of the head trauma patient, Systemic complications of severe brain injury.
- Learn management of subarachnoid haemorrhage and vasospasm.

- Learn diagnosis and management of patients with brainstem death; and dealing with patient's relatives.

The following are special procedures which the post graduate student must be able to perform

Sr. No **Name of procedure**

1. Blind Nasal intubation
2. Failed intubation drill (includes Fiberoptic Laryngo/ Bronchoscope)
3. Double Lumen Tube
4. Bronchial Blocker placement
5. Jet Ventilation
6. Suctioning and physiotherapy of wet lung
7. Intubation in Neonates
8. Initiation and management of ventilation
9. Combined Spinal Epidural
10. Brachial Plexus Block
11. Intravenous Regional Anaesthesia
12. Elbow, Wrist, Digital, Sciatic, Femoral, Lateral Cutaneous Nerve of thigh, Ankle – each
13. Cervical plexus(Superficial and Deep), Stellate ganglion and Splanchnic plexus – each
14. Central Venous Line by Brachial, Jugular and Subclavian veins
15. Radial and Femoral Artery Cannulation
16. CVP monitoring
17. Pulmonary Capillary Wedge Pressure
18. Neuro-muscular transmission Monitoring
19. Anaesthetic Depth eg. BIS monitoring

Demonstration of anesthetic abilities in the intraoperative period keeping in consideration the specific requirement of the surgical procedure – ENT, Orthopaedic, Gynaecology – Obstetrics, General surgery, Oncosurgery, replacement surgeries, urosurgery, vascular, plastic, Thoracic, Dental etc

The table indicates the procedures that the student should, by the end of the course, be able to perform independently (PI) by himself / herself, should have performed with assistance (PA) should have observed (O) or assisted (A) during the course.

Operative Skills

Skills may be considered under the following headings:

1. Basic Clinical Skills.
2. Anaesthesia Procedures.
3. Critical Care Procedures.
4. Emergency Room Procedures.
5. Pain Alleviation Procedures.

6. Special Monitoring Techniques.

1. Basic clinical Skills:

The student should have acquired certain skills during his undergraduation and internship. These skills have to be reinforced at the beginning of the training period. These include;

Procedure	Category	Year	No
Recording of vital signs	PI	I	150
Insertion of intravenous lines	PI	I	100
Insertion of nasogastric tubes	PI	I	50
2) Anaesthesia Procedures:			
Airway Insertion			
Oropharyngeal	PI	I/II/III	50/100/100
Nasopharyngeal	PI	I/II/III	25/25/35
Intubation			
Orotracheal intubation	PI	I/II/III	25/50/100
Nasotracheal Intubation	PI	I/II/III	25/25/25
Endobronchial (double lumen tube)	PA	II/III	02/05
Retrograde intubation	O	II/III	02/02
Fiber optic intubation	PA	II/III	02/02
LMA			
LMA insertion	PI	I/II/III	25/25/25
Intubating LMA	PI	II/III	02/05
Regional blocks			
Subarachnoid block	PI	I/II/III	50/100/100
Epidural block	PI	I/II/III	15/25/50
Caudal block	PI	I/II/III	05/10/15
Brachial plexus block	PI	II/III	05/10
Wrist block	PI	II/III	02/05
Ankle block	PI	II/III	02/05
Popliteal block	PI	II/III	02/05
Intravenous Regional Analgesia	PI	II/III	05/10
Three in one block	PI	II/III	02/05
Rectus sheath block	PA	II/III	02/02
Hernia block	PI	II/III	05/10
Anaesthetic procedures			
Major anaesthesia procedures	PA/PI	I/II/III	50/100/150

Minor anaesthesia procedures	PA/PI	I/II/III	50/100/200
3) Critical Care Procedures:			
Insertion of arterial lines	PI	II/III	05/05
Insertion of central venous lines	PI	II/III	05/15
Intercostal drainage	O	II/III	05/05
Tracheostomy	O	III	10
Ventilatory management of patients	PI	II/III	10/25
Sampling for and interpretation of arterial blood gases (ABG)	PI	II/III	10/50
Correction of electrolyte imbalance	PI	II/III	10/50
Fiber Optic Bronchoscopy	O	III	10
Cricothyrotomy	O	III	10
Insertion of pulmonary artery catheter	O	III	05
4) Emergency Room Procedures:			
Management of airway obstruction	PI	II/III	10/25
Management of shock	PI	II/III	10/25
Management of respiratory failure	PI	II/III	05/10
Management of cardiac failure	PI	II/III	02/05
Cardio Pulmonary Resuscitation (CPR) Basic Life Support and Advance Cardiac Life Support	PI	II/III	05/15
5) Pain Alleviation Procedures:			
Acute pain management			
Chronic pain management			
Postoperative pain management	PI	II/III	50/100
Labour analgesia	PI	II/III	10/15
Under Radiographic Guidance			
Stellate ganglion block	PA	III	02
Coeliac ganglion block	PA	III	02
Trigeminal nerve block	PA	III	02
Neurolysis and other nerve ablation Procedures including	PA	III	02
Ultrasound guided nerve blocks			
TENS	PI	II/III	02/02
6) Special Monitoring Techniques			
Bi-Spectral Index (BIS)	O	II/III	05/05
Nerve stimulator	PA	II/III	05/05
Invasive Blood Pressure monitoring (IBP)	PA	II/III	05/05

Pulmonary Artery Pressure monitoring (PAP) O	II/III	05/05
Central Venous Pressure monitoring (CVP) PA	II/III	05/05
Trans Esophageal Echocardiography (TEE) O	II/III	05/05

Year Wise Structured Training Schedule

First Year:

I. **During the first 3 months**

a) Basic sciences related to Anaesthesia Theoretical knowledge of Anatomy & Physiology
b) Special emphasis on clinical examination of patients, learning clinical methods, arriving at correct diagnosis.
c) Pre anaesthetic evaluation under supervision.
d) Choosing a topic for dissertation, submission of synopsis to the University, collection of literature, conduct pilot studies.

The students attend a P G orientation program during the second month, where in they will be taught, application of statistics , communication skills, how to select a topic for research and do the research work (for dissertation),sterilization of equipments used in operation theatres, ICUs and anaesthesia equipments and usage of library resources and e-learning &biomedical waste management.

