CURRICULUM / STATUTES & REGULATIONS
FOR
5 YEARS DEGREE PROGRAMME
IN
UROLOGY

(MS Urology)

RAWALPINDI MEDICAL UNIVERSITY

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STATUTES

Nomenclature of the Proposed Course

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

Course Title:

MS Urology

Training Centers

Departments of Urology (accredited by UHS) in affiliated institutes of University of Health Sciences Lahore.

Duration of Course

The duration of MS Urology course shall be five (5) years with structured training in a recognized department under the guidance of an approved supervisor.

After admission in MS Urology Programme the resident will spend first 6 Months in the relevant Department of Urology as **Induction period** during which resident will get orientation about the chosen discipline and will also participate in the **mandatory workshops** (Appendix E)**.** The research project shall be designed and the **synopsis** be prepared during this period

On completion of Induction period the resident will start training to learn Basic Principles of General Surgery for 18 Months. During this period the Research Synopsis shall be got approved by the AS&RB of the university. At the end of 2nd Calender year the candidate shall take up Intermediate Examination.

During 3rd, 4th & 5th years, of the Program, there shall be two components of the training.

1) Clinical Training in Urology.
2) Research and Thesis writing

The candidate will undergo clinical training in the discipline to achieve the educational objectives (knowledge & Skills) alongwith rotation in the relevant fields during the 4th & 5th years of the programme. The clinical training shall be competency based. There shall generic and specialty specific competencies and shall be assessed by continuous Internal Assessment. (Appendix F&G).

The Research & thesis Component shall be completed over the five years duration of the course. The Candidate will spend total time equivalent to one calendar on research during the training. Research can be done as one block or it can be done as regular periodic rotation over five years as long as total research time is equivalent to one calendar year.

Admission Criteria

Applications for admission to MS Training Programs 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 Urology 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.
- 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 five years MS programme in Urology 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 Urology 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 urological 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 urological system and differentiate those amenable to surgical treatment
    - Effectively manage the care of patients with urological 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 Urology
    - Facilitate the learning of others.
7. Appreciate ethical issues associated with Urology:
    - 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 Urology
    - 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 programme, Urology 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 Urology at secondary and tertiary care level with proficiency in the basic and applied clinical sciences, intensive care and emergency (A&E) medicine related to Urology and complementary surgical disciplines.

Cognitive knowledge: Describe embryology, applied anatomy, physiology, pathology, clinical features, diagnostic procedures and the therapeutics including preventive methods, (medical/surgical) pertaining to Urology.

Clinical Decision Making & Management Expertise for the patient with:

- Stone disease
- Acute or chronic abdominal pain referable to the urinary tract
- Upper and lower urinary tract urinary tract obstruction
- Acute or chronic urinary retention
- Haematuria
- Urethral stricture
- Benign & malignant lesions of male genitalia skin.
- A scrotal swelling
- Urinary incontinence.
- Prostate cancer
- Bladder cancer
- Renal cancer
- Infertility, ejaculatory disorders etc
- Erectile dysfunction
- Penile deformity, priapism, penile fracture etc
- The common urological conditions of childhood
- Renal failure
- Multiple injuries.
- Trauma of the renal tract according to accepted protocols.

Cognitive Skills:

- Evaluation and principles of management of a patient with hematuria (microscopic and gross)
- Evaluation of a patient with acute renal, bladder or urethral injury and principles of management
- Diagnosis and treatment of a patient with urinary infection including: acute cystitis and pyelonephritis, recurrent cystitis, persistent urinary tract infection, prostatitis (acute and chronic) and epididymo-orchitis
- Diagnosis and management of a patient with a common urological malignancy including the treatment options for the various stages of carcinoma prostate, bladder, testis and kidney with an understanding of the multidisciplinary approaches to these disease processes including the palliative care of a patient with advanced stage metastatic carcinoma

- Diagnosis and management of a patient with urinary obstruction (prostatic, bladder neck or ureteric)
- Diagnosis and management options for a patient with urolithiasis (including acute renal colic and chronic renal calculi)
- Evaluation and diagnosis of the common paediatric urological problems including hydrocele, cryptorchidism, ureteropelvic junction obstruction and vesicoureteric reflux
- Evaluation and diagnosis of various forms of urinary incontinence
- Diagnosis and management of various scrotal masses including hydrocele, epididymal cysts, orchitis, testis tumor, varicocele, torsion testis or appendages
- Principles and practice of renal transplantation - including organ harvesting including multi-organ harvesting, organ preservation, implantation and immunosuppression
- Psychological and emotional aspects of urological diseases including the emotional implications of a diagnosis of malignant disease, anaesthetic hazards in the elderly and in the management of acute confusional states in the elderly, medical/legal and ethical issues arising in urological patients with respect to transplantation, infertility and impotence evaluation, and the awareness of the concept of body image in surgical patients.

