CURRICULUM

Rawalpindi Medical University

University Residency Program 2023

MS (ORTHOPAEDIC SURGERY)

CURRICULUM & REGULATIONSFOR 5 YEARS DEGREE PROGRAMME INORTHOPAEDICS (MS ORTHOPAEDICS)

RAWALPINDI MEDICAL UNIVERSITY, RAWALPINDI

Dr. Obaid ur Rahman
Head of Orthopaedic Surgery

MASTERS IN ORTHOPAEDICS (MS)

MS Orthopaedics will be a 5-year program. Those candidates who will complete their training and other requirements will be awarded an MS (Orthopaedics) degree by the Rawalpindi Medical University.

RECOGNIZED TRAINING CENTERS AND SUPERVISORS

Three hospitals attached with Rawalpindi Medical University (RMU) and Allied Teaching Hospitals will start with MS program, i.e.

- Department of Orthopaedic Surgery (Benazir Bhutto Hospital, Rawalpindi)
- Department of Orthopaedic Surgery (Holy Family Hospital, Rawalpindi)
- Department of Orthopaedic Surgery (Rawalpindi Teaching Hospital, Rawalpindi)

Teaching faculty with five or more years than five years teaching experience in a PMDC recognized teaching hospital will be eligible to act as supervisors for MS program.

DURATION OF PROGRAM.

The duration of MS Orthopaedic course shall be five (5) years (first year in general surgery including two months of rotation and next four years in orthopaedics including nine months of rotations) with structured training in a recognized department under the guidance of an approved supervisor.

The course is structured in two parts:

Part I is structured for the 1st and 2nd calendar years. The candidate shall undertake clinical training in fundamental concepts of General Surgery and Orthopaedics. At the end of 2nd year, the examination (MTA) shall be held in fundamental concepts of General Surgery and Orthopaedics.

Part II is structured for 3rd, 4th and 5th calendar years in MS Orthopaedics. It has two components; Clinical and Research. The candidate shall undergo clinical training to achieve educational objectives of MS Orthopaedic (knowledge ,skills & attitude) along with rotation in relevant fields.

REGISTRATION AND ENROLLMENT

Total number of students enrolled for the course must not exceed 2 per-supervisor/year.

- The maximum number of trainees that can be attached with a supervisor at a given point of time (inclusive of trainees in all years/phases of MS training), must not exceed 6.
- Beds to trainee ratio at the approved teaching site shall be at least 5 beds per trainee.
- The University will approve supervisors for MS courses.
- Candidates selected for the courses after their enrollment at the relevant institutions shall be registered with Rawalpindi Medical University (RMU) as per prescribed Registration Regulation.

AIM OF MS(ORTHOPAEDICS) PROGRAM

- This course is designed to produce specialist in Orthopaedic and trauma surgery, who will have adequate knowledge and skills in Orthopaedic& Trauma surgery and can recognize two deal safely with a wide range of Orthopaedic and Trauma problems as consultants.

ADMISSION CRITERIA

Admission Criteria

For admission in MS Orthopaedics course, the candidate shall have:

- MBBS degree
- Completed one year House Job
- Registration with PMDC
- Passed Entry Test conducted by the University & aptitude interview by the Institute concerned
- Having up to the mark credentials as per RMU rules (no. of attempts in each professional, any gold medals or distinctions, relevant work experience, Rural/ Army services, research experience in a recognized institution, any research article published in a National or International Journal) may also be considered on case to case basis.

Exemptions: A candidate holding FCPS/MRCS/Diplomate/equivalent qualification in Orthopaedic Surgery shall be exempted from Part-I Examination and shall be directly admitted to Part-II Examinations, subject to fulfillment of requirements for the examination.

PART:1 ENTRY TEST

A. WRITTEN PAPER

The written examination will consist of 100 Multiple Choice Questions with single best answer. Division of MCQs will be as follows:

i. Basic Sciences (50 MCQs)
ii. Anatomy (15 MCQs)
iii. Orthopaedic Surgery (35 MCQs)

The applicant scoring a minimum of 60% marks will be considered pass.

B. OBJECTIVE STRUCTURED CLINICAL EXAMINATION (OSCE)

The Objective Structured Clinical Examination will consist of 25 stations.

Each station will consist of data and images based on the subject of General & Orthopaedic Surgery.

Each correct answer will carry 2 marks

The applicant scoring 60 % of marks will be considered pass.

GOALS OF THE COURSE

The goal of MS course in Orthopaedics is to produce a competent Orthopaedic surgeon who is:

- Aware of the current concepts in quality care in Orthopaedics and musculoskeletal trauma and also of diagnosis, therapeutic, medical and surgical management of Orthopaedic problems
- Able to offer initial primary management of acute Orthopaedic and trauma emergencies
- Aware of the limitations and refer readily to major centres for more qualified care of cases which warrant such referral
- Aware of research methodology and be able to conduct research and publish the work done
- Able to effectively communicate with patients, their family members, people and professional colleagues
- Able to exercise empathy and a caring attitude and maintain high ethical standards
- Able to continue taking keen interest in continuing education irrespective of whether he / she is in teaching institution or in clinical practice
- Dynamic, available at all times and proactive in the management of trauma victims and Orthopaedic emergencies

OBJECTIVES OF THE COURSE

At the end of MS course, the resident should be adept in the following domains:

- Skill to take a proper history for musculoskeletal disorders
- Clinical examination of all musculoskeletal disorders
- Application of history & clinical findings in making an appropriate clinical diagnosis
- Interpretation of investigations
- Discussion of options of treatment and follow up rehabilitation for the diagnosis made
- Have an in-depth theoretical knowledge of the syllabus with emphasis on current concepts
- Learn basic skills in musculoskeletal surgery including training on bone models and on patients by assisting or performing under supervision or perform independently as required.
- Have basic knowledge of common disorders of the spine, degenerative disorders of spine, trauma spine and infections of spine for diagnosis and evaluation of the common spine disorders
- Develop a familiarity to major topics under “Sports Medicine” - to gain exposure to the basic surgery, master the patho-physiology of the conditions usually encountered and develop a sound foundation to add new knowledge in the future
- Learn basic principles of Hand Surgery with emphasis on applied anatomy, understanding patho-physiology of common conditions, planning of treatment and post-operative protocols
- Develop understanding of principles of soft tissue coverage and learn basic techniques used in extremity surgery.

SYLLABUS OF THE COURSE

1. Theory

- **General Orthopaedics**
  - **Infections**
    - General Principles of Infection
    - Osteomyelitis
    - Infectious Arthritis
    - Tuberculosis and Other Infections
  - **Tumors**
    - General Principles of Tumors
    - Benign Tumors of Bone
    - Malignant Tumors of Bone
    - Soft Tissue Tumors and Non-neoplastic Conditions Simulating Bone Tumors
- **Congenital Anomalies**
  - Congenital Anomalies of Lower Extremity
  - Congenital and Developmental Anomalies Of Hip and Pelvis
  - Congenital Anomalies of Trunk and Upper Extremity
- **Peripheral Nerve Injuries**
  - Diagnosis and management
- **Microsurgery**
  - Basic principles and techniques
- **Imaging in Orthopaedics**

- **Other Non-traumatic Disorders**
  - Osteochondrosis
  - Rickets and osteomalacia
  - Metabolic bone disease
  - Cerebral Palsy
  - Paralytic Disorders
  - Neuromuscular Disorders
  - Genetic disorders
  - Osteonecrosis

- **Traumatology**
  - **Fractures and Dislocations**
    - General Principles of Fracture Treatment
    - Fractures of Lower Extremity
    - Fractures of Hip
    - Fractures of Acetabulum And Pelvis
    - Fractures of Shoulder, Arm, and Forearm
    - Malunited Fractures
    - Delayed Union and Nonunion Of Fractures
    - Acute Dislocations
    - Old Unreduced Dislocations
    - Fractures, Dislocations and Ligamentous Injuries of the hand
    - Fractures and Dislocations of Foot
    - Fractures and Dislocations In Children

