SRI DEVARAJ URS ACADEMY OF HIGHER EDUCATION AND RESEARCH
(A Deemed to be University Declared under Section 3 of UGC Act, 1956)
Comprising Sri DevarajUrs Medical College
[Constituent Unit of Sri DevarajUrs Educational Trust for Backward Classes (Regd.)]
TAMAKA, KOLAR-563103, KARNATAKA, INDIA
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(With effect from 2019-2020 batches)

Competency Based Postgraduate Curriculum for Doctor of Medicine Pathology

Dean Faculty Of Medicine
Sri Devaraj Urs Academy of Higher
Education & Research, Tamaka, Kolar.

Approved as per BOM-56-2019, (Resolution No-LVI.06) Dated-20/12/2019

REGULATIONS GOVERNING

POST GRADUATE DEGREE PROGRAMMES

CURRICULUM 2019-2020

SRI DEVARAJ URS ACADEMY OF HIGHER EDUCATION AND RESEARCH

Comprising Sri Devaraj Urs Medical College

A Deemed To Be University

Declared under section 3 of UGC, Act,1956,
MHRD GOI NO.F,9-36/2006-U.3(A), Dt.25th may 2007
Post box No.62, Tamaka, Kolar-563101, Karnataka, INDIA
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REGULATIONS AND CURRICULA
FOR
POST GRADUATE DEGREE PROGRAMMES
IN
MEDICAL SCIENCES
2019-2020

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Edition Year: 2020 **Published by SDUAHER**

VISION:

"UNIVERSITY OF EXCELLENCE - KNOWLEDGE FOR POSTERITY"

MISSION:

1. To be a global centre of excellence for Teaching, Training and Research in the field of Higher education.
2. To inculcate scientific temper, research attitude and social accountability amongst faculty and students.
3. To promote with value based education for the overall personality development and leadership qualities to serve the humanity.

OBJECTIVES:

1. To provide need based infrastructure and facilities to students to become responsible professionals with social commitment and accountability.
2. To implement effectively innovative programs in teaching learning and evaluation.
3. To impart scientific and socio cultural temperament among students to forge national identity and needs.
4. To provide instruction and training in Basic and advanced branches of learning.
5. To provide facilities for research for the advancement and dissemination of knowledge.
6. To undertake extra mural studies, consultancy, extension programmes and field outreach services for the development of society.
7. To collaborate with other Universities, Institutions of excellence and research organizations within the country and outside for the purpose of teaching, training and research.
8. To undertake need based activities for the betterment of socially and educationally backward society.

At a glance this logo is abstract, yet it contains the vital ingredients for an institution like Sri Devaraj Urs Academy of Higher Education and Research, Tamaka, Kolar.

The institution's medical background, Humanitarian values, Compassion,

Approachability, Social Commitment and the subsequent research towards the most precious thing, the human life, is the core theme.

The graphic form of a person in the centre of a bud represents the humanity. It denotes the growing process of life and its existence. And the two hands safeguarding them show the care and a sense of security. It is also capable of holding something within the vast expanse of knowledge by the University for the People's benefit. Hence, the motto "Knowledge for Posterity" is very appropriate and gives a punch in Red. The four light blue half circles (smaller to bigger) depict the unending quest for knowledge and imparting it to a wider horizon, growing higher and higher.
And finally, the whole unit is embedded in a "D" shaped graphic template as background to give it a corporate identity.

COLORS USED:

Deep Blue: Credible, Confident and Dependable. Represents Peace, Tranquility, Stability, Harmony, Trust, Security, Cleanliness and Loyalty

Light Blue: For Sky and Water (color scheme for 4 half circles)

Red: A dominant color for strengths.

Green: For Nature, Health and Generosity. It is cool quality soothes and has great healing powers

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No. SDUAHER/KLR/ADMN/1322/2020-21 Date:12/10/2020

NOTIFICATION

Sub: Regulations, curricula and syllabi of Postgraduate medical degree programmes in Preclinical, Paraclinical and clinical subjects- reg

Ref.

I. **Proceedings of the Academic Council meetings**
II. **Proceeding of the Board of Management meetings**
III. **MCI notifications**
IV. **SDUAHER notification:**

Academic Council Meetings		**Board of Management Meetings**	
19th	17.11.2014	34th	19.06.2015
21st	25.04.2015	36th	04.12.2015
22nd	18.11.2015	44th	23.06.2017
27th	29.04.2017	45th	09.11.2017
28th	04.11.2017	48th	20.06.2018
30th	05.05.2018	50th	22.12.2018
31st	03.11.2018	54th	06.07.2019
33rd	04.06.2019	56th	20.12.2019
34th	15.11.2019	59th	09.10.2020
36th	30.09.2020		

Agenda discussed:

- Objectives of external postings of Post Graduates
- Internal & External postings of PG's with assessment tools
- Minimum marks to be scored in PG theory examinations
- Topics to be included in Forensic medicine and toxicology in paper 4 for PG students
- Work placed based assessment for PG students
- Introduction of Assessment of AETCOM in formative/summative assessment
- Design and development of E-portfolio for all PG's
- Patient handover as common EPA for all departments
- Preparation of Question paper from question bank using software

- Coding of answer booklet by software enabled barcoding
- Development of CBME in PG programmes
- Quarterly formative assessment as an assessment tool for all PGs
- Start course in MD psychiatry
- Implement E- Portfolio of PG's
- Discontinuation of practice for 5th evaluation in PG exam
- Post graduate training programme MCI-PG Medical Education Regulations 2000, amended upto May 2018
- Approval of EPA's as competency based medical training for PG's
- Work placed based assessment as part of quarterly assessment for PG's
- PLO's for all programmes

V. MCI Notifications

- MCI Notification dated 09-12-2009, vide No.MCI.18(1)/2009-Med.55455
- No. MCI-23(1)/2014/Med/153433 Dated 28-01-2015
- MCI Guidelines 2017(CBME based)
- MCI postgraduate medical education regulations 2000 amended upto 2018
- (clause 13.2,gazette notification dated 05/04/2018)
- Basic Programme in Biomedical Research(MCI-23(1)/2019-Med./141602 dated 27-08-2019).
- MCI-12(2)/2019-Med.Misc./189334.- Dated:12th February 2020
- MCI-18(1)/2020-Med./121415.-date 16/09/2020- (District Residency Programme' (DRP)

VI. Office Memorandum No. SDUAHER / KLR/ ADMN /8071/2019- 20 Dated 22/06/2019

VII. SDUAHER / KLR/ ADMN /1571/2019-20 dated 12/09/2019

REGULATIONS FOR POST GRADUATE DEGREE PROGRAMME IN MEDICAL SCIENCES

CHAPTER- I

1. Branches of Study

1.1 Postgraduate Degree Programme
The following programmes may be pursued.

A. M.D. (Doctor of Medicine)

1. Anatomy
2. Physiology
3. Biochemistry
4. Pharmacology
5. Pathology
6. Microbiology
7. Forensic Medicine
8. Community Medicine
9. General Medicine
10. Dermatology, Venereology and Leprosy
11. Anesthesiology
12. Paediatrics
13. Radio-Diagnosis
14. Psychiatry

B. M.S. (Master of Surgery)

1. General Surgery
2. Obstetrics and Gynecology
3. Orthopedics
4. Ophthalmology
5. OTO-Rhino-Laryngology

1.2. Eligibility for Admission

1.2.1 MD / MS Degree Programme: A candidate affiliated to this academy and who has passed final year M.B.B.S. examination after pursuing a study in a medical college recognised by the Medical Council of India, from arecognised Medical College affiliated to any other Academy recognised as equivalent thereto, and has completed one year compulsory rotating internship in a teaching Institution or other Institution recognised by the Medical Council of India, and has obtained permanent registration of any State Medical Council will be eligible foradmission.

1.2.2 A Candidate seeking admission should have successfully cleared the qualifying examination – NEET (National Eligibility cum Entrance Test) conducted by NBE (National Board of Examination).

1.3. Obtaining Eligibility Certificate by the Academy before making Admission

No candidate will be admitted for any postgraduate degree programme unless the candidate has obtained and produced the eligibility certificate issued by the Academy. The candidate has to make an application to the Academy with the following documents along with the prescribed fee:

1. S.S.L.C Marks card
2. 10+2 Certificate
3. All MBBS Marks Cards
4. Internship Completion Certificate
5. Attempt / Academic certificate
6. Degree Certificate
7. Transfer Certificate
8. Migration Certificate
9. Study/Bonafide Certificate
10. Character & Conduct certificate
11. MCI Recognisized Certificate by college
12. Karnataka Medical Council/State medical council
13. MCC Allotment Letter
14. NEET Admission Ticket
15. NEET Rank card
16. Caste (SC/ST) /OBC certificate (domicile) & Income Certificate
17. Aadhar card of both candidate and parents / sponsors
18. Bond for SR Ship
19. Remaining years fee bond

NOTE: The NRI/NRI Sponsor students have to submit the documents as per the MCC/DGHS Criteria for NRI status

Candidates should obtain the Eligibility Certificate before the last date for admission as notified by the Academy.

A candidate who has been admitted to postgraduate programme should register his / her name in the Academy within a month of admission after paying the registration fee.