II. **Other topics** -- The student should be taught expertise in the management of uncomplicated cases not belonging to any super specialty (ASA I and II cases). To start with, the student will observe and slowly become independent in giving general anaesthesia and spinal aneasthesia to ASA I and II cases for minor and major surgery, under graded supervision.

The postgraduate student should learn the basic principles of safe and effective anaesthesia, resuscitation, and both the prevention and treatment of pain, perioperative care of the surgical patient, care of handling equipments, basic techniques in anaesthesia, and anaesthetic pharmacology, and electrical safety.

Skills to be learnt in the first year are

1. Cardiopulmonary brain resuscitation(CPBR)
2. Basic life support & Advanced cardiac life support
3. Anaesthesia skills, including
    a) Setting up of Anaesthesia machine, monitors & Ventilators.
    b) Assisting the conduct of anaesthesia for major surgeries

c) Initially Assisting the conduct of anaesthesia for minor surgeries and conducting it independently later on.
d) Conduct of anaesthesia in out patient department.
e) Learn about management of complications of Anaesthesia & their proper management.
f) Learn monitoring of patients throughout perioperative period. Become skilled in using and interpreting the following routine noninvasive monitors intraoperatively
   i. Electro Cardiography (ECG) with ST segment analysis
   ii. Non Invasive Blood Pressure monitoring (NIBP)
   iii. Capnograph: values and changes in waveform
   iv. Pulse oximetry: values and changes in waveform
   v. Neuromuscular blockade monitor

4. Assisting setting up of anaesthesia machine, monitor and ventilator.
5. Assisting the conduct of anaesthesia for major surgeries.
6. Conduct of anaesthesia in Out Patient Department (OPD) under supervision
7. Cardio Pulmonary brain Resuscitation (CPBR) training and learning Basic Life Support (BLS) and Advanced Cardiac Life Support (ACLS).

III. **Dissertation:** Choosing a topic of dissertation, submission of synopsis to the university, collection of literature, conduct of pilot studies.

Second Year:

1. To gain theoretical knowledge of allied subjects, subspecialties of anaesthesia. Assisting senior anesthesiologists in specialized branches like pediatric surgery, cardio thoracic surgery, critical care trauma, Neurosurgery etc.
2. Learn anaesthetic Skills:

- Anaesthetizing patients without assistance but under supervision.
- Identifying the complication of anaesthesia and manage them independently but under supervision.
- Setting up of anaesthesia machine, monitor and ventilator independently.

3. Conference and Workshops: attending one state level and one national level conference/CME and presentation of a scientific paper.
4. Dissertation: Carrying out of the dissertation study work, periodic reviews, and interaction with guide. Organization of the data, writing the manuscript of dissertation at end of 2nd year.

The student should be actively involved in presentation of seminars, journal clubs, and case presentation/discussions. The student should widen his experience and should be able to undertake anaesthetic care of all routine cases, assist in the anaesthetic care for routine obstetric practice, understand basic principles of critical care, pain management, and participate in audit.

The student should be trained in administration of general anaesthesia and regional anaesthesia for ASA I to V under supervision. The student should be able to give extradural block (EDB) lumbar and thoracic, Spinal Block, and Peripheral Nerve Blocks under

supervision, and use of Ultrasound machine for giving blocks and venous cannulation. The student should learn adult and paediatric trauma life supports and maintain skills for basic and advanced cardiac life support.
It is advised that they should be posted in the following specialties: general surgery including gastrointestinal surgery, transplant, ENT, Urology, Obstetrics, Dental Surgery, Eye, ICU, Pain Clinic and peripheral theatres like ECT, radiodiagnostic and therapeutic procedures (CT scan, MRI scan, angiography).
The student should be able to analyze data and write a thesis. He/she should be able to present scientific data.

Third Year:

1. The student should be well versed with basics, allied subjects and recent advances in the respective fields.
2. Anaesthesia Skills: At the end of the 3rd year the candidate should be able to make independent decisions as regards anaesthesia, pain management and post operative care of all kinds of patients.
3. Teaching Activities: Final year student should take lead in conducting seminars, journal clubs, case discussions, panel discussions with I and II year students. The third year students should also involve in teaching undergraduate students specially bedside clinics.
4. Dissertation: The completed dissertation must be submitted to the University, 6 months before the notified date of examination.

The student must get expertise in the specialized procedures as noted in the course content table. The post graduate student should be given experience of various super-specialties like cardiothoracic and vascular surgery, neurosurgery and transplantation, and paediatric surgery. The student should be able to plan and administer anaesthesia to all emergency patients under supervision including patients for Cardiac, Neurosurgery, Pediatric surgery, and for all major surgeries. The aim at the end is to be competent and independent soon after the third year of junior residency in providing anaesthesia to elective and emergency cases.

The post graduate student should be able to manage critically ill patients and treat intractable pain. They should also know how to organize resources in case of mass casualty. The curriculum should be able to provide a minimum of 04 months of elective Intensive Care Unit posting. (2 months during initial years under supervision and 2 months independently in the last six months).

At the end of 3 years, the post graduate student should have the skills to:
Plan and conduct anaesthesia and provide post-operative care including pain relief for elective and emergency surgical procedures related to all surgical specialties.
Carry out basic life support (BLS) and advanced life support (ALS) and train medical and paramedical staff in BLS and ALS.
Manage patients admitted to an intensive care unit with the help of latest equipment.

Manage patients suffering from acute and chronic intractable pain.
Organize the hospital environment to manage mass casualty situation and camp anaesthesia.
Critically review and acquire relevant knowledge from the journals about the new development in the specialty.
Should be able to participate in anaesthesia audit.
Overall the student should acquire skills in the information management in preoperative evaluation and outcome enhancement.

Syllabus

The course content of **1st year** should cover the following:

1. **Anatomy related to:**

   Diaphragm, upper and lower airway

   Regional anaesthesia, field block, central neuraxial blockade, block for acute pain states

   Intramuscular injections, arterial and venous cannulations and positioning.

