CURRICULUM FOR MS OTORHINOLARYNGOLOGY RESIDENTS

Acknowledgement

This curriculum has been adopted from UHS Lahore with some modifications.

RAWALPINDI MEDICAL UNIVERSITY
RAWALPINDI

STATUTES

Nomenclature Of The Proposed Course

The name of degree programme shall be MS Otolaryngology. This name is well recognized and established for the last many decades worldwide***.***

Course Title:

MS Otolaryngology

Training Centers

Departments of Otolaryngology (accredited by RMU) in affiliated institutes/ Hospitals of Rawalpindi Medical University, Rawalpindi.

Duration of Course

The duration of MS Otolaryngology course shall be four (4) years with structured training in a recognized department under the guidance of an approved supervisor. After admission in M.S. Otolaryngology Programme the resident will spend first 6 Months in the relevant Department of Otolaryngology as **Induction period** during which resident will get orientation about the chosen discipline and will also undertake the **mandatory workshops** (Appendix E). The research project will be designed and the **synopsis** be prepared during this period.
On completion of the induction period the resident will start formal training in the Basic Principles of General Surgery for 06 Months. At the end of one calendar year the candidate will take up the Abridged Examination.
During 2nd, 3rd & 4th years, of the Programme there shall be two components of the Programme. The Research Synopsis must be got approved by AS&RB of the University within first two years of the Programme.
1. Clinical Training in Otolaryngology

2. Research and Thesis writing

The candidate shall undertake clinical training to achieve educational objectives of M.S. Otolaryngology (knowledge & Skills) along with rotations in the 3rd year of the programme as follows:

a) 3 months is Plastic Surgery
b) 3 months in Neurosurgery

Research Component and thesis writing shall be completed over the four years duration of the course. Candidates will spend total time equivalent on calendar for research during the training. Research can be done as one block or it can be done in the form of regular periodic rotationsp over four years as long as total research time is equivalent to one calendar year.

Admission Criteria

Applications for admission to MS Training Programs of University will be invited through advertisement in print and electronic media mentioning closing date of applications and date of Entry Examination.
Eligibility: The applicant on the last date of submission of applications for admission must possess the:
i) Basic Medical Qualification of MBBS or equivalent medical qualification recognized by Pakistan Medical & Dental Council.
ii) Certificate of one year's House Job experience in institutions recognized by Pakistan Medical & Dental Council Is essential at the time of interview. The applicant is required to submit Hope Certificate from the concerned Medical Superintendent that the House Job shall be completed before the Interview.
iii) Valid certificate of permanent or provisional registration with Pakistan Medical & Dental Council.

Registration and Enrollment

 As per policy of Pakistan Medical & Dental Council the number of PG Trainees/ Students per supervisor shall be maximum 05 per annum for all PG programmes including minor programmes (if any).

 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 UHS as per prescribed Registration Regulation.

Accreditation Related Issues of The Institution

A). Faculty

Properly qualified teaching staff in accordance with the requirements of Pakistan Medical and Dental Council (PMDC)

B). Adequate Space

Including class-rooms (with audiovisual aids), demonstration rooms, computer lab and clinical pathology lab etc.

C). Library

Departmental library should have latest editions of recommended books, reference books and latest journals (National and International).

- Accreditation of Otolaryngology training program can be suspended on temporary or permanent basis by the University, if the program does not comply with requirements for residents training as laid out in this curriculum.
- Program should be presented to the University along with a plan for implementation of curriculum for training of residents.
- Programs should have documentation of residents training activities and evaluation on monthly basis.
- To ensure a uniform and standardized quality of training and availability of the training facilities, the University reserves the right to make surprise visits of the training program for monitoring purposes and may take appropriate action if deemed necessary.

AIMS AND OBJECTIVES OF THE COURSE

AIM

The aim of four years MS programme in Otolaryngology is to train residents to acquire the competency of a specialist in the field so that they can become good teachers, researchers and clinicians in their specialty after completion of their training.

GENERAL OBJECTIVES

MS Otolaryngology training should enable a student to:

1. Access and apply relevant knowledge to clinical practice:
    - Maintain currency of knowledge
    - Apply scientific knowledge in practice
    - Appropriate to patient need and context
    - Critically evaluate new technology
2. Safely and effectively performs appropriate surgical procedures:
    - Consistently demonstrate sound surgical skills
    - Demonstrate procedural knowledge and technical skill at a level appropriate to the level of training
    - Demonstrate manual dexterity required to carry out procedures
    - Adapt their skills in the context of each patient and procedure
    - Maintain and acquire new skills
    - Approach and carries out procedures with due attention to safety of patient, self and others
    - Critically analyze their own clinical performance for continuous improvement
3. Design and implement effective management plans:
    - Recognize the clinical features, accurately diagnose and manage neurological problems
    - Formulate a well-reasoned provisional diagnosis and management plan based on a thorough history and examination
    - Formulate a differential diagnosis based on investigative findings
    - Manage patients in ways that demonstrate sensitivity to their physical, social, cultural and psychological needs
    - Recognize disorders of the nervous system and differentiate those amenable to surgical treatment
    - Effectively manage the care of patients with ENT trauma including multiple system trauma
    - Effectively recognize and manage complications

- Accurately identify the benefits, risks and mechanisms of action of current and evolving treatment modalities
- Indicate alternatives in the process of interpreting investigations and in decision-making
- Manage complexity and uncertainty
- Consider all issues relevant to the patient
- Identify risk
- Assess and implement a risk management plan
- Critically evaluate and integrate new technologies and techniques.

4. Organize diagnostic testing, imaging and consultation as needed:
   - Select medically appropriate investigative tools and monitoring techniques in a cost-effective and useful manner
   - Appraise and interpret appropriate diagnostic imaging and investigations according to patients' needs
   - Critically evaluates the advantages and disadvantages of different investigative modalities

5. Communicate effectively:
   - Communicate appropriate information to patients (and their family) about procedures, potentialities and risks associated with surgery in ways that encourage their participation in informed decision making
   - Communicate with the patient (and their family) the treatment options including benefits and risks of each
   - Communicate with and co-ordinate health management teams to achieve an optimal surgical environment
   - Initiate the resolution of misunderstandings or disputes
   - Modify communication to accommodate cultural and linguistic sensitivities of the patient

6. Recognize the value of knowledge and research and its application to clinical practice:
   - Assume responsibility for self-directed learning
   - Critically appraise new trends in Otolaryngology
   - Facilitate the learning of others.

7. Appreciate ethical issues associated with Otolaryngology:

- Consistently apply ethical principles
- Identify ethical expectations that impact on medico-legal issues
- Recognize the current legal aspects of informed consent and confidentiality
- Be accountable for the management of their patients.

8. Professionalism by:

- Employing a critically reflective approach to Otolaryngology
- Adhering with current regulations concerning workplace harassment
- Regularly carrying out self and peer reviewed audit
- Acknowledging and have insight into their own limitations
- Acknowledging and learning from mistakes

9. Work in collaboration with members of an interdisciplinary team where appropriate:

- Collaborate with other professionals in the selection and use of various types of treatments assessing and weighing the indications and contraindications associated with each type
- Develop a care plan for a patient in collaboration with members of an interdisciplinary team
- Employ a consultative approach with colleagues and other professionals
- Recognize the need to refer patients to other professionals.

10. Management and Leadership

- Effective use of resources to balance patient care and system resources
- Identify and differentiate between system resources and patient needs
- Prioritize needs and demands dealing with limited system resources.
- Manage and lead clinical teams
- Recognize the importance of different types of expertise which contribute to the effective functioning of clinical team.
- Maintain clinically relevant and accurate contemporaneous records

11. Health advocacy:

- Promote health maintenance of patients

- Advocate for appropriate health resource allocation
- Promote health maintenance of colleagues and self scholar and teacher

SPECIFIC LEARNING OUTCOMES

On completion of the training program, Otolaryngology trainees pursuing an academic pathway will be expected to have demonstrated competence in all aspects of the published syllabus. The specific training component would be targeted for establishing clearly defined standards of knowledge and skills required to practice Otolaryngology at secondary and tertiary care level with proficiency in the Basic and applied clinical sciences, Basic Otolaryngologic care, ENT intensive care, Emergency (A&E) medicine and Complementary surgical disciplines.

1. **Cognitive knowledge:** Describe embryology, applied anatomy, physiology, pathology, clinical features, diagnostic procedures and the therapeutics including preventive methods, (medical/surgical) pertaining to Otolaryngology and Head & Neck Surgery.
2. **Clinical Decision Making Ability & Management Expertise:** Diagnose conditions from history taking, clinical evaluation and investigations and develop expertise to manage medically as well as surgically the commonly encountered, disorders and diseases in different areas as follows:
   Otology, Neurology & Skull-base Surgery: External, middle and internal ear diseases, deafness including the common complications associated with middle ear inner facial Nerve palsy, tinnitus, vertigo and other conditions such as acoustic neuroma, malignant tumours, glomus tumor and petrous apex cholesteatoma etc. and to be capable of doing early diagnosis of these conditions and also to acquire adequate knowledge about principles of therapy of these diseases.
3. **Rhinology:** Able to diagnose and manage nasal and paranasal sinus conditions such as infection, polyps and allergy. Acquire some surgical skills to do septorhinoplasty, septoplasty, functional endoscopic sinus surgery (FESS). Develop capability to do oncologic diagnosis and therapy planning for proper management of such patients in collaboration with radiotherapists and medical oncologists.
4. **Laryngology:** Able to diagnose and manage benign lesions of the larynx including voice-disorders and pharyngeal and nasopharyngeal diseases, viz-adenoids and angiofibroma. Capable to diagnose oncologic conditions such as laryngeal carcinoma and plan its therapy strategies.

