FACULTY OF MEDICINE
M.S. ORTHOPAEDICS
REGULATIONS & SYLLABUS
CHETTINAD ACADEMY OF RESEARCH AND EDUCATION
REGULATIONS FOR M.D. & M.S. CLINICAL PROGRAMS

CONTENTS

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>INTRODUCTION</td>
</tr>
<tr>
<td>2.</td>
<td>SHORT TITLE AND COMMENCEMENT</td>
</tr>
<tr>
<td>3.</td>
<td>GOAL</td>
</tr>
<tr>
<td>4.</td>
<td>AIMS AND OBJECTIVES</td>
</tr>
<tr>
<td>5.</td>
<td>COMPONENTS OF THE POSTGRADUATE CURRICULUM</td>
</tr>
<tr>
<td>6.</td>
<td>NOMENCLATURE OF POSTGRADUATE COURSES</td>
</tr>
<tr>
<td>7.</td>
<td>ELIGIBILITY FOR ADMISSION</td>
</tr>
<tr>
<td>8.</td>
<td>RECOGNITION FEE AND ELIGIBILITY CERTIFICATE</td>
</tr>
<tr>
<td>9.</td>
<td>REGISTRATION</td>
</tr>
<tr>
<td>10.</td>
<td>PERIOD OF TRAINING /DURATION OF THE COURSE</td>
</tr>
<tr>
<td>11.</td>
<td>COMMENCEMENT OF THE COURSE</td>
</tr>
<tr>
<td>12.</td>
<td>CUT OFF DATES FOR ADMISSION</td>
</tr>
<tr>
<td>13.</td>
<td>SYLLABUS</td>
</tr>
<tr>
<td>14.</td>
<td>MEDIUM OF INSTRUCTION</td>
</tr>
<tr>
<td>15.</td>
<td>WORKING DAYS / ATTENDANCE</td>
</tr>
<tr>
<td>16.</td>
<td>CONDONATION FOR LACK OF ATTENDANCE</td>
</tr>
<tr>
<td>17.</td>
<td>MIGRATION / TRANSFER OF CANDIDATES</td>
</tr>
<tr>
<td>18.</td>
<td>TRAINING PROGRAMME</td>
</tr>
<tr>
<td>19.</td>
<td>MAINTENANCE OF LOG BOOK</td>
</tr>
<tr>
<td>20.</td>
<td>THESIS / DISSERTATION AND EVALUATION</td>
</tr>
<tr>
<td>21.</td>
<td>SCHEDULE OF EXAMINATIONS</td>
</tr>
<tr>
<td>22.</td>
<td>SCHEME OF EXAMINATIONS</td>
</tr>
<tr>
<td>23.</td>
<td>EXAMINERS</td>
</tr>
<tr>
<td>24.</td>
<td>MAXIMUM NUMBER OF CANDIDATES</td>
</tr>
<tr>
<td>25.</td>
<td>NUMBER OF EXAMINATIONS</td>
</tr>
<tr>
<td>26.</td>
<td>REVALUATION OF ANSWER PAPERS</td>
</tr>
</tbody>
</table>
CHETTINAD ACADEMY OF RESEARCH AND EDUCATION

Regulations for M.D./M.S. Clinical Courses

1. INTRODUCTION:
M.D. / M.S. Clinical course is a three year post graduate program under the Faculty of Medicine for students with an Under Graduate Degree in Medicine. This program is taught course that covers relevant topics and a research project in the area of specialization. This program shall be competence based and learning shall be essentially autonomous and self directed and supplemented with practical and laboratory work. The curriculum shall have modular approach to learning. The research component is through original exploration and experiments culminating in the research project. This program shall impart advanced theoretical and practical aspects of subjects previously studied in a more general manner at the undergraduate level.

These courses are aimed at imparting higher-level training to qualified under graduate medical students in various branches of M.D./M.S. Clinical subjects and to involve the learning experiments to the needs of community.

In exercise of the powers conferred under sub rule (a) and (g) of Rule 8 (b) of Memorandum of Association and Clause 2.1, Chapter III of Bye-laws of Chettinad Academy of Research and Education, the Academic Council hereby makes the following regulations:

2. SHORT TITLE AND COMMENCEMENT:
These Regulations shall be called the “Regulations for M.D /M.S. Clinical Courses of Chettinad Academy of Research and Education. These regulations shall come into force from the academic year 2012-2013. These regulations are subject to modifications as may be approved by the Academic Council from time to time.

3. GOAL:
The goal of postgraduate medical education shall be to produce competent specialists and/or medical teachers:

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 advance and developments in the discipline concerned.

iv) who shall have acquired a spirit of scientific inquiry and is oriented to the principals of research methodology and epidemiology and

v) who shall have acquired the basic skills in teaching of the medical and paramedical professionals.
4. **AIMS AND OBJECTIVES:**

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

i) Recognize the importance to the concerned speciality in the context of the health needs of the community and the national priorities in the health section.

ii) Practice the speciality concerned ethically and in step to the principles of primary health care.

iii) Demonstrate sufficient understanding of the basic sciences relevant to the concerned speciality.

iv) Identify social, economic, environmental, biological and emotional determinants of health in a given case, and take them into account while planning therapeutic, rehabilitating, preventive and primitive measures/strategies.

v) Diagnose and manage majority of the conditions in the speciality concerned on the basis of clinical assessment, and appropriately selected and conducted investigations.

