



# **BLDE** **(DEEMED TO BE UNIVERSITY)**

## **Competency Based Medical Education** **(CBME)**

### **PG CURRICULUM** **2019-20**

### **MD Pharmacology**

Published by

**BLDE**

**(DEEMED TO BE UNIVERSITY)**

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**

Smt. Bangaramma Sajjan Campus, B. M. Patil Road (Sholapur Road), Vijayapura - 586103, Karnataka, India.

BLDE (DU): Phone: +918352-262770, Fax: +918352-263303, Website: [www.bldedu.ac.in](http://www.bldedu.ac.in), E-mail: [office@bldedu.ac.in](mailto:office@bldedu.ac.in)

College: Phone: +918352-262770, Fax: +918352-263019, E-mail: [bmpmc.principal@bldedu.ac.in](mailto:bmpmc.principal@bldedu.ac.in)



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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 28<sup>th</sup> meeting Academic Council of the University held on April 26, 2019.  
3. Minutes of the 47<sup>th</sup> 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 47<sup>th</sup> 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

Smt. Bangaramma Sajjan Campus, B. M. Patil Road (Sholapur Road), Vijayapura - 586103, Karnataka, India.

**BLDE (DU)** : Phone: +918352-262770, Fax: +918352-263303 , Website: www.bldedu.ac.in, E-mail:office@bldedu.ac.in  
**College** : Phone: +918352-262770, Fax: +918352-263019, E-mail: bmpmc.principal@bldedu.ac.in

## **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 outcomes 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 1<sup>st</sup> year commonly for all new postgraduates and later in 2<sup>nd</sup> year or 3<sup>rd</sup> 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 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 1<sup>st</sup> paper in clinical subjects will be on applied aspects of basic medical sciences and 4<sup>th</sup> 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 1<sup>st</sup> 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]

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.

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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

### MD PHARMACOLOGY

#### A. GOALS:

After completing the postgraduate medical (MD) in pharmacology, the student should be able to:

1. Teach & train UG, PG medical & students of allied subjects the basic principles of pharmacology & be up to date with recent advances.
2. Impart skills related to teaching, research methodology & pharmaceutical industry requirements.
3. Understand the importance of Pharmacovigilance and Pharmacoeconomics.
4. Detect, treat & manage toxicological aspects of drugs and poisons.
5. Understand & apply the recent advances in pharmacological and its applied aspects in clinical practice.
6. Devise experimental models with minimal use of animals.
7. Plan and organize projects using managerial & leadership skills.
8. Design protocol for clinical trials
9. Incorporate knowledge of information technology in medical sciences
10. Function as a productive member of a team engaged in research, medical education and Pharmaceutical industry
11. Play the assigned role in the implementation of various national health programs effectively, including planning of drug procurement and distribution, designing Hospital & National Formulatory.

#### B. General Objectives

1. Demonstrate sound knowledge of general pharmacology principles like pharmacokinetics and pharmacodynamics of drugs, drug interactions and adverse effects.
2. Study the effects of drugs on various systems in the body and rational drug therapy.
3. Plan & conduct lecture, practical demonstration, and tutorial classes for students of medical & allied disciplines.
4. Carry out screening of drugs for their pharmacological and toxicological profile.
5. Carry out drug related literature search, formulate research projects and undertake the same.
6. Present research findings in conferences (Oral/Poster sessions), critically review & comment on research papers. Communicate research/ educational papers in peer reviewed journals.
7. Measure drug levels in blood and other biological fluids using suitable qualitative & quantitative methods and interpret the same in therapeutic/toxicological contest.