5. **Oral cavity/salivary glands:** Learn about Oral cavity and salivary gland diseases, their diagnosis and therapy planning with referral strategies for cancer patients to advanced cancer centers/ Hospital.
6. **Head/Neck conditions/diseases:** Learn about head and neck diseases including Parotid gland and thyroid diseases, neurogenic tumours and neck space infections/and their management.
7. **Broncho-esophageal region:** Learn about broncho-esophageal diseases/disorders such as congenital disorders, diagnosis of Foreign bodies in wind/food pipes with their management policies. Capable to perform panendoscopies for oncologic evaluation in the head-neck region, including oesophageal malignancy.
8. **Plastic reconstruction following major head neck surgery & trauma:** Acquire general principles of reconstructive surgery and its referral needs.
9. **Advanced Surgical methods:** Acquire knowledge about phonosurgery like microlaryngoscopic surgery, palatopharyngoplasty for VPI & Cleft palate, and thyroplasty for voice-disorders.
10. **General principles of newer therapy/Surgery:** Newer knowledge about ENT diseases in general, including technological (Laser) and pharmacologic advances (medicines) and newer method of therapy for certain conditions such as Obstructive sleep apnoea syndrome and asthma.
11. **Traumatology & Facio-maxillary Injury:** Acquire knowledge in the management of Traumatology in general and facio-maxillary injury in particular, including nasal fractures. Be capable of doing screening in the community, of the audiological & speech related disabilities, and also to do early identification of malignancies and create its awareness in the community/ society to eventually get better cooperation from people in health management.
12. **Radiology:** Acquire knowledge about radiology/imaging and to interpret different radiological procedures and imaging in Otolaryngology – Head and Neck and skull base regions. There should be collaboration with Radiology department for such activities.
13. **Audiology & Rehabilitation:** Perform different audiological and neuro-otological tests for diagnosis of audiologic/vestibular disorders/diseases and become capable to interpret these findings and to incorporate their implication in diagnosis and their treatment including the rehabilitative methods in Audiology

and speech pathology including hearing aids and other assistive and implantable devices.

14. **Psychologic and social aspect:** Some elementary knowledge in clinical Psychology and social, work management is to be acquired for management of patients, especially those terminally ill and disable-persons and interacting with their relatives.
15. **Preventive Otolaryngology:** Acquire knowledge about prevention of some conditions especially in children such as middle ear and sinus infection, hereditary deafness and early diagnosis of head-neck malignancy. Hence he/she should know about the preventive Otorhinolaryngology (ENT).
16. **Identification of a special areas within the subject:** To further develop higher skills within the specialty in a specialized are such as Otology, Neurology, Rhinology, head and neck oncology, skull base surgery and Audiological medicine, Resident may identify some area of interest, during the Residency Programme in one of such areas like Otology.
17. **Research Experience:**

All residents in the categorical program are required to complete an academic outcomes-based research project during their training. This project can consist of original bench top laboratory research, clinical research or a combination of both. The research work shall be compiled in the form of a thesis which is to be submitted for evaluation by each resident before end of the training. The designated Faculty will organize and mentor the residents through the process, as well as journal clubs to teach critical appraisal of the literature.

PRACTICAL TRAINING

1. A Resident doctor, pursuing MS Degree course is expected to perform major and minor surgical procedures first through observation and then under supervision of a supervisor/faculty member till he/she is proficient to perform major and minor surgical maneuvers independently such as: (Few examples only given):

- Tracheostomy
- Tonsillectomy
- Adenoidectomy/grommet insertion,
- Nasal Polypectomy
- Incision/drainage of quinsy/other abscesses,
- S.M.R. & Septoplasty
- Cortical mastoidectomy
- Modified radical Mastoidectomy.

2. Be able to manage common emergencies like, fracture nasal bone, stridor requiring a tracheostomy, epistaxis, subperiosteal abscess, and Peritonsillar abscess.
3. He/she should be capable to do minor operations independently (Few examples only given)
   - Myringotomy and myringoplasty
   - Antral washout and nasal biopsy
   - Sub-mandibular salivary gland removal
   - Biopsy from a neck mass, such as a node
   - Direct Laryngoscopy
   - Nasophayrngoscopy
   - Flexible Bronchoscopy and Oesophagoscopy
   - Aural polypectomy
   - Fibre-optic rigid endoscopy of oesophagus
   - He/she should be able to do the following operations under supervision/guidance of senior colleagues/ faculty member (Few examples only given):
   - Maxillectomy (Partial and Total)
   - Superficial Parotidectomy
   - Radical block dissection of the neck for metastatic nodes.
   - Total Laryngectomy for cancer.
   - Laryngofissure
   - Repair of laryngotracheal trauma.
   - Ligation external carotid artery
4. He/she should be able to do under guidance/supervision the following specialized operative procedures (Few examples only given):
   - Facial nerve decompression

- Pinna-Repair (Post-traumatic)
- Surgery of choanal atresia,
- External canal atresia-surgery,
- Functional endoscopic/sinus surgery,
- Stapedectomy
- Tympanoplasty with mastoid surgery
- Rhinoplasty for cosmetic purposes.
- Fibre-optic bronchoscopy and oesophagoscopy including foreign body removal
- Cryo/Laser surgery in ENT
- Micorlaryngoscopic voice-surgery for vocal nodules, polyps/ cyst etc
- Phonosurgery for cord palsy including type I thyroplasty.
- Skull base/parapharyngeal space surgery
- Thyroid surgery,
- Laryngo-tracheal stenosis – surgical correction,
- Facio-maxillary injury etc.

PROCEDURES TO BE LEARNED BY MS TRAINEES

1st year

Procedures	**Under Supervision**	**Assist**	**Independently**
F.B Removal From Nose	2	1	15
F.B Removal From Ear	2	1	15
Anterior Nasal Packing	2	1	10
posterior Nasal Packing	1		5
Tonsillectomy	3	3	10
Tracheostomies	3	3	10

Esophagoscopy		3	
Bronchoscopy		7	

02nd Year

Procedures	**Under Supervision**	**Assist**	**Independently**
Septoplasty	3	3	10
Intranasal Polypectomy	2	5	3
CWL	2		
Myringotomy + Grommet Insertion	2	2	3
Esophagoscopy			5
Bronchoscopy		10	5
DL		5	
Thyroidectopmy		5	
Mastoid Exploration		10	
FESS		20	

03rd Year/ 04th Year

Procedures	**Under Supervision**	**Assist**	**Independently**
Cortical Mastoidectomy	3	3	
Modified Radical Mastoidectomy	2	5	
FESS	5	20	
Tympanoplasty	10	2	
Thyroidectomy	10	1	
Tonsillectomy			15
Septoplasty			15
Intranasal Polypectomy			10
DL			10
Esophagoscopy			15
Bronchoscopy			15

REGULATIONS

Scheme of the Course

A summary of four year course in MS Otolaryngology is presented as under:

Course Structure	**Components**	**Examination**
At the end of 02nd year of Programme	• Principles of general surgery • Relevant Basic Sciences (Anatomy, Physiology, Pharmacology, Pathology) • General Principles of ORL • Infective Pathologies of ORL • Trauma related to ORL • Principles of Nutrition,	**Intermediate module Examination** at the end of 02nd year of M.S MCQs TOACS

	• Radiotherapy and Chemotherapy • Preop and postop management of patients undergoing surgery • Audiology	
At the end of final year of Programme	**Clinical Component** • **Professional Education in Otolaryngology** **Clinical Component** Training in Otolaryngology during 02nd, 03rd & 04th Years of the M.S Programme. Rotations in the related fields **Research Component of final Examination** Research work/ thesis writing must be completed and submitted atleast 6months before the end of training.	**Final Examination** at the end of 4th year of M.S Otolaryngology **Written:** Paper 1 & 2 of problem based MCQs and SEQs in the subject: **Clinical, TOACS/ OCSE & ORAL:** **Examination:** • Short Cases • Long Cases • TOACS/OCSE & ORAL • Continuous Internal Assessment Thesis evaluation and defence at the end of 4th year of M.S Otolaryngology Programme

Abridge M.S. Otolaryngology Examination

Eligibility Criteria: To appear in the Final Examination the candidate shall be required:

i) To have submitted the result of passing Abridged Examination.

ii) To have submitted the certificate of completion of 2 years of training, issued by the Supervisor will be mandatory.

iii) To have submitted assessment proforma from the supervisor on 03 monthly basis achieving a cumulative score of **75%** (in 2nd year)

iv) To have submitted certificate of ongoing research by supervisor.

v) To have submitted evidence of payment of examination fee.