1.4. Intake of Students

The intake of students to each programme will be in accordance with the ordinance in this behalf.

1.5. Duration of Study

a) M.D /M.S Degree Programme

The programme of study will be for a period of 3 years consisting of 6 academic terms.

1.6. Method of training

The training of postgraduate for degree will be residency pattern with graded responsibilities in the management and treatment of patients entrusted to his/her care. The participation of the students in all facets of educational process is essential. Every candidate should participate in seminars, group discussions, grand rounds, case demonstration, clinics, journal review meetings, CPC and clinical meetings. Every candidate should participate in the teaching and training programme of undergraduate students. Training includes involvement in laboratory and experimental work and research studies.

1.6.1. Teaching methodology

1.6.1.1 Includes Didactic lectures, small group discussion such as seminars, journal clubs, symposia, reviews and guest lectures for acquiring theoretical knowledge.

1.6.1.2 Bedside teaching, grand rounds, structured interactive group discussions and clinical demonstrations should be the hallmark of clinical/practical learning with appropriate emphasis on e-learning. Student should have hand-on training in performing various procedures and ability tointerpret varioustests/investigations.

1.6.1.3 Exposure to newer specialized diagnostic/therapeutic procedures concerning her/his subject should be given.

1.6.4 Self-learning tools like assignments and case-based learning should be promoted.

1.6.2. Clinical postings and Rotation of posting

Basic medical sciences students will be posted to allied and relevant clinical departments or institutions. Students working in clinical departments will be posted to basic medical sciences and allied speciality departments or institutions. It should be done as concurrent studies during the 1st year of training Similarly Inter-unit rotation in the department should be done for a period of up to one year. Rotation in appropriate related subspecialties **should not extend for a period exceeding 06 months.** Postings to other specialty departments will be during the second year.

All postgraduates' students pursuing MD/MS in broad specialities shall undergo a compulsory residential rotation of three months in District Hospital / District Health system as a part of the course curriculum. Such rotation shall take place in the 3rd or 4th or 5th semester of the postgraduates programme. This rotation shall be termed as District residency programme and the postgraduate medical student undergoing training shall be termed as a District Resident.

Satisfactory completion of the District Residency shall be an essential condition before the candidate is allowed to appear in the final examination of the respective postgraduate course. The District Residency Programme Coordinator (DRPC) shall issue certificate of satisfactory completion of DRP and report on the performance of the District Resident on a prescribed format to the concerned Medical College and the Government of State/Union Territory. No. MCI-18(1)/2020-Med./121415.—date16/09/2020

1.6.3. Clinical meetings:

Clinical meetings will be conducted within the department weekly and also inter departmental meetings will be conducted monthly to discuss uncommon/interesting cases.

1.6.4 Log book:

Each student should maintain a logbook and document day to-day activities like documentation of ward work, teaching and learning activities , clinical case discussion, procedures performed , seminars, journal clubs, symposium ,CPC meets, inter-unit/interdepartmental teaching sessions, mortality meets, workshops, CME/conferences .The Log books will be checked and assessed periodically by the faculty members imparting the training. This will in turn be evaluated/assessed by an external reviewer appointed by the Director of PG Studies biannually during the months of July and January. The log book should be preserved and presented at the time of summative examinations conducted by the Academy.

1.6.5 Research activities:

1.6.5.1 The student should know the basic concepts of research methodology plan a research project and be able to retrieve information from the library. The student should have a basic knowledge of statistics.

1.6.5.2 A postgraduate student of a postgraduate degree programme in broad specialities should present one poster presentation, read one paper at a national/state conference and publish one research paper which should be published /accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination. MCI Notification No.18(1)/2009/ medicine/55455 Dated:09-12-2009

1.6.5.3 Department should encourage e-learning activities.

1.6.6 Basic Programme in Biomedical Research:

In order to improve the research skills of post-graduate students, the Board of Governors (BoG) has recommended a uniform research methodology programme across the country, the online programme, "Basic programme in Bio-medical Research", will be offered by ICMR-National Institute of Epidemiology (ICMR-NIE), Chennai (www.nie.gov.in). The programme will explain fundamental concepts in

Research methodology. This programme is being offered through SWAYAM programme of ministry of human resource development through SWAYAM NPTEL (http://swayam.gov.in/nc details/NPTEL)

1.6.7 Synopsis and Dissertation:

Every candidate will submit to the Registrar of the Academy in the prescribed proforma, a synopsis containing particulars of proposed dissertation work within six months from the date of commencement of the programme on or before the dates notified by the Academy. The synopsis will be sent through the properchannel.

Such synopsis will be reviewed and the dissertation topic will be registered by the Academy. No change in the dissertation topic or guide will be made without prior approval of the Academy.

Every candidate pursuing MD/MS degree programme is required to carry out work on a selected research project under the guidance of a recognized post graduate teacher. The results of such a work will be submitted in the form of a dissertation.

The dissertation is aimed to train a post graduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis and comparison of results and drawingconclusions.

The dissertation should be written under the following headings:

- Introduction
- Aims or Objectives of study
- Review of Literature
- Material and Methods
- Results
- Discussion
- Conclusion
- Summary
- References
- Tables
- Annexures

The written text of dissertation will be not less than 50 pages and will not exceed 150 pages excluding references, tables, questionnaires and other annexures. It should be neatly typed in double line spacing on one side of paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. The dissertation will be certified by the guide, Head of the department and Head of theInstitution.

Six hard copies of dissertation and one soft copy thus prepared will be submitted to

the Controller of Examination (CoE), six months before final examination on or before the dates notified by the Academy.

The dissertation will be valued by examiners appointed by the Academy. Approval of dissertation work is an essential precondition for a candidate to appear in the Academy examination.

Guide: The academic qualification and teaching experience required for recognition by this Academy as a guide for dissertation work is as per Medical Council of India, Minimum Qualifications for Teachers in Medical Institutions Regulations, 1998. Teachers in a medical college/institution having a total of eight years teaching experience out of which at least four years teaching experience as Assistant Professor with at least one research publication in indexed journals gained after obtaining post graduate degree will be recognized as post graduate teachers. (No.MCI- 12(2)/2019-Med.Misc./189334.- Dated: 12th February 2020)

Co-guide: may be included provided the work requires substantial contribution from a sister department or from another medical institution recognized for teaching/training by Sri Devaraj Urs Academy /Medical Council of India. The co- guide will be a recognized post graduate teacher of Sri Devaraj Urs Academy.

Change of guide: In the event of a registered guide leaving the college for any reason or in the event of death of guide, guide may be changed with prior permission from the academy.

1.6.8 Journal Club:

Journal club will be conducted once a week. All the PG students are expected to attend and actively participate in discussion and enter the relevant details in the log book. Further, every candidate must make a presentation from the allotted journal(s), selected articles, at least four times a year and a total of 12 presentations in three years. The presentations would be evaluated using check lists and would carry weightage for internal assessment (See checklist - I in Chapter V). A time table with names of the student and the moderator should be announced periodically, (Quarterly).

1.6.9 Subject Seminar:

Subject seminar will be conducted once a week. All the PG students are expected to attend and actively participate in discussion and enter the relevant details in the log book, Further, every candidate must present selected topics at least four times a year and a total of 12 seminar presentations in three years. The presentations would be evaluated using check lists and would carry weightage for internal assessment (See checklist-II in Chapter V). A timetable for the subject with names of the student and the moderator should be announced periodically, (Quarterly).

1.6.10 Student Symposium:

Student Symposium as an additional inter departmental programme will be conducted periodically, once in three months. The evaluation may be similar to that described for subject seminar.

1.6.11 Ward Rounds:

Ward rounds are service or teaching rounds.

i. ***Service Rounds:*** Postgraduate students and Interns will do every day for the care of the patients. Newly admitted patients should be worked up.by the PGs and presented to the seniors the following day.

ii. ***Teaching Rounds:*** Every unit will have 'grand rounds' for teaching purpose.
A diary should be maintained for day to day activities by the students.
Entries of (i) and (ii) should be made in the Log book.

1.6.12 Clinico-Pathological Conference:

CPC will be conducted once in two months for all post graduate students. Presentation will be done by rotation. If cases are not available due to lack of clinical postmortems, it could be supplemented by published CPCs.

1.6.13 Inter Departmental Meetings:

These will be conducted once a month. These meetings will be attended by post graduate students and relevant entries must be made in the Log Book.

1.6.14 Teaching & Learning Skills:

Post graduate students must teach under graduate students (Eg. medical, nursing) by taking demonstrations, bed side clinics, tutorials, lectures etc.

Assessment is made using a checklist by surgery faculty as well as students. (See model checklist -III in Chapter V). Record of their participation should be documented in the Log book. Training of post graduate students in Educational Science and Technology is recommended.

Further, all postgraduate students are required to attend at least about 35 hours of didactic lecture as notified by the individual departments.