vi) Plan and advise measures for the prevention and rehabilitation of patients suffering from disease and disability related to the speciality.

vii) Demonstrate skills in documentation of individual case details as well as morbidity and mortality rate relevant to the assigned situation.

viii) Demonstrate empathy and human 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 Programme 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 education needs: select and use appropriate learning resources.

xii) Demonstrate competence in basic concepts of Research Methodology and epidemiology, and be able to critically analyze 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 health team engaged in health care, research or training

5. **COMPONENTS OF THE POSTGRADUATE CURRICULUM:**

The major components of the Postgraduate curriculum shall be:

- Theoretical knowledge
• Practical and clinical skills
• Writing Thesis/Research articles
• Attitudes including communication skills.
• Training in research methodology, Medical Ethics and Medicolegal aspects.

6. NOMENCLATURE OF POSTGRADUATE COURSES:

The nomenclature of Post Graduate Degree should be as laid down in the Post Graduate Medical Education Regulations prescribed by the Medical Council of India.

7. ELIGIBILITY FOR ADMISSION:

Every student, selected for admission to a post graduate medical course in Chettinad University on acquiring M.B.B.S degree or an equivalent qualification thereto shall have obtained permanent registration with the Medical Council of India, or any of the State Medical Council(s) or shall obtain the same within a period of one month from the date of his/her admission, failing which his/her admission shall stand cancelled.

Provided that in the case of a foreign national, the Medical Council of India may, on payment of the prescribed fee for registration, grant temporary registration, for the duration of the post graduate course limited to the medical college/institution to which the candidate is admitted for the time being exclusively for pursuing post graduate studies.

Provided further the temporary registration to such foreign national shall be subject to the condition that such person is duly registered with appropriate registering authority in his own country wherefrom he has obtained his basic medical qualification and is duly recognized by the corresponding Medical Council or concerned authority.

8. RECOGNITION FEE AND ELIGIBILITY CERTIFICATE:

Candidates who have passed the M.B.B.S Degree Examination other than that conducted by Chettinad Academy of Research and Education shall obtain Eligibility Certificate from this University at the time of admission and also remit recognition fee as prescribed.

9. REGISTRATION:

A candidate admitted to the Post Graduate Course shall register with the University by submitting the prescribed application form for registration, duly filled in along with the prescribed fee, through the Head of the Institution.

10. PERIOD OF TRAINING /DURATION OF THE COURSE:

The duration of certified study and training for the M.D. / M.S. Post Graduate Clinical Courses shall be three completed years including the period of examination.

Provided that in the case of students possessing a recognised two year postgraduate diploma course in the same subject, the period of training, including the period of examination, shall be two years.

11. COMMENCEMENT OF THE COURSE:
The course shall ordinarily commence from 2\textsuperscript{nd} May of the academic year.

\textbf{12. CUT OFF DATES FOR ADMISSION:}

Candidates admitted up to 31\textsuperscript{st} May of the Academic year shall be registered for the same Academic Year but shall be eligible to take up the final examination along with others students admitted prior to their admission. There shall be no admission of students in respect of any academic session beyond 31st May for postgraduate courses under any circumstances. The University shall not register any student admitted beyond the said date.

\textbf{13. SYLLABUS:}

The Syllabus for the course shall be as specified in the annexure to these Regulations.

\textbf{14. MEDIUM OF INSTRUCTION:}

English shall be the medium of instruction for all the subjects of study and for examination.

\textbf{*15. WORKING DAYS / ATTENDANCE}

All the candidates joining the Post Graduate training program shall work as “Full Time Residents” during the period of training and shall attend not less than 85\% (Eighty Five percent) of the imparted training during each academic year including assignments, assessed full time responsibilities and participation in all facets of the educational process as per MCI norms. 85\% attendance is compulsory for all the Post Graduate students for every academic year. The Attendance details may be submitted to the Controller of Examinations at the end of every academic year. The student should also be intimated quarterly regarding the lack of attendance.

\textbf{*16. CONDONATION FOR LACK OF ATTENDANCE:}

The discretionary power of condonation of shortage of attendance to appear for University Examination rests with the Vice Chancellor.

Lack of attendance can be condoned up to a maximum of 5\% of the minimum attendance required in the following exceptional circumstances:

(i) Any illness/ accident (for which Medical certificate from a registered medical practitioner must be produced)
(ii) Any unforeseen tragedy in the family (should produce the letter from the parent/guardian)
(iii) Participation in NCC/NSS and other co-curricular activities representing the Institution / University. (Certificate from competent authority is required)

For any of the above reasons, request shall be made by the candidate with prescribed fees to the Controller of Examination through proper channel, ten days prior to the commencement of the theory examination. Based on the recommendation of the Head of
the Institution, the Controller of Examination shall obtain the approval of the Vice Chancellor for admission of the candidate to the University Examination.

*Sl.No.15 & 16 Amended vide XVIII meeting of Academic Council dated 15.04.2014 and to be replaced as detailed below:
In the existing regulations for M.D. Pre – Para and M.D./M.S. Clinical courses, it has been stipulated that 85% attendance is compulsory for all the Post graduate students for every academic year. This has been modified to 80% attendance in keeping with Statutory Body norms. There shall be no condonation for attendance. The attendance criteria will hence read as follow as in MCI regulations.