8. Monitor adverse drug reactions. Carry out therapeutic audit & provide drug information service to doctors/public.
9. Use computer and IT tools for teaching, research & presentation/publication of data.
10. Preparation of protocols to conduct preclinical and clinical research independently.
11. Demonstrate knowledge of National Health Policy, National list of essential medicine (NLEM), p- drug –concept and supervise drug management in a hospital.
12. To function as an active member of Drugs and Therapeutics Committee (DTC).
13. Drug Utilization Review (DUR)
14. Assess emergency situations while carrying out drug trials and institute exigency management till appropriate assistance from clinical side is available.
15. Plan and carry out both laboratory and clinical research with adherence to ethical principles and ICH – GCP/ GLP guidelines.
16. Be aware of legal and ethical aspects of drug evaluation.
17. Be aware of regulatory procedures needed to be carried out prior to the marketing of a new drug in India.
18. Understand and apply ethical principles involved in animal and human research.
19. Handle animals to conduct experiments e.g. screening of various drugs
20. Perform qualitative and quantitative identification and estimation of drugs in different samples of body fluids.
21. Develop skills as a self-directed learner, recognize continuing educational needs, use appropriate learning resources and be able to critically analyze relevant published literature.
22. Function as a productive member of a team engaged in research, Medical education & industry

### ***C. SUBJECT SPECIFIC COMPETENCIES***

**The student during the training program should acquire the following competencies:**

#### **a) Cognitive domain**

1. Describe and apply pharmacological principles to explain the mechanism/s of the effects of drugs used in diagnosis, prevention and treatment of diseases of all systems of human body.
2. Explain Pharmacodynamics and pharmacokinetics of drugs.
3. Describe mechanisms of drug-drug interactions and their clinical importance.
4. Apply and integrate knowledge of pathophysiology of diseases and its modulation by drugs.
5. Acquire knowledge on pharmacogenetic and Pharmacogenomic
6. Acquire knowledge on principles of Pharmacoeconomics
7. Acquire knowledge on Pharmacoepidemiology, including drug utilization studies.
8. Acquire knowledge and understanding of principles of Good clinical practice (GCP) and Good laboratory practice (GLP) guidelines

9. Acquire knowledge on essential medicines
10. Acquire knowledge on Pharmacovigilance
11. Acquire knowledge and apply the principle of biostatistics in the evaluation and interpretation of drug safety and efficacy studies
12. Describe how to evaluate, analyse and monitor preclinical and clinical data in drug discovery
13. Able to integrate principles of immunology in biochemistry.
14. Demonstrate knowledge of basics of research methodology, develop a research protocol, conduct the study, record experimental observations, analyse data using currently available statistical software, interpret results and disseminate these results and to have the potential ability to pursue further specializations and eventually be competent to guide students.
15. Describe the principles of teaching - learning technology towards application and take interactive classroom lectures, modules for problem based learning (PBL), case discussions, small group discussions, seminars, Journal club and research presentations
16. Demonstrate knowledge about computer assisted learning (CAL) softwares and ability to use them efficiently to promote learning of pharmacology.
17. Demonstrate knowledge of principles of Instrumentation.
18. Demonstrate knowledge about recent advances and trends in research in the field of pharmacology and clinical pharmacology.
19. Acquire knowledge on generic drugs and generic prescription.
20. Acquire knowledge on rational use of drugs and prescription auditing
21. Acquire knowledge about antimicrobial stewardship programs and strategies for Prevention of antibiotic resistance
22. Acquire knowledge on animal toxicity studies
23. Acquire knowledge on common poisoning
24. Acquire knowledge on the legal & ethical issues involved in drug development and research.
25. Acquire knowledge in Biostatistics including use of statistical softwares:
  - Estimation Sample size for a clinical trial
  - Scales of measurement, data display, measures of central tendency (mean, median, mode)
  - Dispersion of data (variance, standard deviation)
  - Selection of tests (of significance) and their applicability
  - Correlation and regression analysis
  - Basics of systematic reviews and meta-analysis

**b) Affective domain**

1. Effectively explain to patients, the effects and side effects of drugs, including the need for medication adherence.

2. Communicate effectively with pharmacological reasoning with students, peers, staff and faculty, and other members of the health care team on rational use of drugs and improving spontaneous reporting of adverse events.
3. Demonstrate respect in interactions with peers, and other healthcare professionals.
4. Demonstrate ethical behavior and integrity in one's work.
5. Demonstrate ability to generate awareness about the use of generic drugs in patients.
6. Acquire skills for self-directed learning to keep up with developments in the field and to continuously build to improve on skills, expertise and perpetual professional development.