1.6.15 Entrustable Professional Activity:

EPAs are units of professional practice, defined as tasks or responsibilities to be entrusted to the unsupervised execution by a trainee once he or she has attained sufficient specific competence. EPAs are independently executable, observable, and measurable in their process and outcome, and therefore, suitable for entrustment decisions. The Entrustable professional activity (EPA) concept allows faculty to make competency-based decisions on the level of supervision required by trainees. The Academy has identified few such EPA's for all students in various degree programme. These are:

1. EPA 1: Gather a history and perform a physical examination

2. EPA 2: Prioritize a differential diagnosis following a clinical encounter
3. EPA 3: Recommend and interpret common diagnostic and screening tests
4. EPA 4: Obtain informed consent for tests and / or procedures
5. EPA 5: Recognize a patient requiring urgent or emergent care and initiate evaluation and management
6. EPA 6: Give or receive a patient handover to transition care responsibility
7. EPA 7: Undertake complete patient monitoring including the preoperative and post-operative care of the patient.
8. EPA 8: Provide basic and advanced lifesaving support services in emergency situations
9. EPA 9: Collaborate as a member of an inter-professional team
10. EPA 10: Perform general procedures of a physician
11. EPA 11: Enter and discuss orders and prescriptions
12. EPA 12: Prepare a comprehensive discharge summary.
13. EPA 13: Form clinical questions and retrieve evidence to advance patient care.

However in addition to these common EPA's individual departments are advised to develop their own EPA's.

1.7. Continuing Medical Education (CME):

Every PG student must attend at least 2 CME programes either at state/regional /zonal/national levels.

1.8. Conferences:

Attending conferences is optional. However it has to be encouraged. All students are encouraged to attend conferences (at state/national/international levels) to enable them to make paper/poster presentations, which is a mandatory requirement to fulfill before appearing for final examinations.

1.9. Attendance, Progress and Conduct:

- A candidate pursuing degree programme will work in the concerned department of the institution for the full period as a full time student. No candidate is permitted to run a clinic/laboratory/nursing home while studying postgraduate programme.
- Academic term of 6 months will be taken as a unit for the purpose of calculating attendance. The candidate should have 80% attendance in each academic term of 6 months.

- Every student will attend symposia, seminars, conferences, journal review meetings, grand rounds, CPC, case presentation, clinics and lectures during each year as prescribed by the department and not absent himself / herself from work without valid reasons.
- Every candidate is required to attend a minimum of 80% of the training during each academic term of the post graduate programme. Provided further, leave of any kind will not be counted as part of academic term without prejudice to minimum 80% attendance of training period every term.
- All the candidates joining the Post Graduate training programme will work as 'Full Time Residents' during the period of training and will attend not less than 80% (Eighty percent) of the imparted training during each academic term. Including assignments, full time responsibilities and participation in all facets of the education process.
- Any student who fails to complete the programme in the manner stated above will not be permitted to appear for the Academy Examinations.
- A Postgraduate student of a postgraduate degree programme would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published / accepted for publication/sent for publication during the period of postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
  Ref: As MCI Notification dated 09-12-2009, vide No.MCI.18 (1)/2009- Med.55455 and Para No.4.

Procedure for defaulters:

Every department will have a committee containing Head of the department and PG guides to review such situations. The defaulting candidate is counseled by the guide and head of the department. In extreme cases of default the departmental committee may recommend that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the, requirements in spite of being given adequate chances to set himself or herself right.

2 Monitoring Progress of Studies:

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring will be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Chapter V.

The learning out comes to be assessed should include:

- Personal Attitudes,
- Acquisition of Knowledge,
- Clinical and operative skills,
- Teaching skills and
- Dissertation.

a. Personal Attitudes:

The essential items are:

- Caring attitudes
- Initiative
- Organisational ability
- Potential to cope with stressful situations and undertake responsibility
- Trustworthiness and reliability
- To understand and communicate intelligibly with patients and others
- To behave in a manner which establishes professional relationships with patients and colleagues
- Ability to work in team
- A critical enquiring approach to the acquisition of knowledge

The methods used mainly consist of observation. It is appreciated that these items require a degree of subjective assessment by the guide, supervisors, self, peers, faculty from the unit and nurses. (Multi source feedback MSF)checklistXII

b. Acquisition of Knowledge:

The methods used comprise of

2.1 Log book: (Check List – XIII Chapter – V)

'Log Book' which records participation in various teaching / learning activities by the students. The number of activities attended and the number in which presentations are made must be recorded. The log book will periodically be validated by the supervisors. Some of the activities are listed. During the training period, the post graduate student should maintain a Log Book indicating various teaching / learning activities, duration of the postings/work done in Wards including super specialty, OPDs and Casualty. This should indicate the specified number of cases for clinical discussion, procedures and operations observed, assisted and performed /presented seminars and review articles from various journals in inter- unit/inter departmental teaching sessions.

The purpose of the Log Book is to:

- Help maintain a record of the work done during training,
- Enable Consultants to have direct information about the work; intervene if necessary,
- Use it to assess the experience gained periodically.

The log book will be used to aid the internal evaluation of the student.
The Log books will be checked and assessed periodically, monthly basis by guide / head of the unit/ head of the department and biannually by external reviewer.

Procedure for defaulters:
Every department will have a committee to review such situations. The "defaulting candidate is counseled by the guide and head of the department. In extreme cases of default the departmental committee will recommend that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the requirements in spite of being given adequate chances to set himself or herself right

2.2 Journal Review Meeting (Journal Club):
The ability to do literature search, in depth study, presentation skills, and use of audio-visual aids are to be assessed. The assessment is made by faculty members and peers attending the meeting using a checklist (see Model Checklist -I, in Chapter V)

2.3 Seminars / Symposia:
The topics will be assigned to the student well in advance to facilitate in depth study. The ability to do literature search, in depth study, presentation skills and use of audio- visual aids will be assessed using a checklist (see Model Checklist -II, Chapter V)

2.4 Clinico'-Pathological conferences:
This will be a multidisciplinary case study of an interesting case to train the candidate to solve diagnostic and therapeutic problems by using an analytical approach. The presenter(s) are to be assessed using a check list similar to that used for seminar.

2.5 Surgical Audit:
Periodic morbidity and mortality meeting must be held. Attendance and participation in these must be insisted upon. This may not be included in assessment.

2.6 Clinical skills
Day to Day work: Skills in outpatient and ward work will be assessed periodically. The assessment should include the candidates' sincerity and punctuality, analytical ability and communication skills (see Model Checklist -V, Chapter V). – Mini CEX (Model check list VII, Chapter V)

2.7 Clinical meetings (Clinical Presentations :) *:*
Candidates should periodically present cases to his peers and faculty members. This should be assessed using a check list (see Model checklist V, Chapter V).

2.8 Clinical and Operative skills:

The candidate will be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by DOPS (Model check list VI, Chapter V). Particulars are recorded by the student in the log book.

2.9 Teaching skills:

Post graduates are required to teach undergraduate medical students and paramedical students, if any *(as a part of Post graduate training)*. This performance should be based on assessment by the faculty members of the department and from feedback from the undergraduate students (See Model checklist III, Chapter V) - Microteaching Pedagogy (Model check list VIII, Chapter V)

2.10 Dissertation in the Department:

Periodic presentations must be made in the department. Initially the topic selected is to be presented before submission to the Academy for registration and again before finalization for critical evaluation and before final submission of the completed work (See Model Checklist IX & X, Chapter V)

2.11 Periodic tests:

The concerned departments will conduct quarterly tests. The final test will be held three months before the final examination. The tests may include written papers, practical's / clinical and viva voce. Records and marks obtained in such tests will be maintained by the Head of the Department and sent to the Academy, when called for.

2.12 Work diary / Log Book-

Every candidate will maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention must be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate.

2.13 Records:

Monthly and quarterly reviews of records, log books and marks obtained in tests will be maintained by the Head of the Department and will be made available to the Academy, when called for.

3. ASSESSMENT:

3.1 Formative Assessment

It is essential to monitor the learning progress of each candidate through **continuous appraisal and regular assessment.** It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring to be done by the staff of the department based on participation of students in various teaching /learning

activities. It may be structured and assessment be done using checklists that assess, various aspects. This includes assessment of patient care, procedural & academic skills, interpersonal skills, professionalism, self-directed learning and ability to practice in the system.

Checklists are given in Chapter-V

Assessment during the MS/MD training should be based on:

Assessment at end of rotation (Quarterly Postgraduate Student's Appraisal Form) by the Unit Head. The student to be assessed periodically as per categories listed in **Postgraduate Student Appraisal Form** (See Model checklist-X, Chapter V).

Multisource Feedback (MSF) – Quarterly

MSFs should be obtained quarterly from:- 2 from faculty of the unit/department; 2 from peers posted in the unit; 2 from interns,2 from staff nurses from the areas attached to the unit,2 from patient/patient relative. (Checklist XII – Chapter V)

Periodic assessment –The Quarterly tests may include written papers (theory), practical's / clinical and viva voce.

Quarterly Postgraduate Student's Appraisal Form (See Model checklist-X I, Chapter V).

- Journal based/ recent advances learning
- Patient based or Skill based learning
- Self-directed learning and teaching
- Departmental & interdepartmental learning activity
- External & Outreach activities/ Continuing Medical Education (CME)
- Attendance, Progress and Conduct

A candidate pursuing degree programme should work in the concerned department of the institution for the full period as a full time student. No candidate is permitted to run a clinic/laboratory/nursing home while studying postgraduateprogramme.