“All the candidates joining the Post Graduate training programme shall work as ‘Full Time Residents’ during the period of training and shall attend not less than 80%(Eighty percent) of the imparted training during each academic year including assignments, assessed full time responsibilities and participation in all facets of the educational process.”

The Attendance details shall be submitted to the Controller of Examinations at the end of each academic year. The student should also be intimated quarterly regarding the lack of attendance.

16 (a) STIPEND AND GRANT OF LEAVE
The Post Graduate students undergoing Post Graduate Degree / Diploma/Super-Specialty course shall be paid stipend on par with the stipend being paid to the Post Graduate students of State Government Medical Institutions / Central Government Medical Institutions, in the State / Union Territory where the institution is located. Similarly, the matter of grant of leave to Post Graduate students shall be regulated as per the respective State Government rules.

17. MIGRATION / TRANSFER OF CANDIDATES:
Under no circumstances, Migration/transfer of student undergoing any Post Graduate degree course shall be permitted by the University/Authority

18.TRAINING PROGRAM:
The training given with due care to the Post Graduate students in the recognised institutions for the award of various Post Graduate medical degrees / super speciality degrees shall determine the expertise of the specialist and / or medical teachers produced as a result of the educational program during the period of stay in the institution.

The Post Graduate students of the institutions which are located in various States / Union Territories shall be paid remuneration at par with the remuneration being paid to the Post
Graduate students of State Government medical institutions / Central Government Medical Institutions, in the State/Union Territory in which the institution is located. Similar procedure shall be followed in the matter of grant of leave to Post Graduate students.

(a) Every institution undertaking Post Graduate training programme shall set up an Academic cell or a curriculum committee, under the chairmanship of a senior faculty member, which shall work out the details of the training programme in each speciality in consultation with other department faculty staff and also coordinate and monitor the implementation of these training Programmes.

(b) The training programmes shall be updated as and when required. The structured training programme shall be written up and strictly followed, to enable the examiners to determine the training undergone by the candidates and the Medical Council of India inspectors to assess the same at the time of inspection.

During the training for PG Degree Courses to be awarded in clinical disciplines, there shall be proper training in basic medical sciences related to the disciplines concerned; during the training for the degree to be awarded in basic medical sciences, there shall be training in applied aspects of the subject; and there shall be training in allied subjects related to the disciplines concerned. In all Post Graduate training programmes, both clinical and basic medical sciences, emphasis is to be laid on preventive and social aspects and emergency care facilities for autopsies, biopsies, cytopies, endoscopic and imaging etc. also be made available for training purposes. The Post Graduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.

Training in Medical Audit, Management, Health Economics, Health Information System, basics of statistics, exposure to human behaviour studies, knowledge of pharmaco – economics and introduction to non- linear mathematics shall be imparted to the Post Graduate students.

Implementation of the training programmes for the award of various Post Graduate Degree course shall include the following:

**Basic Medical Sciences**

(i) Lectures, Seminars, Journal Clubs, Group Discussions, Participation in laboratory and experimental work, and involvement in research studies in the concerned speciality and exposure to the applied aspects of the subject relevant to clinical specialities.

**Clinical disciplines**

(i) In service training, with the students being given graded responsibility in the management and treatment of patients entrusted to their care; participation in Seminars, Journal clubs, Group Discussions, Clinical Meetings, Grand rounds, and Clinico - Pathological Conferences; practical training in Diagnosis and medical and Surgical treatment; training in the Basic Medical Sciences, as well as in allied clinical specialities.
The training program shall be on the same pattern as for M.D. / M.S. in clinical disciplines; practical training including advanced Diagnostic, Therapeutic and Laboratory techniques, relevant to the subject of specialization.

*The Academic Council in its XV meeting held on 08.05.2013 resolved to approve the following Curriculum Committee’s recommendations.*

- The members of Post Graduate Curriculum committee recommended that M.D/M.S. specialty Post Graduates can be posted to other department, so that it may give the Post Graduate an integrated approach.

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<thead>
<tr>
<th>MD PG Speciality</th>
<th>Departments to which they may be posted</th>
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<tbody>
<tr>
<td>Anaesthesia</td>
<td>Medicine, Obstetrics and Gynaec</td>
</tr>
<tr>
<td>Dermatology</td>
<td>Medicine, Pulmonology</td>
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<tr>
<td>Pulmonology</td>
<td>Medicine, Cardiology, Cardio thoracic surgery</td>
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<tr>
<td>Obstetrics and Gynaec</td>
<td>Medicine, Neonatology, Oncology</td>
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<tr>
<td>Orthopaedics</td>
<td>General Surgery</td>
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<tr>
<td>ENT</td>
<td>General Surgery</td>
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<tr>
<td>Ophthalmology</td>
<td>General Surgery, Medicine</td>
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19. MAINTENANCE OF LOG BOOK

a) Every Post Graduate student shall maintain a record (Log) book containing skills, the candidate has acquired during the training period certified by the various heads of department where the candidate has undergone training including outside the institution.

b) The students shall maintain a Record Book (Log Book) of the work carried out by them & training program undergone during the period of training including details of procedures carried out independently or assisted by the candidate. The log book will be checked by the faculty members imparting the training.

c) At the end of the course, the candidate should summarise the contents and get the record (Log) book certified by the Head of the Department.

d) The record (Log) book should be submitted at the time of practical examination for the scrutiny of the Board of Examiners.

e) It would be the constant endeavour of the faculty to develop desirable attitudes in the PG trainees during the course by personal examples, interaction and group discussion. Constant watch will be maintained during their work in the wards to ensure that this objective is being met. Although there will be no formal evaluation of
attitude, some aspects of this domain would be covered during the formative evaluation as noted below for continued internal assessment. Formative evaluation will be carried out over following activities of the P.G. resident.

i) Ward work

ii) Case presentation

iii) P.G. Lecture

iv) Journal club

v) General assessment of affective function attitude by medical & paramedical staff;

vi) Internal Assessment

Candidates can appear for theory examination only after being certified on the basis of Internal assessment.

