15 March-2024

Minutes of the Meeting Board of Study (BOS)

A faculty meeting along with external faculty was held in the chamber of head of department on 15th March-2024 at 03:00 pm. The following members were present.

Name	Designation	Signature
Dr. Amit Saraf	Prof. & HOD (Chairperson)	
Dr. Atul Agarwal	Professor and external faculty (Himalyan Institute of Medical Sciences)	
Dr. Sudhir Singh	Professor (Member)	
Dr. Manmohan Sharma	Professor (Member)	
Dr. Adhish Pratap Singh	Assistant Professor (Member)	
Dr. Rajul Rastogi	Professor and external faculty within TMU University	

Following points discussed and finalized in presence of external faculty.

1. CBME Based Curriculum implementation .
2. Post graduate teaching schedule focus CBME.
3. Inclusion of OSCE Pattern in PG Examination.
4. CBME based examination pattern was discussed.
5. COMPETENCY OF MS ORTHPAEDICS PROGRAM-Year Wise are attached as per Annexure-1.

Dr. Amit Saraf

Prof.& HOD

Department of Orthopaedics

BOARD OF STUDIES

Minutes of meeting

MARCH 15, 2024

DEPARTMENT OF ORTHOPAEDICS
Teerthanker Mahaveer Medical College, Moradabad

Teerthanker Mahaveer Medical College & Research Center

Bagarpur, Delhi Road, NH-24 Moradabad-244001(U.P.)

Date: 15-03-2024

DEPARTMENT OF ORTHOPAEDICS

Minutes of Meeting of Board of Studies

A meeting of Board of Studies members was held in the Department of Orthopaedics on 15-03-2024 at 03:00 PM.

The Members present in the meeting were:

1. Professor Amit Saraf (Chairperson, Professor & HOD Dept. of Orthopaedics, TMMC&RC)
2. Dr. Atul Agrawal (External Faculty, Professor & Head Dept. of Orthopaedics, Himalayan Institute of Medical Sciences, Uttarakhand)
3. Professor Sudhir Singh (Member, Professor Dept. of Orthopaedics, TMMC&RC)
4. Professor Manmohan Sharma (Member, Professor Dept. of Orthopaedics, TMMC&RC)
5. Dr. Adhish Pratap Singh (Member, Assistant Professor Dept. of Orthopaedics, TMMC&RC)

The external member present within

TMU University:

1. **Professor Rajul Rastogi, Dept. of Radiodiagnosis, TMMC&RC, Moradabad**

The meeting commenced with a discussion on the guidelines for postgraduate (PG) courses, specifically focusing on the three-year training program for the MS degree (PGMER 2023; dated 29th December 2023) and "revised CBME document" (**D 11011/1/22/AC/Guidelines/22 Dated: 02-11-2022)**.

Proposed agenda items which were already circulated:

1. Implementation of Competency based curriculum of MS Orthopaedics and discuss and formulate Updated evaluation scheme of MS students as directed by "revised CBME document" (**D 11011/1/22/AC/Guidelines/22 Dated: 02-11-2022)**
2. Implementation of contents of gazette notification dated 29th December 2023 PGMER 2023.
3. Finalization of Panel of external examiners for university Postgraduate examination
4. Finalization of Panel of external examiners for university Undergraduate examination
5. Any other item with permission of chair.

The following key points were highlighted:

Full-time Engagement as Junior Residents: All students enrolled in PG courses are required to work as full-time (Junior) residents throughout their training period. Attendance at training activities must not be less than 80% during the calendar year.

Participation in Educational Process: Students are expected to actively participate in all assignments and facets of the educational process relevant to their course.

Logbook Maintenance: Both CBME and PGMER 2023 mandates Students to maintain a logbook to record their training experiences, including details of procedures performed during clinical postings in real-time. However, PGMER 2023 stresses upon maintaining e-logbooks (dynamic electronic logbooks).

Three-Year Training Program Structure: The three-year training program for the MS degree will consist of postings to different assignments for specified periods. The recommended duration for these assignments/postings is 36 months, with breaks only for examinations.

Flexibility in Posting Schedules: Posting schedules may be modified based on the needs, feasibility, and exigencies of the training program. The feasibility of extramural postings for facilities not available in the parent institution was discussed and the scope of which was explored.

Variations in Postings: Departments have the flexibility to vary postings slightly based on the clinical profile of the hospital. It was emphasized that at least the lower limit for each of the four main components of the course must be covered during postings.

The attendees deliberated on the importance of a diverse mix of methodologies to ensure comprehensive training for postgraduate students.

Various teaching-learning methods discussed include:

Demonstrations, Symposia, Journal clubs, Clinical meetings, Seminars, Small group discussions, Case-based learning, Simulation-based teaching, Self-directed learning, Integrated learning, Interdepartmental meetings, Interactive slide and gross sessions

Students will be posted for **DISTRICT RESIDENCY PROGRAMME (DRP)** for a period of 3 months on rotation basis in the 3rd or 4th or 5th semester of the postgraduate program as mandated by PGMER 2023.

Course in Research Methodology: It was unanimously agreed that all postgraduate students must complete an online course in Research Methodology within six months from the commencement of their batch. All students must complete online course, in **"Basic Course in Biomedical Research", offered by ICMR-National Institute of Epidemiology (ICMR-NIE), Chennai**. This online course covers essential topics such as research design, data collection methods, statistical analysis, ethics in research, and academic writing. Upon successful completion of the course, students are required to generate an online certificate as proof of completion.

Course in Ethics

a. All postgraduate students shall complete a course in ethics including **Good Clinical Practices**, to be conducted by institution/Universities.

b. The students are expected to complete the course in the first year.

c. No postgraduate student shall be permitted to appear in the examination without the above certification.

Course in Cardiac Life Support Skills:

a. All postgraduate students shall complete a course in **Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS) skills** to be conducted by the institution.

b. The students are expected to complete the course in the first year.

c. No postgraduate student shall be permitted to appear in the examination without the above certification.

Participation in Teaching and Training Program: It was agreed that postgraduate trainees must actively participate in the teaching and training program of undergraduate students in the department. This involvement is crucial for their professional development and the enhancement of educational standards within the department.

Attendance at Accredited Scientific Meetings: It was decided that postgraduate trainees must attend accredited scientific meetings such as Continuing Medical Education (CME), symposia, and conferences **at least once a year.** This exposure will broaden their knowledge base and keep them updated with the latest advancements in their respective fields.

PGMER 2023 states that "A post-graduate student of a degree course in broad specialty/super specialty will do at least one of the following to make him/her eligible to appear in his/her final examination: a. Poster presentation at a National/Zonal/State conference of his/her specialty; b. Podium presentation at a National/Zonal/State conference of his/her specialty; c. Have one research paper published/accepted for publication in journal of his/her specialty as first author"

But **revised CBME guideline states that** "At least two presentations at state/national level conference. One paper (thesis or non-thesis related work) should be published /accepted/publication draft in an indexed journal."

We thus agreed to adopt the one prescribed by revised CBME which covers implementation of both CBME and PGMER 2023 and thus makes it compulsory for all post graduate student to present at least two presentations at state/national level conference. One paper (thesis or non-thesis related work) to be published /accepted/publication draft in an indexed journal.

Encouragement of E-Learning Activities: The department will actively encourage e-learning activities among postgraduate trainees. This includes utilizing online resources, participating in webinars, and engaging with digital learning platforms to supplement their traditional training.

Training in Basic and Advanced Cardiac Life Support (BCLS and ACLS): It was emphasized that postgraduate trainees should undergo training in Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS). This training is essential for equipping them with the necessary skills to handle cardiac emergencies effectively.

Training in Information Technology and Computer Usage: The department will provide training sessions for postgraduate trainees in information technology and the use of computers. Proficiency in these areas is indispensable in modern medical practice and research.

After discussion and deliberation of subject specific **learning objectives, subject specific competencies and syllabus** is unanimously adopted as specified in revised CBME document.

Recommended Readings as mentioned in the revised CBME document is also adopted as minimum suggested standard reading.

Discussion on Formative Assessment: It was unanimously agreed that formative assessment is crucial for improving learning outcomes. Assessment should encompass medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self-directed learning, and ability to practice within the healthcare system. Internal assessment should be frequent, covering all

domains of learning, and used to provide feedback to enhance learning. It should particularly emphasize professionalism and communication skills.

Quarterly Assessment Plan:

The following components were agreed upon for quarterly assessments during the MS training:

- Journal based / recent advances learning
- Patient based /Laboratory or Skill based learning
- Self-directed learning and teaching
- Departmental and interdepartmental learning activity
- External and Outreach Activities / CMEs
- Mini Cex encounter – at least 4
- Clinical encounter cards - at least -4
- Direct observation of procedural skills – at least 6 including Cadaver dissection
- OSCE/Theory, Essay, Short notes
- MCQS
- Bone Skill Lab performance assessment

It was suggested that these assessment sessions be organized and recorded as an institutional activity for all postgraduates, ensuring consistency and transparency.

Assessment Methodology: Participants agreed that students should be periodically assessed according to categories listed in appropriate non-clinical/clinical postgraduate student appraisal forms.

SUMMATIVE ASSESSMENT:

The examination format for postgraduate medical education will adhere to 'Marking system' as specified in the latest POSTGRADUATE MEDICAL EDUCATION REGULATIONS.

It is mandatory for postgraduate students to obtain a minimum of 50% marks in both 'Theory' and 'Practical' components separately to pass the examination.

Examinations for M.S. programs will be conducted at the conclusion of the 3rd academic year. Four theory papers will be included in the examination structure as per PG Regulations:

There shall be four theory papers (as per PG Regulations).

- Paper I: Basic sciences as applied to the subject
- Paper II: Traumatology and Rehabilitation
- Paper III: Orthopaedics diseases
- Paper IV: Recent advances in Orthopaedics surgery & General Surgery as applied to Orthopaedics

Each paper will ideally contain **one structured long-answer question** to assess comprehensive in-depth knowledge, along with 6-8 short-answer questions.

Practical/clinical and Oral/viva voce examination:

1. **Practical examination:**
   Practical examination should be spread over two days and include various major components of the syllabus focusing mainly on the psychomotor domain.

2. **Oral/Viva voce examination:** on defined areas should be conducted by each examiner separately. Oral examination shall be comprehensive enough to test the post graduate student's overall knowledge of the subject focusing on psychomotor and affective domain. It should include:

i. Stations for clinical, procedural and communication skills
ii. Log Book Records and reports of day-to-day observation during the training.
iii. Should test the post graduate student's overall knowledge of the subject in:

- Ortho Radiology
- Ortho Pathology
- Histopathology & Gross anatomy
- Instruments
- Orthotics and Prosthotic

It was noted that the examination structure should adhere to general guidelines outlined, with modifications allowed according to local university guidelines.

Examiners: a. The examiner (both internal and external) for the post-graduate examination in Broad and Super Specialties **shall have three years' experience as recognised Post-graduate Guide in the concerned subject.**

b. The minimum number of examiners for post-graduate examination shall be four. Out of which, at least two shall be external examiners and least **one of them shall be from different university outside the state**.

c. An examiner **shall not be appointed for more than two consecutive regular examinations** for the same institution.

A suggested marks distribution **for practical examination was presented, allocating 400 marks (including 100 marks for viva voce)** across different sections.

Oral/Viva Voce Examination:

i. 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 consultant/specialist/teacher, for which candidates shall be examined for one long case and two short cases.

ii. Practical examination for other subjects shall be conducted to test the knowledge and competence of the candidates for making valid and relevant observations based on the experimental/ laboratory studies and his ability to perform such studies as are relevant to his subject.

iii. The viva voce examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the Speciality.

iv. Clinical/practical examination shall include Objective Structured Clinical Examination (OSCE).

Emphasis was placed on the comprehensive nature of the oral examination, ensuring it adequately assesses the student's understanding and competence in the subject matter.

Final Clinical Examination: The final clinical examination in broad specialty clinical subjects should include cases pertaining to major systems, stations for instruments, procedural and communication skills, logbook records, and reports of

day-to-day observations during training.

It was reiterated that the oral/viva voce examination should be comprehensive enough to test the postgraduate student's overall knowledge of the subject.

Panel of external examiners for MS examination:

S.No.	Name, Designation & Address of External examiner	Mobile No.	Email ID
1.	**Dr. Sandeep Kumar,** Professor & HOD Department of Orthopaedics Hamdard Intitute of Medical Science, New Delhi	8860810064	Drsandeepkumar20@gmail.com
2.	**Prof. Anil Juyal** Department of Orthopaedics Himalyan Institute of Medical Sciences, Dehradun	9412928899	
3.	**Prof. Pankaj Singh** Head, Department of Orthopaedics, GMC Haldwani	9837407957	
4.	**Prof. Rehanul Haq** Head, Dept. of Orthopaedics, AIIMS Bhopal	7982360432	docrehan1975@gmail.com
5.	**Prof. Rajesh Maheshwari,** Prof. & Head, Department of Orthopaedics, Himalyan Institute of Medical Sciences, Swami RamaHimalayan University, Swami Ram Nagar, Jolly Grant, Dehradun, Pin - -248016 (U.K.)	9411712626	Rajesh1969m@yahoo.co.in
6.	**Prof. Puneet Gupta** Prof. & Head, Dept. of Orthopaedics Shri Guru Ram Rai Institute of Medical & Health Sciences Patel Nagar, Dehradun-248001	9837538343	
7.	**Prof. S. Bhandari** Professor, Dept. of Orthopaedics Govt. Medical College Rampur Road, Haldwani, Nainital, Haldwani, Uttarakhand - 263129	9837251168	
8.	**Prof. Sudhir Garg** Department of Orthopaedics Government Medical College, Chandigarh	9646121591	
9.	**Dr. Siddharth Goel** Prof. & Head, Dept. of Orthopaedics SHKM Govt. Medical College, Mewat, (Haryana)	9412175373	drsiddharthgoel@gmail.com
10	**Dr. Manjeet Singh** Professor, Department of Orthopaedics, adesh medical college , Ambala Cantt	**9872809355**	
11	**Dr. Mahendra Kumar Aseri** Professor, Department of Orthopaedics, SN Medical College, Jodhpur	**9414200900**	
12	**Dr. Aniruddha Sengupta** Professor, Medical college, Kolkata	**9433248279**	
13	**Dr. MM Nagar** Prof. & Head, Dept. of Orthopaedics Rohilkhand Medical College Barielly	9837147854	
14	**Dr. Sanjay Gupta** Prof. & Head, Dept. of Orthopaedics **Shri Ram Murti Smarak Institute, Bareilly**	9458702287	
15	**Dr. Atul Agarwal** Prof. & Head, Dept. of Orthopaedics **Himlayan Institute of Medical Sciences, Uttrakhand**	6397558155	

Panel of external examiners for MBBS examination:

S.No.	Name, Designation & Address of External examiner	Mobile No.	Email ID
1.	**Dr. Sandeep Kumar,** Professor & HOD Department of Orthopaedics Hamdard Intitute of Medical Science, New Delhi	8860810064	Drsandeepkumar20@gmail.com
2.	**Prof. Anil Juyal** Department of Orthopaedics Himalyan Institute of Medical Sciences, Dehradun	9412928899	
3.	**Prof. Pankaj Singh** Head, Department of Orthopaedics, GMC Haldwani	9837407957	
4.	**Prof. Rehanul Haq** Head, Dept. of Orthopaedics, AIIMS Bhopal	7982360432	docrehan1975@gmail.com
5.	**Prof. Rajesh Maheshwari,** Prof. & Head, Department of Orthopaedics, Himalyan Institute of Medical Sciences, Swami RamaHimalayan University, Swami Ram Nagar, Jolly Grant, Dehradun, Pin - -248016 (U.K.)	9411712626	Rajesh1969m@yahoo.co.in
6.	**Prof. Puneet Gupta** Prof. & Head, Dept. of Orthopaedics Shri Guru Ram Rai Institute of Medical & Health Sciences Patel Nagar, Dehradun-248001	9837538343	
7.	**Prof. S. Bhandari** Professor, Dept. of Orthopaedics Govt. Medical College Rampur Road, Haldwani, Nainital, Haldwani, Uttarakhand - 263129	9837251168	
8.	**Prof. Sudhir Garg** Department of Orthopaedics Government Medical College, Chandigarh	9646121591	
9.	**Dr. Siddharth Goel** Prof. & Head, Dept. of Orthopaedics SHKM Govt. Medical College, Mewat, (Haryana)	9412175373	drsiddharthgoel@gmail.com
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15	**Dr. Atul Agarwal** Prof. & Head, Dept. of Orthopaedics **Himlayan Institute of Medical Sciences, Uttrakhand**	6397558155	

Action Items:

Document and circulate the finalized guidelines among all stakeholders.

The Head of Department (HOD) office will review and update **their posting schedules**. They will ensure that students complete the following mandatory postings:

1. **Clinical postings :**
   A major portion of posting should be in Orthopaedics department. It should include in-patients, out-patients, ICU, trauma, emergency room and speciality clinics.
2. **Rotation of posting :**
   - Inter-unit rotation in the department should be done for a period of up to one year.
   - Rotation in appropriate related subspecialties for a total period not exceeding 06 months.
3. Medical Education Unit (MEU) or Department of Medical Education (DOME) (optional)
4. **T/L Education:**

- Bone Skills Lab sessions – Twice a week
- Surgical Audit sessions – Once every week
- Cadaver based education – Twice a month
- Web based e-learning sessions – Once a fortnight
- Simulated environment learning – Two sessions in a week
- Mortality & Morbidity meetings with SURGICAL AUDIT: Once a month.

5. 3 months of district residency program.
6. Additionally, students must fulfill a total of 36 months of posting, excluding the examination period.

Explore and promote the implementation of e-records for training procedures.

It was decided that didactic lectures should be used sparingly, with a minimum of **10 lectures per year** suggested. The topics for lectures will be selected based on subject requirements.

Journal club meetings will be held at least once every 1-2 weeks to present and critically appraise original research papers.

Student seminars will take place twice a week, focusing on in-depth study of important topics selected as per subject requirements.

Student symposiums will be organized once every 3 months, aiming for an evidence-based exhaustive review of broad topics of significance.

Interdepartmental colloquiums will be held (already being conducted) monthly to discuss topics of common interest or clinical cases.

Rotational clinical/community/institutional postings will be arranged based on institutional policy and subject specialty needs.

All students must complete online course, in **"Basic Course in Biomedical Research", offered by ICMR-National Institute of Epidemiology (ICMR-NIE), Chennai**. an **online course in Research Methodology within six months** or one year from the commencement of their batch.

Department Heads to facilitate the attendance of postgraduate trainees at accredited scientific meetings.

IT Department to organize **training sessions on information technology and computer usage** for postgraduate trainees.

Training Coordinator to arrange **BCLS and ACLS** training sessions for postgraduate trainees.

Schedule regular meetings to review assessment outcomes and make necessary adjustments.

Course in Ethics

a. All post-graduate students shall complete course in ethics including **Good Clinical Practices**, to be conducted by institution.

b. The students are expected to complete the course in the first year.

c. No post-graduate student shall be permitted to appear in the examination without the above certification.

Course in Cardiac Life Support Skills:

a. All post-graduate students shall complete a course in Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS) skills to be conducted by the institution.

b. The students are expected to complete the course in the first year.

c. No post-graduate student shall be permitted to appear in the examination without the above certification.

Presentation and Publications: "At least two presentations at state/national level conference. One paper (thesis or non-thesis related work) should be published /accepted/publication draft in an indexed journal."

SUMMATIVE ASSESSMENT:

Thesis: 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 in broad specialty shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

Theory examination:

The examinations shall be organized on the basis of 'Grading' or 'Marking system' to evaluate and to certify post graduate student's level of knowledge, skill and competence at the end of the training, as given in the latest POSTGRADUATE MEDICAL EDUCATION REGULATIONS. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination as a whole. The examination for M.S shall be held at the end of 3rd academic year.

There shall be four theory papers (as per PG Regulations).

Paper I: Basic sciences as applied to the subject

Paper II: Traumatology and Rehabilitation

Paper III: Orthopaedics diseases

Paper IV: Recent advances in Orthopaedics surgery & General Surgery as applied to Orthopaedics.

Each paper will contain one structured long-answer question of 20 marks and 8 short-answer questions of 10 marks each.

Practical examination:

Practical examination should be spread over two days and include various major components of the syllabus focusing mainly on the psychomotor domain.

- **Practical Examination:** To be spread over at least two days for each student. The examination should cover various major components of the syllabus, with a focus on the psychomotor domain.