2. **Physics related to:**

   Anaesthesia machine - assembly of necessary items.
   Airway equipment including laryngoscopes, airway devices Breathing systems
   Monitoring in anaesthesia with concepts of minimum monitoring Gas laws, medical gas supply system
   Fluidics
   Electricity and diathermy
   Oxygen therapy

3. **Physiology related to:**

   Theories of anaesthesia
   Respiratory, cardiovascular, hepatobiliary, renal and endocrine system, pregnancy, blood, muscle and N-M junction, Nerve impulse transmission, ECG, regulation of temperature and metabolism, stress response, cerebral blood flow and ICP.

   Central, autonomic and peripheral nervous systems. Metabolic response to stress and trauma.

4. **Pharmacology related to**

   General principles, concepts of pharmacokinetics and pharmacodynamics Drug interactions in anaesthesiology with the other drugs taken concomitantly by the patient and anaphylactoid reactions commonly used drugs in anaesthesia practice (premedication, preinduction agents, Intra-venous and inhalational, neuromuscular blocking agents and reversal of muscle relaxants, Local Anaesthetics and opioids).

5. **Biochemistry** relevant to fluid balance and blood transfusion, perioperative fluid therapy, acid base homeostasis in health and diseases.

6. Theoretical background of the commonly used anaesthetic techniques of general and regional anaesthesia, general principles of pre-anesthetic assessment and medication, recovery from anaesthesia and post operative care, effects of positioning during anaesthesia.
7. Introduction to the operation theatre, post-anaesthesia care rooms
8. Introduction to acute, chronic pain and pain management.
9. Documentation and medico-legal aspects of anaesthesia. Defensive anaesthesia. Concept of informed consent.
10. Resuscitation - basic and advanced life support (cardiac and trauma life support), neonatal resuscitation.
11. Intensive care of critical patients with introduction to artificial ventilation, management of unconscious patients, oxygen therapy, shock - pathophysiology and management.
12. Introduction to Research methodology, basics of biostatistics.

The course content of **2nd year** should cover the following:
Anatomy related to blocks for chronic pain, chemical neurolysis and different organ systems.

1. **Physics related to:**

   Equipments used in anaesthesia monitors, ventilators, vaporizers, fibroptics. Laser

   Pacemaker and defibrillator

   Monitoring equipment used for assessment of cardiac functions, temperature, respiratory functions, blood gases, intracranial pressure, depth of anaesthesia and neuromuscular block.

   Sterilization of equipment.

   Computers in anaesthesia
2. Pharmacology of drugs used in cardiovascular, respiratory, endocrine, renal diseases and CNS disorders.
3. Interpretation of blood gases and other relevant biochemical values, various function tests and basics of measurement techniques, ECG.
4. Blood coagulation mechanism, disturbances, blood components.
5. Special anaesthetic techniques as relevant to – Outpatient anaesthesia, hypotensive anaesthesia, anaesthesia in abnormal environments including rural area and calamitous situations
6. Geriatric and pediatric anaesthesia
7. Emergency, ENT, orthopedic, ophthalmology, obstetrics, dental, radio-diagnosis and radiotherapy.
8. Medical statistics relevant to data collection, analysis, record keeping in anaesthesia, comparison and estimation of significance.
9. Care of terminally ill, Hospices management. Do not resuscitate orders.
10. Postures and anaesthesia.
11. Induced hypothermia, incidental, environmental safety of patient.

12. Malignant hyperthermia, myasthenia gravis, GB syndrome and other neuromuscular diseases, obesity, COPD, Diabetes mellitus, bronchial asthma and hypertensive crises..
13. Third world anaesthesia.
14. Inherited metabolic diseases and anaesthesia.

The course contents of **3rd year** should cover the following:

1. Principles of anaesthetic management of neuro/cardiac/thoracic/vascular/ transplantation/burns and plastic surgery.
2. Anaesthesia for patients with severe cardiac, respiratory, renal and hepatobiliary disorder posted for unrelated surgery
3. Shock, types, pathogenesis and management of patients in shock, renal failure, critically ill and/or on ventilator.
4. Multiple organ failure
5. Infection control, cross contamination in OT and ICU.
6. Immune response and anaesthesia.
7. Concept of cytokines, and other enzymes.
8. Selection, maintenance and sterilization of anaesthesia and related equipment
9. Chronic pain therapy and therapeutic nerve blocks.
10. Acupuncture, acupressure and other non-conventional methods of treatment.
11. Principles of neonatal resuscitation, ventilation and critical care.
12. Principles of human resources and material management.
13. General principles of medical audit. Critical incident reporting
14. Ethics and clinical trial.
15. Hospital, ICU and OT design and planning.
16. Medical education including evidence based medical education.

IV. TEACHING AND LEARNING ACTIVITIES

A candidate pursuing the course should work in the institution as a full time student. No candidate should be permitted to run a clinic/laboratory/nursing home while studying postgraduate course. Each year should be taken as a unit for the purpose of calculating attendance.

Every student shall attend teaching and learning activities during each year as prescribed by the department and not absent himself/herself from work without valid reasons.

A list of teaching and learning activities designed to facilitate students acquire essential knowledge and skills outlined, is given below.

A. Theoretical Teaching

1. Lectures:

a) Didactic lectures/ interactive lecture

One lecture in a week out of which is one integrated teaching in a month. Selected topics are discussed in these interactive theory classes.

b) **Integrated teaching** (Lecture): One Integrated teaching every month (Horizontal) to be employed.