20. THESIS / DISSERTATION AND EVALUATION

a) All Candidates admitted to undergo Post Graduate Degree course shall be assigned a topic for dissertation / thesis by the Head of the concerned unit and the title of the topic assigned to the candidates be intimated to the Controller of Examination of the University by the Head of the Department through the Head of the Institution before end of the First year.

b) The dissertation / thesis shall be a bound volume of minimum 50 pages and not exceeding 75 pages of typed matter (double line spacing and on one side only) excluding certification, acknowledgements, annexure and bibliography.

c) Four copies of dissertation shall be submitted six months prior to the commencement of the examination on the prescribed date to the controller of examination of the University.

d) Two copies are to be submitted as an electronic version of the entire dissertation in a standard C.D. format mentioning the details and technicalities used in the C.D. format.

e) The concerned Professors / Readers are to supervise and to see that the dissertation is done properly utilising the clinical materials of their own department / institution. The students must learn the design and interpretation of research studies, responsible use of informed consent and research methodology and interpretation of data and statistical analysis. They should seek the help of qualified staff members in the conduct of research. They must learn to use library and the computer-based research. This training will help them to develop skills in planning, designing and conduct of research studies.

f) All candidates on admission will be allotted one of the department faculties who have fulfilled the requirement to be guides for purposes of guiding Dissertation/thesis. The topic for dissertation shall be finalized and discussed in the departmental faculty
meeting and allotted to the individual candidates before the completion of 3 months after admission. The purpose of dissertation is to develop in the candidate the ability to perform an independent study keeping the principles and research methodology in mind. The candidate will therefore work on the prospective problem either within the department or in collaboration with other departments. There will be continuous monitoring of the dissertation work by the guides and co-guide and by the other department staff throughout the course. The candidate will present the progress of the dissertation to the faculty on the completion of 1 ½ years for monitoring and feedback. The completed dissertation should be submitted not later than 6 months before final examination.

g) The theory examinations shall be held sufficiently earlier than the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the start of the Clinical/Practical and Oral examination.

h) 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. A candidate shall be allowed to appear for Theory and Practical/Clinical examination only after the acceptance of thesis by the examiners. The thesis shall be evaluated under the following heading:

1) Approved
2) Not approved

In all cases the approval shall be given before 3 months of the date of appearing for the examination and this will be essential before the candidate is allowed to appear for the written examination.

21. SCHEDULE OF EXAMINATIONS:

The examination for M.D./MS, shall be held at the end of 3rd academic year. An academic term shall mean six month's training period."

22. *SCHEME OF EXAMINATIONS:


The examinations shall be organised on the basis of "Marking system" to evaluate and to certify candidate's level of knowledge, skill and competence at the end of the training.


b. A postgraduate student of a postgraduate degree course 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.

c. **Theory**: A Written Examination shall consist of four theory papers each of three hours duration. Each paper carries 100 marks (Total 400 marks). Out of these one shall be of Basic Medical Sciences and one shall be of Recent advances. The theory examinations shall be held well in advance than the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the commencement of the Clinical/Practical and Oral examination.

d. **Clinical Examination**: Clinical examination for the subjects in Clinical sciences shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a specialist/Teacher, for which candidates shall examine a minimum one long case and two short cases.

e. **Oral Examination**: The Oral examination shall be thorough and shall aim at assessing the candidate knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty, which form a part of the examination.

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<th>THEORY</th>
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<tr>
<td>No. of Theory Papers</td>
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<tr>
<td>Marks for each Theory Paper</td>
</tr>
<tr>
<td>Total marks for Theory Paper</td>
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<tr>
<td>Passing Minimum for Theory</td>
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<tr>
<td>Total Marks for CLINICAL</td>
</tr>
<tr>
<td>Passing Minimum for Clinical</td>
</tr>
<tr>
<td>Viva voce</td>
</tr>
<tr>
<td>Passing minimum for Clinical including Viva voce</td>
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(i) if any candidate fails even under one head, he/she has to re-appear for entire examination.

(ii) Theory paper consist of 2 essay questions of 25 marks each (2 X 25 = 50) & 5 short notes of 10 marks each (5 X 10 = 50). Total =100 marks each.

*Sl.No.22 (ii) Amended vide XVIII meeting of Academic Council dated 15.04.2014 and to be replaced as detailed below:*

Resolved to approve 2 Essay Questions (2 x 20 marks) and 10 short notes (10 x 6 marks) for all post graduate medical / broad and higher speciality courses which will take effect for the students appearing for first time examination from March 2015.
Sl.No.22(ii) Amended in XX Academic Council dated 25.03.2015.
Resolved to approve 2 essays (2 x 20 marks) and 6 short notes (6 x 10 marks) for theory paper in all M. D/ M.S. courses by the Academic Council in its XX meeting held on 25.03.2015.