Principles of Preoperative Assessment of the Surgical Patient

- Routine preoperative assessment of surgical patient with particular reference to patients with renal disease
- Assessment of patients with various co-morbidities (cardiac, pulmonary, renal and metabolic)
- Examination and management of a patient in shock (septic due to urinary infection vs. Hypovolemic, neurogenic, cardiogenic shock)

Emergency Urological Care:

- Management of the patient with an acute ureteric colic
- Management of the patient with acute urinary infection including a patient with urosepsis
- Management of a child with an acute scrotum
- Principles of management of a patient with urological trauma
- Suprapubic catheterization

Renal Transplantation:

- Immunosuppression (including principles of management of rejection)
- Recipient selection
- Relevant transplantation immunology

Congenital and Developmental Abnormalities

- Cystic diseases of the kidney
- Horseshoe kidney and other renal anomalies
- Scrotal and external genital anomalies
- Vesicoureteral reflux
- Epispadias and extrophy
- Hypospadias and chordee
- External genital anomalies
- Intersex
- Undescended testis
- Scrotal and external genital anomalies
- Other anomalies

Obstructive Disease of the Upper Urinary Tract

- Obstructive uropathy, hydronephrosis and obstructive renal failure
- Ureteropelvic junction obstruction

Obstructive Disease of the Lower Urinary Tract

- Bladder outflow obstruction
- Benign prostatic hypertrophy
- Lower urinary tract symptoms ("luts")
- Renal and ureteral calculi
- Bladder calculi
- Posterior urethral valves
- Functional obstruction secondary to neurological disorders

Trauma

(Including the management and evaluation of a patient with multisystem trauma involving the GU Tract and the role of the urologist in multidisciplinary approach to multisystem trauma)

- Renal trauma
- Ureteral trauma

- Vesical trauma
- Urethral trauma
- External genital trauma

Urological Oncology

- For tumors (benign and malignant) of the genito-urinary tract, etiology, prevention, nutritional and environmental aspects of urologic malignant disease, including the natural history, histology and pathology.
- Cancer of the kidney
- Cancer of the prostate
- Cancer of the testis

Voiding Disorders including Relevant Neuro-urology

- Urinary incontinence (including stress urinary incontinence, urgency incontinence, total incontinence)
- Voiding dysfunction due to neurological disease
- Enuresis

Urinary and Genital Infections and Sexually Transmitted Disease

- Bacterial (complicated and uncomplicated) and non-bacterial cystitis and urethritis
- Pyelonephritis and other renal infections
- Prostatitis including prostatodynia
- Genito-urinary tuberculosis
- Fungal/yeast urinary tract infections
- Other granulomatous infections (including xanthogranulomatous disease)
- Other genital infections (including Fournier's gangrene)

Systemic Diseases and Other Processes Affecting the Urinary Tract

- Urological manifestations of systemic diseases (including e.g. diabetes mellitus, sepsis, AIDS, immunocompromised or immunoincompetent patients)
- The urinary tract in pregnancy (including normal physiologic and anatomic changes and management of urinary tract problems in the pregnant patient)

Renovascular Hypertension

- Surgically correctable hypertension

Andrology
- Male sexual function and dysfunction
- Fertility and male factor infertility

Adrenal Diseases
- Adrenal cysts, hyperplasia
- Adrenal hyperfunction and hypofunction and associated syndromes

Male Sexual Function and Dysfunction
- Fertility and male factor infertility

Miscellaneous
- External genital problems (including hydrocele, varicocele, spermatocele, cysts)
- Torsion of testis, cord and appendages
- Dermatological lesions of the male external genitalia (including benign, pre-malignant and malignant lesions)
- Interstitial cystitis
- Male sexual dysfunction

Technical Skills & Procedures

Technical Skills:
- Catheterization including urinary catheter care.
- Urethral manipulation and dilatation using filiforms and followers
- Cystoscopy
- Installation of intravesical therapeutic agents
- Wound closure
- Vasectomy (if resident is so interested)
- Introduction to therapeutic technologies including electrosurgery, Extracoporeal Shock Wave Lithotripsy, lasers in urology (carbon dioxide, Nd/YAG, Holmium-YAG).