Abridge Examination Schedule and Fee

I. Abridge Examination at completion of two years of training, will be held twice a year.

II. II. There will be a minimum period of 30 days between submission of applications for the examination and the conduction of examination.

III. Examination fee will be determined periodically by the university.

IV. The examination fee once deposited cannot be refunded / carried over to the next examination under any circumstances.

V. The Controller of Examination will issue Roll Number Slips on receipt of prescribed application form, documents satisfying eligibility criteria and evidence of payment of examination fee.

Written Exam

There will be 100 Single best answer type MCQs with a total of 200 marks as follows:-

I. Each correct answer to MCQ will carry 2 marks. Incorrect response will result in deductions of 0.5. Duration of this exam will be 100 minutes.

II. The candidates scoring 50% marks will pass the written examination and will then be eligible to appear in the TOACS.

TOACS part of Abridge Exam

There will be 15 TOACS station covering the syllabus of 2nd year of training. Marks for each station will be 10 with a total of 150. Candidate securing 70% marks will pass the examination.

Declaration of Result

The Candidate will have to score 50% marks in written and 70% in TOACS to be declared successful.

A maximum total of four consecutive attempts (availed or unavail) will be allowed in the Abridge during which the candidate will be allowed to continue his training program. If the candidate fails to pass his IMM within the above mentioned limit of four attempts, the candidate shall be removed from the training program, and the seat would fall vacant, stipend/ scholarship if any would be stopped.

Final Examination M.S. Otolaryngology

Eligibility Criteria: To appear in the Final Examination the candidate shall be required:

i) To have submitted the result of passing Abridged and intermediate module Examination.
ii) To have submitted the certificate of completion of training, issued by the Supervisor will be mandatory.
iii) To have achieved a cumulative score of 75% in Continuous Internal assessments of all training years.
iv) To have got the thesis accepted and will then be eligible to appear in Final Examination.
v) To have submitted no dues certificate from all relevant departments including library, hostel, cashier etc.
vi) To have submitted evidence of submission of examination fee.

Final Examination Schedule and Fee

a) Final examination will be held twice a year.
b) The candidates have to satisfy eligibility criteria before permission is granted to take the examination.
c) Examination fee will be determined and varied at periodic intervals by the University.
d) The examination fee once deposited cannot be refunded / carried over to the next examination under any circumstances.
e) The Controller of Examinations will issue an Admittance Card with a photograph of the candidate on receipt of prescribed application form, documents satisfying eligibility criteria and evidence of payment of examination fee. This card will also show the Roll Number, date / time and venue of examination.

Components of Final Examination

Written Part of Final Examination Total marks 500

Clinical, TOACS/OSCE & ORAL Total marks 500

Contribution of CIS to the Final Examination Total marks 100

Thesis Evaluation Total marks 400

Total 1500 Marks

Written Part of Final Examination

a) There will be two written papers which will cover the whole syllabus of the specialty of training with total marks of 500.

b) The written examination will consist of 200 single best answer type Multiple Choice Questions (MCQs) and 10 Short Essay Questions (SEQs). Each correct answer in the Multiple Choice Question paper will carry 02 marks, but an incorrect response will result in deduction of 0.5 mark. Each Short Essay Question will carry 10 marks.

c) The Total Marks of the Written Examination will be 500 and to be divided as follows:

- Multiple Choice Question paper Total Marks = 400
- Short Essay Question paper Total Marks = 100

Total **500 Marks**

d) The candidates scoring a score of 50% marks in multiple choice question paper and short essay question paper will pass the written part of the final examination and will become eligible to appear in the clinical and oral examination.

e) The written part result will be valid for three consecutive attempts for appearing in the Clinical and Oral Part of the Final Examination. After that the candidate have to re-sit the written part of the Final Examination.

Clinical, TOACS/OSCE & ORAL:

a) The Clinical and Toacs/OSCE & Oral will consist of 04 short cases, 01 long case and Oral Examination with 01 station for a pair of Internal and External Examiner Each short case will be of 07 minutes duration, 05 minute will be for examining the patient and 02 minutes for discussion. The Oral Examination will consist of laboratory data assessment, interpretation of Radiology images, ECG and others.

b) The Total Marks of Clinical & Oral Examination will be 500 and to be divided as follows:

Short Cases Total Marks	= 200
Long Case Total Marks	= 100
TOACS/OSCE & ORAL Total Marks	= 200
Total	**Marks 500**

c) A panel of four examiners will be appointed by the Vice Chancellor and of these two will be from RMU whilst the other two will be the external examiners. Internal examiner will act as a coordinator. In case of difficulty in finding an Internal Examiner in a given subject, the Vice Chancellor would, in consultation with the concerned Deans, appoint any relevant person with appropriate qualification and experience, outside the University as an examiner.

d) The internal examiners will not examine the candidates for whom they have acted as Supervisor and will be substituted by other internal examiner.

e) The candidates scoring 50% marks in each component of the Clinical & Oral Examination will pass this part of the Final Examination.

f) The candidates will have two attempts to pass the final examination with normal fee. A special administration fee of Rs.10,000 in addition to normal fee or the amount determined by the University from time to time shall be charged for further attempts.

Final Examination M.S. Otolaryngology
Eligibility Criteria: To appear in the Final Examination the candidate shall be required:
i) To have submitted the result of passing Abridged Examination.

ii) To have submitted the certificate of completion of training, issued by the Supervisor will be mandatory.

iii) To have achieved a cumulative score of 75% in Continuous Internal assessments of all training years.

iv) To have got the thesis accepted and will then be eligible to appear in Final Examination.

v) To have submitted no dues certificate from all relevant departments including library, hostel, cashier etc.

vi) To have submitted evidence of submission of examination fee.

Final Examination Schedule and Fee
a) Final examination will be held twice a year.

b) The candidates have to satisfy eligibility criteria before permission is granted to take the examination.
c) Examination fee will be determined and varied at periodic intervals by the University.
d) The examination fee once deposited cannot be refunded / carried over to the next examination under any circumstances.
e) The Controller of Examinations will issue an Admittance Card with a photograph of the candidate on receipt of prescribed application form, documents satisfying eligibility criteria and evidence of payment of examination fee. This card will also show the Roll Number, date / time and venue of examination.

Components of Final Examination
Written Part of Final Examination Total marks 500
Clinical, TOACS/OSCE & ORAL Total marks 500
Contribution of CIS to the Final Examination Total marks 100
Thesis Evaluation Total marks 400
Total 1500 Marks
Written Part of Final Examination
a) There will be two written papers which will cover the whole syllabus of the specialty of training with total marks of 500.

b) The written examination will consist of 200 single best answer type Multiple Choice Questions (MCQs) and 10 Short Essay Questions (SEQs). Each correct answer in the Multiple Choice Question paper will carry 02 marks, but an incorrect response will result in deduction of 0.5 mark. Each Short Essay Question will carry 10 marks.

c) The Total Marks of the Written Examination will be 500 and to be divided as follows:

- Multiple Choice Question paper Total Marks = 400
- Short Essay Question paper Total Marks = 100

Total 500 Marks

d) The candidates scoring a score of 50% marks in multiple choice question paper and short essay question paper will pass the written part of the final examination and will become eligible to appear in the clinical and oral examination.

e) The written part result will be valid for three consecutive attempts for appearing in the Clinical and Oral Part of the Final Examination. After that the candidate have to re-sit the written part of the Final Examination.

Clinical, TOACS/OSCE & ORAL:

a) The Clinical and Toacs/OSCE & Oral will consist of 04 short cases, 01 long case and Oral Examination with 01 station for a pair of Internal and External Examiner Each short case will be of 07 minutes duration, 05 minute will be for examining the patient and 02 minutes for discussion. The Oral Examination will consist of laboratory data assessment, interpretation of Radiology images, ECG and others.

b) The Total Marks of Clinical & Oral Examination will be 500 and to be divided as follows:

Short Cases Total Marks = 200
Long Case Total Marks = 100
TOACS/OSCE & ORAL Total Marks = 200

Total Marks 500

c) A panel of four examiners will be appointed by the Vice Chancellor and of these two will be from UHS whilst the other two will be the external examiners. Internal examiner will act as a coordinator. In case of difficulty in finding an Internal Examiner in a given subject, the Vice Chancellor would, in consultation with the concerned Deans, appoint any relevant person with appropriate qualification and experience, outside the University as an examiner.

d) The internal examiners will not examine the candidates for whom they have acted as Supervisor and will be substituted by other internal examiner.

e) The candidates scoring 50% marks in each component of the Clinical & Oral Examination will pass this part of the Final Examination.

f) The candidates will have two attempts to pass the final examination with normal fee. A special administration fee of Rs.10,000 in addition to normal fee or the amount determined by the University from time to time shall be charged for further attempts.