- Oral/Viva voce examination on defined areas should be conducted by each examiner separately. Oral examination shall be comprehensive enough to test the post graduate student's overall knowledge of the subject focusing on psychomotor and affective domain. It should include:
  i.) Stations for clinical, procedural and communication skills
  ii.) Log Book Records and reports of day-to-day observation during the training.
  iii.) Should test the post graduate student's overall knowledge of the subject in:

- Ortho Radiology
- Ortho Pathology
- Histopathology & Gross anatomy
- Instruments
- Orthotics and Prosthotic

Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination. The examination for

M.S shall be held at the end of 3rd academic year. {"Post-Graduate Medical Education Regulations, 2023" or "PGMER-23"}

CRITERIA FOR EVALUATION OF M.S. COURSE		
1	No. of Theory Papers	4
	Marks for each Theory Paper	100
	Total marks for Theory Paper	400
	Passing Minimum for Theory	200/400 (40% minimum in each paper)
2	PRACTICAL/CLINICAL	300
3	VIVA VOCE	100
Passing minimum for Practical/Clinical including Viva voce		200/400

The candidate shall secure not less than 50% marks in each head of passing which shall include
(1) Theory – aggregate 50% (In addition, in each Theory paper a candidate has to secure minimum of 40%)
(2) Practical/Clinical and Viva voce - aggregate 50%
(3) If any candidate fails even under one head, he/she has to re-appear for both Theory and Practical/Clinical and Viva voce examination.
(4) Five per cent of mark of total marks of Clinical/Practical and Viva Voce marks (20 marks) will be of dissertation/thesis and it will be part of clinical/practical examination marks. External examiner outside the state will evaluate dissertation/ thesis and take viva voce on it and marks will be given on quality of dissertation/thesis and performance on its viva voce.
(5) No grace mark is permitted in post-graduate examination either for theory or for practical.

{ "Post-Graduate Medical Education Regulations, 2023" or "PGMER-23"}

Details of examination structure and evaluation are as follows.

PRACTICAL EXAM		
S. NO.	**Long case**	
1.	LONG CASE	
1X150	150	150
SHORT CASES		
1.	SHORT CASE 1	
2.	SHORT CASE 2	
3.	SHORT CASE 3	
3X50	50+50+50	150
TABLE VIVA		
1.	ORTHO RADIOLOGY	
2.	ORTHO PATHOLOGY, HISTOPATHOLOGY & GROSS ANATOMY	
3.	INSTRUMENTS	
4.	ORTHOTICS AND PROSTHOTIC	
4X20	20+20+20+20	80
VIVA VOCE		
Oral Viva	THESIS	
1X20	20	20

Student's Name	MSOP 151 Clinical Exercise Max Marks - 300					MSOP152 Viva Max Marks - 100	TOTAL = 400Marks
	Long Case - I	Short Case - I	Short Case - II	Short Case - I II	Total Marks	Oral	
	150	50	50	50	300	100	

Date :

Internal Examiners :

Signature & Date

Name

External Examiners :

Signature & Date

Name

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These action items are to be diligently addressed to ensure the effective implementation of the guidelines and the successful execution of the three-year training program for MD degree postgraduate courses.

Signature of the members of Board of Studies

1. **Dr. Amit Saraf:** .....
2. **Dr. Atul Agarwal:** .....
3. **Dr. Sudhir Singh:** .....
4. **Dr. Manmohan Sharma :** .....
5. **Dr. Adhish Pratap Singh:** .....
6. **Dr. Rajul Rastogi:** .....

Copy to:

1. Vice Chancellor, TMU
2. Registrar, TMU
3. Principal, TMMC & RC
4. HOD, Pharmacology Department

for HOA Sir,

BOARD OF STUDIES

POSTGRADUATE PROGRAM

MS-ORTHOPAEDICS

SUMMARY OF CHANGES IN CURRICULUM

	BOS of Orthopaedics 2017	BOS of Orthopaedics 2023	Approximate % of revision
Goals	Grossly defined	Revised and well defined	**60%**
Program Outcome	Grossly defined	Revised and well defined	
Course Outcome	Grossly defined	Revised and well defined	
Duration of Program	03 years	**03 years** Inclusive of 03 months District Residency program 02 months of posting in Emergency department	
Assessment	**Formative-** Included theory and practical internal assessment every six months till end of 5th semester Formative assessment was done for theory and practical competencies at the end of every semester. The last semester exam (VI Semester) was a pre university exam Each Semester Exam theory and practical was of 100 marks each Pre University Exam theory and practical was of 400 marks each	**Formative-**The formative shall comprise of: 1. Day to day assessment 2. Quarterly assessment Day to day and Quarterly assessment will be done based on journal club, case presentation , CME, Seminar, SDL and assessment of competencies (theory and practical) as specified in that quarter of that year. The Department will conduct quarterly assessment of the postgraduate students which will also include 2 sessional exams per year (2nd and 4th Quarter of each year and last quarter just before the university exams shall be Pre-university examination). The Sessionals and Pre university examination will be conduct centrally by HIMS.	

	Paper title: Paper I: Basic Sciences including principles of General surgery as applied to Orthopaedics Paper II: Traumatology Paper III: Diseases in Orthopaedics Paper IV: Recent Advances	Log book shall be maintained and assessed periodically separately Sessional Exam theory and practical will be of 100 marks each Pre-University Exam theory and practical will be of 400 marks each Paper I: Basic Sciences including principles of General surgery as applied to Orthopaedics Paper II: Traumatology & Rehabilitation Paper III: Orthopaedic Diseases Paper IV: Recent Advances in Orthopaedic surgery	
Eligibility criteria for University Exam	**Attendance**-90% attendance **Internal assessment**- Average of 40% marks in best of three, 40% in pre university exams Acceptance of thesis To present one poster and one oral paper in state/national conference To present one research paper, which should be published/accepted for publication/sent for publication during the period of his postgraduate studies in State/National journal.	**Attendance**-90% attendance **Internal assessment**- • A student must secure a minimum of 40% marks each in best of three out of 5 sessional examination and 40% marks in the Pre-university examination. Acceptance of thesis At least two presentations at national level conference One research Paper published/ accepted in an indexed journal 03 Month DRP with a satisfactory completion certificate Basic Course in Biomedical Research (BCBR) Certification in first six months of commencement of program	

		Course in Ethics BLS and ACLS **Logbook** of work done during the training period including rotation postings, departmental presentations, and internal assessment reports should be submitted.	
University Examination marks distribution	**Theory**-Four papers of 100 marks each**: Total = 400 marks** and **Oral (Viva-Voce)** 100 marks and practical 300 marks (300 marks) **Total- 800 marks**	**Theory**-Four papers of 100 marks each: **Total = 400 marks** and **Oral (Viva-Voce)** 100 marks and practical 300 marks (300 marks) **Total- 800 marks**	
University question paper pattern (Nature of questions)	**Theory:** Two Descriptive type questions (20 marks)= Total 40 marks Three describe briefly (10 marks each)= Total 30 marks Five short notes 6 marks each (30 marks) TOTAL =100 Marks **Practical**: One long case 150 marks Three short cases 50 marks each= 150 marks Table viva – Orthopaedic anatomy, including Osteology Orthopaedic pathology (specimen)	**Theory:** Two Descriptive type questions (20 marks)= Total 40 marks Three describe briefly (10 marks each)= Total 30 marks Five short notes 6 marks each (30 marks) TOTAL =100 Marks **Practical**: One long case 150 marks Three short cases 50 marks each= 150 marks Table viva – Orthopedic anatomy, including Osteology Orthopaedic pathology (specimen) X-ray reading , CT and MRI used in Orthopaedics	

	X-ray reading , CT and MRI used in Orthopaedics Instruments, Implants and Operative approaches Orthotics & prosthetics TOTAL 400 MARKS	Instruments, Implants and Operative approaches Orthotics & prosthetics TOTAL 400 MARKS	
Pass criteria	A candidate shall secure not less than 50% marks in each head of passing which shall include (1) theory (2) Practical/clinical and viva-voce examination.	Obtaining a minimum of 40% marks in each theory paper and not less than 50% cumulatively in all the four papers for degree examination shall be mandatory. 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. Hence a candidate shall secure not less than 50% marks in each head of examination which shall include Theory and Practical including clinical and viva voce examination. No grace mark is permitted in Postgraduate Examination either for Theory or for Practical.	
Logbook and student appraisal form	Single logbook maintained No appraisal form	Separate logbooks for DRP and Department= Total two log books Satisfactory completion of student appraisal form	
Course outcome and program outcome grid	Not an element	Added as a new element	

BOARD OF STUDIES 2023

MS ORTHOPAEDIC PROGRAM

I. GOAL:

The goal of MS Orthopaedic program shall be to produce competent Orthopaedic 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 Orthopaedics 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 advancements and developments in the discipline of Orthopaedics.

I. PROGRAM OUTCOMES OF MS ORTHOPAEDIC PROGRAMME

At the end of the MS Orthopaedic training, the learner will be able to;

1. Identify and recognize various congenital, developmental, inflammatory, infective, traumatic, metabolic, neuromuscular, degenerative and oncological disorders of the musculoskeletal system.

2. Provide competent professional services to trauma and Orthopaedic diseases (congenital, developmental, inflammatory, infective, metabolic, neuromuscular, degenerative and oncological) patient at primary, secondary, tertiary health care centers.

3. Demonstrate empathy and humane approach and good communication skills towards patients and their families and exhibit interpersonal behavior in accordance with the societal norms and expectations.

4. Demonstrate professionalism.

5. Acquire skills as a self-directed learner; recognize continuing education needs, select and use appropriate learning resources.

6. Demonstrate competence in basic concepts of research methodology and epidemiology, and be able to critically analyze relevant published research literature.

7. Demonstrate teaching skills using educational methods and techniques as applicable to the teaching of medical/nursing students, general physicians and paramedical health workers.

8. Function as an effective leader of a health team engaged in health care, research or training.

Course outcomes

At the end of the course the learner will be able to:

A. Cognitive domain

1. Demonstrate sufficient understanding of the basic sciences relevant to Orthopaedic specialty through a problem based approach.

2. Describe the principles of traumatic injury, its mechanism, clinical presentation and plan & interpret appropriate laboratory and radio diagnostic imaging investigations & institute appropriate management including rehabilitation of a musculoskeletal injured patient.

3. Discuss the aetiopathogenesis, clinical presentation of congenital, developmental, inflammatory, infective, metabolic, neuromuscular, degenerative and oncological musculoskeletal disorders (Orthopaedic) and plan & interpret appropriate laboratory and radio diagnostic imaging investigations & institute appropriate management including rehabilitation for the same.

4. Demonstrate sufficient knowledge regarding the recent advances taking place in the field of Orthopaedics.

5. Identify a problem, prepare a research protocol, conduct a study, record observation and analyses data, interpret result, discuss and disseminate the finding.

6. Understand the basic principles of biomaterials and Orthpaedic metallurgy.

7. Demonstrates knowledge of the medico-legal aspects of trauma and Orthopaedic disease.

B. Psychomotor skills

1. Elicit and record from the patient, and other relevant sources including relatives and caregivers, a history that is complete and relevant to Orthopaedic trauma and disease.

2. Perform clinical examinations of musculo-skeletal system that is complete and relevant to trauma & Orthopaedic disease identification, disease prevention, and health promotion.

3. Demonstrate effective clinical problem solving, judgment, ability to interpret and integrate available data in order to address patient problems, generate differential diagnoses and develop individualized management plans that include preventive, promotive & therapeutic goals for Orthopaedic trauma and disease.

4. Perform basic Orthopaedic procedures& surgeries as applicable to a primary, secondary care centers.

5. Assist advance and complex Orthopaedic surgeries as applicable to secondary and tertiary care centers.

C. Affective domain

1. Demonstrate ability to communicate adequately, sensitively, effectively and respectfully with patients in a language that the patient understands and in a manner that will improve patient satisfaction and health care outcomes.

2. Work effectively and appropriately with colleagues in an inter-professional health care team respecting diversity of roles, responsibilities and competencies of other professionals.

3. Understands the importance of ethics, integrity & responsibility in the profession as well as professional boundaries between patients, colleagues and society.

4. Understands the code of medical ethics as propose by the National Medical Commission of India.

Introduction

The curriculum has been broadly classified into the following five areas:

1. Applied clinical knowledge related to Orthopaedic :
2. Clinical skills related to Orthopaedic
3. Attitudes including communication skills
4. Professionalism
5. Scientific and clinical enquiry

Explanation of terms used in this document

Lecture	Any instructional large group method including traditional lecture and interactive lecture.
Small group discussion	Any instructional method involving small groups of students in an appropriate learning context.
DOPS	Direct observation of practical skills.
Skill assessment	A session that assesses the skill of the student including the practical laboratory, skills lab, skill station that uses mannequins/ paper case/simulated patients/real patients as the context demands.
Core	A competency that is necessary in order to complete the requirements of the subject (traditional must know).
Non-Core	A competency that is optional in order to complete the requirements of the subject. (Traditional nice to know/ desirable to know).
OSCE	Objective structured clinical examination.
OSPE	Objective structured practical examination.
WPBA	Work place based assessments.
Mini CEX	Mini clinical examination.

Organization of Teaching &Training

Learning in postgraduate degree program shall essentially be autonomous and self-directed. The teaching and training program will be conducted for a period of 03 years. It will consist of the following:

Teaching and training		**Frequency**
1.	Morning Reports	Daily
2.	Lectures	2 per week
3.	Case Presentation	2 per week
4.	Surgical Audit	2 per week
5.	CME	Every Saturday
6.	Seminar	1 / at fortnight
7.	Journal Club	1 / at fortnight
8.	Mortality-morbidity meet	1/ Month
9.	Inter departmental meets (radiology & Pathology)	Once in a three months
10.	Evaluation of a guided research project, leading to thesis	Every 3rd month
11.	Student symposium	Once in three months
12.	Bone Skills Lab sessions	Once in a year
13.	Cadaver based education	Once in a year
14.	DRP (District Residency Program)	3 months posting in District Hospital

DETAILS OF TEACHING LEARNING METHODS

A. **Lectures**: To attend Two Didactic lectures per week with the UG students. Apart from this the PG shall attend lectures on:

1. Orthopeadics related important topics
2. Recent advances in Orthopeadics
3. Research methodology and biostatistics
4. Salient features of Undergraduate/Postgraduate medical curriculum
5. Teaching and assessment methodology.

Topic numbers 3, 4, 5 will be done during research methodology/biostatistics and medicaleducation workshops in the institute.

B **Journal club**: Minimum of twice a month.

Topics will include presentation and critical appraisal of original research papers published in peer reviewed indexed journals. The presenter(s) shall be assessed by facultyand grades recorded in the logbook.

C. **ORTHO RADIOLOGY MEETS:** Once in three months to discuss amongst Ortho &Radiology Residents under facilitation of faculty on various imaging modalities used and its interpretation.

D. **ORTHO SURGICAL PATHOLOGICAL MEET**: Special emphasis shall be given on the surgical pathology radiological aspect of the case in the pathology department. Clinician (Ortho resident) shall presents the clinical details of the case, radiology PG student describes the Radiological findings and its interpretation and Pathology student describes the morbid anatomy and histopathology of the same case.

E. **SKILLS LAB SESSIONS:** Twice a year for first 2 years.

F. **Student Seminar**: Twice a month.

Important topics will be allotted for in-depth studyby a postgraduate student. A teacher will be allocated for each seminar as faculty moderatorto help the student prepare the topic well. With an aim for a comprehensive evidence-based review of the topic. The student will be graded by the faculty and peers.

G. **Student Symposium: Once every 3 months.**

A broad topic of significance will be selected, and each part will be dealt by one postgraduate student. A teacher moderator will be allocated for each symposium and moderator would track the growth of students. The purpose of the symposium is evidence- based exhaustive review of the topic. All participating postgraduates will be graded by the faculty and peers.

H. Laboratory work / Bedside clinics/case presentation: Case presentation twice a week in the ward, outpatient department/special clinics.

Laboratory work/Clinics/bedside teaching will be coordinated and guided by faculty from the department. Various methods like DOAP (Demonstrate, Observe, Assist, Perform), simulations in skill lab, and case-based discussions etc. will be used. Faculty from the department will participate in moderating the teaching-learning sessions during clinical rounds.

I. Interdepartmental colloquium

Faculty and students will attend monthly meetings between the main Department and other department/s on topics of current/common interest or clinical cases.

J. a. Rotational clinical / community / institutional postings

All Postgraduate trainees will be posted in relevant departments/ units/ institutions. The aim would be to acquire more in-depth knowledge as applicable to Orthopaedics.

b. Clinical postings

A major portion of posting will be in Orthopaedics department. It would include in- patients, out-patients, ICU, trauma, emergency room and specialty clinics.

Inter-unit rotation in the department will be done four monthly on a continuous basis.

c. Posting under "District Residency Programme" (DRP):

All postgraduate students will undergo a compulsory rotation of three months in District Hospitals/District Health System as a part of the course curriculum, as per the Postgraduate Medical Education (Amendment) Regulations (2020). Such rotation shall take place in the 2nd year and early 3rd year of the Postgraduate programme and the rotation shall be termed as "District Residency Programme" and the PG medical student undergoing training shall be termed as "District Resident".

K. Research skills

Writing a thesis will be used for inculcating research knowledge and skills. All postgraduate students will conduct a research project of sufficient depth to be presented to the University as a postgraduate thesis under the supervision of an eligible faculty member of the department as guide and one or more co-guides who may be from the same or other departments.

L. Training in teaching skills

MEU/DOME will train PG students in education methodologies and assessment techniques. The PG students shall conduct UG classes in various courses and a faculty shall observe and provide feedback on the teaching skills of the student.

M. Log book

During the training period, the postgraduate student will maintain a Log Book indicating the duration of the postings/work done in Wards, OPDs, Casualty and other areas of posting. This should indicate the procedures assisted and performed and the teaching sessions attended. The log book entries must be done in real time. The log book is thus a record of various activities by the student like: (1) Overall participation & performance, (2) attendance, (3) participation in sessions, (4) record of completion of pre-determined activities, and (5) acquisition of selected competencies.

The purpose of the Log Book is to:

a) help maintain a record of the work done during training,
b) enable Faculty/Consultants to have direct information about the work done and intervene, if necessary,
c) provide feedback and assess the progress of learning with experience gained periodically.

The Log Book will be used in the internal assessment of the student, and would be checked and assessed periodically by the faculty members imparting the training. The PG students will be required to produce completed log book in original at the time of final practical examination. It should be signed by the Head of the Department. A proficiency certificate from the Head of Department regarding the clinical competence and skillful performance of procedures by the student will be submitted by the PG student at the time of the examination.

The PG students will be trained to reflect and record their reflections in log book particularlyof the critical incidents. Components of good teaching practices will be assessed in all academic activity conducted by the PG student and at least two sessions will be dedicated for assessment of teaching skills will be must be conducted every year of the PG program.

N. Course in Research Methodology: All postgraduate students will complete an online course in Research Methodology within six months of the commencement of the batch and generate the online certificate on successful completion of the course.

Other aspects

- The Postgraduate trainees must participate in the teaching and training program of undergraduate students and interns attending the department.
- Trainees shall attend accredited scientific meetings (CME, symposia, and conferences)at least once a year.
- Department will encourage e-learning activities.