Diagnostic Skills:
- Urinalysis, including routine urinalysis, urine culture techniques, urinary collections for metabolic studies and urine cytologic studies

- Renal function tests
- Adrenal function tests
- Tumor markers – e.g. alpha-feto protein, b-HCG, PSA, etc.
- Radiological Studies Including intravenous excretory urography voiding cystourethrography
- Ultrasonography – including Doppler studies
- Radioisotope Studies
- CT scanning and MRI Scanning of the urinary tract
- Intravenous excretory urography
- Voiding cystourethrography

Endoscopic Procedures:

- Cystoscopy and urethroscopy, ureteric catheterization including ureteric stent insertion and removal, retrograde pyelography
- Urethral dilatation and visual internal urethrotomy
- Transurethral biopsy of bladder and urethra
- Transurethral resection of prostate
- Urethral dilatation and visual internal urethrotomy
- Transurethral biopsy of bladder and urethra
- Transurethral resection of prostate
- Transurethral resection of bladder tumors
- Ureteroscopy and lithotripsy of ureteric calculi
- Transurethral resection/ incision of ureterocele
- Ureteroscopy and lithotripsy of ureteric calculi
- Percutaneous renal surgery including nephrolithotomy with ultrasound / electrohydraulic / laser lithotripsy

Open Surgical Procedures:

- Circumcision
- Suprapubic catheterization
- Fulguration of venereal warts, biopsy of penile lesions
- Cavernosal shunting procedures for priapism
- Testis biopsy
- Vasovasostomy
- Vasectomy
- Scrotal surgery - hydrocele, epididymal cyst, epididymectomy, simple orchidectomy
- Inguinal surgery - varicocele, herniotomy, orchidopexy

- Radical orchidectomy
- Repair of testis torsion
- Orchidopexy for undescended testis
- Insertion testis prosthesis
- Vesical neck suspension and procedures for stress urinary incontinence
- Pelvic lymphadenectomy
- Simple retropubic prostatectomy

Therapeutic Technologies

- The resident will be able to describe the basic physics and technological application of the following therapeutic modalities. He/she will be able to describe the indications, contraindications, peri -operative and post-operative complications specific for each modality:
- Electrosurgery
- Extracoporeal Shock Wave Lithotripsy
- Lasers in urology - carbon dioxide, Nd/YAG, Holmium-YAG, etc.
- Transurethral prostatic hyperthermia/thermotherapy and other alternative modalities used in the
- Transurethral prostatic hyperthermia/thermotherapy and other alternative modalities used in the
- Management of patients with benign prostatic hyperplasia

Imaging Studies

- Radiological studies - intravenous excretory urography angiography of the kidneys and pelvic vessels
- Venography (including vena cavography)
- Loop-o-graphy
- Voiding cystourethrography
- Ultrasonography -
- Radioisotope studies -
- The indications, application to clinical urology, principles, pharmacokinetics and application of radiopharmaceuticals used in:
- Renal imaging (including function studies)
  - Voiding cystograms
  - Bone scans for staging of malignant disease
  - For adrenal localization
- CT scanning and MRI scanning of the urinary tract
- Urodynamic studies

- Cystometrogram
- Uroflowmetry
- Voiding pressure studies
- Pelvic floor electromyography
- Videourodynamic studies
- Intravenous excretory urography
- Retrograde urethrography, cystography and antegrade pyelography
- Doppler studies of renal, gonadal and penile vessels

REGULATIONS

Scheme of the Course

A summary of five years course in MS Urology is presented as under:

Course Structure	Components	Examination
At the End of 2nd year MS Urology Programme	▯ Principles of General Surgery ▯ Relevant Basic Science (Anatomy, Physiology, Pharmacology & Pathology)	**Intermediate Examination** at the end of 2nd Year of M.S. Urology Programme Written MCQs = 300 Marks Clinical, TOACS/OSCE & ORAL= 200 Marks Total = 500 Marks
At the end of 5th year MS Urology Programme	**Clinical component** Training in Urology with rotations in the relevant fields. **Research component** Research work / Thesis writing must be completed and thesis be submitted at least 6 months before the end of final year of the programme..	**Final Examination** at the end of 5th year of M.S. Urology Programme. Written = 500 Marks Clinical, TOACS/OSCE & ORAL = 500 Marks Contribution of CIS = 100 Marks Thesis Evaluation = 400 Marks **Total = 1500 Marks** Thesis evaluation and defense at the end of 5th year of the programme.

Intermediate Examinations M. S. Urology

All candidates admitted in M.S. Urology course shall appear in Intermediate examination at the end of 2nd calendar year.

Eligibility Criteria:

The candidates appearing in Intermediate Examination of the M.S. Urology Programme are required:

a) To have submitted certificate of completion of mandatory workshops.
b) To have submitted certificate / certificates of completion of first two years of training from the supervisor / supervisors during rotation.
c) To have submitted CIS assessment proforma from his/her own supervisor on 03 monthly basis and also from his/her supervisors during rotation, achieving a cumulative score of 75%.
d) To have submitted certificate of approval of synopsis or undertaking / affidavit that if synopsis not approved with 30 days of submission of application for the Intermediate Examination, the candidate will not be allowed to take the examinations and shall be removed from the training programme.
e) To have submitted evidence of payment of examination fee.