Academic term of 6 months will be taken as a unit for the purpose of calculating attendance. Every student will attend symposia, seminars, conferences, journal review meetings, grand rounds, CPC, case presentation, clinics and lectures during each year as prescribed by the department and not absent himself / herself from work without valid reasons.

Every candidate is required to attend a minimum of 80% of the training during each academic term of the post graduate programme. Provided further, leave of any kind will not be counted as part of academic term without prejudice to minimum 80% attendance of training period every term.

All the candidates joining the Post Graduate training programme will work as 'Full Time Residents' during the period of training and will attend not less than 80% (Eighty percent) of the imparted training during Academic Term of 6 months including assignments, full time responsibilities and participation in all facets of the education process.
Any student who fails to complete the programme in the manner stated above will not be permitted to appear for the Academy Examinations.

A Postgraduate student of a postgraduate degree programme in broad specialities/super specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published / accepted for publication/sent for publication during the period of postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
Ref: As MCI Notification dated 09-12-2009, vide No.MCI.18 (1)/2009-Med.55455 and Para No.4.

Procedure for defaulters:

Every department should have a committee containing Head of the department and PG guides to review such situations. The defaulting candidate is counseled by the guide and head of the department. In extreme cases of default the departmental committee may recommend that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the, requirements in spite of being given adequate chances to set himself or herself right.

3.2 Scheme of examinations

Summative assessment

The summative examination would be carried out as per the Rules given in POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000 and amended up to 2018. (The Clause 14 under the heading "EXAMINATION" shall be substituted in terms of Gazette Notification published on 05.04.2018).
The examination will be in three parts:

3.2.1 DISSERTATION

Every post graduate student will carry out work on an assigned research project under the guidance of a recognized Post Graduate Teacher, the result of which will be written and submitted in the form of a dissertation. Work for writing the dissertation is aimed at contributing to the development of a spirit of enquiry, besides exposing the candidate to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature. Dissertation will be submitted at

least six months before the Theory and Clinical / Practical examination. The dissertation will be examined by a minimum of three examiners; one internal and two external examiners, who will not be the examiners for Theory and Clinical examination. A candidate will be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the dissertation by the examiners.

3.2.2. THEORY

There will be four question papers, each of three hours duration. Each paper will consist of ten questions each question carrying 10 marks, so the total marks for each paper will be 100. Questions on recent advances maybe asked in any or all the papers. The examinations will be organised on the basis of 'Grading'or 'Marking system' to evaluate and to certify candidate's level of knowledge, skill and competence at the end of the training. The Clause 14 under the heading "EXAMINATION" shall be substituted in terms of Gazette Notification published on 05.04.2018 and the same is as under:-

Obtaining a minimum of 40% marks in each theory paper and not less than 50% cumulatively in all the four papers for degree examinations and three papers in diploma examination. Obtaining of 50% marks in Practical examination shall be mandatory for passing the examination as a whole in the said degree/diploma examination as the case may be. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately will be mandatory for passing examination as a whole. The examination for MS/MD will be held at the end of 3rd academic year.

3.2.3. Clinical / Practical and viva voce Examination

Clinical examination will be conducted to test the knowledge, skills, attitude and competence of the post graduate students for undertaking independent work as a specialist/Teacher, for which post graduate students will examine a minimum one long case and two short cases.

The Oral examination will be thorough and will aim at assessing the post graduate student's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty, which form a part of the examination.

Assessment may include Objective Structured Clinical Examination (OSCE) Oral/Viva-voce examination needs to assess knowledge on X-rays, instrumentation, operative procedures. Due weightage should be given to Log Book Records and day to-day observation during the training.

ALLOTMENT OF MARKS

THEORY	MARKS ALLOTMENT	MAXIMUM MARKS	
PAPER-I	10 X 10	100	400
PAPER-II	10 X 10	100	
PAPER-III	10 X 10	100	
PAPER-IV	10 X 10	100	

CLINICALS/ PRACTICALS		200
VIVA VOCE	80	100
PEDAGOGY	20	
TOTAL		**700**

3.2 Examiners:

There will be at least four examiners in each subject. Out of them two will be external examiners and two will be internal examiners. The qualification and teaching experience for appointment as an examiner will be as laid down by the Medical Council of India. No person will be appointed as internal examiner in any subject unless he/she has three years' experience as recognized PG teacher in the concerned subject. For external examiners he/she should have minimum six years of experience as recognized PG teacher in the concerned subject.

3.2.4 Criteria for declaring as pass in Academy Examination:

A candidate should score minimum 40% marks in each theory paper and not less than 50% marks cumulatively in all the papers in postgraduate degree/diploma, to be declared as pass in the examinations. A candidate shall secure not less than 50% marks in each head of passing which shall include (1) Theory, (2) Practical including clinical and viva voce examination. A candidate securing less than 50% of marks as described above shall be declared to have failed in the examination. (No. MCI-23(1)/2014/Med/153433 Dated 28-01-2015) A failed candidate may appear in any sub-sequent examination upon payment of fresh fee to the Registrar of the University.

3.2.5* Declaration of distinction*:

A successful candidate passing the Academy examination in first attempt will be declared to have passed the examination with distinction, if the grand total aggregate marks are 75 percent and above. Distinction will not be awarded for candidates passing the examination in more thanone attempt.

3.2.6 Number of Candidates per day.

The maximum number of candidates for practical/clinical and viva-voce examination will be as under: MD / MS Programme: Maximum of 8 per day

4. ELIGIBILITY CRITERIA FOR APPEARING FOR EXAMINATIONS 4.1 ATTENDANCE

All the candidates joining the Post Graduate training programme will work as 'Full Time Residents' during the period of training and will attend not less than 80% (Eighty percent) of the imparted training during Academic Term of 6 months including assignments, full time responsibilities and participation in all facets of the education process.

- Every student will attend all teaching programmes during each year as prescribed by the department and not absent himself / herself from work without valid reasons
- Every candidate is required to attend a minimum of 80% of the training during each academic year of the post graduate programme. Provided further, leave of any kind will not be counted as part of academic term without prejudice to minimum 80% attendance of training period every term.
- Any student who fails to complete the programme in the manner stated above will not be permitted to appear for the Academy Examinations.

4.2. PROGRESS AND CONDUCT

- Every student will attend symposia, seminars, conferences, journal review meetings, grand rounds, CPC, case presentation, clinics and lectures during each term as prescribed by the department and not absent himself / herself from work without valid reasons.
- Every candidate is required to attend a minimum of 80% of the training during each academic term of the post graduate programme. Provided further, leave of any kind will not be counted as part of academic term without prejudice to minimum 80% attendance of training period every term.

4.3. RESEARCH ACTIVITIES-PAPER/POSTER/PUBLICATIONS

- A Postgraduate student of a degree programme in broad speciality would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published / accepted for publication/sent for publication during the period of postgraduate studies so as to make him eligible to appear at the postgraduate degree examination. Ref: As MCI Notification dated 09-12-2009, vide No.MCI.18 (1)/2009-Med.55455 and Para No.4.
- It is mandatory for all postgraduate students to undergo training in online programme in "Basic Programme in Biomedical Research" Which should be completed by the end of second semester .Not completing the programme will make them ineligible for appearing for the final academy examinations.(MCI-23(1)/2019-Med./141602 dated 27-08-2019).

4.4 DISSERTATION

Every post graduate student will carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher, the result of which will

be written and submitted in the form of a dissertation. Dissertation will be submitted at least six months before the Theory and Clinical / Practical examination. The dissertation will be examined by a minimum of three examiners; one internal and two external examiners, who will not be the examiners for Theory and Clinical examination. A candidate will be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the dissertation by the examiners.

4.5 District Residency Programme

All postgraduates students pursuing MD/MS in broad specialties shall undergo a compulsory residential rotation of three months in District Hospital / District Health system as a part of the course curriculum. Such rotation shall take place in the 3rd or 4th or 5th semester of the postgraduates programme. This rotation shall be termed as District residency programme and the postgraduate medical student undergoing training shall be termed as a District Resident.

Satisfactory completion of the District Residency shall be an essential condition before the candidate is allowed to appear in the final examination of the respective postgraduate course. The District Residency Programme Coordinator (DRPC) shall issue certificate of satisfactory completion of DRP and report on the performance of the District Resident on a prescribed format to the concerned Medical College and the Government of State/Union Territory. No. MCI-18(1)/2020-Med./121415.—date 16/09/2020

Procedure for defaulters:

Every department should have a committee containing Head of the department and PG guides to review such situations. The defaulting candidate is counseled by the guide and head of the department. In extreme cases of default the departmental committee may recommend that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the, requirements in spite of being given adequate chances to set himself or herself right.

CHAPTER II

GOALS AND GENERAL OBJECTIVES OF POSTGRADUATE MEDICAL EDUCATION PROGRAM

GOALS:

The goal of postgraduate medical education will be to produce a competent specialist and /or a medical teacher:

i. Who will recognize the health needs of the community, and carry out professional obligations ethically and in keeping with the objectives of the national health policy;
ii. Who will have mastered most of the competencies, relating to the specialty, that are required to be practiced at the secondary and the tertiary levels of the health care delivery system:
iii. Who will be aware of the contemporary advances and developments in the discipline concerned;
iv. Who will have acquired a spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology; and
v. Who will have acquired the basic skills in teaching of the medical and paramedical professionals.