2. **Journal Club:** Recommended to be held as per the norms of the Medical Council of India (MCI) rules. All the postgraduate students are expected to attend and actively participate in discussion and enter in the logbook relevant details. Further, every candidate must make a presentation from the allotted journal(s) and relevant points in the logbook during his/her course. The presentations would be evaluated using checklists and would carry weightage for internal assessment (as per annexure). A timetable with names of the students and the moderator should be announced at the beginning of every year.
3. **Subject seminar:** Recommended to be held as per the norms of MCI rules. All the postgraduate students are expected to attend and actively participate in discussion and enter in the logbook relevant details. The presentations would be evaluated using checklists and would carry weightage for internal assessment (as per annexure). A timetable for the subject with names of the student and the moderator should be scheduled at the beginning of every year.
4. **Case Discussion:** Recommended to be held once a week. All the post graduate students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. The presentations would be evaluated using check lists and would carry weightage for internal assessment (as per annexure). A time table for the case presentation with names of the students should be announced in advance.
5. **Pro & Con -** There will be one "Pro & Con" session per month where in controversial topics are taken up by the Post Graduate students for discussion.
6. **How I do it?-** An interesting and intriguing hypothetical clinical scenario is taken up for discussion , once in a month .
7. **Roleplays, videos, cinemeducation**. -The communication skills will be taught by using these tools and will be assessed by 'two minute paper'. This activity will be conducted once in six months.
8. **Ward Rounds:** May be service rounds or teaching rounds.
    a) Service Rounds: Postgraduate students should do ward rounds every day.
        i. For pre anaesthetic evaluation of the patients posted for operation.
        ii. And to do the post anaesthetic follow up of operated patients for alleviation of post-operative pain and for diagnosis and management if any of the post-operative sequelae.
    b) Teaching Rounds: Every unit will conduct grand round for teaching clinical methods and pre anaesthetic evaluation.
    Entries of (a) and (b) should be made in the logbook.
    c) Hands-on training in performing various procedures.
    d) Exposure to newer specialized diagnostic/therapeutic procedures.
9. **CPC/Critical Incidents meetings:** The meeting is held once in a month and the management and outcome of critical cases discussed. The post graduate students involved in the anaesthetic management will present the cases one after the other.

10. **Teaching skills:** Postgraduate students must teach undergraduate students (e.g. medical, paramedical, nursing) by taking demonstrations, bedside clinics, tutorials, lectures etc. Assessment is made using a checklist by faculty. Record of their participation should be kept in the logbook. Training of postgraduate students in educational technology is recommended.
11. **Continuing Medical Education Programme (CME):** At least one state / national level CME programme should be attended by each student in three years.
12. Reviews and guest lectures
13. **Conferences:** Attending conferences, participation and presentation of scientific paper should be encouraged.
14. **Research Activities:** The Post-graduate students are to be encouraged to carry out research activities in the department other than dissertation work.
15. **Student Symposium:** Recommended as an optional multi disciplinary program. The evaluation may be similar to that described for subject seminar.
16. **Scientific research society Meetings:** Attending SRS meetings and actively participating in them.
17. **Participation in state/ National conferences:** A "Post –Graduate of PG course in broad specialities/ Super specialities would be required to present one poster or oral presentation at a National/ State Conference and one research paper which should be published / accepted for publication /sent for publication during the period of his post –graduate studies, so as to make him eligible to appear at the post-graduate degree examination.
18. Department should encourage e-learning activities.

Schedule of students postings in OT: This may change as per availability of specialities.

Operation theatre	**Months**
General Surgery	6
Urology	1
Ophthalmology	1
Otorhinology	2
Dental	1
Orthopedics/Trauma/casualty	3
Gynecology	3
Obstetrics	3
Pediatrics surgery	2
Burns/Plastic	1
CTVS	1

Neurosurgery	1	
Casualty Posting	--	2 weeks
Anaesthesia for investigative procedure like CT & MRI Scan, Lithotripsy,	--	2 weeks
ICU	4	
Pain	1	
Recovery	1	
Organ Transplant	(Radiology,Radiotherapy)	
posting in the other areas.		

B. Rotational Postings in other departments: (Subject Wise)

The listed knowledge and skills are to be learnt over a period of 3 years. The process is a continuous one. However the recommended period and timing of training in basic sciences, allied departments and speciality departments are given below.

Basic Sciences:

Rotation in these departments viz., Anatomy, Physiology, Pharmacology etc. are to done as concurrent studies during the 1st year of training. Basic Science relevant to anaesthesia can be studied in the respective departments in the afternoons.

Anatomy: Special emphasis for the dissection of larynx, trachea, heart, various nerves and plexuses.

Physiology: Thorough revision of all the systems, in particular Cardio Vascular System and Respiratory System.

Pharmacology: Drugs used in anaesthesia and drugs used for management of systemic disease and drug interactions.

Allied Speciality: Students should be posted to Intensive Care Unit (ICU), Intensive Coronary Care Unit (ICCU), Surgical Intensive Care Unit (SICU), Pediatric ICU (PICU, NICU), Trauma unit and pain clinic during 2nd year of training for two weeks in each, for total duration of two months.

V. OTHER CRITERIA TO BE FULFILLED

1. Internal evaluation

Periodic tests During the course of three years, the department will conduct six written tests. One test per term.

The sixth test will be preliminary examination which will be held three months before the final examination. The test may include the written papers, practicals / clinicals and viva voce.

Direct observation of the procedural skills (DOPS) shall be done, once in six months for assessment of Practical skills.

Records and marks obtained in such tests will be maintained by the head of the department and will be sent to the university when called for .Results of all evaluations should be entered into PG's diary and departmental file for documentation purposes. Main purpose of periodic examination and accountability is to ensure clinical expertise of students with practical and communication skills and balance broader concept of diagnostic and therapeutic challenges.

2. **Maintenance of Log Book**:

Every candidate shall maintain a Log book/work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any, conducted by the candidate. All the procedures performed by the post graduate students should be entered in the Log book. All the daily activities including the ward rounds and the routine procedures performed on day to day basis should be entered in the Log book and it should be verified and signed by the faculty member. The Log book shall be scrutinized and certified by the Head of the Department and presented in the University practical / clinical examination.

Format for the log book for the different activities is given in Tables 1, 2 and 3 and Check lists I to VII has been enclosed as a annexure

Monitoring progress of studies

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 is be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and the assessment will be done using checklists that assess various aspects.

The learning out comes to be assessed include: (i) Personal attitudes, (ii) Acquisition of knowledge, (iii) Clinical and operative skills, (iv) Teaching skills and (v) Dissertation.

i. **Personal Attitudes:** The essential items are:

- Caring attitudes
- Initiative
- Organizational ability
- Potential to cope with stressful situations and undertake responsibility
- Trust worthiness and reliability

- To understand and communicate intelligibly with patients and others
- To behave in a manner which establishes professional relationships with patients and colleagues
- Ability to work in team
- A critical enquiring approach to the acquisition of knowledge

The methods used mainly consist of observation. It is appreciated that these items require a degree of subjective assessment by the guide, supervisors and peers.

ii. **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.

iii. Clinical skills

Day to Day work: Skills in outpatient and ward work should be assessed periodically. The assessment should include the candidates' sincerity and punctuality, analytical ability and communication skills (see Model checklist III).