Intermediate Examination Schedule and Fee

a) Intermediate Examination at completion of two years training, will be held twice a year.
b) There will be a minimum period of 30 days between submission of application for the examination and the conduction of examination.
c) Examination fee will be determined periodically 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 Roll Number Slips on receipt of prescribed application form, documents satisfying eligibility criteria and evidence of payment of examination fee.

Intermediate Examinations M. S. Urology

At the end of 2nd year Calendar of the programme

Written Examination	= 300 Marks
Clinical, TOACS/OSCE & ORAL	= 200 Marks

Written:

MCQs 100 (2 marks each MCQ)

SEQs 10 (10 Marks each SEQ)

Total = 300 Marks

Principles of General Surgery	= 70 MCQs	7 SEQs
Specialty specific	= 10 MCQs	1 SEQs

Basic Sciences	= 20 MCQs	2 SEQs
? Anatomy	= 6 MCQs	1 SEQs
? Pharmacology	= 2 MCQs	-------
? Pathology	= 6 MCQs	1 SEQ
? Physiology	= 2 MCQs	-------

The clinical examination will evaluate patient care competencies in detail,

A panel of four examiners will be appointed by the Vice Chancellor of the University and of these two will be from within the university whilst two will be the external examiners In case of difficulty in finding an internal examiner in a given subject the Vice Chancellor would, in consultation with the concerned Deans will appoint any relevant person inside/ outside the University as an examiner.

Clinical and Oral Examination = Total Marks 200

a) 4 short Course	=	100 marks
b) Long course	=	50 marks
c) Clinical, TOACS/OSCE & ORAL	=	50 marks

? Each short case will be of 07 minutes duration, 05 minutes will be for examining the patient and 02 minutes for discussion.

? The long case and oral examination will each be of 15 minutes duration.

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

Declaration of Result

The Candidate will have to score 50% marks in written, clinical, Toacs/ OSCE & Oral and practical components and a cumulative score of 60% to be declared successful in the Intermediate Examination.

A maximum of four consecutive attempts (availed or unavailed) will be allowed in the Intermediate Examination during which the candidate will be allowed to continue his training program. If the candidate fails to pass his Intermediate Examination 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. Urology

At the end of 5th Calendar year of the Programme

Eligibility Criteria:

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

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

ii) To have submitted the certificate of completion of training, issued by the Supervisor which 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 Papers:

Paper 1	= 100 MCQs	5 SEQs
Paper 2	= 100 MCQs	5 SEQs

Clinical, TOACS/OSCE & ORAL

Short Cases	= 200 Marks
Long Case	= 100 Marks
Toacs/ OSCE & Oral	= 200 Marks

Total = 500 Marks

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 reelvant 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 onsultation 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 Urology Degree

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

CONTENT OUTLINE

MS Urology

Basic Sciences:
Student is expected to acquire comprehensive knowledge of Anatomy, Physiology, Pathology (Microbiology) and Pharmacology relevant to surgical practice appropriate for Urology

1. Anatomy

- *Clinical and functional anatomy with pathological and operative relevance*
- *Surgical approaches to the renal and urinary structures*
- *Histology and embryology related to Urology*

- 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.

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 kidney

- Urogenital sinus & its transformation
- Origin of Mullerian system
- Development/ Descent of Testis
- Endocrinological influences on male & female genitalia
- Development of adrenals
- Embryology of extrophy, hypo / epispadias

Teratogenesis:

- Factors known to be involved in the development of congenital anomalies especially related to the urological 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 urological system, in routine histological preparations under the light microscope.

The Epithelial Tissue

- General structure, functions and classification of epithelia
- Their location in the body
- The Connective Tissue
- Histology of the kidney

Anatomy:

- Anterior abdominal wall and loin with reference to surgical incisions & herniae.
- Anatomy & relations of kidneys & ureters and suprarenal glands.
- Anatomy of pelvic fascia & diaphragm.
- Anatomy of perineum including perineal pouches.
- Urinary bladder --------- ligaments & blood supply.
- Prostate --- zones ,lobes & fascial sheaths.
- Lymphatic drainage of pelvis and posterior abdominal wall.
- Anatomy of urethra, penis, scrotum, testes, epididymis, vas deferens & seminal vesicles.
- Anatomy and relation of female reproductive and genital tract.
- Neuro anatomy/ nerves with reference to bladder, erectile and ejaculatory function.