Declaration of Result

For the declaration of result

I. The candidate must get his/ her Thesis accepted.

II. The candidate must have passed the final written examination with 50% marks and the clinical & oral examination securing 50% marks. The cumulative passing score from the written and clinical/ oral examination shall be 60%. Cumulative score of 60% marks to be calculated by adding up secured marks of each component of the examination i.e written and clinical/ oral and then calculating its percentage.

III. The MS degree shall be awarded after acceptance of thesis and success in the final examination.

IV. On completion of stipulated training period, irrespective of the result (pass or fail) the training slot of the candidate shall be declared vacant.

Submission / Evaluation of Synopsis

1. The candidates shall prepare their synopsis as per guidelines provided by the Advanced Studies & Research Board, available on university website.
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 2nd year of MS program. The synopsis after review by an Institutional Review Committee shall be submitted to the University for consideration by the Advanced Studies & Research Board, through the Principal / Dean /Head of the institution.

Submission of Thesis

1. Thesis shall be submitted by the candidate duly recommended by the Supervisor.
2. The minimum duration between approval of synopsis and submission of thesis shall be one year.
3. The research thesis must be compiled and bound in accordance with the Thesis Format Guidelines approved by the University and available on website.
4. The research thesis will be submitted along with the fee prescribed by the University.

Thesis Examination

a) The candidate will submit his/her thesis at least 06 months prior to completion of training.
b) The Thesis along with a certificate of approval from the supervisory will be submitted to the Registrar's office, who would record the date / time etc. and get received from the Controller of Examinations within 05 working days of receiving.
c) The Controller of Examinations will submit a panel of eight examiners within 07 days for selection of four examiners by the Vice Chancellor. The Vice Chancellor shall return the final panel within 05 working days to the Controller of Examinations for processing and assessment. In case of any delay the Controller of Examinations would bring the case personally to the Vice Chancellor.
d) The Supervisor shall not act as an examiner of the candidate and will not take part in evaluation of thesis.
e) The Controller of Examinations will make sure that the Thesis is submitted to examiners in appropriate fashion and a reminder is sent after every ten days.
f) The thesis will be evaluated by the examiners within a period of 06 weeks.
g) In case the examiners fail to complete the task within 06 weeks with 02 fortnightly reminders by the Controller of Examinations, the Controller of Examinations will bring it to the notice of Vice Chancellor in person.
h) In case of difficulty in find an internal examiner for thesis evaluation, the Vice Chancellor would, in consultation with the concerned Deans, appoint any relevant person as examiner in supersession of the relevant Clause of the University Regulations.
i) There will be two internal and two external examiners. In case of difficulty in finding examiners, the Vice Chancellor would, in consultation with the concerned Deans, appoint minimum of three, one internal and two external examiners.
j) The total marks of thesis evaluation will be 400 and 60% marks will be required to pass the evaluation.

k) The thesis will be considered / accepted, if the cumulative score of all the examiners is 60%.

l) The clinical training will end at completion of stipulated training period but the candidate will become eligible to appear in the Final

Examination at completion of clinical training and after acceptance of thesis. In case clinical training ends earlier, the slot will fall vacant after stipulated training period.

Award of MS Otolaryngology Degree

After successful completion of the structured courses of MS Otolaryngology and qualifying Abridged. Intermediate module and Final examinations (Written, Clinical, TOACS/OSCE & ORAL and Thesis) the degree with title MS Otolaryngology shall be awarded.

CONTENT OUTLINE

MS Otolaryngology

Basic Sciences:

Student is expected to acquire comprehensive knowledge of Anatomy, Physiology, Pathology, and Pharmacology relevant to surgical practice appropriate for Otolaryngology

1. Anatomy

- *Clinical and functional anatomy with pathological and operative relevance*
- *Surgical approaches to the ear, nose, larynx and head & neck structures*
- *Histology and embryology of ear, nose, larynx and head & neck structures*
- Cell Biology: Cytoplasm – Cytoplasmic matrix, cell membrane, cell organelles, cytoskeleton, cell inclusions, cilia and flagella.
- Nucleus – nuclear envelope, nuclear matrix, DNA and other components of chromatin, protein synthesis, nucleolus, nuclear changes indicating cell death.
- Cell cycle, mitosis, meiosis, cell renewal.
- Cellular differentiation and proliferation.
- Tissues of Body: Light and electron microscopic details and structural basis of function, regeneration and degeneration. Confocal microscopy.
- The systems/organs of body – Cellular organization, light and electron microscopic features, structure function correlations, and cellular organization.

Embryology

- General Features of Human Development
- Features of mitotic and meiotic modes of cell division. Genetic consequences of meiotic division.
- Abnormal miototic and meiotic divisions of clinical importance.
- Gametogenesis: origin of germ cells.
- Oogenesis: prenatal and postnatal development of ova.
- Spermatogenesis: proliferation and maturation of male germ cells. Abnormal gametes, their clinical significance.
- Ovulation, fertilization and the consequences of fertilization.

Early Embryonic Development:

- Cleavage, morula and blastocyst formation and implantation.
- Formation of the three primary germ layers.
- List of the derivatives of the respective germ layers.

Period of the Growing Fetus:

- Various stages and salient features of the fetus development

Extraembryonic Membranes:

- Development, functions and anomalies of yolk sac, amnion, chorion, allantois, umbilical cord and placenta.

Development of the External Body Form:

- Shaping of the head and neck. Common developmental anomalies associated.

The Branchial Apparatus:

- Development and fate of the bronchial grooves, arches and pouches. Their derivatives and anomalies.

Teratogenesis:

- Factors known to be involved in the development of congenital anomalies especially related to the otolaryngological system.
- Concept of critical periods.

Histology:

Structural and Functional Organization of the Tissues of Body

- Classification of tissues and identification of various tissues particularly those related to the musculoskeletal system, in routine histological preparations under the light microscope.

The Epithelial Tissue

- General structure, functions and classification of epithelia
- Their location in the body
- General characters of serous and mucous membranes
- General structural features of exocrine and endocrine glands

The Connective Tissue

- Cartilage
- Structure of bone marrow. Cell lines seen in haemopoiesis.
- Factors required for bone growth.

The Muscular Tissue

- Structural and functional differences between the smooth skeletal and cardiac types of muscle.
- Fine structure of skeletal and cardiac muscle fibers, and its relationship to the mechanism of contraction.
- Specialized conducting tissue of the heart.

The Neural Tissue

- The neuron, morphology of the perikaryon and its processes.
- Coverings of the axons in the peripheral nerves and the central nervous system.
- Types of neuroglia and their functions.
- Process of myelination in the peripheral nerves and the central nervous system.
- Axon terminals and synapses. Nerve fiber degeneration and regeneration.

Surface and Imaging Anatomy

Upper respiratory system including

- Ear (sense of hearing enters via cranial nerve)
- Nose.
- Paranasal Sinuses.
- Oral Cavity
- Pharynx.
- Larynx
- Salivary Glands
- Head and neck
- Blood supply, Nerve supply and the Lymphatic drainage of the ear, nose,

Throat and trachea, larynx and accessory sinuses

- Anatomy of the Central Nervous System with particular reference to ear, nose and throat
- Gross Anatomy of neck and chest in relation to trachea and oesophagus
- Comparative study of Anatomy of the ear, nose and throat in relation to lower animals.

2. Physiology

- Physiology of ear, nose, throat and oesophagus
- Sound Transmission
- Functions of the nose
- Physiology of olfaction
- Physiology of hearing
- Middle ear impedance transformer mechanism
- Vestibular function in maintaining equilibrium
- Auditory pathway
- Physiology of swallowing
- Speech generation
- Endocrine glandular function, particularly thyroid, parathyroid and pituitary glands
- Shock and circulatory support
- Exocrine glands, particularly salivary glands
- Special senses, particularly hearing, balance and olfaction

3. Pharmacology

- The Evolution of Medical Drugs
- British Pharmacopia
- Introduction to Pharmacology
- Receptors
- Mechanisms of Drug Action
- Pharmacokinetics
- Pharmacokinetic Process
- Absorption
- Distribution
- Metabolism
- Desired Plasma Concentration
- Volume of Distribution
- Elimination
- Elimination rate constant and half life
- Creatinine Clearance
- Drug Effect
- Beneficial Responses

- Harmful Responses
- Allergic Responses
- Drug Dependence, Addiction, Abuse and Tolerance
- Drug Interactions
- Dialysis
- Drug use in pregnancy and in children
- Ototoxicity and medication

4. Pathology

Pathological alterations at cellular and structural level in infection, inflammation, ischaemia, neoplasia and trauma affecting the ear, nose and upper respiratory tract

Cell Injury and adaptation

- Reversible and Irreversible Injury
- Fatty change, Pathologic calcification
- Necrosis and Gangrene
- Cellular adaptation
- Atrophy, Hypertrophy,
- Hyperplasia, Metaplasia, Aplasia