*Resolved to approve that an examinee should obtain minimum 40% marks in each theory paper and not less than 50% marks cumulatively in all the four papers in P.G. degree examination to be cleared as passed which will be implemented prospectively. (Academic Council in its XX meeting held on 25.03.2015).

23. EXAMINERS:
All the Post Graduate Examiners shall be recognized Post Graduate Teachers holding recognized post graduate qualification in the subject concerned. For all Post Graduate Examinations, the Minimum number of examiners shall be Four, out of which at least two (50%) shall be external examiners who shall be invited from other recognized universities from outside the state / outside university. The remaining two will be internal examiners.

The qualification and teaching experience for appointment of examiner shall be as detailed below and by the guidelines of Medical Council of India issued from time to time.

No person shall be appointed as an internal examiner in any subject unless he/she has three years’ experience as recognized PG teacher in the concerned subject. For external examiners, he/she should have minimum six years of experience as recognized PG teacher in the concerned subject. “An examiner shall ordinarily be appointed for not more than two consecutive terms”

i. Under exceptional circumstances, examinations may be held with 3 (three) examiners provided two of them are external and Medical Council of India is intimated for the justification of such action prior to publication of result for approval. Under no circumstances, result shall be published in such cases without the approval of Medical Council of India.

24. MAXIMUM NUMBER OF CANDIDATES:
The maximum number of candidates to be examined in clinical/practical and oral on any day shall not exceed eight for M.D./M.S. Clinical Courses.

25. *NUMBER OF EXAMINATIONS:
The University shall conduct not more than two examinations in a year, for any subject, with an interval of not less than 4 and not more than 6 months between the two examinations. The examination shall be conducted in March and September.

*Sl. No.25 Amended in XXI meeting of Academic Council dated 22.07.2015. Resolved to approve the commencement of M.D. /M.S. University examination in April (for Regular Batch) and October (for Supplementary Batch).

26. REVALUATION OF ANSWER PAPERS:
There shall be no revaluation of answer papers. However, re-totaling is allowed in the failed subjects with the payment of required fee fixed by the University within 15 days from the date of receipt of statement of marks.

SYLLABUS FOR M.S. ORTHOPAEDICS
POSTGRADUATE COURSE

1. OBJECTIVES:
The aim of the postgraduate course in Orthopedics is to help the candidates achieve milestones and gain knowledge, skills and attributes essential for a successful Orthopedic surgeon.

APPLIED CLINICAL KNOWLEDGE:

Cognitive knowledge:
1) Knowledge of basic sciences pertinent to the practice of Orthopaedics and applied aspects of those fields such as anatomy, physiology, pathology, microbiology etc. which would aid in diagnosing and treating conditions.
2) Ability to diagnose and treat common orthopaedic conditions.
3) Knowledge of recent advances.

Application of knowledge for Clinical decision making:
1) Accurate history taking and clinical evaluation.
2) Ordering appropriate investigations.
3) To develop expertise to manage medically as well as surgically the commonly encountered disorders.
4) To apply knowledge gained about disease prevention in the community.

APPLIED CLINICAL SKILLS:

Procedural skills:
1) To gain confidence in performing basic orthopaedic procedures both elective and trauma.
2) To assist all sub specialty cases and have adequate knowledge of the treatment options for these patients.

Core competencies:
1) Acquiring informed consent
2) Proper pre-operative planning
3) Pre-operative preparation
4) Exposure and closure
5) Intra operative technique
6) Postoperative management

Mastering core competencies is as essential as learning the procedure as treatment of the patient is viewed as the whole interaction from the time of the first visit of the patient to the time of discharge.
PROFESSIONAL AND MANAGEMENT SKILLS:

PATIENT CARE:
1) To always keep patient’s wellbeing as the basis for all therapeutic interventions and decisions.
2) To keep the patient informed at all times and to involve him/her in the decision-making process.
3) To always follow principles of ethical medical practice

TEAMWORK:
1) To learn to work collaboratively with colleagues
2) To know of one’s limitations and involve seniors when required
3) To learn proper delegation and review of work.

TEACHING SKILLS:
Acquire ability to teach the undergraduate students in simple language about common orthopaedic disorders, particularly, the signs and symptoms for diagnosis and general principles of therapy.

RESEARCH:
Learn the basic tenets of modern research including formulation of research protocol, review of literature, recruitment of patients, record keeping, follow up of patients, analysis of data and finally writing up the study for publication or presentation.

3. SYLLABUS

BASIC SCIENCES
Development of skeleton, histology of cartilage histology & histopathology of bone, physiology of fracture healing, delayed and non-union of bones, histology of skeletal muscle, collagen, physiology and mineralization of bone, physiology of cartilage, biophysical properties of bone and bone disease and related dysfunction of parathyroid glands and Anatomy, Physiology, Biochemistry, Pharmacology, Pathology as applied to orthopaedics.

PRINCIPLES & PRACTICE OF ORTHOPAEDICS
Bone infections (Pyogenic, tuberculosis, syphilis, mycotic infections, salmonella & brucella osteomyelitis), congenital deformities (upper & lower extremities, spine and general defects), developmental conditions (osteogenesis imperfecta, dysplasias, hereditary multiple exostosis etc.) diseases of the joints (osteoarthritis, rheumatoid arthritis, neuropathic joints, ankylosing spondylitis, sero-negative spondyloarthropathy, traumatic arthritis etc.) orthopaedic neurology, tumors of bone, disorders of hand & their management.