- **Regional Orthopaedics**
  - **Spine**
    - Spinal Anatomy And Surgical Approaches
    - Fractures, Dislocations, And Fracture-Dislocations Of Spine
    - Arthrodesis Of Spine
    - Pediatric Cervical Spine
    - Scoliosis And Kyphosis
    - Lower Back Pain And Disorders Of Intervertebral Discs
    - Infections Of Spine

- **Sports Medicine**
  - Ankle Injuries
  - Knee Injuries
  - Shoulder And Elbow Injuries
  - Recurrent Dislocations

- **The Hand**
  - Basic Surgical Technique and Aftercare
  - Acute Hand Injuries
  - Flexor and Extensor Tendon Injuries
  - Wrist Disorders
  - Paralytic Hand
  - Cerebral Palsy of the Hand
  - Arthritic Hand
  - Compartment Syndromes and Volkmann Contracture
  - Dupuytren Contracture
  - Carpal Tunnel, Ulnar Tunnel, and Stenosing Tenosynovitis
  - Tumors and Tumorous Conditions of Hand
  - Hand Infections
  - Congenital Anomalies of Hand
- **The Foot and Ankle**
  - Surgical Techniques
  - Disorders of Hallux
  - PesPlanus
  - Lesser Toe Abnormalities
  - Rheumatoid Foot
  - Diabetic Foot
  - Neurogenic Disorders
  - Disorders of Nails and Skin Disorders of Tendons and Fascia

- **Operative Orthopaedics**
- **Surgical Techniques and Approaches**
  - **Arthrodesis**
    - Arthrodesis of Ankle, Knee and Hip
    - Arthrodesis of Shoulder, Elbow and Wrist
  - **Arthroplasty**
    - Arthroplasty of Ankle and Knee
    - Arthroplasty of Hip
    - Arthroplasty of Shoulder and Elbow
  - **Amputations**
    - General Principles of Amputations
    - Amputations about Foot
    - Amputations of Lower Extremity
    - Amputations of Hip And Pelvis
    - Amputations of Upper Extremity
    - Amputations of Hand
  - **Arthroscopy**
    - General Principles Of Arthroscopy
    - Arthroscopy Of Lower Extremity
    - Arthroscopy Of Upper Extremity

2. Practical

- Closed Reduction of Fractures, Dislocations
- Mastering Plastering Techniques
- Debridement of Open Fractures
- External Fixator application
- Internal Fixation of minor fractures with K-wires
- Closed manipulative correction of congenital problems like CTEV & other skeletal deformities Biopsies – FNAB, FNAC, Trocar needle, open
- Excision of benign lesions
- Tendon lengthening
- Incision and drainage, acute Osteomyelitis / Septic Arthritis
- Skull tongs application
- Tension band wiring
- Interfragmentary compression
- Plate Osteosynthesis of Forearm bones
- Carpal Tunnel Release
- Bone grafting
- Soft tissue releases
- Interlocking IM Nailing of Tibia & Femur
- Humerus Plating
- Ankle Fracture Fixations
- DHS Fixation
- Hemi-arthroplasty Hip
- Caudal epidural injections
- Facet Block
- Vertebroplasty
- Exposure of posterior spine
- Laminectomy
- Anterior and posterior instrumentation of spine
- Bone Skills Lab

- Tension Band Wiring
- Lag Screw Interfragmentary Compression
- Broad Plating
- Narrow Plating
- External Fixation
- Cancellous Screw Fixation
- Dynamic Hip Screw Fixation
- Dynamic Condylar Screw Fixation
- Tibia Intramedullary Interlocking Nailing
- Femur Intramedullary Interlocking Nailing
- Tibial Condyle Fixation
- Elbow fractures Fixation
- Ankle Fractures Fixation
- Pelvis – External Fixation
- Pubic Symphysis – ORIF
- Acetabulum Fracture Fixation
- MIPPO Tibia
- Hemiarthroplasty
- Spine - Posterior Instrumentation
- Spine – Anterior Instrumentation
- To clinically diagnose, assess, investigate and initially manage all surgical and medical emergencies To learn to assess ABC and perform CPR

- To perform

    - Endotracheal intubation
    - Peripheral and Central intravenous cannulation
    - Intercostal drainage tube insertion
    - Peritoneal aspiration
    - Splintage of the spine and limbs for fracture-dislocations

- To learn the use of certain emergency drugs – adrenaline, atropine, dopamine, Steroids, analgesics etc.
- To learn to apply
  - Glasgow Coma Scale (GCS)
  - AO classification of fractures
  - Gustillo Anderson grading of open fractures
  - Mangled Extremity Severity Scoring

- To learn to communicate with patient's attendants on death of patient
- To learn to handle confidentiality issues

TEACHING PROGRAM

1. General Principles

- Acquisition of practical competencies being the keystone of postgraduate medical education, postgraduate training is skills oriented.

- Learning in postgraduate program is essentially self-directed and primarily emanating from clinical and academic work. The formal sessions are merely meant to supplement this core effort.

2. Teaching Sessions

- Bedside teaching rounds
- Journal club
- Seminar
- PG case discussion
- X – Ray discussion
- Ortho-radiology meeting
- Central session (held in hospital auditorium regarding various topics like CPC, guest lectures, student seminars, grand round, sessions on basic sciences, biostatistics, research methodology, teaching methodology, health economics, medical ethics and legal issues).

3. Teaching Schedule

In addition to bedside teaching rounds, in the department there will be daily hourly sessions of formal teaching per week. The suggested time distribution of each session for department's teaching schedule as follows:

- Journal club Once a week
- Seminar Twice a week
- PG case discussion Twice a week
- Ortho-radiology meeting Once a month
- Central session As per hospital schedule
- Workshop – once every 3 months

Note:

- All sessions are supervised by faculty members. It is mandatory for all residents to attend the sessions except those posted in emergency.
- All the teaching sessions are assessed by the faculty members at the end of session and marks are given out of 10 and kept in the office for internal assessment.
- Attendance of the residents at various sessions has to be at compulsory.

MODULAR SYSTEM

The 5-year MS (Orthopaedics) training will comprise of:

First 01 year in General surgery (including plastic surgery rotation) and next 04 years in Orthopaedic Surgery.

Training Year	Module Name	Duration
1st	General Surgery	10 Months
1st	Plastic Surgery (Minor rotation)	01 rotation of 02 months
2nd	Orthopaedics	**1 year**
3rd	Orthopaedics	**1 year**
4th	Orthopaedics	**1 year**
5th	Rotations 1. Neuro-Spine (Compulsory) 2. Paediatric Orthopaedics 3. Arthroplasty 4. Arthroscopy and Sports 5.Hand Surgery	During 3 years Training in Orthopaedics, 03 rotations of 03 Months each:

- Credit hours will be awarded to the candidates after they have attended and cleared the Internal assessment of each module

- MS (Orthopaedics) will comprise of 03 exams; one at the end of 1st year (conducted by the General Surgery Department), then at the end of 2nd year of training and other on completion of 5th year of training.

EXAMINATIONS

PART-I EXAMINATION

- All candidates admitted in MS Orthopaedics course shall appear in Part-I examination at the end of second calendar year.
- Conducted by the General Surgery Department.

PART-II EXAMINATION

- All candidates admitted in MS Orthopaedics course shall appear in Part-II(clinical) examination at the end of structured training programme (end of 5th calendar year), and having passed the part I examination.
- However, a candidate holding FCPS / MRCS / Diplomate / equivalent qualification in Orthopaedic Surgery shall be exempted from Part-I Examination and shall be directly admitted to Part-II Examination, subject to fulfillment of requirements for the examination.
- The examination shall be held on biannual basis.
    a. To be eligible to appear in Part-III examination the candidate must submit;
    b. duly filled, prescribed Admission Form to the Controller of Examinations duly recommended by the Principal/Head of the Institution in which he/she is enrolled;
    c. a certificate by the Principal/Head of the Institution, that the candidate has attended at least 75% of the lectures, seminars, practical/clinical demonstrations;
    d. Original Log Book complete in all respect and duly signed by the Supervisor (for Oral & practical/clinical Examination);certificate of having passed the Part-I examination;
    e. Examination fee as prescribed by the University.