Inflammation

- Acute inflammation
- Cellular components and chemical mediators of acute inflammation
- Exudates and transudate
- Sequelae of acute inflammation
- Chronic inflammation
- Etiological factors and pathogenesis
- Distinction between acute and chronic (duration) inflammation
- Histologic hallmarks
- Types and causes of chronic inflammation, non-granulomatous & granulomatous,

Haemodynamic disorders

- Etiology, pathogenesis, classification and morphological and clinical manifestations of Edema, Haemorrhage, Thrombosis, Embolism, Infarction & Hyperaemia
- Shock; classification etiology, and pathogenesis, manifestations.
- Compensatory mechanisms involved in shock
- Pathogenesis and possible consequences of thrombosis
- Difference between arterial and venous emboli

Neoplasia

- Dysplasia and Neoplasia
- Benign and malignant neoplasms
- Etiological factors for neoplasia

- Different modes of metastasis
- Tumor staging system and tumor grade

Immunity and Hypersensitivity

- Immunity
- Immune response
- Diagnostic procedures in a clinical Immunology laboratory
- Protective immunity to microbial diseases
- Tumour immunology
- Immunological tolerance, autoimmunity and autoimmune diseases.
- Transplantation immunology
- Hypersensitivity
- Immunodeficiency disorders
- Immunoprophylaxis & Immunotherapy

Related Microbiology

- Role of microbes in various otolaryngological disorders
- Infection source
- Nosocomial infections
- Bacterial growth and death
- Pathogenic bacteria
- Vegetative organisms
- Spores
- Important viruses
- Important parasites
- Surgically important microorganisms
- Sources of infection
- Asepsis and antisepsis
- Sterilization and disinfection
- Infection prevention
- Immunization
- Personnel protection from communicable diseases
- Use of investigation and procedures in laboratory
- Basics in allergy and immunology

Special Pathology

- Foreign body in Ear, Nose & Throat
- Otitis media
- Otitis externa
- Mastoiditis
- Rupture of tympanic membrane
- Meniere's disease
- Nasal allergy
- Nasal Polyp
- Epistaxis
- Sinusitis

- Hearing Loss
- Tonsillitis and peritonsillar abscess
- Pharyngitis
- Ludwig's Angina
- Hoarseness of voice
- Laryngotracheitis
- Laryngeal obstruction
- Diphtheria
- Indication of tracheostomy
- Carcinoma of Larynx
- Wax in ear, Haematoma auris, Furunculosis
- Indications for and interpretation of results of common biochemical and haematological tests
- Macroscopic and microscopic appearances of common or important diseases found in otolaryngology

MS Otolaryngology

Principles of General Surgery for Abridged Examination

- History of surgery
- Preparing a patient for surgery
- Principles of operative surgery: asepsis, sterilization and antiseptics
- Surgical infections and antibiotics
- Basic principles of anaesthesia and pain management
- Acute life support and critical care:
- Pathophysiology and management of shock
- Fluids and electrolyte balance/ acid base metabolism
- Haemostasis, blood transfusion
- Trauma: assessment of polytrauma, triage, basic and advanced trauma
- Accident and emergency surgery
- Wound healing and wound management
- Nutrition and metabolism
- Principles of burn management
- Principles of surgical oncology
- Principles of laparoscopy and endoscopy
- Organ transplantation
- Informed consent and medicolegal issues
- Molecular biology and genetics
- Operative procedures for common surgical manifestations e.g. cysts, sinuses, fistula, abscess, nodules, basic plastic and reconstructive surgery

Common surgical skill

Incision of skin and subcutaneous tissue:

- Langer's lines
- Healing mechanism
- Choice of instrument
- Safe practice

Closure of skin and subcutaneous tissue:

- Options for closure
- Suture and needle choice
- Safe practice

Knot tying:

- Choice of material
- Single handed
- Double handed
- Superficial
- Deep

Tissue retraction:

- Choice of instruments
- Placement of wound retractors
- Tissue forceps

Use of drains:

- Indications
- Types
- Insertion
- Fixation
- Management/removal

Incision of skin and subcutaneous tissue:

- Ability to use scalpel, diathermy and scissors

Closure of skin and subcutaneous tissue:

- Accurate and tension free apposition of wound edges

Haemostasis:

- Control of bleeding vessel (superficial)
- Diathermy
- Suture ligation
- Tie ligation
- Clip application
- Plan investigations
- Clinical decision making
- Case work up and evaluation; risk management

Pre-operative assessment and management:

- Cardiorespiratory physiology
- Diabetes mellitus
- Renal failure
- Pathophysiology of blood loss
- Pathophysiology of sepsis
- Risk factors for surgery
- Principles of day surgery
- Management of comorbidity

Intraoperative care:

- Safety in theatre
- Sharps safety
- Diathermy, laser use
- Infection risks
- Radiation use and risks
- Tourniquets
- Principles of local, regional and general anaesthesia

Post-operative care:

- Monitoring of postoperative patient
- Postoperative analgesia
- Fluid and electrolyte management
- Detection of impending organ failure

- Initial management of organ failure
- Complications specific to particular operation
- Critical care

Blood products:

- Components of blood
- Alternatives to use of blood products
- Management of the complications of blood product transfusion including children

Antibiotics:

- Common pathogens in surgical patients
- Antibiotic sensitivities
- Antibiotic side-effects
- Principles of prophylaxis and treatment

Safely assess the multiply injured patient:

- History and examination
- Investigation
- Resuscitation and early management
- Referral to appropriate surgical subspecialties

Technical Skills

- Central venous line insertion
- Chest drain insertion
- Bleeding diathesis & corrective measures, e.g. warming, packing
- Clotting mechanism; Effect of surgery and trauma on coagulation
- Tests for thrombophilia and other disorders of coagulation
- Methods of investigation for suspected thromboembolic disease
- Anticoagulation, heparin and warfarin
- Role of V/Q scanning, CT angiography and thrombolysis
- Place of pulmonary embolectomy
- Awareness of symptoms and signs associated with pulmonary embolism and DVT
- Role of duplex scanning, venography and d-dimmer measurement
- Initiate and monitor treatment

Diagnosis and Management of Common Surgical Conditions:

- Abdominal pain
- Vomiting
- Trauma
- Urological conditions (Urinary retention)
- Constipation
- Head / neck swellings
- Abscess

In terms of general experience it is expected that trainees would have gained exposure to the following procedures and to be able to perform those marked (*) under direct supervision.

- Lymph node biopsy*
- Insertion of CV lines
- Excision of skin lesions*
- Incision and drainage of abscess*
- Insertion of pleural drain*
- Insertion of suprapubic catheter*

Specialty Component for Final Examination

Students should be familiar with typical clinical presentation, key physical findings, radiological findings and differential diagnosis, initial treatment, and referral indications for common otolaryngological diseases

1. Otology

- Examination of Ear.
- Aetiopathology of Inflammatory Conditions of External & Middle Ear
- Pathology of Cochlea.
- Pathology of Vestibular System.
- Diseases of External Ear.
- Ear Trauma.
- Plastic Surgery of the Ear.
- Acute Suppurative Otitis Media.
- Management of Acute Suppurative Otitis Media
- Chronic Suppurative Otitis Media.
- Management of Chronic Suppurative Otitis Media.
- Reconstruction of the Ear.
- Complication of Suppurative Otitis Media.
- Otalgia.

- Otosclerosis.
- Diseases of Temporal Bone.
- Sensorineural Hearing Loss.
- Sudden & Fluctuant Sensorineural Hearing Loss.
- Vertigo.
- Meniere's disease.
- Ototoxicity.
- Vestibular Schwannoma.
- Epithelial Tumours of External Auditory Meatus.
- Glomus & Other Tumours of the Ear.
- Disorders of Facial Nerve.
- Surgery of the Vestibular System.
- Cochlear Implants.
- Presbycusis.
- Implantable Hearing Devices.

2.Rhinology

- Examination of Nose.
- Conditions of the External Nose.
- Congenital Anomalies of the Nose.
- Evaluation of the Nasal Airway & Nasal Challenge.
- Abnormalities of Smell.
- Mechanism & Treatment of Allergic Rhinitis.
- Food Allergy & Intolerance.
- Infective Rhinitis & Sinusitis.
- Intrinsic Rhinitis.
- Nasal Polyps.
- The Nasal Septum.
- Surgical Management of Sinusitis.
- Complications of Sinusitis.
- Cerebrospinal Fluid Rhinorrhoea.
- The Upper Airways & their relation to the respiratory System.
- Fracture of Facial Skeleton.
- Rhinoplasty.
- Epistaxis.
- Snoring & Sleep Apnoea.

- Non-Healing Granulomas.
- Facial pain & Headache.
- Aspects of Dental Surgery for Otorhinolaryngology.
- Trans-Sphenoidal Hypophysectomy.
- The Orbit.
- Neoplasms of Nose & Paranasal sinuses.