GENERAL SURGICAL PRINCIPLES & ALLIED SPECIALITIES
General surgery, oncology, and medicine as applicable to the Musculo-skeletal disorders/disease.
Radiology, Imaging such as, computed tomography, magnetic resonance imaging, interventional radiology and angiography as related to orthopaedics. General pathologic aspects such as wound healing and also pathology and pathogenesis of orthopaedic diseases, pharmacology, molecular biology, genetics, cytology, haematology, and immunology as applicable to orthopaedics. General principles of traumatology. Plastic surgery as applicable to orthopaedics

**Pediatric orthopaedics** - The student should be exposed to all aspects of congenital and developmental disorders such as CTEV (clubfoot), development dysplasia of hip, congenital deficiency of limbs. Perthe's disease and infections, and also to acquire adequate knowledge about the principles of management of these disorders.

**Orthopaedic oncology** - The resident is expected to be familiar with the tumours encountered in orthopaedic practice and the recent trends in the management of bone tumours.

**Trauma** - Management of Trauma in this country is one of the main causes of morbidity and mortality. The student is expected to be duly conversant with trauma in its entirety. In any type of posting after qualification an orthopaedic surgeon would be expected to manage trauma cases independently. Hence, it is his responsibility to be able to recognize, assess and manage cases and be aware of the medico legal aspects.

**Sports Medicine** – It not only encompasses diagnostic and therapeutic aspects athletic injuries but also their prevention, training schedules of personnel and their selection.

**Physical Medicine and Rehabilitation** - The student is expected to be familiar with this in all its aspects. Adequate exposure in the workshop manufacturing orthotics and prosthetics is mandatory, as is the assessment of the orthopaedically handicapped.

**Orthopaedic Neurology** - The student should be exposed to all kinds of nerve injuries as regards their recognition & management. Knowledge of conditions such as cerebral palsy and acquired neurological conditions such as post-polio residual paralysis is also essential.

**Spine Surgery** - The student is expected to be familiar with various kinds of spinal disorders such as scoliosis, kypho-scoliosis, spinal trauma, PIVD, infections (tuberculosis and pyogenic), & tumours.

**Radiology** - Acquire knowledge about radiology/imaging and to interpret different radiological procedures and imaging in musculoskeletal disorders. There should be collaboration with Radiology department for such activities.

**Psychological and social aspect** - Some elementary knowledge in clinical psychology and social work and management is to be acquired for management of patients, especially the terminally ill and disabled and interacting with their relatives.

**YEAR WISE BREAK UP OF SYLLABUS**

*First Year*
- Humanity/Ethics - Lectures on humanity, personality development, team spirit, Ethical issues in patients, Doctor-patient relationship and interpersonal relationship
- Lectures Basic Sciences - Development of skeleton, Histology & Histopathology of cartilage & bone, Histology of skeletal muscle, collagen, Physiology of cartilage, Biophysical properties of bone and bone diseases and related dysfunction of parathyroid glands. Physiology of fracture healing, Delayed union & non-union of bones
- Emergency management of the injured patient including critical care-lectures by anaesthetist for airway maintenance & shock management, basic splintage and transportation techniques, ATLS.
- Medical record keeping and bio-statistics. Preparation for thesis/protocol
- History taking and clinical examination of the patient.
- Diagnosis and management of common fractures and dislocations
- Traction techniques
- Interpretation of plain x-rays and clinico-radiological correlation
- Diagnosis and management of acute and chronic orthopaedic infections

**Second Year**

- Pediatric Orthopaedics with emphasis on CTEV, CDH, Perthes disease, S.C.F.E., club hand
- Physical Medicine & Rehabilitation: various physiotherapy and occupational therapy techniques
- Orthopaedic neurology including Polio, Cerebral palsy, spina bifida
- Hand Surgery
- Plastic Surgery related to orthopaedics
- Interpretation of C.T., MRI, Bone Scanning - Techniques and clinico-radiological correlation.
- Orthopaedic Oncology
- Surgical stabilizations of orthopaedic trauma
- Peripheral nerve injuries
- Biomaterials in orthopaedics
- Vascular surgery

**Third Year**

- Reconstructive orthopaedics
- Sports medicine and arthroscopy
- Arthroplasty
- Spinal disorders including scoliosis, trauma, infections, degeneration and tumours
- Clinical orthopaedics
- Recent advances in orthopaedics
- Thesis Submission
- Research Publication
- Revision courses
DETAILS OF THE SKILLS TO BE ACQUIRED DURING THE TRAINING PERIOD