**c) Psychomotor domain**

1. Able to predict efficacy & adverse effects associated with use of drugs, along with causality assessment.
2. Demonstrate skills for prescription writing.
3. Perform major *in vivo* and *in vitro* animal experiments.
4. Observe and understand basic principles of working of important advanced techniques, like High Performance Liquid Chromatography (HPLC), ELISA.
5. Demonstrate standard operating procedures of various methods and techniques used in clinical trials and research.
6. Determine levels of common poisons in blood
7. Demonstrate presentation skills at academic meetings, publications and writing research projects for funding agencies.
8. Be able to analyze and evaluate a research paper

**By the end of the course, the trainee should have acquired practical skills in the following:**

1. *In vivo* and *ex vivo* experiments, using organ bath, analgesiometer, physiography/polygraph, convulsimeter, plethysmograph, learning and memory, models for affective disorders.
2. Administration of drugs by various routes (subcutaneous, intravenous, intraperitoneal) in experimental animals
3. Collection of blood samples and oral gavage in experimental animals
4. Preparation and administration of a drug solution in appropriate strength and volume
5. Experiments to show dose response curve of agonists (in the presence or absence of an antagonist) on various biological tissues, like
  - Isolated rabbit/rat/ guinea-pig intestine
  - Isolated rat uterus / Isolated rat colon
6. Determination of EC<sub>50</sub>, ED<sub>50</sub>, pD<sub>2</sub> and pA<sub>2</sub> values of drugs
7. Perform *in vivo* experiments to study effect of mydiatrics and miotics on rabbit eye

8. Perform *in vivo* experiments to study effect of antiepileptic drugs using animal models of epilepsy
9. Perform *in vivo* experiments to study effect of analgesics using animal models of analgesia
10. Perform *in vivo* experiments to study effects of drugs on learning, & motor coordination
11. Estimate toxic drug levels using chemical and biological tests (alkaloids, glycosides, steroids, barbiturates, salicylates) by commonly used methods)
12. Clinical pharmacology
  - Prepare protocol for a clinical trial
  - Prepare Informed consent form and participant information sheet for research involving human participants
  - Report Serious Adverse Effect (SAE)
  - Evaluate promotional drug literature
  - Prepare “Drug Information Sheet” (WHO criteria)
  - Interpret bioavailability parameters with the help of given pharmacokinetics data
  - Perform causality assessment & report ADR as per Pharmacovigilance Programme of India (PvPI)

**Animal Experiments: All animal experiments must be compliant with Govt. of India regulations, notified from time to time. Amphibian/Dog/Cat experiments should be conducted by computer assisted simulation models/ facilities. Other experiments should be performed as permissible by CPCSEA guidelines**

#### **D. DETAILED COURSE CONTENT**

Study of Pharmacology should include all aspects of Pharmacology as encompassed in branches of General and Systemic Pharmacology

#### **THEORY:**

##### **General Pharmacological Principles and Applied Sciences**

Theories and mechanism of drug action, Pharmaco-kinetic principles and parameters, Factors modifying drug action, Pharmaco-genetics, Chrono-pharmacology, Adverse effects of drugs, Drug dependence, Toxicology, Dose-response relationships, structure-activity relationships, Physiological and biochemical basis of drug action, Etiopathogenesis of diseases relevant to therapeutic use of drugs, Basic microbiology, immunology and molecular biology. History of pharmacology, sources of drug information and use of Information Technology.

##### **Systemic Pharmacology, Chemotherapy and Therapeutics:**

Neurotransmission: the autonomic and somatic motor nervous systems, Muscarinic receptor agonist and antagonists , Anticholinesterase agents , Nicotine and agents acting at the neuromuscular junction & autonomic ganglia Adrenergic agonists and antagonists,5-Hydroxytryptamine (serotonin ) & Dopamine ,Neurotransmission in the central nervous system, Drug therapy of depression and anxiety disorders ,Pharmacotherapy of psychosis and mania, Pharmacotherapy of the epilepsies, Treatment of central nervous system degenerative disorders, Hypnotics and sedatives, Opioids, analgesia, and pain management, General Anesthetics & therapeutic gases ,Local Anesthetics, Ethanol, Drug use disorders and addiction, Drugs affecting renal excretory function, Renin and angiotensin, Treatment of ischemic heart disease,