3. Laryngology & Head, Neck

- Examination & endoscopy of the upper aerodigestive tract.
- Oral cavity.
- Acute & chronic infections of pharynx & tonsils.
- Acute & chronic laryngitis.
- Sleep apnoea.
- Adenoidal and tonsillar pathology
- Disorders of voice.
- Management of obstructed airway & tracheostomy.
- Trauma & stenosis of larynx.
- Neurological affections of larynx & pharynx.
- Pharyngeal pouches.
- Tumours of the larynx.
- Angiofibroma.
- Nasopharynx (the postnasal space).
- Tumours of oropharynx & lymphomas of the head & neck
- Benign diseases of neck.
- Malignant neck diseases;
- The thyroid & parathyroid gland.
- Non-neoplastic salivary gland diseases.
- Benign salivary gland tumours.
- Malignant salivary gland tumours.
- Tumours of infratemporal fossa & parapharyngeal space.
- Cysts, granulomas & tumours of the jaw, nose & sinuses.
- The esophagus in otolaryngology.
- Facial plastic surgery.

- Plastic & reconstructive surgery of the head & neck.
- Terminal Care of Patients with head & neck Cancer.

4.Audiology

- Acoustics
- Computers in Audiology.
- Epidemiology.
- Otological Symptoms & Emotional Disturbances.
- Clinical tests of Hearing & Balance.
- Pharmacological Treatment of Hearing & Balance Disorders.
- Legal & Ethical Matters.
- Prevention of Hearing & Balance Disorders.
- Hearing Overview.
- Causes of Hearing Disorders.
- Noise & the Ear.
- Diagnostic Audiometry.
- Audiological Rehabilitation.
- Hearing Aids.
- Cochlear Implants.
- Tactile Aids.
- Central Auditory Dysfunction
- Tinnitus
- Overview of Balance
- Causes of Balance Disorders.
- Diagnostic Testing of Vestibular System
- Rehabilitation of Balance Disorders.

5.Paediatric Otolaryngology

- Improving Paediatric Otolaryngological Consultation.
- Genetic Factors & Deafness.
- The Causes of Deafness.
- Testing Hearing in Children.
- Screening & Surveillance for Hearing Impairment in Preschool Children.

- Otitis Media with Effusion.
- Acute Suppurative Otitis Media in Children.
- Chronic Suppurative Otitis Media in Children.
- Surgery of Congenital Abnormalities of the External & Middle Ear.
- Management of Hearing Impaired Child.
- Cochlear Implantation in Children.
- Vestibular Disorders in Children.
- Speech & Language.
- Foreign Bodies in the Ear & Nose.
- Congenital Anomalies of the Nose.
- Craniofacial Anomalies.
- Nasal Obstruction & Rhinorrhoea in Infants & Children.
- Tonsils & Adenoids.
- Dental development, Orthodontics, Cleft lip& Cleft palate.
- Sleep Apnoea.
- Stertor & Stridor.
- Congenital Disorders of Larynx, Trachea & Bronchi.
- Stenosis of Larynx.
- Acute Laryngeal Infections.
- Foreign Bodies in Larynx & Trachea.
- Tracheostomy & Decannulation.
- Home care of Tracheostomised Child.
- Neonatal Pulmonary Disorders.
- Diseases of the Esophagus in Children.
- Branchial cleft Anomalies, Thyroglossal cysts & Fistulae.
- Tumours of the Head & Neck in Children.
- Salivary Glands Disorders in Children.
- The Drooling Child.
- Recurrent Respiratory Papillomatosis.
- Paediatric Anesthesia.

1. **Emergencies in Otolaryngology-Head and Neck Surgery**
   - Airway Obstruction.

- Inspired or Ingested Foreign Bodies.
- Sore Throat or Difficulty Swallowing.
- Epistaxis.
- Ear Complaints.
- Head and Neck Infections.
- Laryngeal and Tracheal Trauma.
- Facial Trauma

2. **Rehabilitation**

- Speech rehabilitation following laryngectomy
- Rehabilitation following maxillectomy – obturator
- Management of hearing loss
- Hearing aids
- Bone anchored hearing aids
- Cochlear implants
- Radiotherapy, Brachytherapy, Chemotherapy, Palliative Care

Recent Advances:

- Advances in laser in ENT applications
- Ultrasonic scalpel
- Gamma Knife
- Computer assisted surgeries
- Intra -Arterial Local Chemotherapy
- Powered instruments

Common Otolaryngological Skills and Procedures

- On completion of the initial training in Part I, the trainees will be competent in all aspects of the basic, operative and non operative care of surgical patients
- During Part II training, they will understand the importance of Otolaryngological care and management with particular reference to common Otolaryngological presentations recognizing and preventing secondary. They will be capable of resuscitating, assessing and initiating

the surgical management of patients deteriorating as a result of local and systemic complications. They will demonstrate sound judgment when seeking more senior support, prioritizing medical interventions and escalating the level of medical care.

- Administration of antibiotics in the surgical patient
- Use of blood and its products
- The role/complications of diathermy
- Pain relief in surgery
- Thrombo-embolic
- Prevention and management
- Wound care and nosocomial infection
- Suture techniques and materials
- Initial assessment and management of airway problems
- Initial management of foreign bodies in ENT
- Initial epistaxis and its management
- Initial management of facial fractures

Radiological Interpretations:

- Plain films of the head, neck, sinuses and chest.
- CT scans of the sinuses, petrous bone, neck, chest and brain
- MRI scans of the sinuses, brain, neck, chest, head
- Contrast radiology of swallowing, sialography
- Ultrasound of the neck

Audiology and vestibular testing

- Interpretation of report from an Audiologist
- Simple tests for hearing including a pure tone audiogram, loudness discomfort levels and a tympanogram
- Brain stem evoked response audiometry
- Otoacoustic emissions

- Cortical evoked audiometry
- Electronystagmograph
- Equitest
- Rotating chair test
- Familiarity with different types of hearing aids
- Technique of mould impression
- Clinical neurological examination
- Ophthalmoscopy
- Lumbar puncture
- Electromyograph
- Electroneuronograph
- Electroencephalograph

Otology

- Examination of the ear – Auriscope
- Examination under the microscope – de wax
- External meatus and mastoid cavity
- Suction clearance for otitis externa and insertion of wick
- Removal of simple foreign bodies
- Myringotomy and Grommet insertion
- Incision for mastoid surgery
- Clinical examination of hearing
- Clinical examination of vestibular function

Rhinology

- Examination of the nose and sinuses – anterior
- Rhinoscopy
- Examination of smell
- Rigid endoscopy
- Flexible nasendoscopy
- Examination of the post nasal space
- Suction under endoscopic control of surgical cavity
- Insertion and removal of nasal pack and or balloon for epistaxis
- Simple polypectomy

- Biopsy of the nose and nasopharynx
- Antral washout in the management of acute sinusitis
- Removal of simple foreign bodies
- Drainage of septal haematoma
- Reduction of fractured nose
- Submucous resection
- Reduction of turbinates

Laryngology

- Examination of the larynx – indirect
- Laryngoscopy
- Flexible laryngoscopy
- Direct laryngoscopy
- Biopsy of the larynx, pharynx and oral cavity
- (including tongue)
- Adenoidectomy and tonsillectomy
- Removal of simple foreign bodies from the oropharynx and hyper pharynx
- Incision/drainage of Quinsy

Neck

- Examination of the neck
- Emergency and elective tracheostomy
- Fine needle aspiration biopsy of a neck lump

Thesis Component

(4th year of MS Otolaryngology Programme)

RESEARCH/ THESIS WRITING

Total of one year will be allocated for work on a research project with thesis writing. Project must be completed and thesis be submitted before the end of training. Research can be done as one block in 5th year of training or it can be stretched over five years of training in the form of regular periodic rotations during the course as long as total research time is equivalent to one calendar year.

Research Experience

The active research component program must ensure meaningful, supervised research experience with appropriate protected time for each resident while maintaining the essential clinical experience. Recent productivity by the program faculty and by the residents will be required, including publications in peer-reviewed journals. Residents must learn the design and interpretation of research studies, responsible use of informed consent, and research methodology and interpretation of data. The program must provide instruction in the critical assessment of new therapies and of the surgical literature. Resident should be advised and supervised by qualified staff members in the conduct of research.

Clinical Research

Each resident will participate in at least one clinical research study to become familiar with:

1. Research design.
2. Research involving human subjects including informed consent and operations of the Institutional Review Board and ethics of human experimentation.
3. Data collection and data analysis
4. Research ethics and honesty
5. Peer review process

This usually is done during the consultation and outpatient clinic rotations.

Case Studies or Literature Reviews

Each resident will write, and submit for publication in a peer-reviewed journal, a case study or literature review on a topic of his/her choice.

Laboratory Research

Bench Research

Participation in laboratory research is at the option of the resident and may be arranged through any faculty member of the Division. When appropriate, the research may be done at other institutions.