<table>
<thead>
<tr>
<th>S.No</th>
<th>PROCEDURE</th>
<th>ASSISTING</th>
<th>PERFORMING</th>
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<tbody>
<tr>
<td><strong>FIRST YEAR</strong></td>
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</tr>
<tr>
<td>1.</td>
<td>Skin traction</td>
<td></td>
<td>Yes</td>
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<tr>
<td>2.</td>
<td>Skeletal traction of upper Tibia, distal Tibia, lower Femoral, Trochanteric screw, Olecranon, Calcaneal and Skull traction</td>
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<td>Yes</td>
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<tr>
<td>3.</td>
<td>Closed reduction of Fractures &amp; Dislocations: Clavicle, Shoulder dislocation, proximal Humerus, shaft of Humerus, dislocation elbow, fracture of both bones forearm, Colles' and other distal radial fractures, dislocations of hip, fracture shaft of femur in children, tibial shaft fracture, ankle fractures &amp; dislocations.</td>
<td></td>
<td>Yes</td>
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<tr>
<td>4.</td>
<td>Management of open fractures - Debridement, external fixation</td>
<td></td>
<td>Yes</td>
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<tr>
<td><strong>SECOND YEAR</strong></td>
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<tr>
<td>5.</td>
<td>Open reduction and internal fixation of Fractures: Plate Osteosynthesis in shaft Humerus and both bones forearm fractures Kirschner wire fixation of supracondylar fracture of humerus Cannulated screw fixation for fracture neck of femur Dynamic Hip Screw of trochanteric fracture Intramedullary nailing for femoral shaft fracture Fixation of Potts fracture Excision of Head Radius</td>
<td></td>
<td>Yes</td>
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<tr>
<td>6.</td>
<td>TBW Patella, Olecranon, Medial malleolus</td>
<td></td>
<td>Yes</td>
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<tr>
<td>7.</td>
<td>Bone &amp; Joint Infections Aspiration of joints Drilling and decompression of intraosseous pus collection Drainage of abscess Sequestrectomy &amp; saucerisation</td>
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<td>Yes</td>
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</table>
| 8. | Bone tumors  
Biopsy from tumor  
Excision of osteochondroma  
Curettage & Bone grafting | Yes | Yes |
|   |   |   |
| **THIRD YEAR** |   |   |
| 9. | Fixation of Fractures like proximal Humeral, Supracondylar Femur, Proximal tibia & Talus fracture and dislocation | Yes |   |
| 10. | Spine  
Exposure to spine by posterior, anterior and anterolateral approaches | Yes |   |
| 11. | CTEV Manipulation and POP application  
Tendo Achilles lengthening |   | Yes |
| 12. | Postero-medial soft tissue release  
Bony procedures including Triple arthrodesis | Yes |   |
| 13. | High tibial osteotomy | Yes |   |
| 14. | Tendon repair | Yes |   |
| 15. | Poliomyelitis Hamstring Release & Posterior Capsulotomy  
Flexor Abductor release  
Corrective osteotomies of Humerus, Femur and Tibia  
Knee & Ankle arthrodesis  
Pantalar and triple arthrodesis  
Limbs lengthening / Illizarov | Yes |   |
| 16. | Amputations | Yes |   |
| 17. | Limbs salvage procedures | Yes |   |
| 18. | Arthroscopy of knee  
Joint replacement  
Hip joint  
Knee joint  
Peripheral nerve repair  
Tendon transfer procedures  
Spinal stabilization procedures like pedicular screw | Yes |   |
| 19. | IM Nailing of femur, DHS fixation, Plating of simple diaphyseal fractures, Ankle fractures | Yes |   |

**SAMPLE CASES FOR PRESENTATION AND DISCUSSION**

**LONG CASES**
- Fixed/ Ankylosed hip
- Neglected fracture Neck of femur
- Tubercular Hip
- Neglected traumatic dislocation hip
- Potts paraplegia
- Extra dural cord compression
- Prolapsed intervertebral disc
- Spinal Canal stenosis
- Cauda equina syndrome
- Avascular Necrosis of Hip
- Traumatic paraplegia

**SHORT CASES**
- Cubitus varus/ Valgus
- Nonunion Humerus with or without radial nerve palsy
- Nonunion lateral condyle of Humerus
- Infected non union
- Chronic osteomyelitis
- Post-polio flail shoulder/ paralysed elbow
- Neglected unreduced Dislocation Elbow
- Neglected unreduced Dislocation Shoulder
- Malunited Colles Fracture
- Carpal tunnel Syndrome
- Bone tumors like Ostesarcoma, Ewing’s Sarcoma, Giant cell tumor, Osteochondroma, Osteiod osteoma etc
- Genu varum/ Genu Valgum
- Ruptured Tendo Achillis
- Erb’s palsy/ Brachial plexus injury
- Nerve injuries-Median nerve, Radial nerve, Ulnar nerve, Sciatic nerve, Common Peroneal nerve

**SPOTTERS**
- Pathological Specimens-Giant cell Tumor, Osteosarcoma, Ewings sarcoma, Sequestrum, Madura foot
- Bones
- Instruments
- X-Rays
- Orthotics/ Prosthetics-Patellar tendon bearing prosthesis, Cock up splint, Denis-Brown splint, Ischial weight relieving caliper, Jaipur foot etc.