Clinical meetings: Candidates should periodically present cases to his peers and faculty members. This should be assessed using a check list (see Model checklist IV).

Clinical and Procedural skills: The candidate should be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by direct observation. Particulars are recorded by the student in the log book. (Table No.3)

iv. **Dissertation*:*** This is an essential criterion towards the fulfillment of MD course .Periodic presentations are to be made in the department. Initially the topic selected is to be presented before submission to the University for registration, again before finalization for critical evaluation and another before final submission of the completed work (see Model checklist VI and VII).

The postgraduate is responsible to a Faculty member and the latter should be available to advise and assist the student in his clinical assignments.

Departmental teaching committee will be responsible for the educational activities of the department and the teaching schedule.

During the training programme, patient safety is of paramount importance; therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently; for this purpose, provision of skills laboratories in medical colleges is mandatory.

Simulators:

Simulators should be used for the events of high importance but infrequent occurrence and where there may be high risks to the patients. The simulators can also be used for assessment purposes.

v. **Work diary / Log Book** - Every candidate shall maintain a work diary and record his/her participation in the training program 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 clinical or laboratory procedures, if any conducted by the candidate. The work diary shall be scrutinized and certified by the Head of the Department and Head of the Institution, and presented in the university practical/clinical examination.

vi. **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 or MCI.

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 she/he fails to fulfill the requirements in spite of being given adequate chances to set himself or herself right.

vii. **Dissertation**:

Every candidate shall carryout work and submit a Dissertation as indicated above. Acceptance of dissertation shall be a precondition for the candidate to appear for the final examination.

SCHEME OF EXAMINATION

There shall be at least four examiners in each subject. Out of them two shall be external examiners and two shall be internal examiners. The qualification and teaching experience for appointment as an examiner shall be as laid down by the Medical Council of India.

Criteria for declaring as pass in University Examination: A candidate shall secure not less than 50% marks in each head of passing which shall include (1) Theory, (2) Practical/clinical and (3) viva voce examination. The candidate should pass independently in practical/clinical examination and Viva Voce: vide MCI pg 2000 Reg no 14(4) (Ciii)

Obtaining a minimum of 40% marks in each theory paper and not less than 50% cumulatively in all the four papers for degree examinations and three papers in diploma examinations is mandatory to pass the examination. Obtaining of 50% marks in Practical examination shall be mandatory for passing the examination as a whole in the said degree/diploma examination as the case may be.[amendment of MCI PG Regulations clause 14 dated 5.4.2018]

A candidate securing less than 50% of marks as described above shall be declared to have failed in the examination. Failed candidate may appear in any subsequent examination upon payment of fresh fee to the Controller of Examinations.

Declaration of distinction: A successful candidate passing the University examination in first attempt will be declared to have passed the examination with distinction, if the grand total aggregate of marks is 75 percent and above.

Distinction will not be awarded for candidates passing the examination in more than one attempt.

A. **Theory Examination:**

Written examination shall consist of four question papers each of three hours duration. Each paper shall carry 100 marks. Out of the **four** papers, the 1st paper in clinical subjects will be on applied aspects of basic medical sciences and 4th paper on Recent advances, which may be asked in any or all the papers. In basic medical subjects and para-clinical -subjects, questions on applied clinical aspects should also be asked.

Note: The distribution of chapters / topics shown against the papers are suggestive only and may overlap or change.

Total marks for each paper will be 100.

Type of Questions	Number of Questions	Marks for each question	Total Marks
Long essay	2	20	40
Short essay	6	10	60
GRAND TOTAL			100

Paper I: Basic Science as applicable to Anaesthesia. 100 marks

1. Applied Anatomy.
2. Applied Physiology.
3. Applied Pharmacology.
4. Applied Physics.
5. Applied Biochemistry.
6. Patho Physiology.
7. History
8. Equipments.

Paper II: Clinical Practice of Anaesthesia. 100 marks

1. Cardio Vascular System.
2. Respiratory System.
3. Neuro Surgery.
4. Obstetrics and Gyanecology
5. Orthopaedics.

6. Ophthalmology.

Paper III: Clinical Practice of Anaesthesia. 100 marks

1. Pediatrics.
2. Renal and Hepatic system.
3. Endocrines.
4. Haemopoietics.
5. Geriatrics
6. E.N.T.
7. Out Patient Anesthesia and Dental Anaesthesia.
8. Nerve Blocks.

Paper IV: Applied Medicine in Relation to Anaesthesia. 100 marks

Theoretical Aspects of pain and pain relief including postoperative and cancer pain. Intensive Care Medicine, and Recent advances.

Practical / Clinical Examination:

In case of practical examination, it should be aimed at assessing competence and skills of techniques and procedures as well as testing students ability to make relevant and valid observations, interpretations and inference of laboratory or experimental work relating to his/her subject.

In case of clinical examination, it should aim at examining clinical skills and competence of candidates for undertaking independent work as a specialist. Each candidate should examine at least one long case and two short cases minimum. However additional assessment methods can be adopted which will test the necessary competencies reasonably well.

The total marks for Practical / Clinical examination shall be 300.

E. Clinical Examination: 300 marks

- To elicit competence in clinical skills and to discuss differential diagnostic and therapeutic aspects.
- To elicit ability to plan preanaesthetic, preoperative and post anaesthetic care of the patients

Types of Cases	No of Cases	Marks
Long case	1	150
Short Cases	2 (75 marks each)	150
Total	3	300

F. Viva Voce: Examination: 80 + 20 =100

Examination shall aim at assessing depth of knowledge, logical reasoning, confidence and oral communication skills.

The total marks shall be 100:

- 80 Marks, for examination of all components of syllabus
- 20 Marks for Pedagogy- Candidate is asked to make a presentation for 8-10 minutes on a topic given in the beginning of clinical examination -10 marks.

1. Viva-Voce examination – (80 marks)

Viva Voce should be conducted preferably on four tables with one examiner on each table:

Table one: ECG, X-rays, ABG Cards, Pulmonary function tests, Capnographs, clinical exercises card.