2. Physiology

- Functional anatomy of kidney, nephron-structure, parts, function, types.
- Juxtaglomerular apparatus: autoregulation, peculiarities, measurements.
- Renal circulation: Auto regulation, peculiarities, and measurement
- Glomerular filtration: filtration barrier, forces governing filtration, measurement.
- Tubular functions: re-absorption, secretion, Tm values
- Regulation of ECF-volume, osmolality and electrolytes
- Micturition
- Renal function tests, renal clearance, abnormal constituents of urine
- Excretory functions of skin
- Control of water balance & fluid compartments
- Acid base balance
- Oedema & lymphatic function in renal disease
- Calcium metabolism
- Testicular function ----- Spermatogenesis & Endocrine
- Renal & Suprarenal Endocrines
- Physiology of Bladder-innervation
- Micturition reflex
- Clinical and applied physiology
- Membrane biochemistry and signal transduction
- Gene expression and the synthesis of proteins
- Bioenergetics; fuel oxidation and the generation of ATP
- Carbohydrate metabolism
- Lipid metabolism
- Nitrogen metabolism
- Enzymes and biologic catalysis
- Tissue metabolism
- Biotechnology and concepts of molecular biology with special emphasis on use of recombinant DNA techniques in medicine and the molecular biology of cancer
- General principles of biochemical investigations
- Basic techniques in molecular biology
- Cloning and gene analysis
- Immunochemical techniques
- Protein chemistry and enzymology
- Cloning & PCR

- Protein chemistry and quantification
- Electrophoretic techniques; PAGE
- Immunoblotting
- Raising and purifying antibodies
- ELISA
- Composition of intracellular and extracellular compartment fluids.
- Water and sodium balance. Role of kidney in its maintenance.
- Renal mechanism for pH regulation.

3. Pharmacology

- The evolution of medical drugs
- British pharmacopeia
- 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
- Applied aspects related to pharmacokinetics
- Drug therapies of renal failure (including drug interactions)
- Commonly used drugs (antihypertensive, antidiabetic drugs, diuretics etc.)
- Principals and use of anti microbial therapy
- Antiseptics

- Drug interactions
- Dialysis
- Drug use in pregnancy and in children
- Renal toxicity 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 urological 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

Kidney and ureter
- Congenital lesions
- Obstruction
- Calculus
- Infection
- Tumors
- Cystic diseases
- Medical nephropathies
- Vascular
- Renal transplantation
- Trauma

Bladder
- Congenital lesions
- Obstruction
- Inflammatory
- Tumors
- Trauma
- Incontinence & functional disorders
- Urinary diversion

Urethra
- Congenital lesions
- Strictures
- Diverticula
- Trauma

Prostate & Seminal Vesicles
- Congenital lesions
- Benign prostatic hypertrophy
- Inflammatory
- Tumors

Testis & scrotum
- Congenital lesions
- Inflammatory
- Torsion
- Tumors

Adrenal
- Masses

MS Urology

Basic Principles of Surgery

- 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 Skills

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
- Diagnostic peritoneal lavage

- 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-dimer measurement
- Initiate and monitor treatment

Diagnosis and Management of Common Paediatric Surgical Conditions:

- Child with abdominal pain
- Vomiting child
- Trauma
- Groin conditions
  - Hernia
  - Hydrocoele
  - Penile inflammatory conditions
  - Undescended testis
  - Acute scrotum
- Abdominal wall pathologies
- Urological conditions
- 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.

- Elective Procedures
  - Inguinal hernia
- (not neo-natal)
  - Orchidopexy
  - Circumcision*
  - Lymph node biopsy*
  - Abdominal wall herniae
  - Insertion of CV lines
- Emergency Procedures
  - Incision and drainage of abscess*

- Operation for testicular torsion*
- Insertion of suprapubic catheter*

MS Urology
Clinical Component

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

1. GENERAL UROLOGY

- Anatomy and embryology of genitourinary system
- Urologic laboratory examination including renal function tests..
- Radiology & radio nuclide imaging of urinary tract.
- Vascular interventional radiology.
- Urodynamics.
- Principles of chemo-, radio- & immunotherapy as applied to urologic practice.
- Genetics as applied to genitourinary surgical conditions.
- Management of oliguria & acute renal failure.
- Ch. Renal failure & dialysis, angioaccess
- Immunology, immune suppression, immune response
- Pathophysiology of rejection., tissue typing & lymphocyte cross match
- Congenital anomalies of kidney, ureter, bladder, urethra and genitalia, ambiguous genitalia
- Infections of urinary tract, sexually transmitted diseases, specific urologic infections)
- Disorders of kidneys, ureters, bladder, prostate, seminal vesicles and urethra
- Pathophysiology of obstruction, stasis & reflux
- Pathophysiology of neurogenic bladder.
- Pathophysiology of incontinence (neuromuscular dysfunction)
- Disorder of scrotum, testis, and spermatic cord
- Skin disease of external genitalia
- Urolithiasis
- Extracorporeal shockwave lithotripsy
- Hypertension with reference to kidney & adrenals, secondary hypertension, malignant hypertension.
- Principles of endourology, laparoscopic urology, lasers as applied to urology.