Research involving animals

Each resident participating in research involving animals is required to:

1. Become familiar with the pertinent Rules and Regulations of the RMU Rawalpindi i.e. those relating to "Health and Medical Surveillance Program for Laboratory Animal Care Personnel" and "Care and Use of Vertebrate Animals as Subjects in Research and Teaching"
2. Read the "Guide for the Care and Use of Laboratory Animals"
3. View the videotape of the symposium on Humane Animal Care

Research involving Radioactivity

Each resident participating in research involving radioactive material is required to

1. Attend a Radiation Review session.

2. Work with an Authorized User and receive appropriate instruction from him/her.

METHODS OF INSTRUCTION/COURSE CONDUCTION

As a policy, active participation of students at all levels will be encouraged.
Following teaching modalities will be employed:

1. Lectures
2. Seminar Presentation and Journal Club Presentations
3. Group Discussions
4. Grand Rounds
5. Clinico-pathological Conferences
6. SEQ as assignments on the content areas
7. Skill teaching in ICU, Operation theatres, emergency and ward settings
8. Attend genetic clinics and rounds for at least one month.
9. Self study, assignments and use of internet
10. Bedside teaching rounds in ward
11. OPD & Follow up clinics
12. Long and short case presentations

In addition to the conventional teaching methodologies interactive strategies like conferences will also be introduced to improve both communication and clinical skills in the upcoming consultants. Conferences must be conducted regularly as scheduled and attended by all available faculty and residents. Residents must actively request autopsies and participate in formal review of gross and microscopic pathological material from patients who have been under their care. It is essential that residents participate in planning and in conducting conferences.

1. Clinical Case Conference

Each resident will be responsible for at least one clinical case conference each month. The cases discussed may be those seen on either the consultation or clinic service or during rotations in specialty areas. The resident, with the advice of the attending Surgeon on the Consultation Service, will prepare and present the case(s) and review the relevant literature.

2. Monthly Student Meetings

Each affiliated medical college approved to conduct training for MS Otolaryngology will provide a room for student meetings/discussions such as:

a. Journal Club Meeting

b. Core Curriculum Meetings

c. Skill Development

a. Journal Club Meeting

A resident will be assigned to present, in depth, a research article or topic of his/her choice of actual or potential broad interest and/or application. Two hours per month should be allocated to discussion of any current articles or topics introduced by any participant. Faculty or outside researchers will be invited to present outlines or results of current research activities. The article should be critically evaluated and its applicable results should be highlighted, which can be incorporated in clinical practice. Record of all such articles should be maintained in the relevant department.

b. Core Curriculum Meetings

All the core topics of Otolaryngology should be thoroughly discussed during these sessions. The duration of each session should be at least two hours once a month. It should be chaired by the chief resident (elected by the residents of the relevant discipline). Each resident should be given an opportunity to brainstorm all topics included in the course and to generate new ideas regarding the improvement of the course structure

c. Skill Development

Two hours twice a month should be assigned for learning and practicing clinical skills.

List of skills to be learnt during these sessions is as follows:

1. Residents must develop a comprehensive understanding of the indications, contraindications, limitations, complications, techniques, and interpretation of results of those technical procedures integral to the discipline.
2. Residents must acquire knowledge of and skill in educating patients about the technique, rationale and ramifications of procedures and in obtaining procedure-specific informed consent. Faculty supervision of residents in their performance is required, and each resident's experience in such procedures must be documented by the program director.

3. Residents must have instruction in the evaluation of medical literature, clinical epidemiology, clinical study design, relative and absolute risks of disease, medical statistics and medical decision-making.
4. Training must include cultural, social, family, behavioral and economic issues, such as confidentiality of information, indications for life support systems, and allocation of limited resources.
5. Residents must be taught the social and economic impact of their decisions on patients, the primary care physician and society. This can be achieved by attending the bioethics lectures
6. Residents should have instruction and experience with patient counseling skills and community education.
7. This training should emphasize effective communication techniques for diverse populations, as well as organizational resources useful for patient and community education.
8. Residents should have experience in the performance of Otolaryngology related clinical laboratory and radionuclide studies and basic laboratory techniques, including quality control, quality assurance and proficiency standards
9. Each resident will manage at least the following essential Otolaryngological cases and observe and participate in each of the following procedures, preferably done on patients under supervision initially and then independently. (pg. 33-35)

LOG BOOK

The residents must maintain a log book and get it signed regularly by the supervisor. 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 per format:

Procedures Performed

Sr.#	Date	Name of Patient, Age, Sex & Admission No.	Diagnosis	Procedure Performed	Supervisor's Signature
1					
2					
3					
4					

Emergencies Handled

Sr.#	Date	Name of Patient, Age, Sex & Admission No.	Diagnosis	Procedure/ Management	Supervisor's Signature
1					
2					
3					
4					

Case Presented

Sr.#	Date	Name of Patient, Age, Sex & Admission No.	Case Presented	Supervisor's Signature
1				
2				
3				
4				

Seminar/Journal Club Presentation

Sr.#	Date	Topic	Supervisor's signature
1			
2			
3			
4			

Evaluation Record
(Excellent, Good, Adequate, Inadequate, Poor)

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

Sr.#	**Date**	**Method of Evaluation (Oral, Practical, Theory)**	**Rating**	**Supervisor's Signature**
1				
2				
3				
4				

EVALUATION & 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 tend 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
- Peer Assessment
- Informal Internal Assessment by the Faculty

Self Assessment by the Student

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

Peer Assessment

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 non-judgmental 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 weaknesses rather than hiding them from their instructors.

It will include:

a. Punctuality

b. Ward work

c. Monthly assessment (written tests to indicate particular areas of weaknesses)

d. 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.

Abridge Examination
TOTAL MARKS: 350

All candidates will have to appear in Abridge examination at the end of second calendar year.

Written Exam:

There will be 100 single best answer type MCQs with a total of 200 marks as follows

Anatomy	05
Physiology	05
Pathology	05
Pharmacology	05
Principal of general surgery	25
General ENT	45
Trauma related to ORL	05
Audiology	05

Each correct answer to MCQ will carry 2 marks. Incorrect response will result in deductions of 0.5. Duration of this exam will be 150 minutes.

TOACS

- 15 stations covering all the sallybus
- 5 minutes on each station
- 10 marks for each station

The candidates scoring 50% marks in written and 70% marks in TOACS will pass the examination.

Four attempts (availed or unavailed) will be allowed to pass the written examination on three consecutive subsequent occasions.

MS Otolaryngology
Total Marks: 1500

All candidates admitted in MS Otolaryngology course shall appear in Final examination at the end of structured training programme (end of 4th calendar year and after clearing Abridged examinations)

There shall be two written papers of 250 marks each, Clinical, TOACS/OSCE & ORAL of 500 marks, log book assessment of 100 marks and thesis examination of 400 marks.

MS Otolaryngology

Clinical Examination

Total Marks: 1500

Topics included in paper 1

1. Otology	(25 MCQs) (1 SEQs)
2. Rhinology	(25 MCQs) (1 SEQs)
3. Laryngology & Head, Neck	(30 MCQs) (2 SEQs)
4. Audiology	(20 MCQs) (1 SEQs)

Topics included in paper 2

1. Paediatric Otolaryngology	(50 MCQs) (2 SEQs)
2. Emergencies in Otolaryngology	(30 MCQs) (2 SEQs)
3. Rehabilitation	(20 MCQs) (1 SEQs)

Components of final clinical examination

Theory

Paper I 250 Marks 3 hours

5 SEQs 50 Marks

100 MCQs 200 Marks

Paper II 250 Marks 3 Hours

5 SEQs 50 Marks

100 MCQs 200 Marks

Total = 500 Marks

Only those candidates who pass in theory papers, will be eligible to appear in the Clinical, TOACS/OSCE & ORAL.

Clinical, TOACS/OSCE & ORAL

Four short cases 200 Marks

One long case: 100 Marks

Toacs/OSCE & Oral 200 Marks

Continuous Internal Assessment 100 Marks

MS Otolaryngology

Thesis Examination

Total Marks: 400

All candidates admitted in MS Otolaryngology course shall appear in thesis examination at the end of 4th year of the MS programme. The examination shall include thesis evaluation with defense.

RECOMMENDED BOOKS

1. Johnson. A case Approach to Open Structure Rhinoplasty with DVD-ROM

2. Dhingra. Diseases of ENT

3. Lore. An Atlas of Head and Neck Surgery. 4th ed.

4. Glasscock. Glasscock-Shambaugh Surgery of the Ear. 5th ed.

5. Logan. Mcminn's Clor Atlas of Head and Neck Anatomy. 3rd ed.

6. Prescott. Oxford Hand Book of ENT

7. Miller. The Otolaryngolodic Clinics of North America February

8. Kerr. Scott-Brown's Otolaryngology. 6th ed.;1997

9. Watkinson. Stell and Maran's Head and Neck Surgery. 4th ed.

10. Bailey. Head and Neck Surgery –Otolaryngology. 3rd ed.

11. Masud. Text Book of ENT.

12. Wormald. Endoscopic Sinus Surgery

13. Water. Otolaryngology Basic Science and Review.

14. Grewal. Atlas of Surgery of the Facial Nerve.

15. Hazarika. Clinical and Operative Methods in ENT and Head and Neck Surgery

16. Maniglia. Surgical reconstruction of the Face and Anterior Skull Base.

17. Sheen J. H. Assymetrical Alar Base: Secodary Rhinoplasty Video.

18. Salvi-Hende. Auditory System Plasticityand Regeneration

19. Ballenger. Ballenger's Otolaryngology: Head and Neck

20. Rubin J. S. Diagnosis and Treatment of Voice Disorders. 3rd Ed.

21. Yousem M. Head and Neck Surgery: Case Review Series. 2nd ed. (PB)

22. CD-ROM – Laryngoscope 1995-96 CD-ROM

23. Aperilla

24. The British Journal of Otolaryngology

25. Journal of Academy of Otolaryngology and Head and Neck Surgery

26. Otolaryngology Clinics of North America

27. American journal of Otolaryngology

28. Scott Brown Text Book of Otolaryngology

29. Fathalla M. F. and Fathalla M. M. F. A Practical Guide

30. for Health Researcher. Cairo: World Health Organization; 2004.