THE PART-II CLINICAL EXAMINATION SHALL HAVE THE FOLLOWING COMPONENTS:

- Written 300 marks
- Oral & practical/clinical examination 300 marks
- Log Book Evaluation 120 marks (40 marks per year)

- There shall be two written papers of 150 marks each. Both papers shall have problem-based Short/Modified essay questions and MCQs. Oral & practical/clinical examination shall have 300 marks for:
  - Long Case 50
  - Short Cases 100 (25 marks each)
  - OSCE 150
- To be declared successful in Part-II examination the candidate must secure 60% marks in each component and 50% in each sub-component. Only those candidates, who pass in theory papers, will be eligible to appear in the Oral & Practical/ Clinical Examination.
- The candidates, who have passed written examination but failed in Oral & Practical/ Clinical Examination, will re-appear only in Oral &Practical / Clinical examination.
- The maximum number of attempts to re-appear in oral & practical/clinical Examination alone shall be three, after which the candidate shall have to appear in both written and oral & practical/clinical examinations as a whole.
- The candidate with 80% or above marks shall be deemed to have passed with distinction.
- E-Log Book/Assignments: Through out the length of the course, the performance of the candidate shall be recorded on the Log Book.
- The Supervisor shall certify every year that the Log Book is being maintained and signed regularly.
- The Log Book will be developed & approved by the Research Board.

- The evaluation will be maintained by the Supervisor (in consultation with the Co-Supervisor, if appointed).
- The performance of the candidate shall be evaluated on annual basis. The total marks for Log Book shall be 100.The log book shall reflect the performance of the candidate on following parameters:
    - Year wise record of the competence of skills.
    - Year wise record of the assignments.
    - Year wise record of the evaluation regarding attitude & behaviour
    - Year wise record of journal club / lectures / presentations / clinico-pathologic conferences attended & / or made by the candidate.

SUBMISSION / EVALUATION OF SYNOPSIS

1. The candidates shall prepare their synopsis as per guidelines provided by the Rawalpindi Medical University.
2. The research topic in clinical subject should have 30% component related to basic sciences and 70% component related to applied clinical sciences. The research topic must consist of a reasonable sample size and sufficient numbers of variables to give training to the candidate to conduct research, to collect & analyze the data.
3. Synopsis of research project shall be submitted by the end of the 3rd year of MS program. The synopsis after review by an Institutional Review Committee shall be submitted to the University for Consideration by the Research Board, through the Principal / Dean /Head of the institution.
4. **Or else**, if the candidate opts for 02 research publications in PMDC and HEC recognized journals, then he will have to submit 02 research topics along with their synopsis to the University Research Board for approval. He will undertake the study after approval from the board.

SUBMISSION OF THESIS

THESIS SHALL BE SUBMITTED BY THE CANDIDATE DULY RECOMMENDED BY THE SUPERVISOR.

THE MINIMUM DURATION BETWEEN APPROVAL OF SYNOPSIS AND SUBMISSION OF THESIS SHALL BE ONE YEAR, BUT THE THESIS CANNOT BE SUBMITTED LATER THAN 8 YEARS OF ENROLMENT.

THE RESEARCH THESIS MUST BE COMPILED AND BOUND IN ACCORDANCE WITH THE THESIS FORMAT GUIDELINES APPROVED BY THE UNIVERSITY AND AVAILABLE ON WEBSITE.

THE RESEARCH THESIS WILL BE SUBMITTED ALONG WITH THE FEE PRESCRIBED BY THE UNIVERSITY.

OR ELSE, THE CANDIDATE CAN SUBMIT COPIES OF 02 RESEARCH ARTICLES PUBLISHED IN PMDC AND HEC RECOGNIZED JOURNALS WHICH HAD PREVIOUSLY BEEN ACCEPTED IN THE UNIVERSITY RESEARCH BOARD, AT LEAST 06 MONTHS PRIOR TO THE EXAMINATION.

E-LOG BOOK

THE RESIDENTS MUST MAINTAIN AN E-LOG BOOK AND GET IT SIGNED REGULARLY BY THESUPERVISOR. A COMPLETE AND DULY CERTIFIED LOG BOOK SHOULD BE PART OF THE REQUIREMENT TO SIT FOR MS EXAMINATION. LOG BOOK SHOULD INCLUDE ADEQUATE NUMBER OF DIAGNOSTIC AND THERAPEUTIC PROCEDURES OBSERVED AND PERFORMED, THE INDICATIONS FOR THE PROCEDURE, ANY COMPLICATIONS AND THE INTERPRETATION OF THE RESULTS, ROUTINE AND EMERGENCY MANAGEMENT OF PATIENTS, CASE PRESENTATIONS IN CPCS, JOURNAL CLUB MEETINGS AND LITERATURE REVIEW.

PROPOSED FORMAT OF LOG BOOK IS AS FOLLOWS:

CANDIDATE'S NAME: _____

ROLL NO. _____

THE ABOVE MENTIONED PROCEDURES SHALL BE ENTERED IN THE LOG BOOK AS PERFORMAT:

PROCEDURES PERFORMED

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SEMINAR/JOURNAL CLUB PRESENTATION

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EVALUATION RECORD

(Excellent, Good, Adequate, Inadequate, Poor)

At the end of the rotation, each faculty member will provide an evaluationof the clinical performance of the fellow.

Sr.#	Date	**Method of Evaluation (Oral, Practical, Theory)**	Rating	Supervisor's Signature
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EVALUATION AND ASSESSMENT STRATEGIES

Assessment

It will consist of action and professional growth oriented **student-centered integrated assessment** with an additional component of **informal internal assessment, formative assessment** and measurement-based **summative assessment.**

Student-Centered Integrated Assessment It views students as decision-makers in need of information about their own performance. Integrated Assessment is meant to give students responsibility for deciding what to evaluate, as well as how to evaluate. It encourages students to **'own'** the evaluation and to use it as a basis for self-improvement. Therefore, it tends to be growth-oriented, student-controlled, collaborative, dynamic, contextualized, informal, flexible and action-oriented.

In the proposed curriculum, it will be based on:

- Self -Assessment by the student
- 360 Evaluation Forms (Annex Attached)
- Informal Internal Assessment by the Faculty

SELF ASSESSMENT BY THE STUDENT

- Each student will be provided with a pre-designed self-assessment formto evaluate his/her level of comfort and competency in dealing withdifferent relevant clinical situations. It will be the responsibility of thestudent to correctly identify his/her areas of weakness and to takeappropriate measures to address those weaknesses.

360 EVALUATION

- The students will also be expected to evaluate their peers after the monthly small group meeting. These should be followed by a constructive feedback according to the prescribed guidelines and should be nonjudgmental in nature. This will enable students to become good mentors in future.

INFORMAL INTERNAL ASSESSMENT BY THE FACULTY

- There will be no formal allocation of marks for the component of Internal Assessment so that students are willing to confront their weak nessesrat her than hiding them from their instructors.
- It will include:
  - Punctuality
  - Ward work
  - Monthly assessment (written tests to indicate particular area sof weaknesses)
  - Participation in interactive sessions

FORMATIVE ASSESSMENT

- Will help to improve the existing instructional methods and the curriculum in use

FEEDBACK TO THE FACULTY BY THE STUDENTS:

- After every three months students will be providing a written feedback regarding their course components and teaching methods. This will help to identify strengths and weaknesses of the relevant course, faculty members and to ascertain areas for further improvement.

SUMMATIVE ASSESSMENT

- It will be carried out at the end of the programme to empirically evaluate cognitive, psychomotor and affective domains in order to award diplomas for successful completion of courses.

MS ORTHOPAEDICS EXAMINATION - DETAIL

Part I- MS Orthopaedics Examination

Total Marks: 430

- All candidates admitted in MS Orthopaedics course shall appear in Part I examination at the end of second calendar year.
- There shall be two written papers of 100 marks each, Oral & practical/clinical examination of 150 marks and log book assessment of 80 marks.