2. SPECIAL UROLOGY

Operative Urology

- Urethral catheterization/ urethral dilatation
- Suprapubic cystostomy
- Tumors of renal parenchyma
- Prostatectomy
  for benign and malignant disease, principles of radical surgery
- Principles of retroperitoneal surgery
- Radical cystectomy
- Urethroplasty, principles of hypospadias surgery, anastomosis & substitution
- Techniques in urethral stricture disease
- Urinary diversion, ureterosigmoidostomy, orthotopic pouches & continent
- Urinary diversion , resume of current technique in vogue
- Principles of surgery in hydrocele, epididmal cysts & spermatoceles.
- Surgery for vesico vaginal/ uterine fistulae
- Pediatric urology: principles of orchidopexy, pyeloplasty , anti-reflux
- Procedures & scrotal swellings
- Kidney transplantation
- Endourology, retrograde catheterization, cystourethroscopy, ureterorenoscopy.
- Endoscopic management of urethral, prostatic, bladder, ureteral & renal pathologies, retrograde instrumentation of ureter, laparoscopic urological surgery, percutaneous renal surgery.

Uro-Oncology

- Diagnosis, management of renal tumors, bladder malignancies, other neoplasms of urothelium and prostatic carcinoma; testicular tumors; adrenal masses.
- Carcinoma penis, metastatic tumors involving genitourinary tract

Genitourinary Trauma

- Mode/ mechanics of renal, ureteric, bladder, urethral & scrotal injuries, clinical presentation, management & complications

Incontinence

- Classification; indication of surgical intervention, artificial sphincters and bladder substitution
- Neurogenic bladder, immediate as well as long term management

Female Urology

- Urethral stenosis
- Etiology, diagnosis and management of stress, urge, true incontinence and genitourinary fistulae

Paediatric Urology

- Antenatal diagnosis, PUJ, vesicoureteric reflux, posterior urethral valves
- Childhood tumors & disorders of penis and male urethra

Andrology

- Male Infertility
- Etiology, pathophysiology of erectile dysfunction
- Clinical presentation, diagnosis and therapeutic modalities including drugs & prosthesis;
- Management of priapism; Peyronie's disease

8) **Kidney Transplantation:**

- Selection & preparation of donor & recipient for kidney transplantation
- Immunosuppression, donor nephrectomy, transplantation, post op management and complications

(i) Schedule

Year	Category	Level I	Level II	Level III	Level IV	Level V
I	Minor	-	50	10	10	05
	Medium	25	10	05	-	-

	Major	25	10	-	-	-
	Extraordinary	10	05	-	-	-
I	Minor	-	-	50	25	10
	Medium	-	25	15	10	-
	Major	-	25	10	05	-
	Extraordinary	10	10	05	-	-
III	Minor	-	--	-	25	25
	Medium	-	-	50	25	15
	Major	-	-	25	25	10
	Extraordinary	-	10	10	-	-

Level I : Observed and knowledge of instruments
Level II : 2nd assistant
Level III : 1st assistant
Level IV : Performed under supervision
Level V : Performed independently

Operative procedures

MINOR

- Arterial Blood Sampling.
- Central Venous Cannulation.
- Lumbar Puncture.
- E.T. intubation.
- Pleural aspiration.
- Peritoneal aspiration
- Insertion of peritoneal catheter. (APD) (CAPD)
- Aspiration of scrotal cysts.
- Urethral catheterization.
- Suprapubic cystostomy.
- Circumcision.
- Retrograde cystourethrogram., MCU, Anti/Retrograde Pyelography.
- Prostatic Biopsy
- Cystoscopy

MEDIUM

- Retrograde catheterization (ureteric).
- PCN.
- Orchiectomy.
- Vesicolithotomy.
- Litholapaxy.
- Ureterolithotomy.
- Varicocelectomy.
- Testicular Biopsy/ orchiectomy
- Urethroscopy / D.J. removal / internal urethrotomy
- Check cystoscopy.
- A.V. Fistula

MAJOR

- Open Prostatectomy
- Exposure of kidney / Pyelolithotomy.
- Recipient bed.
- TURP.
- TURBT.
- Colposuspension.
- Exposure of urethra in urethroplasty.
- Pyeloplasty.
- Hypospadias surgery.
- Ureteroscopy / Intracorporeal Lithotripsy
- Orchidopexy.
- PCNL
- Laparoscopic Urological Surgery

Extraordinary

- Radical prostatectomy
- Radical cystectomy
- Radical nephrectomy
- RPLND
- Donor Nephrectomy.
- Kidney Transplant.