GENERAL OBJECTIVES:

At the end of the postgraduate training in the discipline concerned the student will be able to:

i. Recognize the importance of the concerned specialty in the context of the health need of the community and the national priorities in the health sector.
ii. Practice the specialty concerned ethically and in step with the principles of primary health care.
iii. Demonstrate sufficient understanding of the basic sciences relevant to the concerned specialty.
iv. Identify social, economic, environmental, biological and emotional determinants of health in a given case, and lake them into account while planning therapeutic, rehabilitative, preventive and promotive measures/strategies.
v. Diagnose and manage majority of the conditions in the specialty concerned on the basis of clinical assessment, and appropriately selected and conducted investigations.
vi. Plan and advice measures for the prevention and rehabilitation of patients suffering from disease and disability related to the specialty.
vii. Demonstrate skills in documentation of individual case details as well as morbidity and mortality data relevant to the assigned situation,
viii. Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behavior in accordance with the societal norms and expectations.
ix. Play the assigned role in the implementation of national health programmes, effectively and responsibly.

x. Organize and supervise the chosen/assigned health care services demonstrating adequate managerial skills in the clinic/hospital or the field situation.
xi. Develop skills as a self-directed learner, recognize continuing educational needs; select and use appropriate learning resources.
xii. Demonstrate competence in basic concepts of research methodology and epidemiology, and be able to critically analyse relevant published research literature.
xiii. Develop skills in using educational methods and techniques as applicable to the teaching of medical/nursing students, general physicians and paramedical health workers.
xiv. Function as an effective leader of a health team engaged in health care, research or training.

STATEMENT OF THE COMPETENCIES

Keeping in view the general objectives of postgraduate training, each disciplines will aim at development of specific competencies, which will be defined and spelt out in clear terms. Each department will produce a statement and bring it to the notice of the trainees in the beginning of the programme so that he or she can direct the efforts towards the attainment of these competencies.

COMPONENTS OF THE PG CURRICULUM

The major components of the PG curriculum will be:

- Theoretical knowledge
- Practical/clinical Skills
- Training in Thesis.
- Attitudes, including communication.
- Training in research methodology.

Source: Medical Council of India, Regulations on Postgraduate Medical Education, 2006 and 2008.

COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR M.D. PATHOLOGY

PREAMPLE:

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training. This programme is meant to standardize Pathology teaching at postgraduate level so that it will benefit in creating suitable manpower with appropriate expertise. The post graduate student should be trained in handling and processing histopathology, clinical pathology, microbiology, biochemistry and transfusion medicine samples with knowledge of general principles and methodology.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment.

GOAL:

The main goal of this course is to create pathology specialists who would provide high quality health care and advance the cause of science through research & training.

SUBJECT SPECIFIC LEARNING OBJECTIVES

The learning objectives in the cognitive, psychomotor and affective domains are:

I. Cognitive Domain

1. Diagnose routine and complex clinical problems on the basis of histopathology (surgical pathology) and cytopathology specimens, blood and bone marrow examination and various tests of Laboratory Medicine (clinical pathology, clinical biochemistry) as well as Blood Banking (Transfusion Medicine).
2. Interpret and correlate clinical and laboratory data so that clinical manifestations of diseases can be explained.
3. Advise on the appropriate specimens and tests necessary to arrive at a diagnosis in a problematic case.
4. Correlate clinical and laboratory findings with pathology findings at autopsy, identify miscorrelations and the causes of death due to diseases (apart from purely metabolic causes).
5. Should be able to teach Pathology to undergraduates, postgraduates, nurses and paramedical staff including laboratory personnel.
6. Plan, execute, analyze and present research work.

7. Make and record observations systematically and maintain accurate records of tests and their results for reasonable periods of time. Identify problems in the laboratory, offer solutions thereof and maintain a high order of quality control.
8. Capable of safe and effective disposal of laboratory waste.
9. Able to supervise and work with subordinates and colleagues in a laboratory.

II. Affective Domain

1. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.
2. Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.
3. Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

III. Psychomotor Domain

1. Able to perform routine tests in a Pathology Laboratory including grossing of specimens, processing, cutting of paraffin and frozen sections, making smears, and staining.
2. Able to collect specimens by routinely performing out-patient procedures such as venipuncture, finger-prick, fine needle aspiration of superficial lumps and bone-marrow aspirates, and provide appropriate help to colleagues performing an invasive procedure such as a biopsy or an imaging guided biopsy.
3. Perform an autopsy, dissect various organ complexes and display the gross findings.
4. Should be familiar with the function, handling and routine care of Equipment's in the laboratory.

SUBJECT SPECIFIC COMPETENCIES

A. Cognitive domain

A post graduate student upon successfully qualifying in the MD (Pathology) examination should have acquired the following broad theoretical competencies and should be:

1. Capable of offering a high quality diagnostic opinion in a given clinical situation with an appropriate and relevant sample of tissue, blood, body fluid, etc. for the purpose of diagnosis and overall wellbeing of the ill.
2. Able to teach and share his knowledge and competence with others. The student should be imparted training in teaching methods in the subject which may enable the student to take up teaching assignments in Medical Colleges/Institutes.
3. Capable of pursuing clinical and laboratory based research. He/she should be introduced to basic research methodology so that he/she can conduct fundamental and applied research.

B. Affective domain

1. The student will show integrity, accountability, respect, compassion and dedicated patient care. The student will demonstrate a commitment to excellence and continuous professional development.
2. The student should demonstrate a commitment to ethical principles relating to providing patient care, confidentiality of patient information and informed consent.
3. The student should show sensitivity and responsiveness to patients' culture, age, gender and disabilities.

C. Psychomotor domain

At the end of the course, the student should have acquired skills, as described below:

Surgical pathology Skills

- Given the clinical and operative data, the student should be able to identify, and systematically and accurately describe the chief gross anatomic alterations in the surgically removed specimens and be able to correctly diagnose at least 80% of the lesions received on an average day from the surgical service of an average teaching hospital.
- A student should be able to demonstrate ability to perform a systematic gross examination of the tissues including the taking of appropriate tissue sections and in special cases as in intestinal mucosal biopsies, muscle biopsies and nerve biopsies, demonstrate the orientation of tissues in paraffin blocks.

- The student should be able to identify and systematically and accurately describe the chief histomorphological alterations in the tissue received in the surgical pathology service. He/she should also correctly interpret and correlate with the clinical data to diagnose at least 90% of the routine surgical material received on an average day.
- Be conversant with automatic tissue processing machine and the principles of its running.
- Process a tissue, make a paraffin block and cut sections of good quality on a rotary microtome.
- Stain paraffin sections with at least the following:

    (i) Haematoxylin and eosin
    (ii) Stains for collagen, elastic fibers and reticulin
    (iii) Iron stain
    (iv) PAS stain
    (v) Acid fast stains
    (vi) Any other stains needed for diagnosis.

- Demonstrate understanding of the principles of:
    (i) Fixation of tissues
    (ii) Processing of tissues for section cutting
    (iii) Section cutting and maintenance of related equipment
    (iv) Differential (special) stains and their utility
- Cut a frozen section using cryostat, stain and interpret the slide in correlation with the clinical data provided.
- Demonstrate the understanding of the utility of various immuno-histochemical stains especially in the diagnosis of tumour subtypes.

Cytopathology Skills

- Independently prepare and stain good quality smears for cyto-pathologic examination.
- Be conversant with the techniques for concentration of specimens: i.e. various filters, centrifuge and cyto-centrifuge.
- Independently be able to perform fine needle aspiration of all lumps in patients; make good quality smears, and be able to decide on the types of staining in a given case.
- Given the relevant clinical data, he/she should be able to independently and correctly:
    i. Diagnose at least 75% of the cases received in a routine laboratory and categorize them into negative, inconclusive and positive
    ii. Demonstrate ability in the technique of screening and dotting the slides

for suspicious cells.

iii. Indicate correctly the type of tumour, if present.

iv. Identify with reasonable accuracy the presence of organisms, fungi and parasites

Hematology Skills

- Correctly and independently perform the following special tests, in addition to doing the routine blood counts:
  i) Haemogram including reticulocyte and platelet counts.
  ii) Bone marrow staining including stain for iron
  iii) Blood smear staining
  iv) Cytochemical characterization of leukemia with special stains like Peroxidase, Leukocyte Alkaline Phosphatase (LAP), PAS, Sudan Black, etc
  v) Hemolytic anemia profile including HPLC, Hb electrophoresis etc.
  vi) Coagulation profile including PT, APTT, FDP.
  vii) BM aspiration and BM biopsy

- Demonstrate familiarity with the principle and interpretation of results and the utility in diagnosis of the following:
  (i) Platelet function tests including platelet aggregation and adhesion and PF3 release
  (ii) Thrombophilia profile: Lupus anticoagulant (LAC), Anticardiolipin Antibody (ACA), Activated Protein C Resistance (APCR), Protein C (Pr C), Protein S (Pr S) and Antithrombin III (ATIII)
  (iii) Immunophenotyping of leukemia
  (iv) Cytogenetics
  (v) Molecular diagnostics.