Topics included in papers 1 & 2:

- Basic Principles of Surgery

Components of Part I Examination

Theory:

Paper 1: 100 Marks 3 Hours

- 10 SEQs (No Choice; 05 marks each) 50 Marks
- 50 MCQs 50 Marks

Paper 2: 100 Marks 3 Hours

- 10 SEQs (No Choice; 05 marks each) 50 Marks
- 50 MCQs 50 Marks

Only those candidates, who pass in theory papers, will be eligible to appearing the Oral & Practical/Clinical Examination.

Oral & Practical/ Clinical Examination shall be held in clinical techniques relevant to Surgery .

OSCE 50 Marks

- 10 stations each carrying 05 marks of 10 minutes duration; each
- evaluating performance-based assessment with five of them interactive

Clinical 100 Marks

- Four short cases (each 15 marks) 60 Marks
- One long case: 40 Marks

e-Log Book 100 Marks

PART II MS ORTHOPAEDICS

Total Marks: 300

- All candidates admitted in MS Orthopaedics course shall appear in Part-II examination at the end of structured training programme (end of 5th calendar year and after clearing Part I examination).

Table of Specifications				
Marks Distribution	Units/Topics	No. of Questions	Eligibility for Exam	Research
WRITTEN & CLINICAL- TOTAL MARKS 750 ***Written- Two papers*** Paper 1 & 2 will comprise 100 MCQs Each (single best answer), 1 mark for each McQ *Written exam should be passed (pass marks=60%) to appear in clinical exam.* **Clinical:** OSCE=150 marks (15 stations 10 Marks each) 5 min for each station Short cases- 200 marks (4 cases 50 marks each) 12min each Long case- 100 marks (1 long case) 70 min duration ***Thesis = 100 marks*** Presentation – 30 Marks Discussion- 70 Marks ***Pass percentage=*** ***Accumulative pass percentage is 60% with separate at least 55% in each component (i.e., paper 1,2, OSCE, short cases, long cases)*** ***Written papers should be passed separately.*** ***OSCE must be passed separately.*** ***Short cases and long cases must be passed separately.*** ***Thesis must have 60% score to qualify.***	**Paper I (100 MCQs)**		1. Completion of 4 year training 2. Year One, MTA, Year three Assessment should be passed. 3. All internal and external rotations to be completed. 4. Cumulative score of 75% in Continuous Internal assessments of all training years. 5. No dues certificate.	Thesis should be accepted.
	1 Basic Orthopedics & Principles	10		
	2 Adult Trauma	50		
	3 Arthroplasty	12		
	4 Infections	08		
	5 Neuromuscular Disorders	10		
	6 Spine	10		
	Paper II (100MCQs)			
	7 Hand & Nerve Injuries (Upper Limb)	15		
	8 Foot & Ankle & Nerve Injuries (Lower Limb)	15		
	9 Amputation, Prosthetics and Orthotics	06		
	10 Tumors	14		
	11 Sports Medicine & Pain	15		
	12 Congenital Disorders	15		
	13 Pediatric Trauma	10		
	14 General Affections of Bones & Joints	10		
	Clinical			
	OSCE stations	15		
	Short cases	4		
	Long cases	1		
	Thesis	1		

PART II MS ORTHOPAEDICS

SCHEME FOR OSCE IN THE FINAL TERM ASSESSMENT

1. Total number of stations – 15 (All Interactive)
2. Time allocation for each station – 5minutes
3. Marks allocation for each station – 10marks

Topic Wise Distribution of OSCE Stations

TOPIC WISE DISTRIBUTION OF OSCE STATIONS

SNO	TOPICS	STATION WISE DISTRIBUTION
01	**PROCEDURE ADULT TRAUMA**	THIS STATION FOCUSES ON THE ASSESSMENT AND MANAGEMENT OF ADULT TRAUMA CASES. IT MAY INVOLVE EVALUATING AND TREATING FRACTURES, DISLOCATIONS, OR OTHER TRAUMATIC INJURIES IN ADULT PATIENTS. CANDIDATES MAY BE ASKED TO DEMONSTRATE THEIR KNOWLEDGE OF SURGICAL TECHNIQUES, SUCH AS, APPLICATION OF SKELETAL TRACTION AND POP APPLICATION, MANIPULATION FOR FRACTURES. DISLOCATIONS, (HIP, ELBOW , SHOULDER). BIOPSY TECHNIQUES TRUCUT BIOPSY, JOINT ASPIRATION, EXTERNAL FIXATOR APPLICATION TENDON REPAIR TECHNIQUE SKIN SUTURE
02	**IMPLANTS ADULT TRAUMA**	THIS STATION CONTINUES TO ASSESS THE CANDIDATE'S PROFICIENCY IN MANAGING ADULT TRAUMA CASES. IT MAY INVOLVE SCENARIOS WHERE CANDIDATES NEED TO APPLY THEIR KNOWLEDGE OF IMPLANT SELECTION AND PLACEMENT FOR FRACTURES OR OTHER TRAUMA-RELATED CONDITIONS. SCREW, ALL SIZES BITS ESP 3.5MM, 4.5MM , 5.00 MM, SKILL STATIONS, PRINCIPAL OF LAG SCREW, GADGETS REQUIRED (SAW BONE, DRILL WITH SLEEVE, SCREWS DRIVERS WITH GAUGE) DHS \DCS, IMPLANT IDENTIFICATION, PRINCIPLES OF DHS, ANGLES, MECHANISM, INDICATION OF DHS, PROS AND CONS OF IMPLANT NAILS, TYPES (IDENTIFICATION), PFN, EXPORT FIXABLE NAIL, NORMAL TIBIAL NAIL, MODE OF NAILING, REAMING OF IM CAVITY, WORKING LENGTH OF NAIL , PLATES, IDENTIFICATION OF IMPLANTS, LOCKING/ NARROW / BROAD, MODE , BUTTRESSING SCREWS WEIGHT BEANING, COMPRESSION, TENSION, WEIGHT SHEARING, BRIDGING, IMPLANTS SPINAL IMPLANTS EXTERNAL \INTERNAL FIXATORS
03	**RADIOLOGY ADULT TRAUMA**	THIS STATION CONTINUES TO ASSESS THE CANDIDATE'S PROFICIENCY IN MANAGING ADULT TRAUMA CASES EG MRI CT SCAN X RAYS BONE SCAN NCS EMG CLINICAL SCENARIO
04	**RADIOLOGY /INSTRUMENTS**	ARTHROPLASTY STATION: THIS STATION EVALUATES THE CANDIDATE'S UNDERSTANDING AND SKILLS RELATED TO JOINT REPLACEMENT PROCEDURES.