Thesis Component
(Fifth year of MS Urology 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. Residents 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 University of Health Sciences Lahore 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 materials 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 Urology 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 Urology 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 Urology 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 Urological cases and observe and participate in each of the following procedures, preferably done on patients under supervision initially and then independently. (pg. 36-37)

3. Annual Grand Meeting

Once a year all residents enrolled for MS Urology should be invited to the annual meeting at UHS Lahore.
One full day will be allocated to this event. All the chief residents from affiliated institutes will present their annual reports. Issues and concerns related to their relevant courses will be discussed. Feedback should be collected and suggestions should be sought in order to involve residents in decision making.
The research work done by residents and their literary work may be displayed.
In the evening an informal gathering and dinner can be arranged. This will help in creating a sense of belonging and ownership among students and the faculty.

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 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
- 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.

MS Urology Examinations

Intermediate Examination M.S. Urology

Total Marks: 500

All candidates admitted in MS Urology course shall appear in Intermediate examination at the end of second calendar year.

At the end of 2nd year Calendar of the programme

Written Examination	= 300 Marks
Clinical, TOACS/OSCE & ORAL	= 200 Marks

Written:

MCQs 100 (2 marks each MCQ)

SEQs 10 (10 Marks each SEQ)

Total = 300 Marks

Principles of General Surgery	= 70 MCQs	7 SEQs
Specialty specific	= 10 MCQs	1 SEQs
Basic Sciences	= 20 MCQs	2 SEQs
Anatomy	= 6 MCQs	1 SEQs
Pharmacology	= 2 MCQs	-------
Pathology	= 6 MCQs	1 SEQ
Physiology	= 2 MCQs	-------

Clinical, TOACS/OSCE & ORAL

Four Short Cases	= 100 Marks
One Long Case	= 50 Marks
TOACS/OSCE & ORAL	= 50 Marks

Total = 200 Marks

Final Examination MS Urology
Total Marks: 1500

All candidates admitted in MS Urology course shall appear in Final examination at the end of structured training programme (end of 5th calendar year) and after clearing Intermediate examination.

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

Topics included in paper 1
General Urology

Topics included in paper 2
Special Urology

Components of Final 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	

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

Oral **80 Marks**

Clinical, TOACS/OSCE & ORAL	**500 Total Marks**
Four short cases	200 Marks
One long case:	100 Marks
Clinical, TOACS/OSCE & ORAL	200 Marks
Continuous Internal Assessment	**100 Marks**

Final MS Urology
Thesis Examination
Total Marks: 400

All candidates admitted in MS Urology course shall appear in thesis examination at the end of 5th year of the MS programme. The examination shall include thesis evaluation with defense.

RECOMMENDED BOOKS

1. General Pathology by J.B Walter & M.S. Israel published by Churchill Living stone.
2. Physiology - Board Review series by Linda S. Costanza
3. Anatomy: Regional and Applied by R.J. Last
4. Langman's Medical Embryology T.W. Sadler
5. Short Practice of Surgery by Bailey & Love Published by Chapman and Hall.
6. Essential Surgical Practice Vol: 1 by Cuschieri published by Butterworth Heimann
7. Smith's General Urology
8. Camp bell's Urology
9. Scientific Foundations of Urology
10. Scheward's Surgery
11. Fathalla M. F. and Fathalla M. M. F. A Practical Guide
12. for Health Researcher. Cairo: World Health Organization; 2004.
13. Rana M. H., Ali S. Mustafa M. A Handnook of Behavioural Sciences for Medical and Dental Students. Lahore: University of Health Science; 2007.

APPENDIX "E"

(See Regulation 9-ili)

MANDATORY WORKSHOPS

1. Each candidate of MD/MSiMDS program would attend the 04 mandatory works ops 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. Communication Skills
   d. Introduc on to Computer / Information Technology a'ld so re programs

3. The workshops will be held on 03 ?n! ly basis.
4. An appropriate fee for each workshop will be charged.
5. Each workshop will be of 02 - 05 days duration.
6. Certificates of attendance will be issued upon satisfactory completion of worksho s.

APPENDIX "F"
(See Regulation 9xxili, 13, 14 & 16)

CONTINUOUS INTERNAL ASSESSMENTS

a) Workplace Based Assessments

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

Generic Competency Training & Assessments

The Candidates of all MD / MS / MDS programs will be trained and assessed i1 the following five generic competencies.

i Patient Care.

a. Patient care competency will include skills of history ta ing, exa:mination, diagnosis, plan of investigation, clinical judgrnent, pl n of treatment, consent, counseling, plan of follow up, communication with patient / relatives and staff.

b. The candidate shall learn patient care through ward teac ing, 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 pr sentati n of cases on clinical ward rounds, scenario based discussions on patient management, multisource feedback evaluation, Direct Observatidn of Procedures (OOPS) and operating room assessments.

d. These methods of assessments will have equal weightage.

ii. Medical Knowledge. and Research

a. The candidate will learn basic factual knowledge of iflnesses relev nt to the specialty through lectures/discussions on topics selected fro"' the syllabus, small group tutorials and bed side rounds.