Table two: Anaesthetic Drugs, Emergency Drugs, IV Fluids, Nerve Bocks (skeleton).

Table three: Anaesthesia machine including circuits and Vaporizers, ETT, Supraglottic Airway devices, ICU Ventilator and oxygen therapy equipment.

Table four: Resuscitation equipments, resuscitation demonstration, Difficult Airway Equipment, monitoring equipments.

2. Pedagogy Exercise – (20 marks)

   Candidate is asked to make a presentation for 8-10 minutes on a topic given in the beginning of clinical examination.

Table showing maximum marks:

Maximum marks	Theory	Practicals/Clinics/Viva		Grand Total
MD Anaesthesiology	400	Practical	Viva	800
		300	100	

Recommended Books (Latest editions): (the following list is not exhaustive. Addition and deletion will be done as need arises)

Books (latest edition)

1. Lee's Synopsis of AnaesthesiaG.B.Cashman, N.J.H Davies, 2006, 13th Butterworth-Heinemenn.
2. Clinical Anaesthesiology G.E.Morgan M.S.Mikhail 2018, 6th, McGraw-Hill
3. Cardiac Anesthesia Kaplan 2009, 5th, W. B. Saunders & Co.
4. Anesthesia and Coexisting DiseaseR. K. Stoelting S.F. Dierdorf 2012, 4th, Churchill Livingstone.
5. Textbook of Anaesthesia by Aitkenhead Rowbotham and Smith. 4th ed
6. Anaesthesia for neonates and infants by Smith;6th ed
7. Pharmac. & Physiology in Anaesthetic Practice - R. K Stoelting, S.C.Hillier 2006, 4th, Lippincott-Raven.
8. Principles of Obstetric Anaesthesia by Craford

9. AnaesthesiaMiller Ronald D. 2015, 8th, Elsevier Churchill Livingstone.
10. ICU Book, Paul Marino; 2012
11. Clinical Application of Mechanical VentilationDavid W. Chang 2001, 2nd, Delmar-Thomas Learning
12. Text Book of Critical Care, by Fink et al
13. Practical Management of Pain, P Prithviraj; 1st ed
14. Understanding Anaesthesia EquipmentJerry A. Dorsch, Susan E. Dorsch 2008, 5th, Williams & Witkins.
15. Wards Anaesthesia EquipmentsDavey 2005, 5th, Baillirro Tindall
16. ECG by Shamroth/Goldman
17. Anatomy for AnaesthetistsHarold Ellis Stanley Fieldman 2005, 8th, Blackwell Science.
18. Clinical Anesthesia by P.G.Barash
19. Shnider and Levinson's Anesthesia for ObstetricsHughes Levinsons Rosen 2002, 5th, Lippincott Williams & Wilkins.
20. Nunn's Applied Respiratory Physiology / A B Lumb and J F Nunn - 6 th ed - Oxford : Elsevier-Butterworth Heinemann, 2005
21. Yao and Artusio's AnesthesiologyFun-Sun F.Yao 2012, 7th, Lippincott Williams & Wilkins.
22. Wylie & Churchill Davidson's – A practice of AnaesthesiaThomas E. Healy Paul R. Knight 2003, 7th, Arnold.
23. Anesthesia and Uncommon DiseaseFleisher 2012, 5th, Saunders Elsevier.
24. Paediatric Anaesthesia Gregory 2012, 4th, Churchil Livingstone.
25. Thoracic Anesthesia – Kaplan 2003, 3rd, Churchil Livingstone.
26. "Recent Advances in Anaesthesia and Analgesia" Last two Editions: Mosby Publications.
27. Oh's Intensive Care Manual / ed by A D Bersten, N Soni and T E Oh - 5 th ed : Butterworth Heinemann, 2003
28. Textbook of Medical Physiology / A C Guyton & J E Hall - 11 th ed - Philadelphia : Elsevier-Saunders, 2005
29. Clinical practice of Cardiac Anaesthesia by Temple DK.
30. A practical approach to regional anaesthesia; Mercharl EM,Christopher Bernards,4th ed.
31. Anaesthesia for Ear, nose, throat. Morrison JD; 2nd ed.
32. Basic and Clinical Biostatistics / B Dawson-Saunders and R G Trapp – 4th ed – New York : McGraw-Hill, 2004
33. Statistical methods for anaesthesia and intensive care / P S Myles and T Gin - Oxford : Butterworth-Heinemann, 2001
34. Geriatric Anaesthesiology. Charles H Melesky
35. Atlas of Ultrasound guided regional Anaesthesia; Gray; 2nd ed

Must refer:

1. Cucchiara and Michenfelder: Clinical Neuroanaesthesia
2. Cottrell and Smith: Anaesthesia and Neurosurgery
3. Complications in Anaesthesiology by Orkin

4. Complications in Anaesthesia by Raven
5. Airway management by JL Benumof
6. Obstetric Anaesthesia by Chestnut

ADDITIONAL READING

1. Indian Council of Medical Research, "Ethical Guidelines for Biomedical Research on Human Subjects", I.C.M.R, New Delhi, 2000.
2. Code of Medical Ethics framed under section 33 of the Indian Medical Council Act, 1956. Medical Council of India, Kotla Road, New Delhi.
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4. Indian National Science Academy, Guidelines for care and use of animals in Scientific Research, New Delhi, 1994.
5. Internal National Committee of Medical Journal Editors, Uniform requirements for manuscripts submitted to biomedical journals, N Engl J Med 1991; 424-8
6. Kirkwood B R, Essentials of Medical Statistics, 1st Ed., Oxford: Blackwell Scientific Publications 1988.
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8. Compendium of recommendations of various committees on Health and Development (1943-1975). DGHS, 1985 Central Bureau of Health Intelligence, Directorate General of Health Services, min. of Health and Family Welfare, Govt. of India, Nirman Bhawan, New Delhi. P - 335.
9. National Health Policy, Min. of Health & Family Welfare, Nirman Bhawan, New Delhi, 1983
10. Srinivasa D K etal, Medical Education Principles and Practice, 1995. National Teacher Training Centre, JIPMER, Pondicherry