Treatment of hypertension, Therapy of heart failure, Anti-arrhythmic drugs, Treatment of pulmonary arterial hypertension ,Blood coagulation and anticoagulant, Fibrinolytic, and antiplatelet drugs, Drug therapy of dyslipidemias ,Introduction to immunity and inflammation, Immunosuppressant and tolerogens, Immunglobulins and vaccines, Lipid derived autacoids: eicosanoids and platelet activating factor, Pharmacotherapy of inflammation, fever, pain & gout, Histamine ,bradykinin & their antagonists, Pulmonary pharmacology, Hematopoietic agents : growth factors, minerals, & vitamins , Introduction Endocrinology : the hypothalamic pituitary axis, Thyroid and antithyroid drugs, Estrogens , progestins & the female reproductive tract ,Androgens & the male reproductive tract, ACTH, adrenal steroids and the adrenal cortex, Endocrine pancreas and pharmacotherapy of diabetes mellitus & hypoglycemia, Agents affecting mineral ion homeostasis and bone turnover ,Pharmacotherapy for gastric acidity, peptic ulcers and gastroesophageal reflux disease, Gastrointestinal motility and water flux, emesis and Biliary and pancreatic diseases, Pharmacotherapy of inflammatory bowel diseases, General principles of antimicrobial therapy, Chemotherapy of malaria, Chemotherapy of protozoal infections : Ameobiasis, giardiasis, trichomoniasis, trypanosomiasis, leishminiasis and other protozoal infections Chemotherapy of helminth infections, Sulfonamides, trimethoprim- sulfamethoxazole , quinolones, and agents for urinary tract infections, Penicillins , cephalosporins & other beta lactam antibiotics ,Aminoglycosides ,Protein synthesis inhibitors and miscellaneous antibacterial agents, Chemotherapy of tuberculosis , mycobacterium avium complex disease and leprosy, Antifungal agents, Antiviral agents(non retroviral), Treatment of viral hepatitis (HBV/HCV),Antiretroviral agents and treatment of HIV infection, General principles in the pharmacotherapy of cancer ,Cytotoxic drugs, Pathway – targeted therapies : monoclonal antibodies , protein kinase inhibitors and various small molecules ,Hormones and related agents in the therapy of cancer, Ocular pharmacology, Dermatological pharmacology, Environmental toxicology : carcinogens and heavy metals, Pharmacogenomics,Pharmacovigilance(ADR reporting),Pharmacoeconomics(cost-effectiveness study) and pharmaco-epidemiology, Over the counter drugs, Dietary supplements and herbal medicines, Pharmacometrics - methods of drug evaluation,

### **Experimental Pharmacology, Bioassay and Statistics:**

Experimental methodologies involved in the discovery of drugs (in vivo, in vitro/ex vivo). Animal handling. Animal care. Methods of anaesthetizing animals and methods of euthanasia.



Restraining and blood collection methods. Drug screening methods involved in the evaluation of Analgesics, Anti-pyretics, Anti-convulsants, Anti-inflammatory drugs, Antidepressants, Anti-anxiety and Antipsychotics, Sedatives, Muscle Relaxants, Anti-hypertensives, Hypocholesterolaemic agents, Anti-arrhythmics, Diuretics, Drugs for heart failure Adrenergic blocking drugs, Drugs used in peptic ulcer diseases/Prokinetic agents/ anti-emetics, Anti-tussives, /anti-asthma agents, Local Anaesthetics, Oxytocics, Anti-fertility agents, Anti-diabetics Chemotherapeutic agents, Anti-malarial drugs , Anti- TB drugs, Anti-cancer drugs

### **Clinical Pharmacology and Recent advances:**

Development of new drugs, protocol designing, methodology and ethics of clinical trials, Clinical Pharmacokinetics and Pharmacodynamic studies in post marketing surveillance, Therapeutic drug monitoring Pharmacovigilance, drug utilization studies, essential drug concept and rational prescribing, GLP and GMP concepts.

Recent advances in understanding of mechanism of drug action and treatment of diseases; New drugs and new uses of old drugs.