	ARTHROPLASTY:	CANDIDATES MAY BE ASKED TO DEMONSTRATE THEIR KNOWLEDGE OF IMPLANT SELECTION, SURGICAL TECHNIQUES, AND POST-OPERATIVE CARE FOR ARTHROPLASTY CASES. CLINICAL SCENARIOS, ALONG WITH CLINICAL PICTURES, IMAGING STUDIES (MRI, CT SCAN, X-RAYS, BONE SCAN, NCS, EMG), MAY BE PROVIDED TO ASSESS THE CANDIDATE'S DECISION-MAKING ABILITIES. CANDIDATES MAY ALSO NEED TO DEMONSTRATE THEIR UNDERSTANDING OF ARTHROPLASTY IMPLANTS AND THEIR APPROPRIATE USE. INSTRUMENTS MAY BE USED LIKE (TOTAL HIP REPLACEMENT / TOTAL KNEE REPLACEMENT) NAMES, USES WITH SEQUENCE TECHNIQUES. (SAW BONE MODELS OF PELVIS ,KNEE ,SHOULDER)
05	**RADIOLOGY INFECTIONS:**	THIS STATION ASSESSES THE CANDIDATE'S KNOWLEDGE AND APPROACH TO MANAGING ORTHOPEDIC INFECTIONS. CLINICAL SCENARIOS, CLINICAL PICTURES AND IMAGING STUDIES (MRI, CT SCAN, X-RAYS, BONE SCAN, NCS, EMG) MAY BE PRESENTED. CANDIDATES MAY BE ASKED TO DIAGNOSE AND DEVELOP TREATMENT PLANS FOR VARIOUS ORTHOPEDIC INFECTIONS, AS WELL AS DEMONSTRATE PROCEDURAL SKILLS SUCH AS JOINT ASPIRATION.
06	**PATIENT\INVESTIGATIONS NEUROMUSCULAR DISORDERS**	NEUROMUSCULAR DISORDERS STATION: THIS STATION FOCUSES ON THE EVALUATION AND MANAGEMENT OF ORTHOPEDIC CONDITIONS RELATED TO NEUROMUSCULAR DISORDERS. CANDIDATES MAY ENCOUNTER PATIENT, CLINICAL SCENARIOS, CLINICAL PICTURES, AND IMAGING STUDIES (MRI, CT SCAN, X-RAYS, BONE SCAN, NCS, EMG) THAT REQUIRE THEM TO ASSESS AND DEVELOP TREATMENT PLANS FOR PATIENTS WITH NEUROMUSCULAR DISORDERS AFFECTING THE MUSCULOSKELETAL SYSTEM.
07	**RADIOLOGY/IMPLANT SPINE:**	THIS STATION EVALUATES THE CANDIDATE'S KNOWLEDGE AND SKILLS RELATED TO SPINE DISORDERS AND CONDITIONS. CANDIDATES MAY ENCOUNTER CLINICAL SCENARIOS, CLINICAL PICTURES, AND IMAGING STUDIES (MRI, CT SCAN, X-RAYS, BONE SCAN, NCS, EMG) REQUIRING THEM TO ASSESS AND MANAGE SPINAL DISORDERS, INCLUDING SURGICAL INTERVENTION. CANDIDATES MAY ALSO NEED TO DEMONSTRATE THEIR UNDERSTANDING OF SPINAL IMPLANTS AND THEIR APPROPRIATE USE.
08	**RADIOLOGY** **HAND & NERVE INJURIES (UPPER LIMB):**	THIS STATION ASSESSES THE CANDIDATE'S PROFICIENCY IN EVALUATING AND MANAGING HAND AND UPPER LIMB INJURIES. CLINICAL SCENARIOS, CLINICAL PICTURES, AND IMAGING STUDIES (MRI, CT SCAN, X-RAYS, BONE SCAN, NCS, EMG) MAY BE PROVIDED TO EVALUATE THE CANDIDATE'S DECISION-MAKING ABILITIES. SOME EXAMPLES FOR RADIOLOGY ARE AS UNDER KENIBOCKS DISEASE 2. TRAN SCAPHOID PERI LUNATE DISLOCATION 3. RADIAL CLUB HAND 4. VISI, DISI EXAMPLES OF CLINICAL VIDEO/PICTURE : DUPUYTRENS CONTRACTURE, VOLKMANN ISCHEMIC CONTRACTURE (VIC), RADIAL CLUB HAND
09	**IMPLANTS/ ORTHOSIS/PROSTHESIS FOOT & ANKLE & NERVE INJURIES (LOWER LIMB):**	THIS STATION FOCUSES ON THE EVALUATION AND MANAGEMENT OF ORTHOPEDIC AILMENTS AND THE USE OF IMPLANTS USED IN FOOT SURGERY / ORTHOSIS/PROSTHESIS AFO, PTB ORTHOSIS, KAFO, HKAFO, BK PROTHESIS, [E.G. UPPER AND LOWER LIMB PROTHESIS, HIP ABDUCTION BRACE, WHO, FRACTURE HUMERUS BRACE FRACTURE TIBIA BRACE, SACH FOOT, CERVICAL ORTHOSIS, SCOLIOSIS BRACES, HIP ABDUCTION BRACE, DDH CLUB FOOT BRACES, DB SPLINT
10	**RADIOLOGY TUMORS**	THIS STATION FOCUSES ON THE EVALUATION AND MANAGEMENT OF ORTHOPEDIC TUMORS. CANDIDATES MAY ENCOUNTER CLINICAL SCENARIOS, CLINICAL PICTURES, AND IMAGING STUDIES (MRI, CT SCAN, X RAYS)

11	**INSTRUMENTS \VIDEO\MRI SPORTS MEDICINE PAIN]**	THIS STATION FOCUSES ON THE EVALUATION AND MANAGEMENT OF SPORTS INJURIES. CANDIDATES MAY ENCOUNTER CLINICAL SCENARIOS, CLINICAL PICTURES, AND IMAGING STUDIES (MRI, CT SCAN, X RAYS) 1INSTRUMENTS ON STATION — VIVA RELATED TO USE AND MARKINGS ON KNEE MODEL 2- MRI KNEE / SHOULDER — DESCRIBE AND THEN VIVA RELATED TO FINDING. 3- VIDEO OF ARTHROSCOPY — IDENTIFY STRUCTURES AND FINDINGS.
12	**PATIENT/RADIOLOGY [CONGENITAL DISORDERS]**	THIS STATION FOCUSES ON THE EVALUATION AND MANAGEMENT OF ORTHOPEDIC CONGENITAL DISORDERS. CANDIDATES MAY ENCOUNTER PATIENT, CLINICAL SCENARIOS, CLINICAL PICTURES, AND IMAGING STUDIES (MRI, CT SCAN, X RAYS, DD H LCPD CVT CTEV PROXIMAL FEMORAL FOCAL DEFICIENCY TIBIA HEMIALGIA AMPHIARTHROSIS TIBIA / FIBULA RICKETS RADIAL CLUBFOOT RICKETS
13	**RADIOLOGY [PAEDIATRIC TRAUMA]**	THIS STATION FOCUSES ON THE EVALUATION AND MANAGEMENT OF PEDIATRIC TRAUMA, CANDIDATES MAY ENCOUNTER CLINICAL SCENARIOS, CLINICAL PICTURES, AND IMAGING STUDIES (MRI, CT SCAN, X RAYS, EXAMPLES OF RADIOLOGY STATIONS MAY BE FRACTURE HUMERUS SALTER HARRIS TYPES HIP FRACTURE / RADIUS SLIPPED CAPITAL HIP DISLOCATION ELBOW DISLOCATION PICTURES CUBITUS VARUS / VALGUS – GENU VALGUM / VARUS
14	**PATIENT GENERAL AFFECTIONS OF BONES & JOINTS**	THIS STATION FOCUSES ON THE EVALUATION AND MANAGEMENT OF PATIENTS WITH PARALYTIC DISORDERS, OSTEOCHONDROSIS, APOPHYSITIS, JOINT DISORDERS AND DEFORMITIES EG .EXAM OF KNEE JOINT OF PATIENT WITH OA,JOINT EXAM OF RHEUMATOID ARTHRITIS
15	**INSTRUMENTS / (SAW BONE MAY BE USED BASIC ORTHOPAEDICS & PRINCIPLES**	> THIS STATION FOCUSES ON THE APPLICATION OF ORTHOPEDIC PRINCIPLES IN DIFFERENT PROCEDURES LIKE 1-LAG SCREW ETC 2-NEUTRALIZATION PLATE ETC 3-DCP ETC 4-PELVIS FRACTURE ETC 5-ANKLE FRACTURE ETC 6- SKELETAL TRACTION ETC 7-LATERAL HIP SKELETAL TRACTION ETC

NOTE: 10% of topics may come from any area

Table of Specification (Unit wise)