- Describe accurately the morphologic findings in the peripheral and bone marrow smears, identifying and the morphologic abnormalities in disease states and arriving at a correct diagnosis in at least 90% of the cases referred to the Hematology clinic, given the relevant clinical data.

Laboratory Medicine Skills

- Plan a strategy of laboratory investigation of a given case, given the relevant clinical history and physical findings in a logical sequence, with a rational explanation of each step; be able to correctly interpret the laboratory data of such studies, and discuss their significance with a view to arrive at a diagnosis.
- Demonstrate familiarity with and successfully perform:

(i) Routine urinalysis including physical, chemical and microscopic, examination of these sediment.
(ii) Macroscopic and microscopic examination of feces and identify the ova and cysts of common parasites.
(iii) A complete examination: physical, chemical and cell content of Cerebrospinal Fluid (C.S.F), pleural and peritoneal fluid.
(iv) Semen analysis.
(v) Examination of peripheral blood for commonly occurring parasites.

- Independently and correctly perform at least the following quantitative

Estimations by manual techniques or automated techniques:

(i) Blood urea

(ii) Blood sugar

(iii) Serum proteins (total and fractional)

(iv) Serum biIirubin (total and fractional)

- Demonstrate familiarity with the following quantitative estimations of blood/ serum by Automated Techniques: Serum cholesterol, Uric acid, Serum Transaminases (ALT and AST/SGOT and SGPT), etc.
- Prepare standard solutions and reagents relevant to the above tests, including the preparation of normal solution, molar solution and buffers.
- Explain the principles of Instrumentation, use and application of the instruments commonly used in the labs eg. Photoelectric colorimeter, Spectrophotometer, pH meter, Centrifuge, Electrophoresis apparatus, ELISA Reader, flow cytometer, PCR, chemi-luminiscence.

Transfusion Medicine Skills

The student should be able to correctly and independently perform the following:

- Selection and bleeding of donors
- Preparation of blood components i.e. Cryoprecipitate, Platelet concentrate, Fresh Frozen Plasma, Single Donor Plasma, Red Blood Cell concentrates.
- ABO and Rh grouping
- Demonstrate familiarity with Antenatal and Neonatal workup.
  (i) Direct antiglobulin test
  (ii) Antibody screening and titer
  (iii) Selection of blood for exchange transfusion
- Demonstrate familiarity with principle and procedures involved in:

(i) Resolving ABO grouping problems.

(ii) Identification of RBC antibody.

(iii) Investigation of transfusion reaction.

(iv) Testing of blood for presence of:

(a) HBV (Hepatitis B Virus Markers). HCV (Hepatitis C Virus Markers)

(b) HIV (Human Immunodeficiency Virus Testing)

(c) VDRL

(d) Malaria

(e)

Immunohistochemistry

Skills (Desirable)

- Be able to perform immuno-histochemical staining using paraffin section with at least one of the commonly used antibodies (Cytokeratin or LCA) using PAP method.

SYLLABUS:

Course contents:

The study of Pathologic Anatomy includes all aspects of Pathology as encompassed in the branches of General and Systemic Pathology. Only the broad outlines are provided.

A) General Pathology:

Normal cell, tissue structure and functions. The changes in cellular structure and function in diseases. Causes of disease and its pathogenesis. Reaction of cells, tissues, organ systems and the body as a whole to various sub lethal and lethal injuries.

B) Systemic Pathology:

The study of normal structure and function of various organ systems and the aetio-pathogenesis, gross and microscopic alterations of structure of these organ systems in disease and functional correlation with clinical features.

C) Haematology

The study of Haematology includes all aspects of the diseases of the blood and bone marrow. This would involve the study of the normal, and the causes of diseases and the changes thereof.

1) Laboratory Medicine (Clinical Biochemistry/Clinical Pathology including Parasitology).

2) Transfusion Medicine (Blood Banking).

3) The student is expected to acquire a general acquaintance of techniques and principles and to interpret data in the following fields.

   a) Immunopathology
   b) Electronmicroscopy
   c) Histochemistry
   d) Immunohistochemistry
   e) Cytogenetics
   f) MolecularBiology
   g) Maintenance ofrecords
   h) Information retrieval, use of Computer and Internet inmedicine.
   i) Quality control, wastedisposal

Surgical Pathology Knowledge

- The student should be able to demonstrate an understanding of the histogenetic and patho-physiologic processes associated with various lesions.
- Should be able to identify problems in the laboratory and offer viable solutions.

Autopsy Pathology Knowledge

- Should be aware of the technique of autopsy.
- Should have sufficient understanding of various disease processes so that a meaningful clinico-pathological correlation can be made.
- Demonstrate ability to perform a complete autopsy independently with some physical assistance, correctly following the prescribed instructions. Correctly identify all major lesions which have caused, or contributed to the patient's death, on macroscopic examination alone and on microscopy in at least 15 cases.
- Write correctly and systematically Provisional and Final Anatomic Diagnosis reports.
- Perform embalming in at least 2 cases

Cytopathology Knowledge

- Should possess the background necessary for the evaluation and reporting of cytopathology specimens.
- Demonstrate familiarity with the following, keeping in mind the indication for the test.

  (i) Choice of site from which smears may betaken

(ii) Type of samples

(iii) Method of obtaining various specimens (urine sample, gastric smear, colonic lavage etc.)

(iv) Be conversant with the principles and preparation of solutions of stain

Haematology Knowledge

- Should demonstrate the capability of utilizing the principles of the practice of Haematology for the planning of tests, interpretation and diagnosis of diseases of the blood and bone marrow.
- Should be conversant with various equipment's used in the Haematology laboratory.
- Should have knowledge of automation and quality assurance in Haematology.
- Correctly plan a strategy of investigating at least 90% of the cases referred for special investigations in the Hematology Clinic and give ample justification for each step in consideration of the relevant clinical data provided.

Laboratory Medicine Knowledge

- Possess knowledge of the normal range of values of the chemical content of body fluids, significance of the altered values and its interpretation.
- Possess knowledge of the principles of following specialized organ function tests and the relative utility and limitations of each and significance of the altered values.
    (i) Renal function tests
    (ii) Liver functiontests
    (iii) Pancreatic function tests
    (iv) Endocrine function tests
- Know the principles, advantages and disadvantages, scope and limitation of
    - Automation in the laboratory.
    - Know the principles and methodology of quality control in the laboratory.

Transfusion Medicine (Blood Banking)
Knowledge

The student should possess knowledge of the following aspects of Transfusion Medicine.

- Basic immunology
- ABO and Rh groups
- Clinical significance of other blood groups
- Transfusion therapy including the use of whole blood and RBC concentrates
- Blood component therapy
- Rationale of pre-transfusion testing.
- Infections transmitted in blood.
- Adverse reactions to transfusion of blood and components
- Quality control in blood bank

Basic Sciences (in relation to Pathology)

a) Immunopathology Knowledge

- Demonstrate familiarity with the current concepts of structure and function of the immune system, its aberrations and mechanisms thereof.
- Demonstrate familiarity with the scope, principles, limitations and interpretations of the results of the following procedures employed in clinical and experimental studies relating to immunology.
    (i) ELISA techniques
    (ii) Radioimmunoassay
    (iii) HLA typing
- Interpret simple immunological tests used in diagnosis of diseases and in research procedures.
    (i) Immuno electrophoresis
    (ii) Immunofluorescence techniques especially on kidney and skin biopsies
    (iii) Anti-nuclear antibody(ANA)
    (iv) Anti-neutrophil cytoplasmic antibody(ANCA)

b) Electron Microscopy Knowledge

- Demonstrate familiarity with the principles and techniques of electron

microscopy and the working of an electron microscope (including Transmission and Scanning Electron microscope: TEM and SEM)

- Recognize the appearance of the normal subcellular organelles and their common abnormalities (when provided with appropriate photographs).

c) Enzyme Histochemistry Knowledge

- Should be familiar with the principles, use and interpretation of common Enzyme histochemical procedures (Alkaline Phosphatase, Acid Phosphatase, Glucose-6-Phosphate Dehydrogenase, Chloro-acetate Esterase).

d) Immunohistochemistry Knowledge

- Demonstrate familiarity with the principles and exact procedures of various immunehistochemical stains using both PAP (Peroxidase-anti- peroxidase) / AP-AAP (Alk. Phosphatase-anti-Alk. Phosphatase) / ABC (Avidin-Biotin Conjugate) systems; employing monoclonal and polyclonal antibodies.
- Be aware of the limitations of immunohistochemistry.

e) Molecular Biology Knowledge

- Should understand the principles of molecular biology especially related to the understanding of disease processes and its use in various diagnostic tests.
- Should be conversant with the principle and steps and interpretation of Polymerase Chain Reaction (PCR), Western Blot, Southern Blot, Northern Blot and Hybridisation) procedures.

f) Cytogenetics Knowledge

- Demonstrate familiarity with methods of Karyotyping and Fluorescent in situ Hybridisation (FISH).

g) Tissue Culture Knowledge

- Demonstrate familiarity with methods of tissue culture.

h) Principles of Medical Statistics Knowledge

- Demonstrate familiarity with importance of statistical methods in assessing data from patient material and experimental studies.