- The Postgraduate trainees will undergo training in Basic Cardiac Life Support (BCLS)and Advanced Cardiac Life Support (ACLS).
- The Postgraduate trainees must undergo training in information technology and use of computers

COURSE CONTENTS

1st Year – MS ORTHOPAEDIC THEORY

Paper 1: Basic Sciences including principles of General surgery as applied to Orthopaedics

A. APPLIED ORTHOPAEDIC ANATOMY

1. Developments of the skeleton

- Cartilage
- Bone
- Joints
- Morphogenesis of the axial skeleton
- Morphogenesis of the appendicular skeleton

2. Histology of cartilage

- Hyaline Cartilage
- Elastic Cartilage
- Fibrocartilage
- Histogenesis of Cartilage
- Cartilage Changes in Growth
- Adult Articular Cartilage
- The Chrondrocytes

3. Histology of Bone

- Types of Bone
- Structure of Bone
- Components of Bone
- Histogenesis of Bone
- Endochondral Ossification
- Intramembranous ossification

4. Histology of Skeletal muscle

- Microanatomy
- Structure of muscle fiber
- Component of sarcoplasm

5. Applied anatomy of Joints

Shoulder, Elbow, Wrist, Hand, Spine, Hip, Knee, Ankle & Foot

6. Osteology

- Muscle and Ligament attachments, nerve Supply, actions
- Exposure to Dissected Cadavers Concerning Extremities and Spine

B. APPLIED ORTHOPAEDIC PHYSIOLOGY

1. Physiology and Mineralization of Bone

- **Physiology of Bone**
  - Biochemistry
  - Basic physiologic processes
  - Factors affecting the fate of bone minerals
  - Phosphorus
  - Calcium
  - Fate of phosphorus and calcium
  - Magnesium
  - Vitamins
  - Glands of internal secretion
  - Enzymes

- **Mineralization of Bone**
  - Theories of mineralization
  - Bone formation, resorption and mineralization

2. Physiology of cartilage

- Normal articular cartilage
- Metabolic studies of articular cartilage
- Biomechanical functions of articular cartilage
- Mechanical functions of articular cartilage
- Factors affecting articular cartilage

3. Biophysical properties of bone and cartilage

- Electrical properties of bone
- Mechanism of electrically induced osteogenesis
- Piezoelectrical property of collagen

4. Remodelling of Bone

1. Ultra structural characteristics of Bone
2. Biological considerations
3. Collagen
   - Function of collagen
   - Structure of collagen molecule
   - Formation of collagen fibrile
   - Cross linking in collagen
   - Bone collagen
   - Collagen of articular cartilage
   - Collagenase
   - Hydroxyproline excretion : An indicator of collagen Metabolism

C. METABOLIC BONE DISEASE AND RELATED DYSFUNCTION OF THE PARATHYROID GLAND

- Factors affecting calcium metabolism
- Parathyroid glands
- Primary hyperparathyroidism
- Hypoparathyroidism
- Pseudohypoparathyroidism
- Low phosphorus rickets and osteomalacia
- Calcium deficiency diseases
- Malabsorption syndrome
- Hypophosphatasia
- Scurvy
- Gout
- Ochronotic arthritis
- Osteoporosis

D. APPLIED ORTHOPAEDIC PATHOLOGY

1. Histopathological aspects of bone

- Osteoprogenitor cell principle
- The Osteogenic cell
- The bone induction principle
- Repair of simple fracture of long bone & cancellous bone
- Delayed union and non-union
- Bone transplantation
- Avascular necrosis of bone
- Dysbaric osteonecrosis
- Hypercortisonism osteonecrosis
- Organ transplant osteonecrosis
- Cadaver bone Allograft
- Effect of ionizing Radiation on bone

2. Inflammation

E. SURGICAL APPROACHES IN ORTHOPAEDICS

F. CONVENTIONAL RADIO DIAGNOSIS, CT SCAN, MRI, ULTRSOUNDS ETC.

G. RADIOACTIVE ISOTOPES IN ORTHOPAEDICS

H. PRINCIPLES OF GENERAL SURGERY

- Principles of wound healing
- Systemic response to injury
- Gen principles of ulcer management
- Vascular injuries
- Nerve injuries
- Principles of Amputations
- Chest injuries
- Peripheral vascular disease

- Gangrene
- Soft tissue injuries
- Fat embolism
- DVT
- Shock
- Crush syndrome

I. HISTORY OF ORTHOPAEDICS

2nd Year – MS ORTHOPAEDIC THEORY

Paper II: Traumatology & Rehabilitation

1. Definition and classification of fractures
2. Complication of fractures
3. Closed treatment of fractures
4. Principles of internal fixation
5. Injuries around shoulder
6. Injuries to arm
7. Injuries around elbow
8. Injuries to forearm
9. Injuries around wrist
10. Fractures and joint injuries of hand
11. Injuries to pelvis
12. Injuries around hip
13. Injuries to thigh
14. Injuries around knee
15. Injuries to leg
16. Injuries around ankle
17. Injuries to foot
18. Spine injuries
19. Management of traumatic paraplegia
20. Management of Polytrauma patient
21. Ligament injuries
22. Pathological fractures
23. Principles of bone grafting
24. Distraction osteogenesis
25. Joint stiffness and traumatic ossification
26. Rehabilitation after fractures and joint injuries
27. Orthopaedic implants
28. Bed Side Physiotherapy

3rd Year – MS ORTHOPAEDIC THEORY

Paper III: ORTHOPAEDIC DISEASES

1. Congenital talipes equino varus
2. Congenital dislocation of hip
3. Congenital abnormalities of limbs
4. Congenital deformities of spine
5. Developmental conditions
6. Osteomyelitis
7. Skeletal tuberculosis
8. Septic arthritis
9. Rheumatoid arthritis & related joint diseases
10. Degenerative joint diseases
11. Diseases of muscles
12. Fibrous diseases
13. Unclassified diseases of bones
14. Regional orthopaedic conditions of cervical spine
15. Regional orthopaedic conditions of cervico brachial region
16. Regional orthopaedic conditions of shoulder
17. Regional orthopaedic conditions of elbow
18. Regional orthopaedic conditions of wrist
19. Regional orthopaedic conditions of hand
20. Regional orthopaedic conditions of the spine
21. Regional orthopaedic conditions of the pelvis
22. Regional orthopaedic conditions of the hip
23. Regional orthopaedic conditions of the knee
24. Regional orthopaedic conditions of the ankle
25. Regional orthopaedic conditions of the foot
26. Benign bone tumours
27. Malignant bone tumours
28. Management of bone tumours
29. Secondary tumours of bone
30. Cerebral palsy
31. Orthopaedic neurology
32. Poliomyelitis and related diseases

Paper IV: Recent Advances in Orthopaedics

(General Guidelines)

1. Newer implants
2. Newer operative procedures/techniques
3. Newer investigative procedures/ Tests
4. Biomaterials
5. Newer concepts in Orthopaedics
6. Newer drugs used in Orthopaedics

Curriculum

A. ORIENTATION PROGRAMME

In addition to three year training in the MS Orthopaedics, the PG Residents will have an Orientation program. The orientation program will be organized soon after the joining of the postgraduates by the Department of Medical Education.

1. **OVERVIEW OF HOSPITAL INFORMATION SYSTEM**

2. **MEDICAL EDUCATION**
   a. Team building
   b. Group Dynamics
   c. Time management
   d. Attitudes
   e. Media in Medical Education (OHP, Chalk Board & Power Point)
   f. Concept Mapping
   g. E-Learning
   h. Residents as teachers - Learning by Teaching
   i. Teaching learning domains
   j. Learning objectives
   k. Small group teaching
   l. How to present a Seminar & Journal Club
   m. Traits of an effective teacher

3. **MEDICAL ETHICS & LEGAL RESPONSIBILITY**
   a. Medical practice in ancient India
   b. Introduction to Medical ethics-the core of Doctor-Patient Relationship
   c. Duties & responsibilities of a Doctor to the patient, family & society
   d. What is ailing Doctor-patient Relationship?
   e. Rights and privileges of the patient; Obtaining valid consent and refusal of treatment
   f. Medical Negligence & CPA; Law, Medicine and the Market
   g. Medico legal protection
   h. Consumer forum
   i. Dealing with partially competent patient
   j. Dealing a patient who refuse treatment
   k. Deciding when it is morally justified to withheld information from a patient
   l. Deciding when it is morally justified to breach confidentiality
   m. Moral aspect of caring for a patient whose prognosis is poor
   n. Procedure in Medico Legal cases; Medico legal examination
   o. Hands-on skills: Medical certificates (Sickness / Fitness, Death Certificate)
   p. Hands-on skills: Medico legal reports & Medico Legal Formalities, Injury / Alcohol
   q. Disaster management
   r. Care of a terminally ill patient

4. **INTERPERSONAL SKILL**
   a. Importance of communication
   b. Components of communication
   c. How to break bad news

5. CORE TOPICS

a. Infection control	
	i. Biomedical Waste Management (with hands on activity) ii. Human Biome iii. Disinfection & Sterilization iv. Prevention & control of Hospital Infection v. Sample collection for microbiological tests in College Lab with form filling. vi. Needle stick injuries and BBIs (Blood Borne Infections) vii. Hands-on training on: Hand hygiene
b. Hands-on Skills	
	i. Ryle's tube insertion ii. Catheterization iii. Insertion of I.V line iv. Arterial puncture v. I.M injection vi. Hand hygiene vii. Hands on Lab skills • Use of glucometer and urine dipsticks • Sample collection for Pathology , Biochemistry, Microbiology viii. Filling of Hospital forms ix. Filling of Medico legal forms x. Blood Pressure Measurement
c. Other Sessions	
	i. DOTS Program at Himalayan Hospital ii. Pharmacovigilance program of India - Filling of the CDSCO form for ADR monitoring (Adverse Drug Reactions) iii. Rational use of Antibiotics iv. National health program v. Sleep hygiene and life style modification vi. Basic concepts of: X-Ray, USG, CT, MRI

6. BCLS / ACLS COURSE

a. AHA Guidelines (2020) for CPR and ECC Science Update
b. BLS/CPR Basics for Adults
c. BLS/CPR Basics for Children and Infants
d. ACLS- Science of resuscitation, ECG
e. CPR, Defibrillator and AED Demonstrations
f. Stroke
g. Acute coronary syndrome and cardiac arrest
h. Workstations of different scenarios
i. Hands on skills using mannequins - CPR and AED

7. SCIENCE OF JOYFUL LIVING PROGRAMME

a. Introduction
b. Diet
c. Science of Breath & Practicum
d. Exercise & Practicum (Diaphragmatic Breathing and Systemic Relaxation)
e. Creative use of emotions
f. Meditation & Practicum
g. Stress management & 31 Point Relaxation

8. THE STUDENTS UNDERGOING POSTGRADUATE COURSES SHALL BE EXPOSED TO THE FOLLOWING:-

a. Basic Introduction to statistical methods and nonlinear mathematics for Research work.
b. Critical evaluation of published research
c. Professionalism & Human Behavior.

9. ONLINE RESEARCH METHODOLOGY COURSE AS PRESCRIBED BY NMC (BCBR):

All postgraduate students shall complete an online course in Research Methodology with in six months of the commencement of the batch and generate the online certificate on successful completion of the course.

10. WORKSHOP ON GCP GUIDELINES

a. GCP framework
b. Epidemiological studies
c. Regulatory clinical trials
d. Ethics in clinical practice/professional ethics
e. Ethics in human research
f. Indian GCP and GLP Guidelines

COMPETENCY OF MS ORTHPAEDICS PROGRAM-Year Wise Annexure-1

A. APPLIED CLINICAL KNOWLEDGE

1st Year- MS Orthopaedics

A postgraduate trainee must be able to apply the knowledge in the relevant clinical situation.

APPLIED ORTHOPAEDIC ANATOMY

A postgraduate trainee should be able to:

No.	Competencies	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	Assessment method	Time for Assessment
i.	Discuss the embryology of the musculo skeletal system	K	KH	Y	Independent Learning Videos Seminars	Short notes Structured essay	Formative & summative evaluation University Exams
ii.	Differentiate the various types of cartilages and describe the histology and functions of articular cartilage	K	KH	Y	Independent Learning Videos Seminars	Short notes Structured essay	Formative & summative evaluation University Exams
iii.	Describe the structure and function of a collagen	K	KH	Y	Independent Learning Videos Seminars	Short notes Viva	Day to day assessments Formative & summative evaluation University Exams
iv.	Classify the types of bones & describe the structure and function of a bone.	K	KH	Y	Independent Learning Videos Seminars	Short notes Structured essay	Formative & summative evaluation University Exams
v.	Classify types of muscles & describe the structure and functions of a muscle.	K	KH	Y	Independent Learning Videos Seminars	Short notes	Formative & summative evaluation University Exams
vi.	Describe the structure & functions of the nerve	K	KH	Y	Independent Learning Videos Seminars	Short notes	Formative & summative evaluation University Exams

vii.	Describe the structure and functions of the ligament	K	KH	Y	Independent Learning Videos Seminars	Short notes	Formative & summative evaluation University Exams
viii.	Describe the structure & functions of the meniscus	K	KH	Y	Independent Learning Videos Seminars	Short notes	Formative & summative evaluation University Exams
ix.	Discus the structure &functions of the synovium	K	KH	Y	Independent Learning Videos Seminars	Short notes	Formative & summative evaluation University Exams
x.	Describe the Morphogenesisof the appendicular and axial skeleton	K	KH	Y	Independent Learning Videos Seminars	Short notes Structured essay	Formative & summative evaluation University Exams
xi.	Describe the Histogenesis of Bone	K	KH	Y	Independent Learning Videos Seminars	Short notes	Formative & summative evaluation University Exams
xii.	Describe and differentiate between the Endochondral and intramembranous Ossification	K	KH	Y	Independent Learning Videos Seminars	Short notes	Formative & summative evaluation University Exams
xiii.	Identify origins and insertion& describe the nerve supply & function of various muscles of the musculo skeletal system.	S,K	S,KH	Y	Independent Learning Videos Seminars	Viva	Formative & summative evaluation University Exams
xiv.	Classify various types of Joints	K	KH	Y	Independent Learning Videos Seminars	Short notes	Formative & summative evaluation University Exams
xv.	Discuss the applied anatomy of shoulder joint.	K	KH	Y	Independent Learning Videos	Short notes Structured essay Case presentations Viva	Day to day assessments Formative & summative evaluation University Exams
xvi.	Discuss the applied anatomy the elbow joint	K	KH	Y	Independent Learning Videos	Short notes Structured essay Case presentations Viva	Day to day assessments Formative & summative evaluation University Exams
xvii.	Discuss the applied anatomy of wrist joint	K	KH	Y	Independent Learning Videos	Short notes Structured essay Case presentations Viva	Day to day assessments Formative & summative evaluation University Exams

xviii.	Discuss the applied anatomy of hand	K	KH	Y	Independent Learning Videos	Short notes Structured essay Viva Case presentation	Day to day assessments Formative & summative evaluation University Exams
xix.	Discuss the applied anatomy of spine	K	KH	Y	Independent Learning Videos	Short notes Structured essay Case presentations Viva	Day to day assessments Formative & summative evaluation University Exams
xx.	Discuss the applied anatomy of hip joint	K	KH	Y	Independent Learning Videos	Short notes Structured essay Case presentations Viva	Day to day assessments Formative & summative evaluation University Exams
xxi.	Discuss the applied anatomy of knee joint	K	KH	Y	Independent Learning Videos	Short notes Structured essay Case presentations Viva	Day to day assessments Formative & summative evaluation University Exams
xxii.	Discuss the applied anatomy of ankle joint	K	KH	Y	Independent Learning Videos	Short notes Structured essay Case presentations Viva	Day to day assessments Formative & summative evaluation University Exams
xxiii.	Discuss the applied anatomy of foot	K	KH	Y	Independent Learning Videos	Short notes Structured essay Case presentations Viva	Day to day assessments Formative & summative evaluation University Exams

APPLIED ORTHOPAEDIC PHYSIOLOGY

A postgraduate trainee should be able to:

No.	Competencies	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss the Physiology and Mineralization of Bone	K	KH	Y	Independent Learning Videos	Short notes Structured essay	Formative & summative evaluation University Exams
ii.	Describe the Electrical properties of bone and discuss the mechanism of electrically induced osteogenesis.	K	KH	Y	Independent Learning Videos	Short notes Structured essay	Formative & summative evaluation University Exams
iii.	Describe the Piezoelectrical property of collagen	K	KH	Y	Independent Learning Videos	Short notes Structured essay	Formative & summative evaluation University Exams
iv.	Describe the Remodelling of Bone	K	KH	Y	Independent Learning Videos	Short notes Structured essay	Formative & summative evaluation University Exams
v.	Describe the Ultra structural characteristics of Bone	K	KH	Y	Independent Learning Videos	Short notes Structured essay	Formative & summative evaluation University Exams
vi.	Discuss the principles of fracture healing	K	KH	Y	Independent Learning Videos	Short notes Structured essay	Formative & summative evaluation University Exams
vii.	Discuss the biology of wound healing	K	KH	Y	Independent Learning Videos	Short notes Structured essay	Formative & summative evaluation University Exams
viii.	Discuss the Principles of ligament injury healing	K	KH	Y	Independent Learning Videos	Short notes Structured essay	Formative & summative evaluation University Exams
ix.	Discuss the etiopathogenesis of nerve injury and its regeneration	K	KH	Y	Independent Learning Videos	Short notes Structured essay	Formative & summative evaluation University Exams

Metabolic bone disease
Hyper parathyroidism, hypoparathyroidism and pseudo-hypo-parathyroidism

A postgraduate trainee should be able to:

No.	Competencies	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	Assessment method	Time for Assessment
i.	Discuss the applied anatomy and physiology of parathyroid glands including calcium homeostasis.	K	KH	Y	Independent Learning Videos Seminars	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
ii.	Discuss the calcium metabolism	K	KH	Y	Independent Learning Videos Seminars	Short notes Structured essay Viva	Day to day assessment Formative & summative evaluation University Exams
iii.	Discuss the role of Vitamin D	K	KH	Y	Independent Learning Videos Seminars	Short notes Structured essay Viva	Day to day assessment Formative & summative evaluation University Exams
iv.	Discuss the aetiopathogenisis, clinical features and management of of hyper-para-thyroidism	K	KH	Y	Independent Learning Videos Seminars	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
v.	Is able to approach a patient with symptoms of Hypercalcemia and investigate him/her to achieve at a diagnosis; suggest medical management for patients and refer him/her to an appropriate specialist for management.	K	KH	Y	Independent Learning Seminars	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
vi.	Differentiate between hyper parathyroidism, hypoparathyroidism and pseudo-hypo-parathyroidism	K	KH	Y	Independent Learning Videos Seminars	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Osteoporosis

A postgraduate trainee should be able to:

No.	Competencies	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Define, classify and discuss the etiopathogenisis, clinical presentation, complication, prevention, investigations and management of osteoporosis.	K	KH	Y	Independent Learning Videos Lectures (UG) Seminars	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
ii.	Discuss the principles vertebroplasty& kyphoplasty.	K	KH	Y	Independent Learning Videos Seminars	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

GOUT
A postgraduate trainee should be able to:

No.	Competencies	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss etiopathogenisis, clinical features, radiological features, and management of gout.	K	KH	Y	Independent Learning Videos Lectures (UG) Seminars	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
ii.	Differentiate between gout, pseudo-gout and other mono-articular arthritis.	K	KH	Y	Independent Learning Videos Lectures (UG) Seminars	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Scurvy
A postgraduate trainee should be able to:

No.	Competencies	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss etiopathogenesis, clinical features, radiological features and management of scurvy.	K	KH	Y	Independent Learning Videos Lectures (UG) Seminar	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Rickets/Osteomalacia
A postgraduate trainee should be able to:

No.	Competencies	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss etiopathogenesis, clinical features, radiological features and management of rickets	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
ii.	Differentiate rickets from other developmental disorders	K	KH	Y	Independent Learning Videos Lectures (UG) Seminars	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
iii.	Discuss etiopathogenesis, ,clinical features, radiological features and management of osteomalcia	K	KH	Y	Independent Learning Videos Lectures (UG) Seminars	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

APPLIED ORTHOPAEDIC PATHOLOGY
Histopathological aspects of bone

A postgraduate trainee will be able to:

No.	Competencies	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss the Osteoprogenitor cell principle	K	KH	Y	Independent Learning Videos Lectures (UG) Seminars	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
ii.	Describe the Osteogenic cell	K	KH	Y	Independent Learning Videos Lectures (UG) Seminars	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
iii.	Discuss the bone induction principle	K	KH	Y	Independent Learning Videos Lectures (UG) Seminars	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
iv.	Discuss the repair of simple fracture of long bone & cancellous bone	K	KH	Y	Independent Learning Videos Lectures (UG) Seminars	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
v.	Discuss the etiopathogenisis of delayed union and non-union	K	KH	Y	Independent Learning Videos Lectures (UG) Seminars	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
vi.	Describe bone transplantation	K	KH	Y	Independent Learning Videos Seminars	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
vii.	Discuss etiopathogenesis, clinical features, radiological features and management of avascular necrosis of bone	K	KH	Y	Independent Learning Videos Seminars	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

viii.	Discuss the dysbaric osteonecrosis	K	KH	Y	Independent Learning Videos Seminars	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
ix.	Discuss the hypercortisonism osteonecrosis	K	KH	Y	Independent Learning Videos Seminars	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
x.	Discuss the organ transplant osteonecrosis	K	KH	Y	Independent Learning Videos Seminars	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
xi.	Discuss the cadaver bone Allograft	K	KH	Y	Independent Learning Videos Seminars	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
xii.	Discuss the effect of ionizing Radiation on bone	K	KH	Y	Independent Learning Videos Seminars	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Principles of General Surgery

A postgraduate trainee will be able to:

No.	Competencies	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss the systemic response to injury	K	KH	Y	Independent Learning Videos Lectures (UG) Seminars	Short notes Structured essay	Formative & summative evaluation University Exams
ii.	Discuss principles of wound healing& principles of management of soft tissue injuries.	K	KH	Y	Independent Learning Videos Lectures (UG) Seminars	Short notes Structured essay	Formative & summative evaluation University Exams

iii.	Define shock ; differentiate between cardiogenic shock, septic shock, neurogenic shock and haemorragic shock. Discuss management of shock.	K	KH	Y	Independent Learning Videos Lectures (UG)	Viva	Day to day assessment Formative & summative evaluation University Exams
iv.	Discuss etiopathogenesis, clinical features and management of thromboembolism	K	KH	Y	Independent Learning Vide Seminars	Short notes Structured essay	Formative & summative evaluation University Exams
v.	Discuss principles of management of chest injuries	K	KH	Y	Independent Learning Videos Seminars	Short notes Structured essay	Formative & summative evaluation University Exams
vi.	Discuss principles of management of peripheral vascular disease	K	KH	Y	Independent Learning Videos Seminars	Short notes Structured essay	Formative & summative evaluation University Exams
vii.	Discuss etiopathogenesis, clinical features and management of crush syndrome	K	KH	Y	Independent Learning Videos Seminars	Short notes Structured essay	Formative & summative evaluation University Exams
viii.	Describe different techniques of pain management as well as recovery of functioninspecificdisease andtraumascenario.	K	KH	Y	Independent Learning Videos Seminars	Short notes Structured essay	Formative & summative evaluation University Exams
ix.	Describethe pharmacokinetics and pharmacodynamics of drug metabolism andexcretion of analgesics, anti-inflammatory agents, antibiotics, disease - modifyingagentsandchemotherapeuticagentsandbiologicals.	K	KH	Y	Independent Learning Videos Seminars	Short notes Structured essay	Formative & summative evaluation University Exams

x.	Discuss principles of amputation	K	KH	Y	Independent Learning Videos Seminars	Short notes Structured essay	Formative & summative evaluation University Exams
xi.	Discuss etiopathogenesis, clinical feature, management of fat embolism	K	KH	Y	Independent Learning Videos Seminars	Short notes Structured essay	Formative & summative evaluation University Exams
xii.	Discuss etiopathogenesis, clinical features and management of deep vein thrombosis.	K	KH	Y	Independent Learning Videos Seminars	Short notes Structured essay	Formative & summative evaluation University Exams
xiii.	Describe the various types of nerve injuries. Discuss principles of management of nerve injuries.	K	KH	Y	Independent Learning Videos Lectures (UG) Seminars	Short notes Structured essay	Formative & summative evaluation University Exams
xiv.	Discuss the various types of vascular injuries and principles of their management.	K	KH	Y	Independent Learning Videos Seminars	Short notes Structured essay	Formative & summative evaluation University Exams
xv.	Discuss general principles of ulcer management.	K	KH	Y	Independent Learning Videos Seminars	Short notes Structured essay	Formative & summative evaluation University Exams
xvi.	Discuss the principles of bone grafting.	K	KH	Y	Independent Learning Videos Seminars	Short notes Structured essay	Formative & summative evaluation University Exams
xvii.	Discuss role of bone grafts and its substitutes in orthopaedics.	K	KH	Y	Independent Learning Videos Seminars	Short notes Structured essay	Formative & summative evaluation University Exams
xviii.	Discuss the various types of turnicates and their use in orthopaedics.	K	KH	Y	Independent Learning Videos Seminars	Short notes Structured essay Viva	Formative & summative evaluation University Exams

xix.	Discuss role of sterilization in surgery.	K	KH	Y	Independent Learning Videos Seminars	Short notes Structured essay	Formative & summative evaluation University Exams
xx.	Discuss various skin preparation techniques.	K	KH	Y	Independent Learning Videos Seminars	Short notes Structured essay Viva	Formative & summative evaluation University Exams
xxi.	Discuss the role of radioactive Isotopes in Orthopaedics	K	KH	Y	Independent Learning Videos Seminars	Short notes Structured essay	Formative & summative evaluation University Exams
xxii.	Classify compound fractures. Discuss principles of managing a compound fracture.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessment Formative & summative evaluation University Exams

2nd Year- MS Orthopaedics
Traumatology

General

A postgraduate trainee should be able to:

No.	Competencies	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Define and classify fractures; differentiate between traumatic, stress and pathological fracture and discuss immediate, early and late complications of fracture.	K	KH	Y	Independent Learning Videos Lectures (UG)	Viva	Day to day assessments Formative & summative evaluation University Exams
ii.	Discuss indications for open reduction internal fixation	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Viva	Day to day assessments Formative & summative evaluation University Exams
iii.	Discuss indications for closed treatment of fracture	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Viva	Day to day assessments Formative & summative evaluation University Exams

Principles of internal fixation

A postgraduate trainee should be able to:

No.	Competencies	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss the basic sand principle sofbio material sand orthopaedic metallurgy.	K	KH	Y	Independent Learning Small Group Discussions Videos	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
ii.	Discuss the principles of absolute and relative stability	K	KH	Y	Independent Learning Small Group Discussions Videos	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
iii.	Discuss indications for Interlocking nailing	K	KH	Y	Independent Learning Small Group Discussions Videos	Short notes Viva	Day to day assessments Formative & summative evaluation University Exams
iv.	Discuss 3 point fixation principle	K	KH	Y	Independent Learning Small Group Discussions Videos	Short notes Viva	Day to day assessments Formative & summative evaluation University Exams
v.	Discuss principle of dynamic compression plating (DCP), LCP,	K	KH	Y	Independent Learning Small Group Discussions	Short notes Structured essay	Day to day assessments Formative & summative

	bridge plating and locking plate.				Videos	Viva	evaluation University Exams
vi.	Discuss principles of compression screw	K	KH	Y	Independent Learning Small Group Discussions Videos	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
vii.	Discuss evolution in AO principles of internal fixation	K	KH	Y	Independent Learning Videos Seminars	Short notes Structured essay	Day to day assessments Formative & summative evaluation University Exams
viii.	Discuss the role of MIPO in orthopaedic surgeries	K	KH	Y	Independent Learning Videos Seminar	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
ix.	Discuss the principle of tension bend wiring	K	KH	Y	Independent Learning Small Group Discussions Videos	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
x.	Describe principle of Distraction osteogenesis	K	KH	Y	Independent Learning Small Group Discussions Videos	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Injuries Around Shoulder

Fracture clavicle

A postgraduate trainee should be able to:

No.	Competencies	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Classify fracture Clavicle. Describe the mechanism of injury, clinical features and complications of fracture clavicle. Discuss the management of fracture clavicle	K	KH	Y	Independent Learning Lectures (UG)	Short notes Viva	Day to day assessments Formative & summative evaluation University Exams

Acromioclavicular joint dislocation

A postgraduate trainee should be able to:

No.	Competencies	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss classification, clinical features, management and complication of Acromioclavicular joint dislocation	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Sternoclavicular joint dislocation

A postgraduate trainee should be able to:

No.	Competencies	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Classify Sternoclavicular joint dislocation; Describe mechanism of injury, clinical features and management of sternoclavicular joint dislocation	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Shoulder Dislocation

A postgraduate trainee should be able to:

No.	Competencies	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Classify dislocation shoulder; describe the mechanism of injury, patho-anatomy, clinical picture, various tests, reduction maneuver and complications associated with dislocation shoulder; discuss post reduction management of patient with dislocation shoulder.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
ii.	Describe etiopathogenesis, clinical features, radiological features and management of recurrent dislocation shoulder	K	KH	Y	Independent Learning Videos	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Fracture neck humerus

No.	Competencies	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Classify fracture of proximal humerus.Discuss the mechanism of injury, clinical features, complications & management of proximal humerus fractures.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Fracture shaft humerus

No.	Competencies	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Classify fractures of shaft humerus. Discuss the mechanism of injury, clinical features, complications & management of shaft humerus fractures	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Elbow

General

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Define three point bony relationship & carrying angle in elbow and discuss their clinical interpretation.	K	KH	Y	Independent Learning Videos Case presentation	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
iii.	Discuss factors affecting stability of elbow	K	KH	Y	Independent Learning	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
iv.	Enumerate ossification centres around elbow	K	KH	Y	Independent Learning Videos	Viva	Day to day assessments Formative & summative evaluation University Exams

Supracondylar fracture humerus
A postgraduate trainee should be able to:

No.	Competencies	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Classify supracondylar fracture humerus. Discuss mechanism of injury, clinical picture, displacements, radiological picture, complications and management of supracondylar fracture of humerus	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Distal humerus fracture of adults
A postgraduate trainee should be able to:

No.	Competencies	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Classify distal humerus fractures. Discuss the mechanism of injury, clinical features, complications and management of lateral condyle fracture of humerus.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
ii.	Discuss the mechanism of injury, clinical features, complications and management of medial epi-condyle fracture humerus	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Viva	Day to day assessments Formative & summative evaluation University Exams
iii.	Discuss the mechanism of injury, clinical features, complications and management of distal intercondylar fracture humerus.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Dislocation of Elbow joint

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Classify elbow dislocations. Discuss mechanism of injury, clinical features, complications and management of a patient with elbow dislocation	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Pulled Elbow

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss pathoanatomy, clinical picture and management of pulled elbow	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Fracture Head of Radius
A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Classify fracture head of radius. Discuss mechanism of injury, clinical presentation, complications and management of fracture head of radius.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Fracture of Capitulum
A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss mechanism of Injury, clinical picture, various treatment options and indications for surgery for fracture capitulum	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Fracture both bone forearm

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss mechanism of Injury, clinical picture, radiological investigations, various treatment options, indications for surgery and complications of fracture both bone forearm.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Fracture Montaggia

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Classify Montaggia fracture dislocations. Discuss mechanism of Injury, clinical picture and management of fracture montaggia dislocations.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Viva	Day to day assessments Formative & summative evaluation University Exams

Fracture Galeazzi

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss mechanism of Injury, clinical picture, complications and management of fracture Galeazzi.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Fracture Ulna

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss mechanism of Injury, clinical picture, complication and management of fracture Ulna	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Anatomy of Radio-ulnar joint

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i	Discuss anatomy of radioulnar joint	K	KH	Y	Independent Learning Videos	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Colles Fracture

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Define colles fracture. Discuss mechanism of injury, clinical picture, radiological picture, complications and management of colles fractures.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Barton's Fracture

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Define Barton fracture. Discuss mechanism of injury, clinical picture, radiological picture, complications and management of Barton's fracture.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Smith's Fracture

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Define Smith's fracture. Discuss mechanism of injury, clinical picture, radiological picture, complications and management of smith fracture.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Chauffeurs Fracture

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Define Chauffeurs fracture. Discuss mechanism of injury and management of Chauffeurs fracture	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Scaphoid Fracture

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Describe applied anatomy and blood supply of scaphoid. Discuss mechanism of injury, clinical picture, radiological investigations, complications and management of fracture scaphoid.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
ii.	Discuss aetiopathogenesis and management of non union scaphoid.	K	KH	Y	Independent Learning Videos	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

DRUJ injury

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss pathoanatomy, clinical picture, and management of distal radio-ulnar joint (DRUJ) disruption	K	KH	Y	Independent Learning Videos	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Mid carpal instability

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Define midcarpal instability. Discuss clinical presentation and management of midcarpal instability.	K	KH	Y	Independent Learning Videos	Short notes Viva	Day to day assessments Formative & summative evaluation University Exams

Lunate fracture

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss clinical picture, complications and management of a patient with lunate fracture.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Viva	Day to day assessments Formative & summative evaluation University Exams

Scapholunate dislocation
A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss clinical picture and management of scapho-lunate dislocation	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Viva	Day to day assessments Formative & summative evaluation University Exams

Bennett's Fracture dislocation
A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Classify Bennett's fracture. Discuss clinical picture and management of Bennett's fracture	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Viva	Day to day assessments Formative & summative evaluation University Exams

Rolando's Fracture

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Classify Rolando's fracture. Discuss clinical picture and management of a patient with Rolando's fracture.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Viva	Day to day assessments Formative & summative evaluation University Exams

Fractures of Metacarpal

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Classify Metacarpal fracture. Discuss clinical picture and management options for metacarpal fractures	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Viva	Day to day assessments Formative & summative evaluation University Exams

Fracture of Phalynx
A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss clinical picture andmanagement options for phalynx fracture.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Viva	Day to day assessments Formative & summative evaluation University Exams
ii.	Discuss role and principle of extension block splint for management of phalynx fracture	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Viva	Day to day assessments Formative & summative evaluation University Exams

Crush Injury
A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss management of crush injury of hand	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Viva	Day to day assessments Formative & summative evaluation University Exams
ii.	Discuss principles of debridement in hand injury	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Viva	Day to day assessments Formative & summative evaluation University Exams

Injuries to Pelvis

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Classify fracture Pelvis. Discuss applied anatomy of pelvis, clinical presentation, radiological investigations, management and complications of fracture pelvis.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Injuries around Hip

Hip Dislocation

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Classify dislocation of hip. Discuss applied anatomy, mechanism of injury, clinical picture, radiological investigations, various closed reduction maneuvers, indications for open reduction, complications and management of anterior/posterior dislocation hip.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Fractures of Acetabulum:
A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Describe the relevant surgical anatomy of the acetabulum with column concept.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
ii.	Classify acetabular fractures. Discuss mechanism of injury, clinical presentation, radiological investigations, complications and management of acetabular fractures.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Fracture Neck Femur
A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Describe the applied anatomy of neck femur with its vascular supply. Discuss mechanism of injury, classification, clinical picture, reduction maneuvers, complications and management of fracture neck femur.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Per-trochanteric fractures
A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Classify per-trochanteric fractures. Discuss mechanism of injury, clinical presentation, radiological investigations, complications and management of per trochanteric fractures of femur.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Injuries of thigh- Fracture shaft femur
A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss mechanism of injury, clinical picture, complication and management of sub trochanteric fracture of shaft femur.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
ii.	Discuss mechanism of injury, clinical picture, radiological investigation, complication and management of fracture of shaft femur.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva Case presentation	Day to day assessments Formative & summative evaluation University Exams

Injuries around knee

Condylar femur

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Describe the surgical anatomy of the knee. Classify condylar fractures femur. Discuss mechanism of injury, clinical picture, radiological investigation, complication and management of condylar fracture femur.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Knee dislocation

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss mechanism of injury, clinical picture, radiological investigation, complications, reduction techniques and management of dislocation of knee.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Fracture Patella
A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Classify fracture patella. Discuss mechanism of injury, clinical picture, radiological investigation, complications and management of fracture patella.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Internal derangement of knee (IDK)
A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Classify IDK (cruciate, menisci, collaterals). Describe mechanism of injury; discuss clinical picture and tests for clinical evaluation of meniscal and cruciate injuries& management of IDK.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Fracture Proximal Tibia
A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Classify fractures of proximal tibia. Discuss the applied anatomy, mechanism of injury, clinical picture, radiological investigation, complications and management of fractures of proximal tibia.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Injuries to leg: Fracture Both Bone Leg
A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Classify fracture both bone Leg .Discuss the relevant anatomy of tibia and fibula, mechanism of injury, clinical picture, radiological investigations, complications and management of fracture both bone leg.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Injuries around ankle
Ankle injuries:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Classify ankle injuries (Lauge-Hansen classification). Discuss the relevant anatomy of ankle, mechanism of injury, clinical picture, radiological investigations, complications and management of ankle injuries.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Soft tissue injuries (ankle sprain)
A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss the relevant anatomy of ankle joint ligaments, mechanism of injury, clinical picture, radiological investigations, complications and management of ankle sprain.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Injuries to foot

Fracture Talus

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Classify fracture Talus . Discuss the applied anatomy and blood supply of Talus, mechanism of injury, clinical picture, radiological investigations, complications and management of fracture talus.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Fracture Calcaneum:

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Classify fracture Calcaneum. Discuss the relevant applied anatomy of Calcaneum, mechanism of injury, clinical picture, radiological investigations, complications and management of fracture calcaneum.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
ii.	Describe the mode of injury leading to fracture Calcaneum	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Lisfranc Fracture Dislocation:

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Classify the Lisfranc Fracture Dislocation. Discuss the relevant anatomy of mid-foot, mechanism of injury, clinical picture, radiological investigations, complications and management of Lisfranc fracture dislocation.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Fractures of the base of 5th Metatarsal (Jones'#):

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Define Jones' fracture. Discuss mechanism of injury, clinical picture, radiological investigations, complications and management of Jones' fracture.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Fractures of the Metatarsals:
A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss the relevant anatomy of foot, mechanism of injury, clinical picture, radiological investigations, complications and management of fracture metatarsal(s).	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Spine injuries
A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Classify cervical injuries. Discuss mechanism of injury, clinical picture, radiological investigations, complications and management of cervical injures.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
ii.	Classify thoracic and lumber spine injuries. Describe the three column. Discuss mechanism of injury, clinical picture, radiological investigations, complications and management of thoracic and lumber spine injuries.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
iii.	Discuss the rehabilitative and physiotherapy program for spinal injuries	K/S	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Distraction osteogenesis
A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss the role of distraction osteogenesis in orthopaedics	K	KH	Y	Independent Learning Videos	Short notes Structured essay	Formative & summative evaluation University Exams

Joint Stiffness
A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss etiopathogenesis of joint stiffness and traumatic ossification and its management	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay	Formative & summative evaluation University Exams
ii.	Discuss various modalities of physiotherapy and their role in rehabilitation of orthopaedic patients	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay	Formative & summative evaluation University Exams

Polytrauma

A postgraduate trainee should be able to:

	Define polytrauma. Discuss the pathophysiology, investigations, complications, concept of damage control and management of a polytrauma patient.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Formative & summative evaluation University Exams

Imaging

A postgraduate trainee should be able to:

	Understand the basic sofdiagnostic imaging in orthopedics	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Formative & summative evaluation University Exams

3rd year – MS-Orthopaedics

Disease in orthopaedics

CTEV

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Define CTEV & describe Patho anatomy of CTEV. Differentiate between neurological & congenital CTEV. Discuss clinical picture, radiological investigation and management of CTEV.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Viva Structured essay	Day to day assessments Formative & summative evaluation University Exams

Congenital dislocation of hip

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Define Congenital Dislocation of Hip. Describe aetiopathogenesis of CDH. Discuss the clinical picture, radiological investigation and management of CDH.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Viva Structured essay	Day to day assessments Formative & summative evaluation University Exams

Congenital abnormalities of limbs

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Classify Congenital Abnormalities of Limbs. Discuss the aetiopathogenesis and management of common congenital abnormalities of limbs.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Viva Structured essay	Day to day assessments Formative & summative evaluation University Exams

Congenital deformities of spine

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Describe various Congenital Deformities of spine. Discuss the aetiopathogenesis, clinical picture, radiological investigation and management of various congenital deformities of spine.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Viva Structured essay	Day to day assessments Formative & summative evaluation University Exams

Developmental conditions

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Describe various developmental anomalies of skeletal system. Discuss the etiopathogenesis and management of developmental anomalies of skeletal system.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Viva Structured essay	Day to day assessments Formative & summative evaluation University Exams

Osteomyelitis

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Define osteomyelitis. Discuss aetio-pathogenesis, clinical features, investigations, complications & management of acute & chronic osteomyelitis	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Viva Structured essay	Day to day assessments Formative & summative evaluation University Exams

Skeletal Tuberculosis

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss aetio-pathogenesis, clinical features, investigations, complications & management of Skeletal Tuberculosis (Hip, knee, shoulder, ankle, elbow etc.)	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Viva Structured essay	Day to day assessments Formative & summative evaluation University Exams
ii.	Discuss aetio-pathogenesis, clinical features, investigations, complications & management of SpinalTuberculosis	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Viva Structured essay	Day to day assessments Formative & summative evaluation University Exams
iii.	Discuss the indications for surgery in spinal tuberculosis	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Viva Structured essay	Day to day assessments Formative & summative evaluation University Exams

Septic Arthritis

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss aetio-pathogenesis, clinical features, investigations, complications & management of Septic arthiritis.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Viva Structured essay	Day to day assessments Formative & summative evaluation University Exams

Rheumatoid arthritis & related joint diseases

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss aetio-pathogenesis, clinical features, investigations, complications & management of rheumatoid arthritis	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Viva Structured essay	Day to day assessments Formative & summative evaluation University Exams
ii.	Discuss the recent advances in management of rheumatoid arthritis (drugs/ surgical)	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Viva Structured essay	Day to day assessments Formative & summative evaluation University Exams

Degenerative joint diseases

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss aetio-pathogenesis, clinical features, investigations, complications & management of osteoarthritis	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Viva Structured essay	Day to day assessments Formative & summative evaluation University Exams

Diseases of muscles

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Describe various diseases of muscle	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Viva Structured essay	Day to day assessments Formative & summative evaluation University Exams
ii.	Discuss aetio-pathogenesis, clinical features, investigations, complications & management of muscular dystrophy	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Viva Structured essay	Day to day assessments Formative & summative evaluation University Exams

Fibrous diseases

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss aetio-pathogenesis, clinical features, investigations, complications & management of fibrous dysplasia	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Viva Structured essay	Day to day assessments Formative & summative evaluation University Exams