	Contents	Learning Objectives:	Teaching Strategies	Formative Assessment	Time Allocation	MCQs	Time Allocation OSCE	Assessment %	
	Basic Orthopaedics	• Understand the principles and techniques of imaging modalities commonly used in orthopaedics, such as X-ray, MRI, CT scan, and ultrasound. • Identify the indications and limitations of different imaging modalities in the evaluation of musculoskeletal conditions. • Demonstrate knowledge of normal anatomy and anatomical variations encountered in orthopaedic imaging studies. • Recognize and describe common radiographic findings and abnormalities seen on X-ray images in orthopaedics, such as fractures, dislocations, and joint degeneration. • Interpret MRI images of the musculoskeletal system, including evaluation of soft tissues, bones, joints, and spinal structures. • Understand the principles of CT scan and its application in orthopaedics, including assessment of bony structures and complex fractures. • Demonstrate proficiency in recognizing and describing common pathological conditions visualized on orthopaedic imaging studies, such as tumors, infections, and inflammatory diseases. • Identify and interpret ultrasound findings relevant to orthopaedics, including evaluation of tendons, ligaments, and joint effusions. • Understand the role of advanced imaging techniques, such as magnetic resonance arthrography (MRA) and computed tomography arthrography (CTA), in the assessment of joint pathology. • Recognize the importance of appropriate imaging protocol selection, including positioning, sequences, and contrast administration, based on the clinical question and suspected pathology. • Discuss the principles of radiation safety and dose optimization in orthopaedic imaging. • Stay updated with the latest advancements and emerging techniques in orthopaedic imaging, such as functional MRI and molecular imaging. • Understand the role of imaging in preoperative planning, intraoperative guidance, and postoperative assessment of orthopaedic procedures. • Communicate effectively with radiologists and other healthcare professionals in discussing imaging findings and formulating management plans for orthopaedic patients.	Seminar, SGD, bedside teaching short case, long case, DOPS MiniCEx	**Log Book** **WPBA** Multisource feedback 360^{o} Performa DOPS MiniCEX		10	1	6%	6%

	Arthroplasty Arthroplasty of Ankle and Knee Arthroplasty of Hip Arthroplasty of Shoulder and Elbow	1. Understand hip and knee conditions that require arthroplasty surgeries 2. Learn surgical techniques for performing hip and knee arthroplasty surgeries 3. Gain knowledge of patient selection and pre-operative assessment 4. Gain an in-depth understanding of surgical anatomy and biology involved in the procedures. 5. Explore the various types of surgical approaches and their benefits and risks 6. Understand Comprehensively management and prevention of post-operative complications. 7. Learn the necessary skills for post-operative rehabilitation and patient education, along with communication with medical teams and patients. 8. Keep up-to-date and execute necessary changes by occasional review of researches, studies, service updates, and enhancements in the field	Seminar, SGD, bedside teaching, short case, long case, DOPS MiniCEx	**Long Book** **WPBA** Multisource feedback 360° Performa DOPS MiniCEX		12	1		
	Infections • General Principles of Infection • Osteomyelitis • Infectious Arthritis • Tuberculosis and Other Infections	• Understand the basic concepts of infection in orthopaedics, including pathogenesis and host immune response. • Identify the common types of infections encountered in orthopaedics, such as surgical site infections, osteomyelitis, and prosthetic joint infections. • Recognize the risk factors and predisposing conditions for orthopaedic infections, including patient-related factors and surgical factors. • Describe the clinical manifestations and signs of orthopaedic infections, including local signs of inflammation, systemic symptoms, and laboratory markers. • Demonstrate knowledge of the diagnostic modalities used to evaluate orthopaedic infections, such as laboratory tests, imaging studies, and microbiological cultures. • Understand the principles of antimicrobial therapy in orthopaedic infections, including selection of appropriate antibiotics, dosage, and duration of treatment. • Recognize the role of surgical intervention in the management of orthopaedic infections, including debridement, drainage, and implant removal. • Understand the principles of implant-related infections and the challenges associated with their treatment. • Identify the preventive strategies and infection control measures in orthopaedics, including preoperative preparation, aseptic techniques, and prophylactic antibiotic administration. • Recognize and manage complications associated with orthopaedic infections, such as soft tissue necrosis, septic arthritis, and chronic osteomyelitis. • Understand the principles of biofilm formation and its significance in orthopaedic infections. • Discuss the emerging techniques and advancements in the diagnosis and treatment of orthopaedic infections, such as molecular diagnostics and local antibiotic delivery systems. • Understand the principles of multidisciplinary collaboration in the management of orthopaedic infections, including infectious disease specialists and microbiologists.	Seminar, SGD, bedside teaching, short case, long case, DOPS MiniCEx	**Log Book** **WPBA** Multi source feedback 360° Performa DOPS MiniCEX	10%	08	1	06 %	06 %

		• Discuss ethical considerations in the management of orthopaedic infections, including informed consent, patient autonomy, and resource allocation.							
	Neuromuscular Disorders • Osteochondrosis • Rickets and osteomalacia • Metabolic bone disease • Cerebral Palsy • Paralytic Disorders • Neuromuscular Disorders • Genetic disorders • Osteonecrosis	• Understand the etiology, pathophysiology, and natural history of common non-traumatic orthopaedic disorders, such as osteoarthritis, rheumatoid arthritis, and osteoporosis. • Identify the clinical manifestations and signs of non-traumatic orthopaedic disorders, including pain, joint deformities, and functional limitations. • Demonstrate knowledge of the diagnostic modalities used to evaluate non-traumatic orthopaedic disorders, such as imaging studies, laboratory tests, and clinical assessment tools. • Understand the principles of non-surgical management and conservative treatment options for non-traumatic orthopaedic disorders, including pharmacological interventions, physical therapy, and lifestyle modifications. • Recognize the indications and principles of surgical intervention for non-traumatic orthopaedic disorders, including joint replacement surgery, arthroscopy, and corrective osteotomies. • Discuss the principles of multidisciplinary collaboration in the management of non-traumatic orthopaedic disorders, involving orthopaedic surgeons, rheumatologists, physiotherapists, and occupational therapists. • Identify and manage the complications and potential sequelae associated with non-traumatic orthopaedic disorders, such as joint stiffness, muscle weakness, and systemic complications. • Understand the principles of pain management and rehabilitation strategies for individuals with non-traumatic orthopaedic disorders. • Recognize the importance of patient education and counseling in non-traumatic orthopaedic disorders, including lifestyle modifications, medication compliance, and self-management strategies. • Stay updated with the latest research and advancements in the diagnosis and treatment of non-traumatic orthopaedic disorders. • Understand the principles of evidence-based practice in the management of non-traumatic orthopaedic disorders. • Recognize the ethical considerations in the management of non-traumatic orthopaedic disorders, including informed consent, patient autonomy, and shared decision-making. • Communicate effectively with patients and their families, providing information, counseling, and support throughout the diagnosis, treatment, and rehabilitation process. Collaborate with other healthcare professionals to optimize the overall care and outcomes of patients with non-traumatic orthopaedic disorders.	Seminar, SGD, bedside teaching, short case, long case, DOPS MiniCEx	**Log Book** **WPBA** Multisource feedback 360^{o} Performa DOPS MiniCEX		10	1	6%	6%

	Spine • Spinal Anatomy And Surgical Approaches • Fractures, Dislocations, And Fracture-Dislocations Of Spine • Arthrodesis Of Spine • Pediatric Cervical Spine • Scoliosis And Kyphosis • Lower Back Pain And Disorders Of Intervertebral Discs • Infections Of Spine	• Understanding Spinal Anatomy: Students should be able to identify and describe the different structures of the spine, including vertebrae, discs, ligaments, and spinal cord. • Exploring Spinal Conditions: Students should gain knowledge about common spinal conditions such as herniated discs, spinal stenosis, scoliosis, and degenerative disc disease. They should understand the causes, symptoms, and available treatment options for each condition. • Examining Diagnostic Techniques: Students should learn about various diagnostic techniques used in evaluating spinal disorders, such as X-rays, MRI scans, CT scans, and physical examinations. They should understand the indications and limitations of each diagnostic method. • Understanding Spinal Biomechanics: Students should grasp the principles of spinal biomechanics, including spinal motion, load distribution, and the influence of posture on spinal health. • Recognizing Red Flags and Emergency Situations: Students should be able to identify red flags and warning signs that indicate a potential serious spinal condition requiring immediate medical attention. • Familiarizing with Conservative Treatment Approaches: Students should gain knowledge about conservative treatment options for spinal disorders, including physical therapy, pain management, and non-surgical interventions. • Introducing Surgical Interventions: Students should understand when surgical intervention is appropriate for spinal conditions and be familiar with common surgical procedures, such as discectomy, laminectomy, and spinal fusion. • Discussing Rehabilitation and Recovery: Students should learn about postoperative care, rehabilitation exercises, and strategies for promoting recovery and preventing future spinal problems. • Considering Minimally Invasive Techniques: Students should be introduced to minimally invasive surgical techniques used in spine surgery, understanding their advantages and potential limitations compared to traditional open surgery. • Exploring Emerging Technologies: Students should be aware of emerging technologies and innovations in the field of spine care, such as robotic-assisted surgery, artificial disc replacement, and regenerative medicine.	Seminar, SGD, bedside teaching, short case, long case, DOPS MiniCEx	**Log Book** **WPBA** Multisource feedback 360° Performa DOPS MiniCEX		10	1	6%	6%
	Hand & Peripheral Nerve Injuries Diagnosis and management	• Understand the anatomy and physiology of peripheral nerves in the context of orthopaedics. • Identify the different types and causes of peripheral nerve injuries in orthopaedics, including traumatic injuries, compression neuropathies, and nerve entrapments. • Recognize the clinical manifestations and signs of peripheral nerve injuries, such as sensory deficits, motor weakness, and altered reflexes. • Demonstrate knowledge of the diagnostic modalities used to evaluate peripheral nerve injuries, such as physical examination techniques, nerve conduction studies, and imaging studies. • Understand the principles of nerve regeneration and recovery following peripheral nerve injuries.	Seminar, SGD, bedside teaching, short case, long case, DOPS	**Log Book** **WPBA** Multisource feedback 360° Performa		15	1	7%	7%