### **PRACTICAL:**

Bioassay of:

1. Acetylcholine
2. Adrenaline/nor-adrenaline
3. Histamine
4. 5-Hydroxytryptamine
5. Insulin
6. Antibiotics
7. Digoxin
8. Glucocorticoids
9. Limitations of animal experiments in drug evaluation
10. Quantitative study of agonists and antagonists on isolated tissues.
11. Interpretation of graphical demonstration of effect of various drugs on blood pressure in anaesthetized dogs.
12. Extraction, purification and characterization of active principles from plant Sources/crude products.

### **EXPERIMENTAL PHARMACOLOGY EXERCISES**

1. Dose-response curve of histamine on isolated guinea pig ileum.
2. Bioassay of histamine on guinea pig ileum by matching method, 3 point method and 4 point (Latin square design) method.
3. Bioassay of Ach on Rat's colon by matching method, 3 point method and 4 point (Latin square design) method.

4. Study of local anaesthetics on rabbit cornea,
5. Interpretation of graph.
6. Study of anti-convulsant activity of drugs on maximal electroshock seizures and letrazole induced convulsions in rats.
7. Study of analgesic activity of drugs using rat tail-hotwire method, hot plate method, acetic acid induced writhing.
8. Study of anti-inflammatory activity of drugs against carraginin induced rat paw oedema.
9. Effect of psychopharmacological drugs on conditioned avoidance response (cook's pole climbing).
10. Effect of drugs on spontaneous motor activity of mice using Photoectometer.
11. Study of miotics and mydriatics on rabbit eye.

Minor procedures:

- Administration of drugs to rats by gastric canula
- Collection of blood from rat tail.
- Collection of blood by puncture in retro bulbar plexus in rat.
- Injection of drugs through marginal ear vein of rabbit.
- Intraperitoneal and subcutaneous injection to rats and mice.

#### **Chemical Pharmacology exercises:**

- Identification of steroids, salicylates, beta blockers using chemical tests.
- Estimation of drug levels using colorimetry, spectrophotometry, high performance liquid chromatography (HPLC), enzyme linked immunoassay. (ELISA)

#### **Clinical Pharmacology Exercises**

1. Recording B.P. in human volunteers.
2. Recording of ECG and measurement of heart rate, PR interval, QT interval, ST Segment depression etc. in human volunteers.
3. Psychomotor testing in volunteers by 6 letter cancellation test, digit-letter symbol substitution test finger tapping test.
4. Training at poison information center. Determination of plasma cholinesterases level in organo-phosphorus poisoned patients. Spot test for aluminum phosphide poisoning. Estimation of lead in drinking water and patient's urine.

#### **Computer Aided Learning (CAL) Program:**

Proficiency in using CAL programs for demonstration of effects of drugs on animals.

#### **Statistics**

Use of calculators and electronic spread sheets for understanding of:

- Elements of data collection and presentation of data
- Measures of central tendency and dispersion

- Non parametric tests
- Parametric tests (including ANOVA)
- Correlation and regression

### **SKILLS:**

1. Elementary principles of common chemical techniques such as colorimeter, spectrophotometer, flame photometer etc.
2. Handling of small animals including various anaesthetic techniques.
3. Recording of blood pressure (In vivo and computer assisted learning programme)
4. Screening of drugs using appropriate models
5. Administration of drugs /chemicals to animals (parenteral and enteral routes)
6. Isolated tissue preparations for dose response and bioassay
7. Use of various methods to evaluate drug effects in humans.
8. Use of appropriate statistical techniques to analyze the results
9. Training at poison information centre.
10. Determination of plasma cholinesterase levels in organophosphorus poisoned patients.
11. Spectrophotometric & fluorimetric estimations of drugs in biological fluids.
12. Calculation of Pharmacokinetic estimates from given concentration vs time data
13. Draft an IND and NDD application for the approval of a numbered compound.
14. Draft a protocol to conduct phase II& Phase III clinical trial for a newly discovered drug.

### **TEACHING AND LEARNING METHODS**

#### **Postgraduate Training programme**

##### **Teaching methodology**

Learning in a PG program is primarily self-directed and in Pharmacology consists of laboratory and academic work. The formal sessions are merely meant to supplement this core effort. Acquisition of practical competencies thus becomes the cornerstone of postgraduate medical education in Pharmacology.