Unclassified diseases of bones

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss aetio-pathogenesis, clinical features, investigations, complications, differential diagnosis & management of pagets disease	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Viva Structured essay	Day to day assessments Formative & summative evaluation University Exams
ii.	Describe Infantile Cortical Hyperostosis	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Viva Structured essay	Day to day assessments Formative & summative evaluation University Exams

Regional orthopaedic conditions
Neck region
A postgraduate trainee will be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss etiopathogenesis, clinical features, radiological investigations& management of Cervical spondylitis	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss the applied anatomy of brachial plexus	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
ii.	Differentiate clinically brachial plexus lesion at different level	K	KH	Y	Independent Learning Videos Case discussion	Structured essay Viva Short case	Day to day assessments Formative & summative evaluation University Exams
iii.	Discuss aetiopathogenesis, clinical features, radiological investigations & management of Thoracic outlet syndrome	K	KH		Independent Learning Videos	Short notes Viva	Day to day assessments Formative & summative evaluation University Exams

Shoulder region

Rotator cuff lesions

A postgraduate trainee will be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Describe the surgical anatomy and arm trunk mechanism of shoulder joint Discuss aetiopathogenesis, clinical features, radiological investigations & management of rotator cuff lesion	K	KH	Y	Independent Learning Videos	Short notes Structured essay	Day to day assessments

Frozen shoulder

A postgraduate trainee will be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss aetiopathogenesis, clinical features, radiological investigations & management of Frozen shoulder	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay	Day to day assessments

TB shoulder joint

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss aetiopathogenesis, clinical features, radiological investigations & management of tuberculosis of shoulder joint	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay	Formative & summative evaluation University Exams

Elbow region

Tennis elbow/golfer's elbow

A postgraduate trainee will be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss the etiopathogenesis, clinical picture & management of Tennis elbow	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
ii.	Discuss the etiopathogenesis, clinical picture & management of Golfers elbow	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Tuberculosis of elbow

A postgraduate trainee will be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss the etiopathogenesis, clinical picture, radiological investigations& management of tuberculosis of Elbow	K	KH	Y	Independent Learning Videos	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Hand region

(De Quervain's, Trigger thumb, Dupuytren,s contracture, Rheumatoid hand, Claw hand)

A postgraduate trainee will be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss the etiopathogenesis, clinical picture & management of De Quervain,s disease	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
ii.	Discuss the etiopathogenesis, clinical picture & management of Trigger thumb	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
iii.	Discuss the etiopathogenesis, clinical picture & management of Dupuytren,s contracture	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
iv.	Discuss the etiopathogenesis, clinical presentation & management of Rheumatoid hand	K	KH	Y	Independent Learning Videos	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
v.	Discuss the etiopathogenesis, clinical presentation & management of Claw hand	K	KH	Y	Independent Learning Videos	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Carpal tunnel

A postgraduate trainee will be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss surgical anatomy, classification, clinical picture, & management of carpal tunnel syndrome	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Ganglion

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss the aeteopathogenesis, clinical presentation, & management of Ganglion	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Viva	Day to day assessments Formative & summative evaluation University Exams

Hip region

Avascular necrosis of femoral head

A postgraduate trainee will be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss biomechanics of hip & its clinical implication	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
ii.	Discuss the classification aeteopathogenesis, clinical presentation, radiological investigations & management of AVN of femoral head	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Slipped capital femoral epiphysis

A postgraduate trainee will be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss the classification aeteopathogenesis, clinical presentation, radiological investigations & management of Slipped capital femoral epiphysis	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Perthe's disease

A postgraduate trainee will be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss the classification aeteopathogenesis, clinical presentation, radiological investigations & management of Perthes disease	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

T.B. hip

A postgraduate trainee will be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss the aeteopathogenesis, stages, clinical presentation, radiological features, investigations & management of T.B. hip	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Osteotomies around hip

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss principles of various Osteotomies around hip	K	KH		Independent Learning Videos	Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Knee region

Genuvarus

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss surgical anatomy of knee pertaining to ligaments, meniscus &bursa around knee	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
ii.	Discuss the aetiopathogenisis & management of Genuvarus.	K	KH	Y	Independent Learning Videos	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Genuvalgus

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss the aetiopathogenisis , clinical features, radiological features & management of Genuvalgus.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Genurecurvatum

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss the aetiopathogenisis , clinical features, radiological features & management of Genurecurvatum.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Tibiavara

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss the aetiopathogenisis , clinical features, radiological features & management of Tibiavara.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Chondromalacia patellae

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Describe the etiopathogenesis, clinical features, radiological features and management of chondromalacia patellae	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Recurrent dislocation patella

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Describe the , etiopathogenesis clinical features, radiological features and management of Recurrent dislocation patella	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Osteochondritisdessicans

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Describe the aetio-pathogenesis, clinical features, radiological features and management of osteochondritisdessicans	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

T.B knee

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Describe the aetiopathogenesis, clinical features, radiological features and management of T.B knee	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Osteoarthritis of knee

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Describe the aetiopathogenesis, clinical features, radiological features and management of Osteoarthritis of knee	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Bursitis around the knee

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Describe the aetiopathogenesis, clinical features, radiological features and managementof Bursitis around the knee	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Foot & Ankle region

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss the aetiology, clinical features, radiological features and management of Flatfoot	K	KH	Y	Independent Learning Videos	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Cavus foot

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss the causes, clinical features, radiological features and management of cavus foot	K	KH	Y	Independent Learning Videos	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Hallux valgus/rigidus Hammer toe

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss the causes, , clinical features, radiological features and management of Hallux valgus/rigidus Hammer toe	K	KH	Y	Independent Learning Videos	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Tarsal tunnel syndrome

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss the clinical features& management of Tarsal tunnel syndrome	K	KH	Y	Independent Learning Videos	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Osteochondritis

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss the clinical features, radiological features and management of osteochondritis of calcaneum/ navicular/metatarsal bone	K	KH	Y	Independent Learning Videos	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Planter Fibromatosis

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Describe the aeteopathogenesis, clinical features, radiological features and management of planter fibromatosis	K	KH	Y	Independent Learning Videos	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
v.	Differentiate various causes of painful heel	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Spine

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss aetiopathogenesis, clinical features, radiological investigations and management of PIVD	K	KH	Y	Independent Learning Videos Seminar	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Spondylolisthesis

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Classify spondylolisthesis. Discuss etiopathogenesis , clinical features, radiological features and management of spodylolisthesis	K	KH	Y	Independent Learning Videos Seminar	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Scoliosis

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Classify Scoliosis. Discuss etiopathogenesis , clinical features, radiological features and management of scoliosis.	K	KH	Y	Independent Learning Videos Seminar	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Adolescent kyphosis

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss etiopathogenesis, clinical features, radiological features and management of Adolescent kyphosis.	K	KH	Y	Independent Learning Videos Seminar	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Backache

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss etiopathogenesis ,red flag sign, clinical features, radiological features and management of Backache	K	KH	Y	Independent Learning Videos Lectures (UG) Seminar	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

T.B. Spine

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss etiopathogenesis, clinical features, radiological features, differential diagnosis and management of T.B. Spine.	K	KH	Y	Independent Learning Videos Lectures (UG) Seminar	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Ankylosing spondylitis

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss etiopathogenesis, clinical features, radiological features, differential diagnosis and management of Ankylosing spondylitis	K	KH	Y	Independent Learning Videos Lectures (UG) Seminar	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Sacroiliitis

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss causes, clinical features and management of Sacroilitis	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Coccydynia

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss causes, clinical features and management of Coccydynia	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Infection of the Hand
Anatomy of mid palmar spaces

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss mid palmar space infections and management	K	KH	Y	Independent Learning Videos	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Tumors
A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Perform independently examination of any swelling of upper/lower limb	K	S	Y	Independent Learning Videos Case presentations	Short case Long structured case Mini CEX	Day to day assessments Formative & summative evaluation University Exams
ii.	Differentiate between benign and malignant tumors.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Viva	Day to day assessments Formative & summative evaluation University Exams

Benign Bone Tumors

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Classify tumors on the basis of osseous and non osseous origin.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short note Viva	Day to day assessments Formative & summative evaluation University Exams
ii.	Enumerate common benign bone tumors	K	KH	Y	Independent Learning Videos Lectures (UG)	Short note Viva	Day to day assessments Formative & summative evaluation University Exams

Fibrous Dysplasia

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss clinical picture, radiological appearance & management of fibrous dysplasia	K	KH	Y	Independent Learning Videos Lectures (UG)	Short note Viva	Day to day assessments Formative & summative evaluation University Exams

Simple bone cyst and aneurismal bone cyst

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Differentiate between simple bone cyst and aneurismal bone cyst on the basis of radiological appearance	K	KH	Y	Independent Learning Videos Lectures (UG)	Short note Viva	Day to day assessments Formative & summative evaluation University Exams
ii.	Discuss treatment of simple bone cyst	K	KH	Y	Independent Learning Videos Lectures (UG)	Short note Viva	Day to day assessments Formative & summative evaluation University Exams
iii.	Discuss treatment of aneurismal bone cyst	K	KH	Y	Independent Learning Videos Lectures (UG)	Short note Viva	Day to day assessments Formative & summative evaluation University Exams

Osteoid osteoma

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss the clinical picture, radiological appearance & management of Osteoid osteoma	K	KH	Y	Independent Learning Videos Lectures (UG)	Short note Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Chondroma

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss the clinical picture, radiological appearance & management of Chondroma.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short note Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Giant cell tumor

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss the clinical picture, radiological appearance & management of Giant cell tumor	K	KH	Y	Independent Learning Videos Lectures (UG)	Structured essay Viva Case presentation	Day to day assessments Formative & summative evaluation University Exams

Malignant bone tumors
A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss the etiopathogenisis, clinical picture, radiological findings &management of Osteosarcoma	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Chondrsarcoma

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss the etiopathogenisis, clinical picture, radiological findings & management of Chondrsarcoma.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Ewings sarcoma

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss the etiopathogenisis, clinical picture, radiological findings & management of Ewings sarcoma	K	KH	Y	Independent Learning Videos UG Lecture	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Plasmacytoma

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss the etiopathogenissis clinical picture, radiological features, investigations and management of plasmacytoma	K	KH	Y	Independent Learning Videos	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Management of bone tumors

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss differential diagnosis of Epiphyseal lesions	K	KH	Y	Independent Learning Videos	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

ii.	Discuss differential diagnosis of Metaphyseal lesions	K	KH	Y	Independent Learning Videos	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
iii.	Discuss differential diagnosis of Diaphyseal lesions	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
iv.	Discuss differential diagnosis of Multiple lytic lesions	K	KH	Y	Independent Learning Videos	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
v.	Discus the surgical principles for obtaining a biopsy in a case of bony tumor	K	KH	Y	Independent Learning Videos	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
vi.	Describe the various techniques to obtain biopsy	K	KH	Y	Independent Learning Videos	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Secondary tumor of bones

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	List the probable sites of primary tumor leading to secondaries into bone	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Viva	Day to day assessments Formative & summative evaluation University Exams
ii.	Identify theosteolytic or osteoblastic bone lesions grossly visible on radiological investigations and interpret most probable cause of the same.	K	S	Y	Independent Learning Videos	Viva X-ray reading	Day to day assessments Formative & summative evaluation University Exams
iii.	Discuss the scoring system for predicting pathological fracture by Mirel'scriterian.	K	KH	Y	Independent Learning Videos	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
iv.	Discuss the surgical management of the impending or pathological fractures.	K	KH	Y	Independent Learning Videos	Structured essay	Day to day assessments Formative & summative evaluation University Exams

Cerebral palsy and Orthopaedic neurology

Cerebral palsy

A postgraduate trainee should be able to:

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Classify cerebral palsy. Discuss the etiopathogeniss, Clinical feature, investigations & management of cerebral palsy.	K	KH	Y	Independent Learning Videos Seminar	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Radial Nerve

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss various investigations used for diagnosing nerve injuries and their limitations.	K	KH	Y	Independent Learning Videos Seminar	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
ii.	Discuss the applied anatomy, clinical features, investigations & management of radial nerve injury.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Ulnar nerve

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss the applied anatomy, clinical features, investigation and management of Ulnar nerve injury.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Median nerve

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss the applied anatomy, clinical features, investigation &management of Median nerve injury.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Sciatic nerve

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss the applied anatomy, clinical picture, investigations and management of Sciatic nerve injury.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Peroneal nerve

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
ii.	Discuss the applied anatomy, clinical picture, investigation and management of Peroneal nerve injury.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

PAEDIATRIC ORTHOPAEDIC SURGERY

Basic Science - Anatomy

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss growth of bones, physeal anatomy and its application to fracture types and pathological processes and infection in particular.	K	KH	Y	Independent Learning Videos	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
ii.	Demonstrate knowledge of anatomy of bones and joints in the growing child and its application to growth and deformity	K	KH	Y	Independent Learning Videos	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
iii.	Discuss neurological processes involved in the production of deformity e.g. spina bifida, cerebral palsy and muscular dystrophy	K	KH	Y	Independent Learning Videos	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

Clinical Assessment

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Demonstrate history taking and examination of the child	K,S,,A,C	S	Y	Independent Learning Videos Case presentation	Mini CEX Long structured case	Day to day assessments Formative & summative evaluation University Exams
ii.	Demonstrate clinical assessment of the disabled child	K,S,A	S	Y	Independent Learning Videos Case presentation	Mini CEX Long structured case	Day to day assessments Formative & summative evaluation University Exams
iii.	Innumerate indications for plain x-ray, CT, MRI, ultrasound and nuclear imaging	K	KH	Y	Independent Learning Videos	Viva	Day to day assessments Formative & summative evaluation University Exams
iv.	Interprete images of plain x-ray, CT, MRI	K	S	Y	Independent Learning Videos Lectures (UG)	Case presentation Viva X-ray reading	Day to day assessments Formative & summative evaluation University Exams

Critical Conditions

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss the differential diagnosis of painful hip.	K	KH	Y	Independent Learning Videos Lectures (UG)	Viva	Day to day assessments Formative & summative evaluation University Exams
ii.	Describe the etiopathogenisis, clinical features, investigations, complications &management of acute osteomyelitis in a child .	K	KH		Independent Learning Videos Lectures (UG)	Structured essay Short notes Viva	Day to day assessments Formative & summative evaluation University Exams
iii.	Discuss the etiopathogenissis, clinical features, investigations, complications & management of chronic osteomylities in a child.	K	KH	Y	Independent Learning Videos Lectures (UG)	Structured essay Short notes Viva	Day to day assessments Formative & summative evaluation University Exams
iv.	Discuss differential diagnosis of irritable hip	K	KH		Independent Learning Videos	Structured essay Short notes Viva	Day to day assessments Formative & summative evaluation University Exams

v.	Discuss differential diagnosis of anterior knee pain	K	KH		Independent Learning Videos	Structured essay Short notes Viva	Day to day assessments Formative & summative evaluation University Exams
vi.	Discuss growth plate injuries and their sequelae	K	KH		Independent Learning Videos	Structured essay Short notes Viva	Day to day assessments Formative & summative evaluation University Exams

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss etiopathogenisis, clinical features, investigation, complication and management of Slipped epiphysis.	K	KH	Y	Independent Learning Videos Lectures (UG)	Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams
ii.	Discuss etiopathogenisis. Clinical features, radiological features, complications and management of Perthes' disease	K	KH	Y	Independent Learning Videos Lectures (UG)	Structured essay Short note Viva	Day to day assessments Formative & summative evaluation University Exams
iii.	Discuss the etiopathogenisis, clinical feature. Radiological feature, complication and management of dysplasia the hip.	K	KH	Y	Independent Learning Videos	Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

iv.	Describe etiopathogenisis clinical feature. Radiological feature, complication and management of Scoliosis in a child	K	KH	Y	Independent Learning Videos	Structured essay Short notes Viva	Day to day assessments Formative & summative evaluation University Exams
v.	Describe various forefoot deformities	K	KH	Y	Independent Learning Videos	Structured essay Short notes Viva	Day to day assessments Formative & summative evaluation University Exams
vi.	Discuss management of forefoot deformities	K	KH	Y	Independent Learning Videos	Structured essay Short notes Viva	Day to day assessments Formative & summative evaluation University Exams
vii.	Describe various Congenital hand abnormalities & discuss their management.	K	KH	Y	Independent Learning Videos	Structured essay Short notes Viva	Day to day assessments Formative & summative evaluation University Exams
viii.	Discuss etiopathogenisis, clinical feature. Radiological feature and management of Osteogenesisimperfecta	K	KH	Y	Independent Learning Videos	Structured essay Short notes Viva	Day to day assessments Formative & summative evaluation University Exams

ix.	Discuss various skeletal dysplasias	K	KH	Y	Independent Learning Videos	Structured essay Short notes Viva	Day to day assessments Formative & summative evaluation University Exams
x.	Discuss tarsal coalitions	K	KH	Y	Independent Learning Videos	Structured essay Short notes Viva	Day to day assessments Formative & summative evaluation University Exams
xi.	Describe etiopathogenisis, clinical feature. Radiological feature and management of Torticollis	K	KH	Y	Independent Learning Videos	Structured essay Short notes Viva	Day to day assessments Formative & summative evaluation University Exams
xii.	Enumerate the causes of Leg length discrepancy and discuss their management.	K	KH	Y	Independent Learning Videos	Structured essay Short notes Viva	Day to day assessments Formative & summative evaluation University Exams
xiii.	Describe various orthosis used in children	K	KH	Y	Independent Learning Videos	Structured essay Short notes Viva	Day to day assessments Formative & summative evaluation University Exams

Knock knees

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Discuss the treatment of knock knees	K	KH	Y	Independent Learning Videos	Structured essay Short notes Viva	Day to day assessments Formative & summative evaluation University Exams
ii.	Discuss the treatment of flat feet	K	KH	Y	Independent Learning Videos	Structured essay Short notes Viva	Day to day assessments Formative & summative evaluation University Exams
iii	Discuss the treatment of femoral anteversion	K	KH	Y	Independent Learning Videos	Structured essay Short notes Viva	Day to day assessments Formative & summative evaluation University Exams
iv	Demonstrate screening for congenital abnormalities	S	P	Y	Independent Learning Videos	Structured essay Short notes Viva	Day to day assessments Formative & summative evaluation University Exams

Greenstick fracture

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment
i.	Describe mechanism of injury and discuss various treatment options in a child with greenstick fracture.	K	KH	Y	Independent Learning Videos Lectures (UG)	Short notes Structured essay Viva	Day to day assessments Formative & summative evaluation University Exams

B. APPLIED CLINICAL SKILLS : GENERAL

A trainee must be able to demonstrate their competence in the procedures below at the appropriately marked level on Miller's pyramid.