		• Identify and describe common peripheral nerve injuries encountered in orthopaedics, such as carpal tunnel syndrome, radial nerve palsy, and brachial plexus injuries. • Recognize the indications and principles of surgical intervention for peripheral nerve injuries, including nerve repair, nerve grafting, and nerve transfers. • Understand the principles of conservative management and rehabilitation strategies for peripheral nerve injuries, such as physical therapy and occupational therapy. • Recognize and manage complications and sequelae associated with peripheral nerve injuries, including muscle atrophy, contractures, and neuropathic pain. • Discuss the latest advancements and emerging techniques in the diagnosis and treatment of peripheral nerve injuries in orthopaedics, such as nerve conduits and nerve transfers. • Understand the principles of multidisciplinary collaboration in the management of peripheral nerve injuries, involving orthopaedic surgeons, neurologists, and rehabilitation specialists. • Recognize the ethical considerations in the management of peripheral nerve injuries, including informed consent, patient autonomy, and resource allocation. • Stay updated with the latest research and advancements in the field of peripheral nerve injuries in orthopaedics. • Communicate effectively with patients and their families, providing information, counseling, and support throughout the diagnosis, treatment, and rehabilitation process.	MiniCEx	DOPS MiniCEX					
	The Foot and Ankle • Surgical Techniques • Disorders of Hallux • PesPlanus • Lesser Toe Abnormalities • Rheumatoid Foot • Diabetic Foot • Neurogenic Disorders • Disorders of Nails and Skin Disorders of Tendons and Fascia	• Understanding Foot and Ankle Anatomy: Students should be able to identify and describe the bones, joints, ligaments, muscles, and tendons of the foot and ankle. • Exploring Common Foot and Ankle Conditions: Students should gain knowledge about common foot and ankle conditions, such as plantar fasciitis, Achilles tendonitis, ankle sprains, bunions, and flat feet. They should understand the causes, symptoms, and available treatment options for each condition. • Examining Diagnostic Techniques: Students should learn about various diagnostic techniques used in evaluating foot and ankle disorders, such as physical examinations, X-rays, MRI scans, and gait analysis. They should understand the indications and limitations of each diagnostic method. • Understanding Foot and Ankle Biomechanics: Students should grasp the principles of foot and ankle biomechanics, including gait analysis, foot function, and the relationship between foot mechanics and lower extremity problems. • Recognizing Red Flags and Emergency Situations: Students should be able to identify red flags and warning signs that indicate a potential serious foot or ankle condition requiring immediate medical attention. • Familiarizing with Conservative Treatment Approaches: Students should gain knowledge about conservative treatment options for foot and ankle disorders, including rest, physical therapy, orthotics, medication, and bracing. • Introducing Surgical Interventions: Students should understand when surgical intervention is appropriate for foot and ankle conditions and be familiar with common surgical procedures, such as bunionectomy, ankle arthroscopy, and Achilles tendon repair.	Seminar, SGD, bedside teaching, short case, long case, DOPS MiniCEx	**Log Book** **WPBA** Multisource feedback 360° Performa DOPS MiniCEX		15	1	7%	7%

		• Discussing Rehabilitation and Recovery: Students should learn about postoperative care, rehabilitation exercises, and strategies for promoting recovery and restoring function in the foot and ankle. • Considering Footwear and Orthotics: Students should understand the importance of proper footwear selection and the use of orthotics in managing foot and ankle conditions. • • Exploring Emerging Technologies: Students should be aware of emerging technologies and innovations in the field of foot and ankle care, such as minimally invasive procedures, regenerative medicine, and advanced imaging techniques.							
	Amputations • General Principles of Amputations • Amputations about Foot • Amputations of Lower Extremity • Amputations of Hip And Pelvis • Amputations of Upper Extremity • Amputations of Hand	• Understand the indications and different types of amputations, ranging from finger to limb. • Learn pre-operative evaluation, selection of patients best suited for amputation, and relevant assessment tools. • Develop skills and knowledge in surgical approaches and techniques for performing amputations. • Acquire appropriate knowledge of complications specific to amputations and their monitoring and management. • Understand the prosthetics, assistive devices, and rehabilitation plan selection and how they enhance a patient's functional outcomes and quality of life after amputation. • Develop expert collaboration skills, advocate, and ensure patient is referred to the right multidisciplinary management team involving psychologic and physiologic rehabilitation. • Learn to be empathic, communicative, and professional with amputated patients throughout the treatment process. • Keep up-to-date by reviewing the latest technological advancements and research in the field of amputations to ensure quality patient care delivery.	Seminar, SGD, bedside teaching, short case, long case, DOPS MiniCEx	**Log Book** **WPBA** Multisource feedback 360° Performa DOPS MiniCEX		6	0		
	Tumors • General Principles of Tumors • Benign Tumors of Bone • Malignant Tumors of Bone • Soft Tissue Tumors and Non-neoplastic Conditions	• Understand the different types of orthopaedic tumors, including primary and metastatic tumors. • Identify the clinical manifestations and signs of orthopaedic tumors, including pain, swelling, and deformities. • Recognize the risk factors and predisposing conditions for the development of orthopaedic tumors. • Describe the principles of tumor staging and grading in orthopaedics. • Demonstrate knowledge of the diagnostic modalities used to evaluate orthopaedic tumors, such as imaging studies (X-ray, MRI, CT scan) and biopsy techniques. • Understand the principles of surgical management of orthopaedic tumors, including tumor resection, limb-sparing surgery, and reconstruction. • Identify the indications and contraindications for adjuvant therapies in orthopaedic tumor management, such as radiation therapy or chemotherapy. • Recognize the complications and potential sequelae associated with orthopaedic tumor treatment, including infection, implant failure, and functional limitations.	Seminar, SGD, bedside teaching, short case, long case, DOPS MiniCEx	**Log Book** **WPBA** Multisource feedback 360° Performa DOPS MiniCEX		14	1	07 %	7%