##### **Formal teaching sessions**

In addition to laboratory work, at least 6-hr of formal teaching per week is necessary. The departments may select a mix of the following sessions:

Theory lecture Once in a week

Journal club Once a week

Seminar Once a week

Practical Once a week

Group Discussions Once a week

Case discussions Once a month

Interdepartmental case or seminar Once a month

**Note:** These sessions may be organized as an institutional activity for all postgraduates.

- Attend accredited scientific meetings (CME, symposia, and conferences).
- A postgraduate student of Pharmacology would be required to present one poster presentation, to read one paper at a 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 eligible to appear at the postgraduate degree examination.
- Additional sessions on basic sciences, biostatistics, research methodology, teaching methodology, hospital waste management, health economics, medical ethics and legal issues related to experimentation are suggested.
- There should be a training program on Research methodology for existing faculty to build capacity to guide research and for keeping abreast with rapidly evolving methods and techniques in Pharmacology.
- The postgraduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.

**Log book:** During the training period, the post graduate student should maintain a Log Book giving details of experimentation done and skills acquired. The log book shall be used to aid the internal evaluation of the student. The Log books shall be checked and assessed periodically by the faculty members imparting the training.

- Department should encourage e-learning activities. The postgraduate student in M.D (Pharmacology) shall undergo a 3 - year (6 terms of 6 months each) training that will comprise of the following:

I Theory: (lectures, seminars, group discussion, journal club) (at least 6 hours a week, daily 2 hours for 3 days)

## II Rotation:

### POSTING IN OTHER DEPARTMENTS

A candidate of the M.D. Degree Course in Pharmacology needs to be well versed in the applied aspects of pharmacology and therapeutics. Actual postings in the wards of the Clinical departments will help the candidate get acquainted with the patterns of drug use, rational drug therapy, adverse drug reactions and interactions etc., Such postings will also help him gain confidence in interacting with the clinicians, which will be needed if he chooses to be a clinical pharmacologist in his future career.

The following clinical postings are recommended:

Department Period of Posting

General Medicine 1½ Months

Pediatrics 01 Month

Anaesthesiology & I.C.U. 15 days

Dermatology & Psychiatry 15 days

Instrumentation /Central Research Lab 15 days

Total duration of clinical postings- 4 months. These postings shall be during the initial phase of the course. Monitoring postings in clinical departments would be through daily discussions with the faculty during the afternoon session & as part of maintenance of work diary.

Practical training in the following suggested areas: (8 hours a week, daily 4 hours for 2days)

### **Experimental Pharmacology:**

*In vitro* (including bioassays), *in vivo* (including common methods of drug evaluation) experiments, computer simulations and toxicity tests

- **Chemical Pharmacology:**

Identification of drug/toxin by using chemical, biological and analytical tests.

Quantitative estimation - Use of colorimeter, spectrophotometer and/or other advanced analytical equipments

- **Clinical Pharmacology:**

I Evaluation of drugs in healthy volunteers as well as patients

II Critical evaluation of drug literature, Pharmacoeconomics, Pharmacovigilance and Pharmacoepidermiology.

III **Thesis on a suitable problem**

IV Training in undergraduate teaching

V Computer training

**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.**

### **Schedule of work time table**

#### **First year**

1. Introduction to pharmacology and its branches.
2. Selection of dissertation topic
3. Rotation in labs
4. Teaching & Learning activities

## **Second year**

1. Teaching & Learning activities
2. Posting to clinical depts.
3. Dissertation work
4. Visit to CRO/ attend clinical pharmacology and teaching learning workshops

## **Third year**

Dissertation completion

Teaching & Learning activities

Presentation of research papers in conference & publication

## **E. MONITORING AND ASSESSMENT METHODOLOGY**

**FORMATIVE ASSESSMENT**, ie., during the training

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 practical/clinical examination.

Quarterly assessment during the MD training should be based on:

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

The student to be assessed periodically as per categories listed in postgraduate student appraisal form (Annexure I)

Log books should be maintained to record the work done which shall be checked and assessed periodically by the faculty members imparting the training.