K= Knows, KH= Know how, S= Shows, P= Performs

During the 1st year of MS Orthopaedics

1. Competency : Perform hand washing by WHO technique

No.	Sub-Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Discuss the importance of hand washing	K	KH	Y	Independent learning Videos	Viva	Day to day assessment	--
ii.	Describe the WHO guidelines for hand washing	K	KH	Y	Independent learning Videos Observes the senior postgraduates, senior residents and faculty	Viva	Day to day assessment	--
iii.	Perform the standard (WHO) hand washing technique	K,S	P	Y	Independent learning Videos Observes the senior postgraduates, senior residents and faculty	Log book/ Portfolio DOPS WPBA	Day to day assessment	03

2. Competency :Wearing of a sterile apron after hand washing before performing a surgery

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Wearing of a sterile apron after hand washing before performing a surgery	K,S	P	Y	Independent learning Observe the senior residents, senior postgraduates and faculty Videos	Log book/ Portfolio DOPS WPBA	Day to day assessment	03

3. Competency: Wearing of a sterile gloves after hand washing before undertaking a surgical procedure

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Wearing of a sterile gloves after hand washing before undertaking a surgical procedure.	K,S	P	Y	Independent learning Videos Observe the senior residents, senior postgraduates and faculty	Log book/ Portfolio DOPS WPBA	Day to day assessment	03

4. Competency: Perform taking of clinical history in patients having orthopaedic injuries / disease

(Fractures, Polytrauma, Painful joints, Swelling around joint, Non-union, Bony swelling, Deformities, Paraplegia, Quadriplegia, Nerve injury, CTEV,CDH, Infective pathologies in the joints and extremities, Backache, Metabolic disorders, Degenerative disorders, congenital disorders, tumors)

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform taking of clinical history & examination in patients having orthopaedic injuries / disease (Fractures, Polytrauma, Painful joints, Swelling around joint, Non-union, Bony swelling, Deformities, Paraplegia, Quadriplegia, Nerve injury, CTEV, CDH, Infective pathologies in the joints and extremities, Backache, Metabolic disorders, Degenerative disorders, congenital disorders, tumors)	K/S/A/C	P	Y	Independent learning Case Presentations	Mini CEX OSCE Short case Long structured case	Day to day assessment University Exam	Min 03 for each

5. Competency :Perform application of POP slab/cast as a splint in a patient with acute soft tissue/bony injury

No.	Sub-Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Discuss the principles of application of a POP slab/cast	K	KH	Y	Independent learning Videos	Short notes Structured questions Viva	Day to day assessment Formative & summative evaluation University examination	--
ii.	Discuss the complications of application of a POP slab /Cast	K	KH	Y	Independent learning Videos	Short notes Structured questions Viva	Day to day assessment Formative & summative evaluation University examination	--
iii.	Perform application of POP slab/cast as a splint in a patient with acute soft tissue/bony injury	K,S,A,C	P	Y	Independent learning Videos Observes the senior residents and senior postgraduates	Log book/ Portfolio DOPS	Day to day assessment Formative & summative evaluation	10

6. Competency :Perform application of skin traction in a patient of skeletal injury in lower extremity to immobilize the limb

No.	Sub-Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Discuss the principles of application of a skin traction	K	KH	Y	Independent learning	Viva Short notes	Day to day assessment Formative & summative evaluation University examination	--
ii.	Perform application of above /below knee skin traction.	K,S,A,C	P	Y	Independent learning Observe the senior residents and senior postgraduates while assisting them	Log book/ Portfolio DOPS	Day to day assessment Formative & summative evaluation	10

7. Competency: Perform catheterization of urinary bladder independently with all aseptic precautions

No.	Sub-Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform catheterization independently with all aseptic precautions	K,S,A,C	P	Y	Independent learning Observe the senior residents and senior postgraduates while assisting them	Log book/ Portfolio DOPS	Day to day assessment	05

8. Competency: Perform application of IV line

No.	Sub-Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform application of IV line	K,S,.A,C	P	Y	Independent learning Videos Practice on mannequins Observes the senior residents and senior postgraduates	Log book/ Portfolio OSCE DOPS	Day to day assessment	05

9. Competency: Provides basic life support

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Provide basic life support (BLS)	K,S	P	Y	To attend workshop on BLS conducted by American Heart Association Practice on mannequins Independent learning Videos	Log book/Portfolio DOPS	During workshop	Certification from American Heart Association

10. Competency: Perform drawing of a blood sample from a cubital vein

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform drawing of a blood sample from a cubital vein	K,S,A,C	P	Y	Independent learning Videos Practice on mannequins Once confident on mannequins, a one day posting in blood sample collection room for practicing under supervision.	Log book/ Portfolio OSCE DOPS	Day to day assessment	05

11. Competency: Demonstrate bed side manners in the wards with the patients

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Demonstrate bed side manners in the wards with the patients	A, C	P	Y	Independent learning Videos Watches the faculty behave with the patients	Log book/Portfolio WPBA 360^0 Feedback	Day to day assessment	10

12. Competency: Perform dressing of wounds

No.	Sub-Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Describe various types of dressing materials and their indications	K	KH	Y	Independent learning	Viva	Day to day assessment	--
ii.	Perform dressing with all aseptic precautions with minimal pain to the patient	K,S,A,C	P	Y	Independent learning Practice on mannequins Videos Observe the senior residents and senior postgraduates	Log book/Portfolio DOPS	Day to day assessment	10

13. Competency: Perform application of Figure of 8 bandage in clavicle fracture

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform application of Figure of 8 bandage in clavicle fracture	K,S,A,C	P	Y	Independent Learning Practice on mannequins Videos	DOPS Logbooks/portfolio	Day to day assessments	5

14. Competency :Perform clinical examination of a joint

(Shoulder, elbow, wrist, hand, knee, hip, ankle, foot, spine)

No.	Sub-Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform clinical examination of a joint (Shoulder, elbow, wrist, hand, knee, hip, ankle, foot, spine)	K,S,A,C	P	Y	Independent learning Videos Observes the senior postgraduates, senior residents and faculty Case presentation	Log book /Portfolio Mini CEX Short case	Day to day assessment Formative & summative evaluation University examination	3 for each joint

15. Competency :Perform clinical examination of swelling

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i	Perform clinical examination of the swelling gently	K,S,A,C	P	Y	Independent learning Videos Observes the senior postgraduates, senior residents and faculty	Log book/ Portfolio Short case Mini CEX	Day to day assessment Formative & summative evaluation University examination	03

16. Competency : Perform clinical examination of an ulcer

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i	Perform clinical examination of an ulcer gently	K,S,A,C	P	Y	Independent learning Videos Observes the senior postgraduates, senior residents and faculty	Log book/ Portfolio Short case Mini CEX	Day to day assessment Formative & summative evaluation University examination	03

17. Competency: Perform clinical examination of sinus

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i	Perform clinical examination of the sinus gently	K,S,A,C	P	Y	Independent learning Videos Observes the senior postgraduates, senior residents and faculty	Log book/ Portfolio Short case Mini CEX	Day to day assessment Formative & summative evaluation University examination	03

18. Competency: Perform application of skeletal traction (Lower femoral, upper tibial, lower tibial, calcaneal)

No.	Sub-Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Discuss the principles& complication of application of a skeletal traction.	K	KH	Y	Independent learning	Short notes Viva	Day to day assessment Formative & summative evaluation University examination	--
ii.	Perform application of skeletal traction	K,S,A,C	S	Y	Independent learning Videos Observe the senior residents and senior postgraduates while assisting them	Log book/ Portfolio DOPS	Day to day assessment Formative & summative evaluation	10

19. Competency: Perform suturing of wounds independently

No.	Sub-Competency/ Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform suturing of the wound independently	K,S.A,C	P	Y	Independent learning Videos Practice on mannequins Observes the senior residents and senior postgraduates	Log book/ Portfolio DOPS	Day to day assessment	10

20. Competency: Performs Joint Aspiration (Hip, knee, ankle, shoulder, elbow, wrist)

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	ssessment method	Time for Assessment	No. required for Certification
i.	Performs Joint Aspiration/Injections	K,S,A,C	P	Y	Independent learning Practice on mannequins Videos Observe the faculty and senior residents while assisting them	Log book/ Portfolio DOPS	Day to day assessments Sessional exam	03 each

21. Competency: Performs application of local injections

(Tennis elbow, Golfers elbow, Dequerins, Painful heal, Retro calcaneal bursits)

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Performs application of local injections	K,S,A,C	P	Y	Independent learning Practice on mannequins Videos Observe the faculty and senior residents while assisting them	Log book/ Portfolio DOPS	Day to day assessments Sessional exam	05

22. Competency: Perform on a cadaver standard surgical approaches

No.	Sub-Competency/ Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform on a cadaver standard surgical approaches to the musculo-skeletal system.	K,S.A,C	P	Y	Independent learning Videos Practice on cadaver Observes the senior residents and senior postgraduates	Log book/ Portfolio DOPS	Day to day assessment	1

23. Competency: Demonstrate identification and usage of basic implants used in orthopaedics

No.	Sub-Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Demonstrate identification and usage of basic implants used in orthopaedics. (Plates,Nails, Screws K-wires, and arthroplasty implants etc)	K,S	S	Y	Independent learning	Log book/Portfolio OSCE Viva	Day to day assessments Sessional exam University exam	05

24. Competency: Demonstrate identification and usage of basic instruments used in orthopaedics

No.	Sub-Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Demonstrate identification and usage of basic instruments used in orthopaedics. (General instruments, Plating insturments, Nailing instruments, DHS set, PFN set , DFN set) Arthroplasty set Arthroscopy set MIPO set, Spine set, etc.	K,S	S	Y	Independent learning Videos	Log book/Portfolio OSCE Viva	Day to day assessments Sessional exam University exam	05

25. Competency: Perform on bone models basic surgical procedures

No.	Sub-Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform on bone models, inter fragmentary compression screws, external fixation, Tension band wiring and Broad plating.	K,S	S	Y	Independent learning Videos	Log book/Portfolio DOPS Viva	Day to day assessments University exam	01 each

26. Competency: Performs close reduction of fracture in children

(Fracture neck humerus (NC), shaft humerus , supracondylar , eppiphysial separation lower end radius, both bone forearm, shaft femur, both bone leg, ankle (NC), hand (NC) and foot (NC))

No.	Sub-Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	**Performs close reduction of fracture in children (Fracture neck humerus (NC), shaft humerus , supracondylar, eppiphysial separation lower end radius, both bone forearm, shaft femur, both bone leg, ankle (NC), hand (NC) and foot (NC))**	K,S,A,C	P	Y	Independent learning Videos Observe the faculty and senior residents while assisting them	Log book/ Portfolio DOPS	Day to day assessments	--

27. Competency :Perform incision and drainage of an abscess

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i	Perform Incision and drainage of an abscess	K,S,A,C	P	Y	Independent learning Video Observe the faculty and senior residents while assisting them	Log book/ Portfolio DOPS	Day to day assessments	03

28. Competency :Perform fasciotomy for Compartment syndrome

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform fasciotomy for compartment syndrome	K,S,A,C	P	Y	Independent learning Videos Observe the faculty and senior residents while assisting them	Log book/ Portfolio DOPS	Day to day assessments	02

29. Competency :Perform wound debridement

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform wound debridement	K,S,A,C	P	Y	Independent learning Videos Observe the faculty and senior residents while assisting them	Log book/ Portfolio DOPS	Day to day assessments	05

During the 2nd year of MS Orthopaedics

30. Competency : Demonstrate managing an Orthopaedic emergency in emergency room

No.	Sub-Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Demonstrate handling of orthopaedic emergencies	K,S	S	Y	Independent learning Observe the senior residents and senior postgraduates while assisting them	Log book/Portfolio DOPS	Day to day assessment	10
ii.	Demonstrate management of shock & perform resuscitation of a polytrauma patient	K,S	S	Y	Independent learning Observe the senior residents and senior postgraduates while assisting them	Log book/Portfolio DOPS	Day to day assessment	10
iii.	Demonstrate intubation in a patient who is having difficulty in breathing	K,S	S	Y	Independent learning Mannequins in skilllab BLS course ATLS course Observe the senior residents and senior postgraduates while assisting them	Log book/Portfolio DOPS	Day to day assessment	05

iv.	Demonstrate performing the medico legal formalities	K,S	S	Y	Independent learning Observe the senior residents and senior postgraduates while assisting them	Log book/Portfolio DOPS	Day to day assessment	05
v.	Counsels appropriately regarding treatment and prognosis	A,C	S	Y	Independent learning Observe the senior residents and senior postgraduates while assisting them	Log book/Portfolio Mini CEX	Day to day assessment	10

31. Competency: Obtain consent appropriately

No.	Sub-Competency/ Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Obtain consent appropriately	K,S,A,C	P	Y	Independent learning	Viva	Day to day assessment	--

32. Competency : Perform pre-operative planning before every surgical procedure

No.	Sub-Competencies	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform pre-operative planning before every surgical procedure.	K,S,A,C	P	Y	Independent learning Observes the senior postgraduates, senior residents and faculty	Viva Log book /Portfolio WPBA	Day to day assessment	10

33. Competency : Perform part preparation before surgery

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform part preparation before surgery	K,S,A,C	P	Y	Independent learning Observes the senior residents and senior postgraduates and faculty. Videos	Log book/ Portfolio DOPS WPBA	Day to day assessment	10

34. Competency : Perform draping of a surgical area maintaining the asepsis technique

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform draping of a surgical area maintaining the asepsis technique	K,S	P	Y	Independent learning Video Observe the senior residents , senior postgraduates and faculty .	Log book/ Portfolio WPBA DOPS	Day to day assessment	5

35. Competency : Performs pre operative preparation

No.	Sub-Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Performs preoperative preparation	A	P	Y	Independent learning Observes the senior postgraduates, senior residents and faculty	Log book /Portfolio DOPS WPBA	Day to day assessment	05

36. Competency: Assists in various Orthopaedic surgeries

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Assists in various Orthopaedic surgeries	K,S,A,C	P	Y	Independent learning Observe the faculty and senior residents while assisting them Videos	Log book/Portfolio WPBA	Day to day assessment	5

To assist in the following surgeries

1. ORIF of fracture clavicle
2. ORIF of fracture neck humerus using PHILOS
3. Fracture shaft humerus - open reduction and internal fixation of fracture using DCP plating / locking plate
4. Supracondylar fracture humerus in children – close / open reduction internal fixation using K-wires.
5. Reconsutructive surgeries for intracondylar fracture shaft humerus
6. Fracture olecranon ulna – Open reduction internal fixation using tension bend wiring
7. Fracture radial head- radial head excision
8. Galliazifracture radius –ORIF using DCP / locking plate
9. Montaggia fracture dislocation

10. Fracture ulna – ORIF using DCP / locking plate/ulna nail
11. Intraarticular fracture lower end radius- ORIF using locking plate
12. Metacarpal fractures - ORIF using K-wires
13. Pelvic reconstruction
14. Hemiarthopasty hip
15. Total hip replacement
16. Fracture neck femur –fixation using canulated cancellous screws
17. Intertrochanteric fracture femur (DHS/PFN)
18. Fracture shaft femur (femoral nail/plates)
19. Supracondylar fracture femur (DFN/Locking plates)
20. Intercondylar fracture femur (Locking plates)
21. Total knee replacement
22. Tibial plateau reconstruction
23. Fracture shaft tibia (nailing/plating)
24. Ankle injuries
25. Foot injuries
26. Arthroscopies
27. Bone tumors
28. Spine surgeries
29. Amputations

37. Performs close reduction of acute dislocations of large joints

No.	Sub-Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Performs close reduction of acute dislocations of large joints	K,S,A,C	P	Y	Independent learning Videos Observe the faculty and senior residents while assisting them	Log book/ Portfolio DOPS	Day to day assessments Sessional exam University exam	--

38. Competency : Performs close reduction of fracture in adults where indicated
(Fracture neck humerus, shaft humerus, supracondylar , both bone forearm, colles, wrist,hand, both bone leg, ankle and foot)

No.	Sub-Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	**Performs close reduction of fracture in adults where indicated (Fracture neck humerus, shaft humerus , supracondylar , both bone forearm, colles, wrist, hand, both bone leg, ankle and foot)**	K,S,A,C	P	Y	Independent learning UG lectures	Log book/ Portfolio DOPS	Day to day assessments	--

39. Competency : Correction of common deformities CTEV

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i	Perform application of POP cast to correct CTEV in a child	K,S,A,C	P	Y	Independent learning Videos Observe the faculty and senior residents while assisting them	Log book/Portfolio DOPS	Day to day assessments	05

40. Competency : Perform Biopsy from soft tissue

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform Biopsy of soft tissue	K,S,A,C	P	Y	Independent learning Observe the faculty and senior residents while assisting them Videos	Log book/ Portfolio DOPS	Day to day assessments	05

41. Competency : Perform open bone biopsy from long bones

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform open bone biopsy from long bones	K,S,A,C	P	Y	Independent learning Videos Observe the faculty and senior residents while assisting them	Log book/ Portfolio DOPS	Day to day assessments	05

42. Competency : Perform Currettage of pin sites

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform currettage of pin sites	K,S,A,C	P	Y	Independent learning Observe the faculty and senior residents while assisting them	Log book/ Portfolio DOPS	Day to day assessments	05

43. Competency : Perform sequestrectomy& saucerization

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform sequestrectomy	K,S,A,C	P	Y	Independent learning Observe the faculty and senior residents while assisting them Videos	Log book/ Portfolio DOPS	Day to day assessments	02

44. Competency :Perform Arthrotomy

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform arthrotomy of hip, knee, shoulder, ankle & elbow	K,S,A,C	P	Y	Independent learning Observe the faculty and senior residents while assisting them Videos	Log book/ Portfolio DOPS	Day to day assessments	02

45. Competency: Perform Repair of open hand injury including Tendon Repair

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform Repair of open hand injury including Tendon Repair	K,S	S	N	Independent learning Observe the faculty and senior residents while assisting them Videos	Log book/ Portfolio DOPS	Day to day assessments	--

46 Competency: Perform application of external fixator

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform application of external fixator	K,S	S	Y	Independent learning Observe the faculty and senior residents while assisting them	Log book/ Portfolio DOPS WPBA	Day to day assessments	05

47. Competency : Perform soft issue releases in contractures, tendon lengthening and correction of deformities.

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform soft tissue releases in contractures, tendon lengthening and correction of deformities.	K,S	P	Y	Independent learning Observe the faculty and senior residents while assisting them Practice on cadavers Videos	Log book/ Portfolio DOPS WPBA	Day to day assessments	--

48. Competency: Perform nerve decompression / neurolysis

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform nerve decompression / neurolysis (carpal tunnel syndrome, tardy ulnar nerve palsy)	K,S	P	N	Independent learning Observe the faculty and senior residents while assisting them Videos	Log book/ Portfolio DOPS WPBA	Day to day assessments	--

During the 3rd year of MS Orthopaedics

49. Competency : Demonstrate common surgical approaches used in orthopaedic surgeries

No.	Sub-Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform anterior approach to shoulder joint	K,S	P	Y	Independent learning Videos Cadaveric dissection Observe the faculty and senior residents while assisting them	Log book/ Portfolio DOPS	Day to day assessments Sessional exam University exam	3
ii.	Perform anterior approach to humerus	K,S	P	Y	Independent learning Videos Cadaveric dissection Observe the faculty and senior residents while assisting them	Log book/ Portfolio DOPS	Day to day assessments Sessional exam University exam	3

iii.	Perform lateral approach to humerus	K,S	P	Y	Independent learning Videos Cadaveric dissection Observe the faculty and senior residents while assisting them	Log book/ Portfolio DOPS	Day to day assessments Sessional exam University exam	3
iv.	Perform posterior approach to humerus	K,S	P	Y	Independent learning Videos Cadaveric dissection Observe the faculty and senior residents while assisting them	Log book/ Portfolio DOPS	Day to day assessments Sessional exam University exam	3
v.	Perform anterior approach to radius	K,S	P	Y	Independent learning Videos Cadaveric dissection Observe the faculty and senior residents while assisting them	Log book/ Portfolio DOPS	Day to day assessments Sessional exam University exam	3

vi.	Perform posterior approach to radius	K,S	P	Y	Independent learning Videos Cadaveric dissection Observe the faculty and senior residents while assisting them	Log book/ Portfolio DOPS	Day to day assessments Sessional exam University exam	3
vii.	Perform posterior approach to ulna	K,S	P	Y	Independent learning Videos Cadaveric dissection Observe the faculty and senior residents while assisting them	Log book/ Portfolio DOPS	Day to day assessments Sessional exam University exam	3
viii.	Perform anterior approach to hip	K,S	P	Y	Independent learning Videos Cadaveric dissection Observe the faculty and senior residents while assisting them	Log book/ Portfolio DOPS	Day to day assessments Sessional exam University exam	3

ix.	Perform posterior approach to hip	K,S	P	Y	Independent learning Videos Cadaveric dissection Observe the faculty and senior residents while assisting them	Log book/ Portfolio DOPS	Day to day assessments Sessional exam University exam	3
x.	Perform lateral approach to hip	K,S	P	Y	Independent learning Videos Cadaveric dissection Observe the faculty and senior residents while assisting them	Log book/ Portfolio DOPS	Day to day assessments Sessional exam University exam	3
xi.	Perform lateral approach to femur	K,S	P	Y	Independent learning Videos Cadaveric dissection Observe the faculty and senior residents while assisting them	Log book/ Portfolio DOPS	Day to day assessments Sessional exam University exam	3

xii.	Perform antero medial approach to knee	K,S	P	Y	Independent learning Videos Cadaveric dissection Observe the faculty and senior residents while assisting them	Log book/ Portfolio DOPS	Day to day assessments Sessional exam University exam	3
xiii.	Perform antero medial approach to tibia	K,S	P	Y	Independent learning Videos Cadaveric dissection Observe the faculty and senior residents while assisting them	Log book/ Portfolio DOPS	Day to day assessments Sessional exam University exam	3
xiv.	Perform exposure of fibula	K,S	P	Y	Independent learning Videos Cadaveric dissection Observe the faculty and senior residents while assisting them	Log book/ Portfolio DOPS	Day to day assessments Sessional exam University exam	3

xv.	Perform anterior approach to ankle	K,S	P		Independent learning Videos Cadaveric dissection Observe the faculty and senior residents while assisting them	Log book/ Portfolio DOPS	Day to day assessments Sessional exam University exam	3
xvi.	Perform posterior approach to ankle	K,S	P	Y	Independent learning Videos Cadaveric dissection Observe the faculty and senior residents while assisting them	Log book/ Portfolio DOPS	Day to day assessments Sessional exam University exam	3
xvii.	Perform posterior exposure of the lumbosacral spine	K,S	P	Y	Independent learning Videos Cadaveric dissection Observe the faculty and senior residents while assisting them	Log book/ Portfolio DOPS	Day to day assessments Sessional exam University exam	3