b. The medical knowledge/skill wili be ssessed by the teacher dpring

c. The candidate will be trained in designing research project, Ldata collection, data analysis and presentation of results by the supervispr.

d. The acqutsition of research skill will be assessed as per regula,ions governing thesis evaluation and its acceptance.

iii. Practice and System Based Learning

a. This competency will be learnt from journal cfubs, review of literafure 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 pre$entation of ;udit projects if any.

c. These methods of assessment shall have equal weight-age.

iv. Communication Skills

a. These will be learnt from role models, supervispr and wor:kshops.

b. They will be assessed by direct observation of the candidate hilst inter.acting with the patients, relatives, colleagu s and ith ":' l is rce feedback evaluation.

v. Professionalism as per Hippocratic Oath

a. This competency is learnt from sup rvisor acting as a role model, et ical case conferences and lectures on ethical issues such as confidentiality, inf rmed consent, end of life decisjons, onflict of intere t. h ras$ ent and use of human subjects in research.

b. The assessment of residents will be through multisource feedpack evaluation according to proformas of evaluation and it · scoring met od.

ecialty Specific Competencies

i. The candidates will be trained in operative and procedural skills according to a quarterly based schedule.

ii. The level of procedural competen
will be according to a competency table to be developed by each s cial.

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
Th candidate operating or performing a procedure uhder dir t supervision

d. Level 4 Performed independently
The candidate operating or performing a pro ure without any superVision

iv. Procedure Based Assessments (PBA)

a. Procedural competency will assess the skill of consent taking, preoperative preparation and planning, intraoperative gener f:: 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 supervistors, consultant colleagues and senior residents.

d. The standardi ed forms will be filled in by the assessor after direct observation.

e. The resident's evaluation will be gr ded as satisfacto,Y, d ficient requiring further training and not assess at all.

f. . Assessment report will be sub1

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

Multisource Feedback Evaluation

r. The supervisor would ensure a multisource feedback to called peer assessments in medical knowledge, clinical skills, communication skills professionalism, integrity, and responsibility.

ii. Satisfactory annual reports will be required to become eligible for the final examination

b) Completion Of Candidate's Training Portfolio

i. The C ndidate's Training Portfolio (CTP) will be published (or computer b sed portfolio downloadable) by the university.

ii. The ca.ndidates would either purchase the CTP or download it from the K MU web site.

iii. The portfolio *will* consist of the following components

a) Enrollment details .

b) Candic;jate's credentials as submitted on the applicatio for admission form.

c) Timeline of scheduled activities e.g dates of c9m encernent and completion of training, submission of synopsis and t esis, assessments and examination dates etc (Appendix H)

d) Log Book of case presentations, Operation and pfocedvres recorded in an appropriate format and validated by the supervisor:

e) Record of participation and presentations in academic activi ies e:9 lectures, workshops, journal clubs, clinical audit projects, morbidity & mortality review meetings, presentation in house as well as n tional and international meetings.

f) Record of Publications if any.

g) Record f results of asse$sment and ex nilnations if any .

h) Synopsis submission proforma and IRB proforma and A &RB approvalletter

i) Copy of Synopsis as approved by AS&RB

iv. Candidates Training Portfolio sha\1 be assessed as per proforma given in

"Appendix-G".

ervisor's Annual Review Re ort.

This report will consist of the following components :-

i. Verification and validation of Log Book of operations & pro ur.es according to the expect number of operations and pro ure's performed (as per levels of co petence) determined by relevant tf>ard of studies.

ii. A 90 % attendance in academic activities is expected. The acad mic activities will indude: Lectures, Workshops other than mand tory workshop , Journal 'Clubs, Morbidity & Mortality Review Meeting and Other presentations.

iii. Assessment report of presentations and lectures

iv. Compliance Report to meet timeline for completi<m of research proj ct.

v. Compliance Report on Personal Development P{an.

vi. Multisource Feedback Report, on relationship- with co11eagues, pati;mts.

vii. Supervisor will produce an annual report based on assessments •per proforma in appendix-G and submit it *tp* the Ex !'Tlin l) .DeP,artOJ !lt.

viii. 75% score will be required to pass the Continuous Internal Assesf\ment 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	
• Medical Error Investigation and Root Cause Analysis	04	
• *Audit Projects*	*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

- P

unctuality and time keeping	04
• Patient doctor relationship	04
• Relationship with colleagues	04
• Awareness of ethical issues	04
• Honesty and integrity	04

2. Specialty specific competencies

Please score from 1 – 100. 75% shall be the pass marks

Score achieved

Operative 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	26	
ii. Record of participation and presentation in academic activities	2"5	
iii. Record of publications	25	
iv. Record of results of assessments and examinations	25	