	Simulating Bone Tumors	• Understand the principles of surveillance and long-term follow-up for patients with orthopaedic tumors. • Discuss the principles of multidisciplinary collaboration in the management of orthopaedic tumors, involving orthopaedic surgeons, oncologists, radiologists, and pathologists. • Understand the emerging techniques and advancements in the diagnosis and treatment of orthopaedic tumors, such as targeted therapies and immunotherapy. • Recognize the ethical considerations in the management of orthopaedic tumors, including informed consent, patient autonomy, and end-of-life care. • Stay updated with the latest research and advancements in orthopaedic tumor management. • Communicate effectively with patients and their families, providing information and support throughout the diagnosis, treatment, and follow-up process.							
	Sports Medicine • Ankle Injuries • Knee Injuries • Shoulder And Elbow Injuries	• 1 Identify and describe common ankle injuries encountered in sports medicine, such as sprains, strains, fractures, and ligamentous tears. • Understand the anatomy and biomechanics of the ankle joint in the context of sports-related injuries. • Recognize the clinical signs and symptoms of ankle injuries, including pain, swelling, instability, and functional limitations. • Demonstrate proficiency in conducting a thorough physical examination of the ankle, including stress testing and special maneuvers. • Understand the principles of imaging modalities used in the evaluation of ankle injuries, such as X-ray, MRI, and ultrasound. • Discuss the principles of non-surgical management and conservative treatment options for ankle injuries, including rehabilitation protocols, bracing, and functional support. • Identify and describe surgical interventions used in the management of complex ankle injuries, such as ligament reconstruction and fracture fixation. • Understand the principles of rehabilitation and return-to-sport guidelines for ankle injuries, including progressive strengthening, proprioceptive training, and sport-specific exercises. • Recognize the potential complications and long-term consequences associated with ankle injuries, such as chronic instability, osteoarthritis, and post-traumatic conditions. • Stay updated with the latest research and advancements in the diagnosis, treatment, and prevention of ankle injuries in sports medicine.	Seminar, SGD, bedside teaching, short case, long case, DOPS MiniCEx	**Log Book** **WPBA** Multisource feedback 360^{o} Performa DOPS MiniCEX		15	1	6%	6%

	Congenital Anomalies • Congenital Anomalies of Lower Extremity • Congenital and Developmental Anomalies Of Hip and Pelvis • Congenital Anomalies of Trunk and Upper Extremity	• Understand the etiology and genetic basis of congenital anomalies in orthopaedics. • Identify and describe common congenital anomalies in orthopaedics, such as clubfoot, congenital hip dysplasia, and limb length discrepancies. • Recognize the clinical manifestations and signs of congenital anomalies, including physical deformities and functional impairments. • Demonstrate knowledge of the diagnostic modalities used to evaluate congenital anomalies, such as physical examination techniques, imaging studies, and genetic testing. • Understand the principles of non-surgical management and conservative treatment options for congenital anomalies, such as bracing, casting, and physical therapy. • Identify the indications and principles of surgical intervention for congenital anomalies, including corrective procedures and limb reconstruction. • Recognize the potential complications and long-term sequelae associated with congenital anomalies and their management. • Understand the importance of early intervention and multidisciplinary collaboration in the management of congenital anomalies. • Discuss the psychosocial and emotional impact of congenital anomalies on patients and their families. • Understand the principles of prosthetic and orthotic interventions for individuals with congenital anomalies. • Recognize the ethical considerations in the management of congenital anomalies, including informed consent, patient autonomy, and resource allocation. • Stay updated with the latest research and advancements in the diagnosis and treatment of congenital anomalies in orthopaedics. • Communicate effectively with patients and their families, providing information, counseling, and support throughout the diagnosis, treatment, and follow-up process. • Collaborate with other healthcare professionals to optimize the overall care and outcomes of patients with congenital anomalies.	Seminar, SGD, bedside teaching, short case, long case, DOPS MiniCEx	**Log Book** **WPBA** Multisource feedback 360° Performa DOPS MiniCEX		15	1	7%	7%
	Paediatric Trauma	• Understand the unique anatomical and physiological considerations in paediatric patients that affect the management of trauma. • Identify and describe the common types of paediatric traumatic injuries, including fractures, soft tissue injuries, head injuries, and abdominal injuries. • Recognize the clinical signs and symptoms of paediatric traumatic injuries, including pain, swelling, deformity, altered mental status, and signs of internal bleeding. • Demonstrate proficiency in conducting a thorough primary and secondary survey in a paediatric trauma patient, including assessing for airway, breathing,	Seminar, SGD, bedside teaching, short case, long case, DOPS	**Log Book** **WPBA** Multisource feedback		10	1		

		circulation, disability, and exposure. • Understand the principles of resuscitation and stabilization in paediatric trauma, including the appropriate use of fluid resuscitation, blood transfusion, and airway management techniques. • Discuss the principles of diagnostic modalities used in the evaluation of paediatric traumatic injuries, such as x-ray, ct scan, ultrasound, and mri. • Identify and describe the specific management strategies for paediatric fractures and dislocations, including closed reduction, immobilization techniques, and surgical interventions. • Understand the principles of head injury management in paediatric trauma, including assessment of concussion, monitoring for raised intracranial pressure, and appropriate referral for neurosurgical intervention. • Recognize the signs and symptoms of child abuse and neglect in the context of paediatric trauma, and understand the appropriate reporting and referral processes. • Discuss the principles of pain management and psychological support for paediatric trauma patients and their families. • Understand the principles of rehabilitation and functional restoration in paediatric trauma patients, including physical therapy and occupational therapy. • Recognize the potential long-term consequences and complications of paediatric trauma, such as growth disturbances, developmental delays, and psychosocial sequelae. • Stay updated with the latest research and advancements in the management of paediatric trauma. • Understand the principles of family-centered care and effective communication with parents/guardians in the context of paediatric trauma.	MiniCEx	360º Perfor ma DOPS MiniC EX					

	Affection of Bones and Joints	• Understand the anatomy and physiology of bones and joints, including their structure, function, and biomechanics. • Identify and describe common diseases and conditions that affect bones and joints, such as osteoarthritis, rheumatoid arthritis, osteoporosis, fractures, and joint infections. • Recognize the risk factors, etiology, and pathophysiology associated with various bone and joint disorders. • Discuss the clinical signs and symptoms of bone and joint diseases, including pain, swelling, stiffness, limited range of motion, deformity, and functional limitations. • Demonstrate proficiency in conducting a thorough physical examination of the musculoskeletal system, including joint assessment, range of motion testing, and functional evaluation. • Understand the principles of diagnostic modalities used in the evaluation of bone and joint diseases, including imaging studies (e.g., X-ray, MRI, CT scan), laboratory tests, and joint aspiration. • Identify and describe non-surgical treatment options for bone and joint diseases, including pharmacological interventions, physical therapy, occupational therapy, assistive devices, and lifestyle modifications. • Understand the principles of surgical management for specific bone and joint disorders, including joint replacement procedures, arthroscopy, fracture fixation, and corrective osteotomies. • Recognize the potential complications and long-term consequences associated with bone and joint diseases, such as joint stiffness, deformities, disability, and decreased quality of life. • Stay updated with the latest research, evidence-based guidelines, and advancements in the diagnosis, treatment, and management of bone and joint disorders. • Understand the principles of multidisciplinary care and the importance of collaboration with other healthcare professionals, such as rheumatologists, physiotherapists, radiologists, and pain management specialists. • Discuss the psychosocial impact of bone and joint disorders on patients' well-being, including the importance of patient education, psychological support, and lifestyle modifications. • Recognize the ethical considerations and challenges in the management of bone and joint diseases, including patient autonomy, informed consent, resource allocation, and end-of-life care.	Seminar, SGD, bedside teaching, short case, long case, DOPS MiniCEx	**Log Book** **WPBA** Multisource feedback 360^{o} Performa DOPS MiniCEX		10	1		

e-Log Book 100 Marks

Part II MS ORTHOPAEDICS

Thesis Examination

Total Marks: 200

- All candidates admitted in MS Orthopaedics course shall appear in Part-II Examination at the end of 5th year of the MS programme and not later than 8th calendar year of enrolment. The examination shall include thesis evaluation with defense.

RECOMMENDED BOOKS

CORE BOOKS

- Apley's System of Orthopaedics& Fractures
- Campbell's Operative Orthopaedics
- Mercer's Orthopaedic Surgery
- Mc Rae – Clinical Examination
- Hamilton Bailey Demonstration of Clinical Signs & Symptoms
- Snell's Anatomy
- Pye's Surgical Handicraft
- Stewart's Manual

REFERENCE BOOKS

- Rockwood & Green – Fractures in Adults
- Rockwood & Green – Fractures in Children
- Chapman Orthopaedic Surgery
- Turek's Textbook of Orthopaedics
- Hoppenfield – Surgical Exposures
- Mc Rae – Surgical Exposures
- Insall& Scott – Surgery of the Knee
- Miller & Cole Textbook of Arthroscopy
- Tachdjian Paediatric Orthopaedics