- F. **SUMMATIVE ASSESSMENT / University Examination** ie., assessment at the end of training The summative examination would be carried out as per the Rules given in POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000 Post Graduate Examination

The Post Graduate examination shall be in three parts:-

1. Thesis:

Every post graduate student shall carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher, the result of which shall be written up and submitted in the form of a Thesis. Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the post graduate student to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

2. THEORY :

**Summative Assessment**

The pass percentage will be 50%

Candidate will have to pass theory and practical examination separately.

**SCHEME OF EXAMINATION**

A. Theory written Examination

There shall be four question papers, each of three hours duration, carrying 100 marks each. Each paper shall consist of two long essay questions each carrying 20 marks and six short essay type questions each carrying 10 marks. Questions on recent advance may be asked in any or all the papers. Details of distribution of topics for each paper will be as follows:

**Paper I:** General Pharmacological Principles, Evaluation/ Screening of Drugs (Experimental& Clinical), Chronopharmacology. Ethno Pharmacology, Pharmacoeconomics, Pharmacovigilance, Pharmacoeidermiology, Statistics, Assays,

**Paper II:** Systemic Pharmacology & Therapeutics- ANS, CVS, CNS, RS, GIT, Autocoids& Blood.

**Paper III:** Systemic Pharmacology & Therapeutics- Endocrines, Chemotherapy, Anticancer Drugs including Monoclonal Antibodies (MABS), Immunopharmacology, Heavy Metal Intoxication and Chelators, Management of Poison Patients, Vitamins, Trace elements & Nutritional supplements.

**Paper IV:** Clinical Pharmacology, New drug development (NDD), Use of drugs in special situations, Extremes of age, Pregnancy & Lactation, Hepatic & Renal impairment, Ocular Pharmacology & Use of Drugs in Dermatology. Recent advances.

**B. Practical Examination (Total 300 Marks)**

Practical are to be held on 2 days, along with Viva voce in the end

**I. Major Experiment:**

1. One expt. pharmacology exercise on isolated tissue. ( 100 Marks)
2. Interpretation of graph demonstrating effects of various drugs on anaesthetized dog blood pressure & other parameters. (50 Marks)

**II. Minor Experiments (80 marks)**

1. Qualitative - Identification of unknown drug using chemical tests/ intact animals.
2. Technique demonstration
3. Protocol writing of clinical trial

**III. Clinical Pharmacology any two: 35 Marks each X 2 (70 marks)**

1. Calculation of Kinetic parameters
2. Case discussion pertaining to drug usage
3. Drug related problem solving
4. Critical appraisal of drug promotional literature
5. Critical evaluation of an article.

**C. VIVA VOCE - (100 Marks)**

1. Viva voce Examination: (80 Marks)

Students will be examined by all the examiners together, about assessing depth of knowledge, comprehension, analytical approach, expression and interpretation of data. Student shall also be given case reports, charts for interpretation. It includes discussion on dissertation.

2. Pedagogy Exercise: (20 Marks)

A topic is given to each candidate along with the Practical Examination on the first day. Student is asked to make a presentation on the topic on the second day for 8-10 minutes.

Maximum marks for	Theory	Practical	Viva	Grand Total
M.D.Pharmacology	400	300	100	800

**RECOMMENDED BOOKS & JOURNALS****Books:-**

1. Lawrence Brunet, Goodman and Gilman's The Pharmacological Basis of Therapeutics, Thirteenth Edition 2018, The Tata McGraw-Hill Education [ISBN-13 9780071624428; ISBN-10 0071624422]