TEACHING AND LEARNING METHODS

- All candidates joining the Post Graduate training program shall work as full- time residents during the period of training, attending not less than 80% (Eighty percent) of the training during each semester.

- All postgraduate students shall complete an **online course in Research Methods** to be conducted by an Institute(s) that may be designated by the Medical Council of India by way of public notice. The students have to complete the course by the end of their 2nd semester.
- The successful completion of the online research methods course with proof of its completion shall be essential before the candidate is allowed to appear for the final examination of the respective postgraduate course. This requirement will be applicable for all postgraduate students admitted from the academic year 2019-20 onwards.

Post Graduate Training teaching methodology

The post graduate students should regularly do seminars, symposia, group-discussions and Journal clubs.

Group Teaching Sessions: -

- Biopsy / Slide review once a week
- Journal review – once a week
- Subject seminar presentation once in a week -
- Grossing sessions / pedagogy – Regularly
- Group discussion of clinical cases / laboratory techniques

Journal Club:

Journal club will to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter the relevant details in the log book. Further, every candidate must make a presentation from the allotted journal(s), selected articles, at least four times a year and a total of 12 presentations in three years.

Subject Seminar:

Subject seminar will be to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter the relevant details in the log book, Further, every candidate must present selected topics at least four times a year and a total of 12 seminar presentations in three years.

PG Student Symposium: will be an optional multi-disciplinary programme.

Clinico-Pathological Conference (CPC)

CPC will be held once in 2 month for all post graduate students. Presentation will be done by rotation. If cases are not available due to lack of clinical postmortems, it could be supplemented by published CPCs.

The post graduate students should regularly discuss cases with various clinical departments and learn cases of interest for discussion with the clinical faculty.

Lectures/ small group discussion for post graduates should be conducted once in week (at least 20 per year).

Rotation:

Postings to laboratories/assignments

The three year training programme for the MD will be postings to different assignments/laboratories for specified periods as outlined below.

Section/Subject	Duration in months
(i) Surgical Pathology and Autopsy and Pathology Techniques	12
(ii) Haematology and Laboratory Medicine	10
(iii) Cytopathology	08
(iv) Transfusion Medicine/Blood Bank	02
(v) Museum techniques and record management	01
(vi) Basic Sciences including Biochemistry, Microbiology, Immunopathology, Electron microscopy, Molecular Biology, Research Techniques and cytogeneticetc.	02
Total	**35**

POSTING TO OTHER DEPARTMENTS

Biochemistry – 15 days

Objectives:

At the end of 15 days of biochemistry posting pathology postgraduate student should be able to

1. Discuss the following biochemical tests with clinical interpretation
   a) urine analysis
   b) Blood glucose,
   c) Blood urea, serum creatinine
   d) Renal function tests
   e) Liver function tests
   f) Thyroid function tests
   g) Lipid profile

2. Describe the principles of above tests.
3. Describe the anticoagulants used for various biochemical tests and methods of preservation, transportation of samples.
4. Describe Principles of following automated and semi-automated instruments:
    - Spectrophotometer
    - Colorimeter
    - PH meter
    - Urino meter
    - Chemi luminance
    - Biochemical Auto analyzer

The assessment of the posting will be sent from the department of biochemistry in the structured feedback form

2. Microbiology – 15 days

Objectives -

At the end of 15 days of Microbiology posting pathology postgraduate student should be able to

1. Describe the Methods of collection of following samples for microbiological examination
    a) Blood, Urine, Stool, CSF, Sputum, Pus

2. Perform and interpret following procedure
    a) Gram stain
    b) ZN stain – 5%, 20%
    c) India Ink preparation
    d) Albert's stain
    e) KOH preparation
3. Discuss different types of culture media and its usage
4. Describe Principles and utility of Immunofluorcecent techniques in microbiology
5. Discuss the Principles and applications of PCR and ELISA

6. Discuss the principles and interpretation of various kits in diagnosis of diseases:
    a) HIV , HBsAg, HCV, VDRL, Malaria, Dengue , Widal test
    b) CRP, ASLO, RA factor

The assessment of the posting will be sent from the department of Microbiology in the structured feedback form

3. Autopsy Room – 15 days

Objectives:

- To conduct 15 Autopsy and interpret the findings
- Embalming and body preservation in at least 2 cases

The assessment of the posting will be sent from the department of Forensic medicine in the structured feedback form

4. Blood Bank – 2 Month:

Objectives: the post graduate should know the following at the end of blood bank posting.

- ABO and Rh groups
- Clinical significance of other blood groups
- Transfusion therapy including the use of whole blood and RBC concentrates
- Blood component therapy
- Rationale of pre-transfusion testing.
- Infections transmitted in blood.
- Adverse reactions to transfusion of blood and components
- Quality control in blood bank. Blood bank techniques

The assessment of the posting will be sent from the Blood bank officer in the structured feedback form

5. Pathology museum – 15 days:

Objectives:

Preservation, preparation and mounting of at least 5 specimens

6. Molecular Genetics & Cell biology- 15 days

Objectives:

- Methods of Karyotyping and Fluorescent in-situ Hybridization (FISH).
- Methods of tissue culture.
- PCR

The assessment of the posting will be sent from the department of Molecular Genetics & Cell biology in the structured feedback form

6. External Posting –

A1 1 Month for training in Oncopathology at Kidwai institute of oncology. Bengaluru

OBJECTIVES: Students posted to Kidwai should learn

1. The procedure and steps in grossing of tumours of radical dissections.
2. Histology and cytology slides pertinent to rare tumours of various organs.
3. Histology and cytology slides pertinent to cancer associated infections disorders like viral,
4. Fungal etc.,
5. Peripheral smear and Bone marrow slides in pre-neoplastic and neoplastic haematological
6. Disorders.
7. The Principle, procedure and utility of immunohistochemistry.
8. The principle, procedure and applications of cytogenetics.
9. Procedure and uses of frozen section.

The assessment of the posting will be sent from the department of Pathology, KMIO in the structured feedback form

B. 15 days for Neuropathology training at NIMHANS Bengaluru

OBJECTIVES: Students posted to NIMHANS should learn

1. Autopsy session – Brain cutting.
2. The gross pathology specimens of CNS
   - Infections.
   - Tumours
   - Congenital disorders
   - Vascular disorders.
3. Histopathological slides of CNS
   - Infections: Bacterial, viral, fungal, parasitic
   - Tumours
   - Neuromuscular disorders.
   - Neurodegenerative disorders.
4. The processing of muscle tissue.
5. The processing of peripheral nerve.
6. The procedure and steps of special stains – Myelin stains, axonal stains etc.,
7. The procedure and steps in Enzyme histochemistry.
8. Demonstration of Electron Microscopy.

The assessment of the posting will be sent from the department of Pathology, NIMHANS in the structured feedback form

ENTRUSTABLE PROFESSIONAL ACTIVITY (EPA)

C. EPAs are units of professional practice, defined as tasks or responsibilities to be entrusted to the unsupervised execution by a trainee once he or she has attained sufficient specific competence. EPAs are independently executable, observable, and measurable in their process and outcome, and therefore, suitable for entrustment decisions. The entrustable professional activity (EPA) concept allows faculty to make competency-based decisions on the level of supervision required by trainees. The Academy has identified 5 subject specific EPA's and core EPA for all students. These are

EPA 1: Gather a history and perform a physical examination
EPA 2: Prioritize a differential diagnosis following a clinical encounter EPA 3: Recommend and interpret common diagnostic and screening tests EPA 4: Obtain informed consent for tests and / or procedures
EPA 5: Give or receive a patient handover to transition care responsibility EPA 6: Provide an oral presentation of a clinical encounter
EPA 7: Collaborate as a member of an inter professional team
EPA 8: Recognize a patient requiring urgent or emergent care by critical value reporting and initiate management

Subject specific EPA

1. Perform gross dissection of simple and complex specimens
2. Compose a diagnostic report for surgical pathology specimens
3. Perform fine needle aspirations
4. Compose a diagnostic report for cytology specimens
5. Compose a diagnostic report for clinical laboratory testing requiring pathologist interpretation

Title of EPA-1	**Perform gross dissection of simple and complex specimens**
Description of EPA	• Postgraduates are able to assess a gross specimen and submit relevant tissue sections to accurately diagnose disease and, when appropriate, stage a Neoplastic process. Knowledge and skills required include the ability to: 1. Properly identify patient specimen before and throughout the grossing process 2. Communicate with clinical team and consult the medical record to verify pertinent clinical history, confirm proper specimen orientation, correlate radiographic and other studies 3. Submit sections necessary to represent tissue pathology, evaluate margin status, and complete the appropriate cancer

	case summary requirements where indicated 4. Distribute tissue for ancillary studies as needed (e.g., flow cytometry, culture, cytogenetics, molecular testing) using appropriate transport conditions 5. Prepare/edit a complete and succinct written report that accurately describes gross findings and handling of tissue
Relevant Core Competencies	• Clinician- Knowledge, analysis of clinical data, Practical skills • communicator- Communicate with clinical team and peer group • lifelong learner- Updated information on grossing technique, WHO TNM staging • Professional - Demonstrates significant awareness of own blind spots, Puts the needs of each patient above his or her own interests **Levels of competence**: Level I: Knowledge only; can observe Level II: Can do under strict supervision Level III: Can do under loose supervision Level IV: Can do independently Level V: Has expertise to teach others All PG expected to reach level I at the end of 6 months All PG expected to reach level II at the end of 1 year All PG expected to reach level III at the end of 2 years All PG expected to reach level IV at the end of 3 years
Assessment Methods	1. Direct observation of grossing skills 2. Record review of gross reports and slides 3. 360 degree evaluations (e.g., attending pathologist, peer group, technician)