**BOOKS AND JOURNALS RECOMMENDED**

**FIRST YEAR**
- Mercer’s orthopaedics surgery - Duthie, Edward Arnold
- Campbell’s Operative Orthopaedics - Canale and Beaty
- Outline of orthopaedics - Crawford Adams
- Closed treatment of fractures - John Charnley
• Apley’s system of orthopaedics

SECOND YEAR
• Text book of orthopaedics - Samuel Turek
• Campbell’s Operative Orthopaedics - Canale and Beaty
• Exposures in Orthopaedic Surgery, Hoppenfeld
• AO Principles of internal fixation
• AO Principles of external fixation
• Chapman’s Orthopaedics
• Watson Jones fractures and joint injuries - J.N. Wilson

THIRD YEAR
• Fractures in adults and children - Rockwood and Green
• Campbell’s Operative Orthopaedics - Canale and Beaty
• AO Spinal fixation
• Tumours and tumorous conditions of bones and joints - Jaffe
• Clinical Examination – Das, McRay, Reider
• Tuberculosis of musculoskeletal system – S.M.Tuli
• Textbook of deformity correction – Dror Paley
• Manual of Ilizarov
• Manual of Arthroscopy – Strobel

JOURNALS
• Indian Journal of Orthopaedics
• Journal of Bone and Joint Surgery (British and American editions)
• Orthopaedics Clinics of North America
• Clinical Orthopaedics and Related Research
• Yearbook of Orthopaedics
• Journal of Rehabilitation
• Injury
• British journal of Rheumatology and Physical Medicine
• Journal of Arthroplasty
• Arthroscopy
• Spine
• Journal of Orthopaedic Trauma
• Journal of Hand Surgery
• Journal of Trauma

SCHEDULE FOR THE 3 YEARS OF M.S. ORTHOPAEDICS DEGREE

ORIENTATION PHASE:
• The first three months will be an orientation phase including exposure to casualty, OPD, emergency operation theatre and ICU.
• Stress will be given on history taking, clinical examination, preoperative workup, postoperative care of the patient and accurate documentation of patient’s progress.
• Learning techniques of traction, wound care and splintage.
• Attending emergency surgeries for acclimatization.
• Assisting ward rounds and visits other wards with senior colleagues.

**MAIN POSTINGS WILL INCLUDE:**
• Specialty Postings - 4 Months
• Attending orthopaedic OPD on rotation
• Case discussion with consultant(s) in OPD/ward.
• Attending operation theatre on rotation
• Attending morning rounds
• 24 hours-emergency duties as per rota.
• Care of the inpatients in the wards allotted to the resident
• Attending the weekly journal club and seminar. Each resident has to make presentations in these sessions by rotation.
• Attending specialty clinics, viz sports medicine, spine, arthritis clinics; presenting cases and participating in discussions including therapy-planning.
• During the course, the resident must attend the combined teaching programs with other departments such as pathology and radiology (Clinico-radio-pathological meets)
• Attending lectures by the visiting faculty to the department/college.
• Attending and presenting papers in State / Zonal /National /International conferences.
• Active participation in organization of departmental workshops, courses in specialized areas like Arthroplasty, Arthroscopy, Spine, and Hand Surgery from time to time.
• Participation in the orthopaedic skills lab and cadaveric skills lab training programs
• Further, the academic work should follow the following guidelines:
  1) Continuous Medical Education (CME) – 50 hrs
  2) Research Work – At least 2 in Number
  3) National/ Regional Conferences – 3 Paper presentations
  4) Academic Activity – 100 case presentation in 3 years
  5) 30 academic presentations inside the department

**METHODS OF TRAINING AND TEACHING**

The following list gives an outline of the methods to be used for the teaching postgraduate students:

1) **Journal Club:** Paper presentation/discussion once a week
2) **Seminar:** One seminar every week
3) **Lecture/Discussion:** Lectures on newer topics by faculty
4) **Case presentation** during the ward round (bedside presentation) and in special clinics (such as Scoliosis/Hand clinics)
5) **Case presentation:** on a regular basis in the afternoon sessions
6) **X-ray Classes:** once or twice a week
7) **Surgico-radio-pathological conference:** Special emphasis is made on the surgical pathology and the radiological aspects of the case.
8) **Combined rounds/Grand rounds**: once a week with all the faculty of the unit. Focus is on improving patient care and treatment of challenging cases.
9) **Emergency duty**: Casualty duty to be arranged by rotation among the PGs with a faculty cover daily.
10) **Afternoon clinics**: Clinical classes in the afternoon from 2 to 4pm daily in the form of case presentation, lectures and CME programs.
11) **Plaster room training**: posting in the plaster room during OPD hours is part of curriculum.
14) **Special postings**: in general surgery, plastic surgery, neurosurgery and physical medicine and rehabilitation department for 1 month each.

**THEORY EXAMINATION – Each paper for 100 marks**

**PAPER I**
Basic Sciences as applied to Orthopaedics.

**PAPER II**
Traumatology and rehabilitation

**PAPER III**
Orthopaedics including Physical Medicine

**PAPER IV**
Recent advances in Orthopaedics

**CLINICAL AND VIVA VOCE (Total = 400 Marks)**

**CLINICAL EXAMINATION - 300 Marks**

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<tr>
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<tbody>
<tr>
<td>Long Case</td>
<td>1</td>
<td>150</td>
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<tr>
<td>Short Cases</td>
<td>(2 x 75)</td>
<td>150</td>
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<tr>
<td><strong>Total</strong></td>
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**VIVA VOCE EXAMINATION - 100 Marks**

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<tbody>
<tr>
<td>1) Operative Surgery</td>
<td>-</td>
<td>25</td>
</tr>
<tr>
<td>2) Orthotics &amp; Prosthetics</td>
<td>-</td>
<td>25</td>
</tr>
<tr>
<td>3) Instruments</td>
<td>-</td>
<td>25</td>
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<tr>
<td>4) X-rays, Histopathology &amp; Specimens</td>
<td>-</td>
<td>25</td>
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