2. H. P. Rang, J. M. Ritter, R. J. Flower, G. Henderson. Rang & Dale's Pharmacology, 8th Edition, Elsevier Churchill Livingstone, 2015 (ISBN-13978-0-7020-5362-7)
3. P. N. Bennett, Morris J. Brown, Peter N. Bennett. Clinical Pharmacology 11th Edition. Churchill Livingstone (2012) [ISBN-13 9780702040849; ISBN-100702040843]
4. M. N. Ghosh. Fundamentals of Experimental Pharmacology 6<sup>th</sup> edition. Hilton & Company (2015)
5. Bertram G. Katzung, Bertram Katzung, Susan Masters. Basic and Clinical Pharmacology 14<sup>th</sup> Edition. McGraw-Hill Medical Publishing (2018)
6. Maxine A. Papadakis, Stephen J. McPhee, Michael W. Rabow. Current Medical Diagnosis and Treatment (2018) 55th Edition. McGraw-Hill Medical Publishing (2018)
7. SK Gupta. Drug Screening Methods (Preclinical Evaluation of New Drugs) 3<sup>rd</sup> Edition. Jaypee Brothers Medical Publishers (p) Ltd. (2018)
8. Avery's Drug Treatment. T M. Speight & NHG Holford (Eds), Adis' International 4th Edn
9. Critical Appraisal of Epidemiological studies and clinical trials- Mark Elwood. Oxford press.
10. Evaluation of drug activities: Pharmacometrics. D R Laurence and ALBacharach (Eds) Academic press London.
11. Introductory medical statistics. Mould RF (Ed), Adam Hilger, Bristol & Philadelphia.
12. Mahajan's Methods in Biostatistics for Medical students and Research workers 8<sup>th</sup> Edn. 2016.

**Journals:**

1. Journal of Pharmacology and Pharmacotherapeutics
2. Journal of Pharmacy and Pharmacology
3. Drugs (Monthly Journal published by Adis International)
4. Clinical Pharmacology and Therapeutics.
5. Indian Journal of Pharmacology.
6. Annual Review of Pharmacology (last 5 years)
7. Trends in Pharmaceutical Sciences.
8. British Journal of Pharmacology.



**B.L.D.E.(Deemed to be University)**

**Shri.B.M.Patil Medical College, Hospital & Research Centre, Vijayapura.**

**FORMATS**

**Check List -I**

**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 0	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 – II****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 – III**

**MODEL CHECK-LIST FOR EVALUATION OF TEACHING SKILL PRACTICE**

Sl. No.	Items for observation during Presentation	Strong Point	Weak Point
1.	Communication of the purpose of the talk		
2.	Evokes audience interest in the subject		
3.	The introduction		
4.	The sequence of ideas		
5.	The use of practical examples and/or illustrations		
6.	Speaking style (enjoyable, monotonous, etc., specify)		
7.	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-IV**

**MODEL CHECK LIST FOR DISSERTATION SYNOPSIS 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.	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-V**

**CONTINUOUS 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 VI**

**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**



## LOGBOOK

### LOGBOOK: Table 1: Academic activities attended

Name:

Admission year:

College:

<b>Date</b>	<b>Type of Activity</b> <b>Specify Seminar, Journal Club, Presentation, UG teaching</b>	<b>Particulars</b>





**LOG BOOK: Table 2: Academic presentations made by the student**

Name:

Admission Year:

College:

<b>Date</b>	<b>Topic</b>	<b>Type of Presentation Specify Seminar, Journal Club, Presentation, UG teaching Etc.</b>



**Table – 3: Experiment conducted by the P.G. student**

Name: ----- Admission year:

<b>Date</b>	<b>Topic</b>	<b>Long expt./short expt.</b>	<b>Category O,A,PA,PI*</b>	<b>Signature of staff</b>

\*Key: O- Observed

A- Assisted a senior faculty

PA- Performed the experiment under the direct supervision of a senior faculty

PI- Performed independently



### 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.											
<b>Total Score</b>											

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

Heteronomous 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**, 2<sup>nd</sup> Ed, 2004 Jaypee 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 et al, 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 J Med 1991
7. Kirkwood B.R, Essentials of Medical Statistics, 1<sup>st</sup> Ed., Oxford: Blackwell Scientific Publications 1998
8. Mahajan B.K. Methods in bio statistics for medical students, 5<sup>th</sup> Ed, New Delhi, Jaypee, Brothers Medical Publishers, 1989
9. Raveendran, B. Gitanjali: A Practical approach to PG dissertation, New Delhi, Jaypee Publications, 1998.
10. John A Dent. Ronald M Harden, A Practical guide for medical teacher, 4<sup>th</sup> 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 Evaluation for Health Educators, Jones & Bartlett Learning.
15. David E. Kern, Patricia 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.
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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.
23. Amar A,Sholapurkar. Publish & Flourish -A practical guide for effective scientific writing, Jaypee Brothers, 2011
24. Charles R.K.Hind, Communication Skills in Medicine, BMJ, 1997.

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