VIII. **Recommended Journals**

1	Anaesthesia
2	Journal of Anesthesiology Clinical Pharmacology
3	Anesthesia and Analgesia
4	Anesthesiology
5	Indian Journal of Anaesthesia
6	Canadian Journal of Anaesthesia
7	British Journal of Anaesthesia
8	Acta Anaesthesiologica Scandinavica
9	Current Opinion in Anesthesiology
10	European Journal of Anesthesiology
11	International Anaesthesiology Clinics

12 Journal of Clinical Monitoring and Computing
13 Journal of Intensive Care Medicine
14 Journal of Neurosurgical Anaesthesiology
15 Pediatric Anaesthesia
16 Anaesthesiologic Clinics of North America
17 Asian Archives of Anaesthesiology and Resuscitation
18 Indian Journal of Critical Care Medicine
19 Annals of Emergency Medicine
20 Journal of Trauma-Injury Infection and Critical Care
21 The Pain Clinic
22 Pain Medicine
23 Critical Care Medicine

SECTION III

Check List – I

MODEL CHECK-LIST FOR EVALUATION OF SEMINAR PRESENTATIONS

Name of the Student: Name of the Faculty/Observer: Date:

Sl. No.	Items for observation during presentation	Below Average 1	Average 2	Good 3	Very Good 4
1.	Whether other relevant publications consulted				
2.	Whether cross references have been consulted				
3.	Completeness of Preparation				
4.	Clarity of Presentation				
5.	Understanding of subject				
6.	Ability to answer questions				
7.	Time scheduling				
8.	Appropriate use of Audio-visual aids				
9.	Any other observation				
	Total Score				

Check List – II

MODEL CHECK LIST FOR EVALUATION OF CLINICAL WORK IN

WARD / OPD

(To be completed once a month by respective Unit Heads including posting in other departments)

Name of the Student: Name of the Unit Head: Date:

Sl. No.	Points to be considered	Below Average 1	Average 2	Good 3	Very Good 4
1.	Regularity of attendance				
2.	Punctuality				
3.	Interaction with colleagues and supportive staff				
4.	Maintenance of case records				
5.	Presentation of cases during rounds				
6.	Investigations work up				
7.	Bedside manners				
8.	Rapport with patients				
9.	Counseling patient's relatives for blood donation or Postmortem and Case follow up.				
10.	Over all quality of Ward work				
	Total Score				

Check List – III

EVALUATION FORM FOR CLINICAL PRESENTATION

Name of the Student: Name of the Faculty: Date:

Sl. No.	Points to be considered	Below Average 1	Average 2	Good 3	Very Good 4
1.	Completeness of history				
2.	Whether all relevant points elicited				
3.	Clarity of Presentation				
4.	Logical order				
5.	Mentioned all positive and negative points of importance				
6.	Accuracy of general physical examination				
7.	Whether all physical signs elicited correctly				
8.	Whether any major signs missed or misinterpreted				
9.	Diagnosis: Whether it follows logically from history and findings				
10.	Investigations required ▪ Complete list				
	▪ Relevant order				
	▪ Interpretation of investigations				
11	Ability to react to questioning Whether it follows logically from history and findings				
12.	Ability to defend diagnosis				
13.	Ability to justify differential diagnosis				
14.	Others				
	Total Score				

Check List – IV

MODEL CHECK LIST FOR EVALUATION OF TEACHING SKILL PRACTICE

Sl. No.		Strong Point	Weak Point
1.	Communication of the purpose of the talk		
2.	Evokes audience interest in the subject		
3.	The introduction		
4.	The sequences of ideas		
5.	The use of practical examples and/or illustrations		
6.	Speaking style (enjoyable, monotonous, etc., specify)		
7.	Attempts audience participation		
8.	Summary of the main points at the end		
9.	Asks questions		
10.	Answers questions asked by the audience		
11.	Rapport of speaker with his audience		
12.	Effectiveness of the talk		
13.	Uses AV aids appropriately		

Check list V

MODEL CHECK-LIST FOR EVALUATION OF JOURNAL

REVIEW PRESENTATIONS

Name of the Student: Name of the Faculty/Observer: Date:

Sl. No.	Items for observation during presentation	Poor 1	Average 2	Good 3	Excellent 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 publications 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				
	Total Score				

Check List – VI

MODEL CHECK LIST FOR DISSERTATION SYNOPSIS PRESENTATION

Name of the Student: Name of the Faculty: Date:

Sl. No.	Points to be considered divine	Poor	Below Average 1	Average 2	Good 3	Very Good 4
1.	Interest shown in selecting a topic					
2.	Appropriate review of literature					
3.	Discussion with guide & Other faculty					
4.	Quality of Protocol					
5.	Preparation of proforma					
	Total Score					

Check List – VII

CONTINOUS EVALUATION OF DISSERTATION WORK BY GUIDE / CO-GUIDE

Name of the Student: Name of the Faculty: Date:

Sl. No.	Items for observation during presentation	Below Average 1	Average 2	Good 3	Very Good 4
1.	Periodic consultation with guide/co-guide				
2.	Regular collection of case material				
3.	Depth of analysis / discussion				
4.	Departmental presentation of findings				
5.	Quality of final output				
6.	Others				
	Total Score				

Annexure VIII

Postgraduate Students Appraisal Form

Pre / Para /Clinical Disciplines

Name of the Department/Unit:

Name of the PG Student:

Period of Training: FROM……TO……

Sr No	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	
		1 2 3	4 5 6		7 8 9
1	Journal based / recent advances learning				
2	Patient based /Laboratory or Skill/ based learning				
3	. Self directed learning and teaching				
4	Departmental and interdepartmental learning activity				
5	External and Outreach Activities / CMEs				
6	Thesis / Research work				
7	Log Book Maintenance				

Publications **Yes/ No**

Remarks* _____

_____

***REMARKS: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.**

SIGNATURE OF ASSESSEE SIGNATURE OF CONSULTANT SIGNATURE OF HOD

Table 1: Academic activities attended

Name: Admission Year:

College:

Date	Type of Activity Specify Seminar, Journal Club, Presentation, UG teaching	Particulars

Table 2

Details of participation in teaching programs

Sl. No.	Date	Type/ Topic	Marks / Grade Obtained	Signature

TABLE 3

Anaesthetic Techniques Performed

Date	Name and IP No.	Surgery Performed	Type of Anaesthesia with details

Model Overall Assessment Sheet

Name of the College: **Academic Year:**

Sl. No.	Faculty Member & Others	Name of Student and Mean Score									
		A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
1.											
2.											
3.											
4.											
5.											
Total Score											

Note: Use separate sheet for each year.