50. Competency : Demonstrate post operative management

No.	Sub-Competency/ Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Ensures the patient is transferred safely from the operating table to bed	A	S	Y	Independent learning Observes the senior postgraduates, senior residents and faculty	Log book /Portfolio DOPS WPBA	Day to day assessment	10
ii.	Constructs a clear operation note	K,S,A	S	Y	Independent learning Observes the senior postgraduates, senior residents and faculty	Log book /Portfolio DOPS WPBA	Day to day assessment	10
iii.	Records clear and appropriate post operative instructions	K,S,A	S	Y	Independent learning Observes the senior postgraduates, senior residents and faculty	Log book /Portfolio DOPS WPBA	Day to day assessment	10
iv.	Deals with specimens. Labels and orientates specimens appropriately	S,A	S	Y	Independent learning Observes the senior postgraduates, senior residents and faculty	Log book /Portfolio DOPS WPBA	Day to day assessment	10

51. Competency : Perform iliac crest bone graft harvesting

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform Iliac crest bone graft harvesting	K,S	P	Y	Independent learning Video Observe the faculty and senior residents while assisting them	Log book/ Portfolio DOPS WPBA	Day to day assessments	5

52. Competency : Perform removal of implant

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i	Perform removal of implant (nail/plates/external fixator/screws/K- wire)	K,S	S	Y	Independent learning Observe the faculty and senior residents while assisting them	Log book/ Portfolio DOPS WPBA	Day to day assessments	05

53. Competency : Perform removal of foreign body

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform removal foreign body from skin / subcutaneous tissue	K,S	P	N	Independent learning Observe the faculty and senior residents while assisting them Videos	Log book/ Portfolio DOPS WPBA	Day to day assessments	--

54. Competency: Perform tension bend wiring for olecranon fracture

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform tension bend wiring for olecranon fracture	K,S	P	Y	Independent learning Observe the faculty and senior residents while assisting them Practice on bone models Videos	Log book/ Portfolio DOPS WPBA	Day to day assessments	5

55. Competency: Perform excision of radial head

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform excision of radial head	K,S	P	N	Independent learning Observe the faculty and senior residents while assisting them Videos	Log book/ Portfolio DOPS WPBA	Day to day assessments	--

56. Competency: Perform fixation of metacarpals

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform fixation of fracture metacarpal with K-wires	K,S	P	Y	Independent learning Observe the faculty and senior residents while assisting them Practice on bone models Videos	Log book/ Portfolio DOPS WPBA	Day to day assessments	5

57. Competency: Perform fixation of phalynx

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform fixation of fracture phalynx with K-wires	K,S	P	Y	Independent learning Observe the faculty and senior residents while assisting them Practice on bone models Videos	Log book/ Portfolio DOPS WPBA	Day to day assessments	5

58. Competency : Perform tension bend wiring for fracture patella

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform tension bend wiring for fracture patella	K,S	P	Y	Independent learning Observe the faculty and senior residents while assisting them Practice on bone models Videos	Log book/ Portfolio DOPS WPBA	Day to day assessments	5

59. Competency : Perform excision of patella

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform excision of patella for badly communited fracture patella	K,S	P	N	Independent learning, Observe the faculty and senior residents while assisting them Practice on bone models Videos	Log book/ Portfolio DOPS WPBA	Day to day assessments	--

60. Competency : Perform fixation of medial malleolus

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform fixation of fracture medial malleolus	K,S	P	Y	Independent learning Observe the faculty and senior residents while assisting them Practice on bone models Videos	Log book/ Portfolio DOPS WPBA	Day to day assessments	02

61. Competency : Perform fixation of fibula

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform fixation of fracture fibula	K,S	P	Y	Independent learning Observe the faculty and senior residents while assisting them Practice on bone models Videos	Log book/ Portfolio DOPS WPBA	Day to day assessments	02

62. Competency : Perform humerus plating

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform humerus plating for fracture shaft humerus	K,S	P	Y	Independent learning Observe the faculty and senior residents while assisting them Practice on bone models Videos	Log book/ Portfolio DOPS WPBA	Day to day assessments	02

63. Competency: Perform ulnar nailing

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform ulnar nailing for fracture shaft ulna	K,S	P	N	Independent learning Observe the faculty and senior residents while assisting them Practice on bone models Videos	Log book/ Portfolio DOPS WPBA	Day to day assessments	--

64. Competency : Perform ulnar plating

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform ulnar plating for fracture ulna	K,S	P	Y	Independent learning Observe the faculty and senior residents while assisting them Practice on bone models Videos	Log book/ Portfolio DOPS WPBA	Day to day assessments	02

65. Competency: Perform radius plating

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform radius plating for fracture radius	K,S	P	Y	Independent learning Observe the faculty and senior residents while assisting them Practice on bone models Videos	Log book/ Portfolio DOPS WPBA	Day to day assessments	02

66. Competency: Perform Femoral nailing

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform femoral nailing for fracture shaft femur	K,S	P	Y	Independent learning Observe the faculty and senior residents while assisting them Practice on bone models Videos	Log book/ Portfolio DOPS WPBA	Day to day assessments	02

67. Competency : Perform tibia nailing

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform tibial nailing for fracture shaft tibia	K,S	P	Y	Independent learning Observe the faculty and senior residents while assisting them Practice on bone models Videos	Log book/ Portfolio DOPS WPBA	Day to day assessments	02

68. Competency : Perform fixation of fracture neck femur with multiple cancellous screws

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform fixation of fracture neck femur with multiple cancellous screws	K,S	P	N	Independent learning Observe the faculty and senior residents while assisting them Practice on bone models Videos	Log book/ Portfolio DOPS WPBA	Day to day assessments	--

69. Competency : Perform fixation of inter-trochantric fracture

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Perform fixation of simple inter-trochantric fracture femur using a DHS/PFN	K,S	P	Y	Independent learning Observe the faculty and senior residents while assisting them Practice on bone models Videos	Log book/ Portfolio DOPS WPBA	Day to day assessments	02

70. Competency : Assist in surgical operations on benign and malignant musculoskeletal tumour

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Assist in surgical operations on benign and malignant musculoskeletal tumour	K,S	P	N	Independent learning Observe the faculty and senior residents while assisting them Videos	Log book/ Portfolio DOPS WPBA	Day to day assessments	--

71. Competency: Assist in Arthroplasty surgeries

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Assist in Arthroplasty surgeries of hip, knee, shoulder and the ankle.	K,S	P	N	Independent learning Observe the faculty and senior residents while assisting them Videos	Logbook/ Portfolio DOPS WPBA	Day to day assessments	--

72. Competency: Assist in spinal decompressions and spinal stabilizations.

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Assist in spinal decompressions and spinal stabilizations	K,S	P	N	Independent learning Observe the faculty and senior residents while assisting them Videos	Log book/ Portfolio DOPS WPBA	Day to day assessments	--

73. Competency : Assist in spinal deformity corrections.

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Assist in spinal deformity corrections.	K,S	P	N	Independent learning Observe the faculty and senior residents while assisting them Videos	Log book/ Portfolio DOPS WPBA	Day to day assessments	--

74. Competency: Assist/perform arthrodesis of major joints like hip, knee, shoulder, elbow.

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Assist/perform arthrodesis of major joints like hip, knee, shoulder, elbow	K,S	P	N	Independent learning Observe the faculty and senior residents while assisting them Videos	Log book/ Portfolio DOPS WPBA	Day to day assessments	--

75. Competency: Assist in corrective osteotomies around the hip, pelvis, knee, elbow, finger, and toes.

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Assist in corrective osteotomies around the hip, pelvis, knee, elbow, finger, and toes	K,S	P	N	Independent learning Observe the faculty and senior residents while assisting them Videos	Log book/ Portfolio DOPS WPBA	Day to day assessments	--

76. Competency: Assist in operative arthroscopy of various joints.

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Assist in operative arthroscopy of various joints	K,S	P	N	Independent learning Observe the faculty and senior residents while assisting them Videos	Log book/ Portfolio DOPS WPBA	Day to day assessments	--

77. Competency: Assist in open reduction and internal fixations of complex fractures

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Assist in open reduction and internal fixations of complex fractures eg. acetabulam, pelvis, ipsi lateral floating knee/elbowinjuries, shoulder girdleand hand.	K,S	P	N	Independent learning Observe the faculty and senior residents while assisting them Videos	Log book/ Portfolio DOPS WPBA	Day to day assessments	--

78. Competency: Assist in limb lengthening procedures.

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Assist in limb lengthening procedures.	K,S	P	N	Independent learning Observe the faculty and senior residents while assisting them Videos	Log book/ Portfolio DOPS WPBA	Day to day assessments	--

79. Competency: Assist in revision surgeries.

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Assist in revision surgeries.	K,S	P	N	Independent learning Observe the faculty and senior residents while assisting them Videos	Log book/ Portfolio DOPS WPBA	Day to day assessments	--

Competencies on communication skills

(Shall be assessed on quarterly basis)

A trainee must be able to demonstrate their competence in the communication skills below at the appropriately marked level on Miller's pyramid.

K= Knows, KH= Know how, S= Shows, P= Performs

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Demonstrate ability to communicate adequately, sensitively, effectively and respectfully with patients in a language that the patient understands and in a manner that will improve patient satisfaction and health care outcomes	A,C	S	Y	Independent Learning Videos Observes the faculty Role plays	360^0feedback WPBA OSCE	Day to day assessments Formative & summative evaluation University Exams	10
ii.	Demonstrate ability to establish professional relationships with patients and families that are positive, understanding, humane, ethical, empathetic, and trustworthy.	A,C	S	Y	Independent Learning Videos Observes the faculty Role plays (during PG orientation program)	360^0feedback WPBA	Day to day assessments	10
iii.	Demonstrate ability to communicate with patients in a manner respectful of patient's preferences, values, prior experience, beliefs, confidentiality and privacy.	A,C	S	Y	Independent Learning Videos Observes the faculty Role plays (during PG orientation program)	360^0feedback WPBA	Day to day assessments	10

iv.	Demonstrate ability to communicate with patients, colleagues and families in a manner that encourages participation and shared decision-making	A,C	S	Y	Independent Learning Videos Observes the faculty Role plays (during PG orientation program)	360^0feedback WPBA	Day to day assessments	10

Competencies on Leader and member of the health care team

A trainee must be able to demonstrate their competence as a leader and member of the health care team below at the appropriately marked level on Miller's pyramid.

K= Knows, KH= Know how, S= Shows, P= Performs

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Work effectively and appropriately with colleagues in an inter-professional health care team respecting diversity of roles, responsibilities and competencies of other professionals.	K,A,C	S	Y	Independent Learning Videos Observes the faculty Role plays (during PG orientation program)	360^0feedback WPBA	Day to day assessments	--
ii.	Recognize and function effectively, responsibly and appropriately as a health care team leader in primary and secondary health care settings.	A,C	S	Y	Independent Learning Videos Observes the faculty Role plays (during PG orientation program)	360^0feedback WPBA	Day to day assessments	--

iii.	Educate and motivate other members of the team and work in a collaborative and collegial fashion that will help maximize the health care delivery potential of the team.	K,A,C	S	Y	Independent Learning Videos Observes the faculty Role plays (during PG orientation program)	360^0feedback WPBA	Day to day assessments	--
iv.	Access and utilize components of the health care system and health delivery in a manner that is appropriate, cost effective, fair and in compliance with the national health care priorities and policies, as well as be able to collect, analyze and utilize health data.	K,A,C	S	Y	Independent Learning Videos Observes the faculty Role plays (during PG orientation program)	360^0feedback WPBA	Day to day assessments	--
v.	Participate appropriately and effectively in measures that will advance quality of health care and patient safety within the health care system	K,A	S	Y	Independent Learning Videos Observes the faculty Role plays (during PG orientation program)	360^0feedback WPBA	Day to day assessments	--
vi.	Recognise and advocate health promotion, disease prevention and health care quality improvement through prevention and early recognition: in a) life style diseases and b) cancer in collaboration with other members of the health careteam.	K,A,C	S	Y	Independent Learning Videos Observes the faculty Role plays (during PG orientation program)	360^0feedback WPBA	Day to day assessments	--

Competencies on Professionalism

A trainee must be able to demonstrate their competence on professionalism below at the appropriately marked level on Miller's pyramid.

K= Knows, KH= Know how, S= Shows, P= Performs

No.	Competency	Domain (K/S/A/C)	K/KH/S/P	Core Y/N	TL method	assessment method	Time for Assessment	No. required for Certification
i.	Practice selflessness, integrity responsibility, accountability and respect.	A	S	Y	Independent Learning Videos Observes the faculty Role plays (during PG orientation program)	360^0feedback WPBA	Day to day assessments	--
ii.	Respect and maintain professional boundaries between patients, colleagues and society.	K,A,C	S	Y	Independent Learning Videos Observes the faculty Role plays (during PG orientation program)	360^0feedback WPBA	Day to day assessments	--

iii.	Demonstrate ability to recognize and manage ethical and professional conflicts.	K,A	S	Y	Independent Learning Videos Observes the faculty Role plays (during PG orientation program)	360^0feedback WPBA	Day to day assessments	--
iv.	Abide by prescribed ethical and legal codes of conduct and practice.	K,A	S	Y	Independent Learning Videos Observes the faculty Role plays (during PG orientation program)	360^0feedback WPBA	Day to day assessments	--
v.	Demonstrate a commitment to the growth of the medical profession as a whole.	K,A	S	Y	Independent Learning Videos Observes the faculty Role plays (during PG orientation program)	360^0feedback WPBA	Day to day assessments	--

THESIS WRITING

To follow the recommendation of NMC

1. It is mandatory that every student pursuing MS degree in Orthopaedics to write a thesis under the guidance of the postgraduate teacher (guide) and if necessary a Co-guide.
2. The basic aim of carrying out thesis writing is to train a postgraduate in research methods and techniques.
3. A Guide shall be appointed from the Department of Orthopaedics and the Co-guide can be either from the department or from other disciplines related to the thesis topic and shall be approved by the University.
4. First to identify a suitable thesis title, formulation of hypothesis, search and review of literature, recent advances, designing of research study, collection of data, critical analysis, comparison of result and drawing conclusions.
5. The thesis protocol will be submitted six months after the admission and thesis will be submitted six months before appearing for final exam.
6. Before the submission of the thesis protocol to the Dean of the Institute it is better to present to the department faculty and peers.

Protocol of thesis:

This should consist of:

1. Introduction
2. Aims and objectives of the research project.
3. Brief review of literature.
4. Material and methods.
5. References.

The Final Thesis:

Thesis should consist of:

1. Introduction
2. Literature Review
3. Aims and objective
4. Material and methods
5. Results
6. Discussion
7. Conclusion
8. Summary
9. Tables
10. Annexures
11. References
12. Master Chart

Evaluation of final thesis: As per NMC guidelines

LOG BOOK

PG shall maintain a record logbook/portfolio (year wise) of the work carried out by them during the period of training.

The logbook/portfolio has to be maintained as recommended by the department, checked, and assessed periodically and signed by the consultant daily and, checked and signed by the HOD at the end of every month.

The PG students will be required to produce completed logbook in original at the time of final practical examination.

A proficiency certificate from the Head of Department regarding the clinical competence and skillful performance of procedures by the student will be submitted at the time of the examination.

ASSESSMENT

The assessment is broadly divided into:

- **Formative**
- **Summative**

1. **FORMATIVE**
   It shall cover all the domains of learning, covering all professional and communication skills.

Components of formative assessment:

A. Quarterly assessment
B. Pre-University

A. QUARTERLY ASSESSMENT: Quarterly assessment during the MS training will be based on following educational activities:

a. Journal based / recent advances learning
b. Patient based /Laboratory or Skill based learning
c. Self directed learning and teaching
d. Departmental and interdepartmental learning activity
e. External and Outreach Activities / CMEs

- Department will take quarterly assessment of the postgraduate students which will also include 2 sessional exams per year (2nd and 4th Quarter of each year shall be sessional exam and last quarter just before the university exams shall be Pre-university examination for postgraduate- MS degree program).
- A student must secure a minimum of 40% marks each in best of three out of 5 sessional examination and 40% marks in the Pre-University examination as one of the eligible criteria for appearing in University examination.

The PG student will be assessed periodically and record maintained as per the NMC 'Student appraisal form for MS in Orthopaedics'- (Annexure III).

B. PRE-UNIVERSITY

Pre University Exam	Marks Distribution	Total Marks
Theory-**4** papers	100 Marks each	400
Practical/Clinical and Viva	400 Marks	400

PAPER-WISE MARKS DISTRIBUTION

Paper	Title	Marks
Paper I	Basic sciences including principles of Gen. Surgery as applied to Orthopaedics	100
Paper II	Traumatology & Rehablitation	100
Paper III	Orthopaedic Diseases	100
Paper IV	Recent advances in Orthopaedics	100
Total		**400**
Practical / Clinical & viva examination		
Long case-**(150)**		150
Short cases- **(3X50)**		150
Table Viva		100
Total		**400**

PAPER-WISE SYLLABUS OF PRE-UNIVERSITY SHALL BE AS PER THE UNIVERSITY EXAMINATION

SAMPLE FORMAT OF QUESTION PAPER OF PRE-UNIVERSITY EXAMINATION

S.no	Questions	Distribution of Marks	Marks Allotted
Theory-3:00 Hours (Same format to be followed for all 4 papers)			
1.	Descriptive type	2x20	40
2.	Describe briefly	3x10	30
3.	Write short notes on	5x6	30
	Total Marks for one paper		**100**
	Total Marks for four papers		**400**

Practical / Clinical & Viva examination **400 marks**

Practical/Clinical 300 marks

1. Long case-one 150 marks
(where history taking, general examination and joint examination, approach to a case and management shall be assessed.)

2. Short cases-Three 50X3 150 marks

Table viva- 100 marks
Osteology, Tractions, Splints, Pathology specimen Problems in ward management, ward procedures, X-ray reading, specimens, Instruments, Implants and Operative approaches and procedures in Orthopaedic surgery, etc. Orthotics & Prosthetics

ELIGIBILITY CRITERIA TO APPEAR FOR THE MS ORTHOAEDIC UNIVERSITY EXAMINATION:

1. **Attendance**

    a. Minimum of 90% attendance in each academic year.
    b. If less than 90% in an academic year, the candidate shall be debarred from appearing in the University Examination.

2. **Formative Assessment**

    - Department will take quarterly assessment of the postgraduate students which will also include 2 sessional exams per year (2nd and 4th Quarter of each year shall be sessional exam and last quarter just before the university exams shall be Pre-university examination for postgraduate- MS degree program).

    - A student must secure a minimum of 40% marks each in best of three out of 5 sessional examination and 40% marks in the Pre-university examination.

3. **Course in Research Methodology**
    a. All postgraduate students will complete an online course in Basic Course in Bio Medical Research (BCBR), within 6 months of commencement of course.
    b. The above certification is mandatory requirement to be eligible to appear for the final University examination.

4. **Course in Ethics**
    a. All postgraduate students shall complete course in Ethics including Good Clinical Practices and Good Laboratory Practices, whichever is applicable to them, to be conducted by Department of Medical Education and get duly certified.
    b. The above certification is mandatory requirement to be eligible to appear for the final University examination.

5. **Course in Basic Cardiac Life Support Skills (BCLS) and Advanced Cardiovascular Life Support (ACLS).**
    a. All postgraduate students shall complete a course in Basic Cardiac life support (BCLS) skills and get duly certified.
    b. The above certification is mandatory requirement to be eligible to appear for the final University examination.

6. **Poster, Paper, Research Presentation and Publication as per NMC:**

    a. At least two presentations at national level conference
    b. One research Paper published/ accepted in an indexed journal

7. **District Residency Program - 03 Month DRP with a satisfactory completion certificate**

8. Thesis acceptance

a. The Thesis has to be accepted by all the examiners prior to appearing for Theory & Practical Examination.
b. If the thesis is not accepted even by one examiner the candidate shall not be allowed to appear for the theory and practical/clinical University Examination.

9. Recommendation from the Department

a. The Department will provide in writing a certificate of good standing of the candidate for being eligible to appear in the University Examination.
b. As per the NMC 'Student appraisal form for MS in Orthopaedics', student should achieve minimum satisfactory grade in all elements mentioned theirin.

10. Barred candidate

a. The candidate must complete pre-requisite conditions for appearing in the University examination.

b. If the candidate has been barred due to shortage of marks / attendance in the sessional examination, he/she has to secure 40% or more marks in one of the two examinations conducted during this extension period.
If the candidate fails to comply, he/she will not be eligible to appear in the postgraduate degree examination.

If any student fails to fulfill these criteria he/she shall not be allowed to appear in the University Examination.