31. Rana M. H., Ali S. Mustafa M. ***A Handbook of Behavioural Sciences for Medical and Dental***

APPENDIX "E"

(see Regulation 9-iii)

MANDATORY WORKSHOPS

1. Each candidate of MD/MS/MDS program would attend the 04 mandatory workshops and any other workshop as required by the University.
2. The four mandatory workshops will include the following
   a. Research Methodology and Biostatistics
   b. Synopsis/Writing
   c. Communications Skills
   d. Introduction to computer/ Information Technology and Software program
3. The workshops will be held on 03 monthly basis.
4. An appropriate fee for each workshop wi;ll be charged.
5. Each workshop will be of 02 -05 days duration.
6. Certificate of attendance will be issued upon satisfactory completion of workshops

APPENDIX "F"

(See Regulation 9xxiii,13,14 & 16)

CONTINUOUS INTERNAL ASSESSMENTS

a) Workplace Based Assessments

Workplace based assessments will consist of Generic as well as Specialty Specific competency Assessments and Multisource Feedback Evaluation.

Generic Competency Training & Assessments

The Candidates of all MD/MS/MDS programs will be trained and assessed in the following five generic competencies.

i. **Patient Care.**
   a. Patient care competency will include skills of history taking. Examination , diagnosis, plan of investigation, clinical judgment, plan of treatment, consent, counseling, plan of follow up, communication with patient/ relatives and staff.
   b. The candidate shall learn patient care through ward teaching, departmental conferences, morbidity and mortality meetings, core curriculum lectures and training in procedures and operations.
   c. The candidate will be assessed by the supervisor during presentation of cases on clinical ward rounds, scenario based discussion on patient management, multisource feedback evaluation. Director observation of Procedures (DOPS) and operating room assessments.

ii. **Medical Knowledge and Research**
   a. The candidate will learn basic factual knowledge of illnesses relevant to the specialty through lecture/ discussions on topics selected from the syllabus, small group tutorials and bed side round.
   b. The medical knowledge/skill will be assessed by the teacher during case based discussions and presentations to the supervisor/Consultants/ Senior Postgraduate trainees.
   c. The candidate will be trained in designing research project. Data collection, data analysis and presentation of results by the supervisor.
   d. The acquisition of research skill will be assessed as per regulations governing thesis evaluation and its acceptance.

iii. **Practice and System Based Learning**

a. This competency will be learnt from journal club, review of literature, policies and guidelines, audit projects, medical error investigation, root cause analysis and awareness of healthcare facilities.
b. The assessment methods will include case studies, presentation in morbidity and mortality review meetings and presentation of projects if any.
c. These methods assessment shall have equal weight-age.

iv. Communication Skills

a. These will be learnt from role models, supervisor and workshop.
b. They will be assessed by direct observation of the candidate whilst interacting with the patients, relatives, colleagues and multisource feedback evaluation.

v. Professionalism as per Hippocratic Oath

a. This competency is learnt from supervisor acting as a role model, ethical case conferences and lectures on ethical issues such as confidentiality informed consent, end of life decisions, conflict of interest, harassment and use of human subjects in research.
b. The assessment of residents will be through multisource feedback evaluation according to proformas of evaluation and its scoring method.

Specialty Specific Competencies

i. The candidate will be trained in operative and procedural skills according to a quarterly based schedule.
ii. The level of procedural competence to be achieved at various levels of training will be according to a competency table to be developed by each specialty.
iii. The following key will be used for assessing operative and procedural competencies:

a. Level 1 Observer Status

The candidate physically present and observing the supervisor and senior colleagues.

b. Level 2 Assistant Status

The candidate assisting procedures and operations

c. Level 3 Performed under Supervision

The candidate operating and performing a procedure under direct supervision.

d. Level 4 Performed independently

The candidate operating and performing a procedure under without any supervision.

iv. Procedure Based Assessments (PBA)

a. Procedural competency will assess the skill of consent taking preoperative preparation and planning, intraoperative general and specific tasks and postoperative management

b. Procedure based assessments will be carried out during teaching and training of each procedure.

c. The assessors may be supervisors, consultant colleagues and senior residents.

d. The standardized forms will be filled in by the assessors after direct observation.

e. The resident's evaluation will be graded as satisfactory, deficient requiring further training and not assessed at all.

f. Assessment report will be submitted to the registrar on 03 monthly bases.

g. A satisfactory score will be required to be eligible for taking final examination.

Multisource Feedback Evaluation

1. The supervisor would ensure a multisource feedback to collect peer assessments in medical knowledge, clinical skills, communication skills, professionalism, integrity, and responsibility.
2. Satisfactory annual report will be required to become eligible for the final examination.

b) Completion of Candidate's Training Portfolio

i. The candidate's Training Portfolio (CTP) will be published (or computer based portfolio downloadable) by the university.
ii. The candidates would either purchase the CTP or download it from the KEMU web site.
iii. The portfolio will consist of the following components.
    a) Enrollment details.
    b) Candidate's credentials as submitted on the application for admission form.
    c) Timeline of scheduled activities e.g dates of commencement and completion of training, submission of synopsis and thesis, assessments and examination dates etc (Appendix H)
    d) Log Book of case presentations, operations and procedures recorded in an appropriate formate and validated by the supervisor.
    e) Record of participation and presentations in academic activities e.g lectures, workshops, journal clubs, clinical audit projects, morbidity and mortality review meetings, presentation in house as well as national and international meetings.
    f) Record of publications if any.
    g) Record of results of assessments and examinations if any.
    h) Synopsis submission proforma and IRB proforma and AS&RB approval letter.
    i) Copy of synopsis as approved by AS&RB
iv. Candidates Training Portfolio shall be assessed as per proforma given in "Appendix-G"

Supervisor's Annual Review Report

This report will consist of the following components:-

1. Verification and validation of Log Book of operations and procedures according to the expected number of operations and procedures performed (as per level of competence) determined by relevant board of studies.
2. A 90 % attendance in academic activities is expected. The academic activities will include: lectures, Workshops other than mandatory workshops, journal clubs, Morbidity & Mortality Review Meetings and Other presentations.

3. Assessment report of presentations and lectures.
4. Compliance report on Personal Development Plan.
5. Multisource Feedback Report. On relationship with colleagues, patients.
6. Supervisor will produce an annual report based on assessments as per proforma in appendix-G and submit it to the examination department.
7. 75 % score will be required to pass the continuous Internal Assessment on annual review.

APPENDIX-G
(See Regulation 9ix, 9xxiii-d, 10,11,14 & 16)

Supervisor's Evaluation

PROFORMA FOR CONTINUOUS INTERNAL ASSESSMENTS

1	**Generic Competencies**		
	(Please score from 1-100. 75% shall be the pass marks)	Component Score	Score Achieved
	i. Patient Care	20	
	ii. Medical knowledge and Research	20	
	iii. Practice and System Based Learning • Journal Clubs	04	

	• Audit Projects	04	
	• Medical Error Investigation and Root Cause Analysis	04	
	• Morbidity/Mortality/Review Meetings	04	
	• Awareness of Health Care Facilities	04	
	iv. Communication Skills • Informed Consent	10	
	• End of Life Decisions	10	
	v. Professionalism • Punctuality and time keeping	04	
	• Patient Doctor relationship		
	• Relationship with Colleagues	04	
	• Awareness of ethical issues	04	
	• Honesty and integrity	04	
		04	
2	**Specialty Specific competencies**		
	(Please score from 1-100. 75% shall be the pass marks)		Score Achieved
	Operatives Skills/Procedural Skills		
3	Multisource Feedback Evaluation(Please score from 1-100. 75% shall be the pass marks)		
4	Candidates Training Portfolio(Please score from 1-100. 75% shall be the pass marks)		
	(Please score from 1-100. 75% shall be the pass marks)	Component Score	Score Achieved
	I. Log Book of Operations and Procedures	25	
	II. Record of participation and presentation in academic activities	25	
	III. Record of Publications	25	
	IV. Record of results of assessments and examinations	25	