SECTION - IV

MEDICAL ETHICS & MEDICAL EDUCATION

Sensitization and Practice

Introduction

There is now a shift from the traditional individual patient, doctor relationship, and medical care. With the advances in science and technology and the needs of patient, their families and the community, there is an increased concern with the health of society. There is a shift to greater accountability to the society. Doctors and health professionals are confronted with many ethical problems. It is, therefore necessary to be prepared to deal with these problems. To accomplish the Goal (i), General Objectives (ii) stated in Chapter II (pages 2.1 to 2.3), and develop human values it is urged that **ethical sensitization** be achieved by lectures or discussion on ethical issues, clinical case discussion of cases with an important ethical component and by including ethical aspects in discussion in all case presentations, bedside rounds and academic postgraduate programs.

Course Contents

1. Introduction to Medical Ethics

   What is Ethics?
   What are values and norms?
   Relationship between being ethical and human fulfillment
   How to form a value system in one's personal and professional life
   Heteronymous Ethics and Autonomous Ethics
   Freedom and personal Responsibility

2. Definition of Medical Ethics
   Difference between medical ethics and bio-ethics
   Major Principles of Medical Ethics 0

Beneficence	= fraternity
Justice	= equality
Self determination (autonomy)	= liberty

3. Perspective of Medical Ethics
   The Hippocratic Oath
   The Declaration of Helsinki
   The WHO Declaration of Geneva
   International code of Medical Ethics (1993)
   Medical Council of India Code of Ethics

4. Ethics of the Individual
   The patient as a person
   The Right to be respected
   Truth and confidentiality
   The autonomy of decision
   The concept of disease, health and healing
   The Right to health
   Ethics of Behavior modification
   The Physician – Patient relationship
   Organ donation

5. The Ethics of Human life
   What is human life?
   Criteria for distinguishing the human and the non-human
   Reasons for respecting human life
   The beginning of human life
   Conception, contraception
   Abortion
   Prenatal sex-determination
   In vitro fertilization (IVF), Artificial Insemination by Husband (AIH)
   Artificial Insemination by Donor (AID)
   Surrogate motherhood, Semen Intra fallopian Transfer (SIFT),
   Gamete Intra fallopian Transfer (GIFT), Zygote Intra fallopian Transfer (ZIFT),
   Genetic Engineering

6. The family and society in Medical Ethics
   The Ethics of human sexuality
   Family Planning perspectives
   Prolongation of life
   Advanced life directives – The Living Will
   Euthanasia
   Cancer and Terminal Care

7. Profession Ethics
   Code of conduct
   Contract and confidentiality
   Charging of fees, Fee-splitting
   Prescription of drugs
   Over-investigating the patient
   Low – Cost drugs, vitamins and tonics
   Allocation of resources in health cares
   Malpractice and Negligence

8. Research Ethics
   Animal and experimental research / humanness
   Human experimentation
   Human volunteer research – Informed Consent
   Drug trials\
   ICMR Guidelines for Ethical Conduct of Research – Human and Animal
   ICH / GCP Guidelines
   Schedule Y of the Drugs and Cosmetics Act.

9. Ethical work -up of cases
   Gathering all scientific factors
   Gathering all human factors
   Gathering value factors
   Identifying areas of value – conflict, setting of priorities,
   Working our criteria towards decisions

Recommended Reading

1. Francis C. M., **Medical Ethics**, 2nd Ed, 2004Jaypee Brothers, Bangalore/-
2. Ethical guidelines for biomedical research on human participants, ICMR publication 2017
3. Santosh Kumar: the elements of research, writing and editing 1994, Dept of Urology, JIPMER, Pondicherry
4. Srinivas D.K etal, Medical Education Principles and Practice, 1995, National Teacher Training Centre, JIPMER, Pondicherry
5. Indian National Science Academy, Guidelines for care and use of animals in scientific Research, New Delhi, 1994
6. International committee of Medical Journal Editors, Uniform requirements for manuscripts submitted to biomedical journals, N Engl G Med 1991
7. Kirkwood B.R, Essentials of Medical Statistics, 1st Ed.,Oxford: Blackwell Scientific Publications 1998
8. Mahajan B.K. Methods in bio statistics for medical students, 5th Ed, New Delhi, Jaypee, Brothers Medical Publishers, 1989
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10. John A Dent. Ronald M Harden, A Practical guide for medical teacher, 4th Edition, Churchill Livingstone, 2009.
11. Tejinder Singh Anshu, Principles of Assessment in Medical Education, Jaypee brothers
12. Dr. K.Lakshman, A Hand Book on Patient Safety, RGUHS & Association of Medical Consultants, 2012

13. Bernard Mogs, Communication skills in health & social care, 3rd Edition, (S) SAGE, 2015
14. Manoj Sharma, R. Lingyak Petosa, Measurement and Evalution for Health Educators, Jones & Bartlett Learning.
15. David E. Kern, Particia A, Thomas Mark T, Hughes, Curriculum Development for Medical Education. A six-step approach, The Johns Hopkins University press/Baltimore.
16. Tejinder Singh Piyush Gupta Daljit Singh, Principles of Medical Education (Indian Academy of Paediatrics), 4th Edition, Jaypee Brothers, 2013.
17. Robert Reid, Torri Ortiz Linenemann, Jessica L.Hagaman, Strategy Instruction for Students with learning disabilities, 2nd Edition, The Guilford Press London.
18. Lucinda Becker Pan Demicolo, Teaching in higher education, (S) SAGE, 2013.
19. C.N. Prabhakara, Essential Medical Education (Teachers Training), Mehta publishers.
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21. R.L.Bijlani, Medical Research, Jaypee Brothers, 2008
22. Stephen Polgar Shane A Thomas, Introduction to Research in the Health Sciences, Churchill Livingstone Elsevier, 2013.
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24. Charles R.K.Hind, Communication Skills in Medicine, BMJ, 1997.