2. **SUMMATIVE - UNIVERSITY EXAMINATION**

University Exam	Marks Distribution	Total Marks
Theory-**4** papers	100 Marks each	400
Practical/Clinical and Viva	400 Marks	400

PAPER-WISE MARKS DISTRIBUTION

Paper	Title	Marks
Paper I	Basic sciences including principles of Gen. Surgery as applied to Orthopaedics	100
Paper II	Traumatology & Rehabilitation	100
Paper III	Orthopaedic Diseases	100
Paper IV	Recent advances in Orthopaedics	100
Total		**400**
Practical / Clinical & viva examination		
Long case-**(150)**		150
Short cases- **(3X50)**		150
Table Viva		100
Total		**400**

SAMPLE FORMAT OF QUESTION PAPER OF UNIVERSITY EXAMINATION

S.no	Questions	Distribution of Marks	Marks Allotted
Theory-3:00 Hours (Same format to be followed for all 4 papers)			
4.	Descriptive type	2x20	40
5.	Describe briefly	3x10	30
6.	Write short notes on	5x6	30
	Total Marks for one paper		**100**
	Total Marks for four papers		**400**

Practical / Clinical & Viva examination **400 marks**

Practical/Clinical 300 marks

3. Long case-one 150 marks
(where history taking, general examination and joint examination, approach to a case and management shall be assessed.)

2. Short cases-Three 50X3 150 marks

Table viva- 100 marks
Osteology, Tractions, Splints, Pathology specimen Problems in ward management, ward procedures, X-ray reading, specimens, Instruments, Implants and Operative approaches and procedures in Orthopaedic surgery, etc. Orthotics & Prosthetics

COURSE CONTENTS PAPER WISE

Paper I: Basic Sciences including principles of General surgery as applied to Orthopaedics

A. APPLIED ORTHOPAEDIC ANATOMY

1. Developments of the skeleton

- Cartilage
- Bone
- Joints
- Morphogenesis of the axial skeleton
- Morphogenesis of the appendicular skeleton

2. Histology of cartilage

- Hyaline Cartilage
- Elastic Cartilage
- Fibrocartilage
- Histogenesis of Cartilage
- Cartilage Changes in Growth
- Adult Articular Cartilage
- The Chrondrocytes

3. Histology of Bone

- Types of Bone
- Structure of Bone
- Components of Bone
- Histogenesis of Bone
- Endochondral Ossification
- Intramembranous ossification

4. Histology of Skeletal muscle

- Microanatomy
- Structure of muscle fiber
- Component of sarcoplasm

5. Applied anatomy of Joints

Shoulder, Elbow, Wrist, Hand, Spine, Hip, Knee, Ankle & Foot

6. Osteology

- Muscle and Ligament attachments, nerve Supply, actions
- Exposure to Dissected Cadavers Concerning Extremities and Spine

B. APPLIED ORTHOPAEDIC PHYSIOLOGY

1. Physiology and Mineralization of Bone

- **Physiology of Bone**
  - Biochemistry
  - Basic physiologic processes
  - Factors affecting the fate of bone minerals
  - Phosphorus
  - Calcium
  - Fate of phosphorus and calcium
  - Magnesium
  - Vitamins
  - Glands of internal secretion
  - Enzymes
- **Mineralization of Bone**
  - Theories of mineralization
  - Bone formation, resorption and mineralization

2. Physiology of cartilage

- Normal articular cartilage
- Metabolic studies of articular cartilage
- Biomechanical functions of articular cartilage
- Mechanical functions of articular cartilage
- Factors affecting articular cartilage

3. Biophysical properties of bone and cartilage

- Electrical properties of bone
- Mechanism of electrically induced osteogenesis
- Piezoelectrical property of collagen

4. Remodelling of Bone

4. Ultra structural characteristics of Bone
5. Biological considerations
6. Collagen
   - Function of collagen
   - Structure of collagen molecule
   - Formation of collagen fibrile
   - Cross linking in collagen
   - Bone collagen
   - Collagen of articular cartilage
   - Collagenase
   - Hydroxyproline excretion : An indicator of collagen Metabolism

C. METABOLIC BONE DISEASE AND RELATED DYSFUNCTION OF THE PARATHYROID GLAND

- Factors affecting calcium metabolism
- Parathyroid glands
- Primary hyperparathyroidism
- Hypoparathyroidism
- Pseudohypoparathyroidism

- Low phosphorus rickets and osteomalacia
- Calcium deficiency diseases
- Malabsorption syndrome
- Hypophosphatasia
- Scurvy
- Gout
- Ochronotic arthritis
- Osteoporosis

D. APPLIED ORTHOPAEDIC PATHOLOGY

1. Histopathological aspects of bone

- Osteoprogenitor cell principle
- The Osteogenic cell
- The bone induction principle
- Repair of simple fracture of long bone & cancellous bone
- Delayed union and non-union
- Bone transplantation
- Avascular necrosis of bone
- Dysbaric osteonecrosis
- Hypercortisonism osteonecrosis
- Organ transplant osteonecrosis
- Cadaver bone Allograft
- Effect of ionizing Radiation on bone

2. Inflammation

E. SURGICAL APPROACHES IN ORTHOPAEDICS

F. CONVENTIONAL RADIO DIAGNOSIS, CT SCAN, MRI, ULTRSOUNDS ETC.

G. RADIOACTIVE ISOTOPES IN ORTHOPAEDICS

H. PRINCIPLES OF GENERAL SURGERY

- Principles of wound healing
- Systemic response to injury
- Gen principles of ulcer management
- Vascular injuries
- Nerve injuries
- Principles of Amputations
- Chest injuries
- Peripheral vascular disease
- Gangrene
- Soft tissue injuries
- Fat embolism
- DVT
- Shock
- Crush syndrome

I. HISTORY OF ORTHOPAEDICS

Paper II: Traumatology & Rehabilitation

1. Definition and classification of fractures
2. Complication of fractures
3. Closed treatment of fractures
4. Principles of internal fixation
5. Injuries around shoulder
6. Injuries to arm
7. Injuries around elbow
8. Injuries to forearm
9. Injuries around wrist
10. Fractures and joint injuries of hand
11. Injuries to pelvis
12. Injuries around hip
13. Injuries to thigh
14. Injuries around knee
15. Injuries to leg
16. Injuries around ankle
17. Injuries to foot
18. Spine injuries
19. Management of traumatic paraplegia
20. Management of Polytrauma patient
21. Ligament injuries
22. Pathological fractures
23. Principles of bone grafting
24. Distraction osteogenesis
25. Joint stiffness and traumatic ossification
26. Rehabilitation after fractures and joint injuries
27. Orthopaedic implants
28. Bed Side Physiotherapy

Paper III: Orthopaedic Diseases

1. Congenital talipes equino varus
2. Congenital dislocation of hip
3. Congenital abnormalities of limbs
4. Congenital deformities of spine
5. Developmental conditions
6. Osteomyelitis
7. Skeletal tuberculosis
8. Septic arthritis
9. Rheumatoid arthritis & related joint diseases
10. Degenerative joint diseases
11. Diseases of muscles
12. Fibrous diseases
13. Unclassified diseases of bones
14. Regional orthopaedic conditions of cervical spine
15. Regional orthopaedic conditions of cervico brachial region
16. Regional orthopaedic conditions of shoulder
17. Regional orthopaedic conditions of elbow
18. Regional orthopaedic conditions of wrist
19. Regional orthopaedic conditions of hand
20. Regional orthopaedic conditions of the spine
21. Regional orthopaedic conditions of the pelvis
22. Regional orthopaedic conditions of the hip
23. Regional orthopaedic conditions of the knee
24. Regional orthopaedic conditions of the ankle
25. Regional orthopaedic conditions of the foot
26. Benign bone tumours
27. Malignant bone tumours
28. Management of bone tumours
29. Secondary tumours of bone
30. Cerebral palsy
31. Orthopaedic neurology
32. Poliomyelitis and related diseases

Paper IV: Recent advances

(General Guidelines)

7. Newer implants
8. Newer operative procedures/techniques
9. Newer investigative procedures/ Tests
10. Biomaterials
11. Newer concepts in Orthopaedics
12. Newer drugs used in Orthopaedics

PASSING CRITERIA

Theory: An examinee should obtain minimum 40% marks in each theory paper and not less than 50% marks cumulatively in all the four papers for degree examination.

Practical: Clinical and Viva- The student shall secure not less than 50% marks in clinical/practical and viva voce.

The student shall secure not less than 50% marks in each head of passing which shall include (i) Theory (ii)Practical including clinical and viva voce examinations.

Failed Candidates

- **a.** A detained student must complete all the pre-requisite criteria for appearing in the next university examination.
- **b.** A failed student if so desire, can continue to attend the clinical and teaching sessions in the respective department

Remedial measures
Scheme for supplementary examination shall be as per the norms of Statutory Council.

Annexure 2

Board of Studies MS Orthopaedics 2023

Recommended text books, reference books, supplementary reading and other materials for MS Orthopaedics

S. No	Title of The Book	Author
1.	Orthopaedics Principles and Their Applications	Turek Samuel. L
2.	Orthopaedics Principles and Their Applications	Turek Samuel. L
3.	Campbells Operative Orthopaedics Vol-1	Canale S Terry
4.	Campbells Operative Orthopaedics Vol-II	Canale S Terry
5.	Campbells Operative Orthopaedics Vol-III	Canale S Terry
6.	Campbells Operative Orthopaedics Vol-IV	Canale S Terry
7.	Rockwood and Greens fractures in Adults Vol-I	Bucholz. Robesrt W
8.	Rockwood and Greens fractures in Adults Vol-II	Bucholz. Robesrt W
9.	Rockwood and Wilkins fractures in Children	BeatyJemes H
10.	Mercer's Orthopaedics Surgery Vol-I	SulthieRobeets B
11.	Mercer's Orthopaedics Surgery Vol-II	SulthieRobeets B
12.	Apleys System of Orthopaedics and fractures	SolomanConis
13.	Clinical Orthopaedics Examination	MC Ral Ronald
14.	The elements of Fracture Fixation	Anand J. Thakur
15.	A.O. Manual of fracture management- Internal Fixation-Concepts & cases using LCP & LISS	Wegner Frigg
16.	Orthotics in Functional Rehabilitation of Lower limbs	Deborah a Nawoczenski
17.	Inter locking nailing	DD Tanna
18.	Manual of Internal Fixation	Muller ME
19.	Grants Atlas of Anatomy	Aqur, Anne, MR
20.	Lasts Anatomy Regional and Applied	Chummy S
21.	Essentials of Orthopedics and Applied Physiotherapy	Joshi Jayant

22.	AO/ASIF Instruments and Implants Physiotherapy	Texhammar R
23.	A Colour atlas of Plastering Techniques	Mills Kemneth
24.	Tuberculosis of the Skeletal System	SM Tuli
25.	Practical fracture treatment	MC Rae, Ronald
26.	Surgical exposures in Orthopaedics	HoppentieldStamley
28.	Treatment and Rehabilitation of fractures	StonleyHoppenjieldVaronth L Murthy
29.	Atlas of Orthopaedic Surgical exposures	Christopher Jordan
30.	Spine	Rothman
31.	Paediatric Orthopaedics	Tachidjian
32.	Text Book of Llizarov Surgical Techniques Bone Correction and Lengthening	Golyakhovsky, Vladimir; Frankel, Victor H
33.	Applied Orthopaedic Biomechanics	Dutta, Santosh; Datta, Debasis
34.	Green's Operative Hand Surgery-Vol. 1&. 2	Green, David P; Hotchkiss, Robert N

C. Journal-

Department of Orthopedics		
Foreign Journals (print) - 2023		
S. No.	**Journal Title**	**Publisher**
1	Injury	Elsevier
2	Journal of Arthroplasty	Elsevier
3	Journal of Bone & Joint Surgery (British)	WW
4	Orthopedic Clinics of North America	Clinics

Indian Journals (print) - 2023		
S. No.	**Title of the Journal**	**Publisher**
1	Journal of Clinical Orthopedics & Trauma	Elsevier India

2	Indian Journal of Rheumatology	Medknow

Online Journals - 2023		
S. No.	**Journal Title**	**Publisher**
1	Arthritis and Rheumatology	Wiley
2	Arthristis Care and Research	Wiley
3	Injury	Elsevier
4	Journal of Arthroplasty	Elsevier
5	Journal of Clinical Orthopedics & Trauma	Elsevier India
6	Indian Journal of Rheumatology	Medknow
7	Injury Prevention	BMJ
8	Lippincott's Bone and Joint Newsletter	LWW
9	Current Orthopaedic Practice	LWW
10	Journal of Orthopaedic Trauma	LWW
11	Journal of Pediatric Orthopaedics B	LWW
12	Journal of Pediatric Orthopaedics	LWW
13	Techniques in Orthopaedics	LWW
14	Bone	Elsevier
15	Foot and Ankle Surgery	Elsevier
16	Joint Bone Spine	Elsevier
17	Journal of Arthroscopy and Joint Surgery	Elsevier
18	Journal of Clinical Orthopaedics and Trauma	Elsevier
19	Journal of Orthopaedics	Elsevier
20	Musculoskeletal Science and Practice	Elsevier
21	Operative Techniques in Orthopaedics	Elsevier
22	Orthopaedics & Traumatology: Surgery & Research	Elsevier
23	Orthopaedics and Trauma	Elsevier
24	Osteoarthritis and Cartilage	Elsevier
25	Osteopathische Medizin	Elsevier

26	Seminars in Arthritis and Rheumatism	Elsevier
27	Seminars in Arthroplasty: JSES	Elsevier
28	Sports Orthopaedics and Traumatology	Elsevier
29	The Foot	Elsevier
30	The Journal of Foot & Ankle Surgery	Elsevier
31	The Knee	Elsevier
32	Arthroplasty Today	Elsevier
33	Arthroscopy Techniques	Elsevier
34	Arthroscopy, Sports Medicine, and Rehabilitation	Elsevier
35	Atherosclerosis Plus	Elsevier
36	Atherosclerosis Supplements	Elsevier
37	Bone Reports	Elsevier
38	Foot & Ankle Surgery: Techniques, Reports & Cases	Elsevier
39	Injury Extra	Elsevier
40	Journal of Cartilage & Joint Preservation	Elsevier
41	Journal of Orthopaedic Reports	Elsevier
42	Journal of Orthopaedic Translation	Elsevier
43	Journal of Orthopaedics, Trauma and Rehabilitation	Elsevier
44	JSES International	Elsevier
45	JSES Open Access	Elsevier
46	JSES Reviews, Reports, and Techniques	Elsevier
47	Osteoarthritis and Cartilage Open	Elsevier
48	Osteoarthritis Imaging	Elsevier
49	Osteoporosis and Sarcopenia	Elsevier

E-learning Resources

1. Bombay Orthopedics Society :- https://youtube.com/@bombayorth
2. Asami India : - https://youtube.com/@asamiindia727

3. ORTHO TV :- https://youtube.com/@orthoTV
4. Indian Arthroscopy Society :- https://youtube.com/@IndianArthroscopySocietyOnline
5. https://youtube.com/@mangalparihar
6. www.aofoundation.org
7. www.orthobullets.com

Annexure 3

Board of Studies MS Orthopaedics 2023

Student appraisal form for MS in Orthopedics											
	Element	**Less than Satisfactory**			**Satisfactory**			**More than satisfactory**			**Comments**
		1	2	3	4	5	6	7	8	9	
1	**Scholastic Aptitude and Learning**										

1.1	Has Knowledge appropriate for level of training										
1.2	Participation and contribution to learning activity (e.g., Journal Club, Seminars, CME etc.)										
1.3	Conduct of research and other scholarly activity assigned (e.g Posters, publications etc.)										
1.4	Documentation of acquisition of competence (eg. Log book)										
1.5	Performance in work based assessments										
1.6	Self- directed Learning										
2	**Care of the patient**										
2.1	Ability to provide patient care appropriate to level of training										
2.2	Ability to work with other members of the health care team										

2.3	Ability to communicate appropriately and empathetically with patients families and care givers										
2.4	Ability to do procedures appropriate for the level of training and assigned role										
2.5	Ability to record and document work accurately and appropriate for level of training										
2.6	Participation and contribution to health care quality improvement										
3	**Professional attributes**										
3.1	Responsibility and accountability										
3.2	Contribution to growth of learning of the team										
3.3	Conduct that is ethical appropriate and respectful at all times										
4	**Space for additional comments**										
5	**Disposition**										

	Has this assessment been discussed with the trainee?	Yes	No								
	If not explain										
	Name and Signature of the assesse										

Program Outcomes (PO)	**Program Outcomes (PO)**

	Name and Signature of the assessor										
	Date										

Annexure 4

Board of studies MS Orthopaedics 2023

Program Outcome and Course Outcome Grid

/ Course Outcomes (CO)		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8
S. No.	Orthopaedics Course Outcome (CO)	identify and recognize various congenital, developmental, inflammatory, infective, traumatic, metabolic, neuromuscular, degenerative, and oncological disorders of the musculoskeletal system.	Provide competent professional services to trauma and Orthopaedic diseases (congenital, developmental, inflammatory, infective, metabolic, neuromuscular, degenerative, and oncological) patient at primary, secondary, tertiary health care centers.	Demonstrate empathy and humane approach and good communication skills towards patients and their families and exhibit interpersonal behavior in accordance with the societal norms and expectations.	Demonstrate professionalism.	Acquire skills as a self-directed learner; recognize continuing education needs, select and use appropriate learning resources.	Demonstrate competence in basic concepts of research methodology and epidemiology, and be able to critically analyze relevant published research literature	Demonstrate teaching skills using educational methods and techniques as applicable to the teaching of medical/nursing students, general physicians and paramedical health workers.	Function as an effective leader of a health team engaged in health care, research, or training. .
1	Demonstrate sufficient understanding of the basic sciences relevant to Orthopaedic specialty through a problem-based approach	3	2	--	--	1	1	--	--
2	Describe the principles of traumatic injury, its mechanism, clinical presentation and plan & interpret appropriate laboratory and	3	3	--	--	2	--	--	--

	radio diagnostic imaging investigations & institute appropriate management including rehabilitation of a musculoskeletal injured patient.								
3	Discuss the aetiopathogenesis, clinical presentation of congenital, developmental, inflammatory, infective, metabolic, neuromuscular, degenerative and oncological musculoskeletal disorders (Orthopaedic) and plan & interpret appropriate laboratory and radio diagnostic imaging investigations & institute appropriate management including	**2**	**2**	**--**	**--**	**2**	**--**	**1**	**2**

	rehabilitation for the same.								
4	Demonstrate sufficient knowledge regarding the recent advances taking place in the field of Orthopaedics	**2**	**2**	--	--	**3**	**2**	--	--
5	Identify a problem, prepare a research protocol, conduct a study, record observation and analyses data, interpret result, discuss and disseminate the finding.	--	--	--	--	--	**3**	--	--
6	Understand the basic principles of biomaterials and Orthpaedic metallurgy.	**3**	**2**	--	--	**1**	**1**	--	--
7.	Demonstrates knowledge of the medico-legal aspects of trauma and Orthopaedic	**3**	**2**	--	--	**1**	--	--	--

	disease.								
8.	Elicit and record from the patient, and other relevant sources including relatives and caregivers, a history that is complete and relevant to Orthopaedic trauma and disease.	**3**	**3**	**--**	**--**	**--**	**--**	**--**	**--**
9.	Perform clinical examinations of musculo-skeletal system that is complete and relevant to trauma & Orthopaedic disease identification, disease prevention, and health promotion	**3**	**3**	**--**	**--**	**--**	**--**	**--**	**--**
10	Demonstrate effective clinical problem solving, judgment, ability to interpret and integrate available data in order to address	**3**	**3**	**--**	**--**	**2**	**--**	**--**	**--**

	patient problems, generate differential diagnoses and develop individualized management plans that include preventive, promotive & therapeutic goals for Orthopaedic trauma and disease.								
11.	Perform basic Orthopaedic procedures & surgeries as applicable to a primary, secondary care center.	--	**3**	--	**3**	--	--	--	--
12.	Assist advance and complex Orthopaedics surgeries as applicable to secondary and tertiary care centers.	--	**2**	--	**2**	--	--	--	--
13.	Demonstrate ability to communicate adequately, sensitively,			**3**					

	effectively, and respectfully with patients in a language that the patient understands and in a manner that will improve patient satisfaction and health care outcomes.	--	--		--	--	--	**3**	**3**
14.	Work effectively and appropriately with colleagues in an inter-professional health care team respecting diversity of roles, responsibilities and competencies of other professionals.	--	**2**	**2**	**3**	--	--	**3**	**3**
15	Understands the importance of ethics, integrity & responsibility in the profession as well as professional boundaries between patients,	--	--	--	**3**	--	--	--	**2**

	colleagues and society.								
16	Understands the code of medical ethics as propose by the National Medical Commission of India	--	--	--	**3**	--	--	**1**	--
		25	**29**	**05**	**14**	**12**	**07**	**08**	**10**