Title of EPA-2	**Compose a diagnostic report for surgical pathology specimens**
Description of EPA	Postgraduates are able to compose a written diagnostic report including diagnosis, microscopic description, interpretation of special studies, and appropriate cancer case summary requirements where indicated for surgical pathology specimens. Knowledge and skills required include the ability to: 1. Properly identify microscopic slides to be evaluated ensuring

	appropriate patient identification 2. Evaluate microscopic slides for pathologic abnormalities 3. Correlate clinical history, radiology findings, biopsy results, intraoperative consultation, frozen sections diagnosis, and gross description with findings on permanent histology slides 4. Obtain ancillary studies as needed for diagnosis of case (e.g., imm unohistochemistry, special stains, and molecular studies) 5. Prepare a complete report incorporating gross description, final diagnosis/impression, and documentation and interpretation of ancillary studies 6. Include complete staging information on synoptic reporting of malignancies as per current standard of care (e.g., CAP / RCPATH Cancer Protocols) 7. Report any relevant clinical information or clinical correlations where indicated. 8. Communicate and document critical values and urgent diagnosis directly with clinicians as indicated 9. Recognize when expert consultation is needed and obtain and document consultation in final report.
Relevant Core Competencies	• Clinician- Knowledge, analysis of clinical data, Practical skills. Demonstrates competence in diagnostic knowledge of pathology. Knows potential confounding factors that may contribute to erroneous results. Seeks appropriate consultations • Communicator- Routinely interfaces with clinical colleagues to formulate a narrow differential diagnosis and arrive at a final diagnosis. Can lead multidisciplinary conferences. Communicates effectively with patients and family members, when applicable • Lifelong learner- Updated information on histopathology, WHO classification, TNM staging and prognostic factors • Professional - Demonstrates significant awareness of own blind spots, Puts the needs of each patient above his or her own interests **<u>Levels of competence</u>**: Level I: Knowledge only; can observe Level II: Can do under strict supervision Level III: Can do under loose supervision Level IV: Can do independently Level V: Has expertise to teach others

	All PG expected to reach level I at the end of 6 months All PG expected to reach level II at the end of 1 year All PG expected to reach level III at the end of 2 years All PG expected to reach level IV at the end of 3 years
Assessment Methods	1. Record review of written reports 2. 360 degree evaluations (e.g., attending pathologist, peer group, technician) Record review (written reports) 3. Portfolio

Title of EPA-3	**Perform fine needle aspirations**
Description of EPA	Postgraduatesare able to perform fine needle aspiration (FNA) biopsy procedures. Knowledge and skills required include the ability to: • knowledge of anatomy and pathology of various organs like Thyroid, breast, Lymphnodes, Liver etc • Obtain informed consent for procedure • Communicate with clinical team and/or patient to verify pertinent clinical history • Perform "time out" or pre procedure verification to ensure correct patient identification, procedure, and site. • Perform FNA biopsy as indicated; assess adequacy where a ppropriate (on site verification for dequacy) and repeat procedure if necessary • Perform ultrasound guided/ CT guided FNA as indicated • Manage complications of procedure when required • Appropriately triage specimen for ancillary studies needed for final diagnosis of case (e.g., cultures, flow cytometry, paraffin block, molecular studies) • Appropriately use and report Current Procedural Terminology (CPT)
Relevant Core Competencies	• Clinician- Knowledge, analysis of clinical data, Practical skills • Communicator- Communicate with clinical team.Communicates effectively with patients and family members, when applicable • Lifelong learner- Updated information on FNA technique, Image guided FNA • Professional - Demonstrates significant awareness of own

	blind spots,Puts the needs of each patient above his or her own interests **<u>Levels of competence</u>**: Level I: Knowledge only; can observe Level II: Can do under strict supervision Level III: Can do under loose supervision Level IV: Can do independently Level V: Has expertise to teach others All PG expected to reach level I at the end of 6 months All PG expected to reach level II at the end of 1 year All PG expected to reach level III at the end of 2 years All PG expected to reach level IV at the end of 3 years
Assessment Methods	1. Direct observation 2. Record review of procedure notes 3. 360 degree evaluations (e.g., attending pathologist, cytotechnologist; patient) 4. Performance metrics (diagnostic yield of FNA biopsies; correlation of Rapid interpretation with final diagnosis) 5. Portfolio or Case Log

Title of EPA-4	**Compose a diagnostic report for cytology specimens**
Description of EPA	Postgraduates are able to compose a written diagnostic report for both gynecologic and non-gynecologic (exfoliative, fine needle aspiration) specimens including diagnosis, microscopic description, and interpretation of special studies where indicated. Knowledge and skills required include the ability to: 1. Properly identify microscopic slides to be evaluated ensuring appropriate patient identification 2. Evaluate slides to determine adequacy and identify diagnostic abnormalities 3. Correlate clinical history, radiology findings, biopsy results, etc., with microscopic findings as needed 4. Obtain ancillary studies as needed for evaluation of case (e.g.immunohistochemistry, special stains, molecular studies) 5. Prepare a complete report incorporating final diagnosis including documentation and interpretation of ancillary studies

	6. Communicate and document critical values and urgent diagnoses directly with clinicians as indicated 7. Appropriately use and report Current Procedural Terminology (CPT)
Relevant Core Competencies	• Clinician- Knowledge, analysis of clinical data, Practical skills, Demonstrates competence in diagnostic knowledge of pathology. Knows potential confounding factors that may contribute to erroneous results. Seeks appropriate consultations • Communicator- Routinely interfaces with clinical colleagues to formulate a narrow differential diagnosis and arrive at a final diagnosis. Can lead multidisciplinary conferences. Communicates effectively with patients and family members, when applicable • lifelong learner- Updated information on cytodiagnosis and reporting format • Professional - Demonstrates significant awareness of own blind spots, Puts the needs of each patient above his or her own interests **<u>Levels of competence</u>**: Level I: Knowledge only; can observe Level II: Can do under strict supervision Level III: Can do under loose supervision Level IV: Can do independently Level V: Has expertise to teach others All PG expected to reach level I at the end of 6 months All PG expected to reach level II at the end of 1 year All PG expected to reach level III at the end of 2 years All PG expected to reach level IV at the end of 3 years
Assessment Methods	1.Direct observation (e.g., "double-scoping") 2. Record review of written reports 3. 360 degree evaluations (e.g., attending pathologist, physician assistant, cytotechnologist, ordering clinicians)

Title of EPA-5	**Compose a diagnostic report for clinical laboratory testing requiring pathologist interpretation**
Description of	Postgraduates are able to review and interpret clinical laboratory findings and

EPA	data and compose a written diagnostic report for clinical laboratory testing requiring pathologist interpretation (e.g. body fluid or peripheral blood smear, bone marrow aspiration, etc.) Knowledge and skills required include the ability to: 1. Verify proper identity of patient diagnostic material (e.g. slides or specimens) or laboratory data (e.g. instrument printouts.) before interpretation and reporting 2. Evaluate/interpret diagnostic material or laboratory data and formulate diagnosis 3. Correlate clinical history, radiology findings, other laboratory data, etc. with clinical laboratory findings 4. Prepare a complete written report with diagnosis, methodology, and clinical correlation 5. Communicate and document urgent diagnoses directly with clinical providers if indicated 6. Appropriately use and report Current Procedural Terminology (CPT)
Relevant Core Competencies	• Clinician- Knowledge, analysis of clinical data, Practical skills, Demonstrates competence in diagnostic knowledge of pathology. Knows potential confounding factors that may contribute to erroneous results. Seeks appropriate consultations • communicator- Routinely interfaces with clinical colleagues to formulate a narrow differential diagnosis and arrive at a final diagnosis • Can lead multidisciplinary conferences. Communicates effectively with patients and family members, when applicable • lifelong learner- Updated information on cytodiagnosis and reporting format • Professional - Demonstrates significant awareness of own blind spots, Puts the needs of each patient above his or her own interests **<u>Levels of competence</u>**: Level I: Knowledge only; can observe Level II: Can do under strict supervision Level III: Can do under loose supervision Level IV: Can do independently Level V: Has expertise to teach others All PG expected to reach level I at the end of 6 months All PG expected to reach level II at the end of 1 year

	All PG expected to reach level III at the end of 2 years All PG expected to reach level IV at the end of 3 years
Assessment Methods	1 Direct observation (e.g., "double-scoping") 2. Record review of written reports 3. 360 degree evaluations (e.g., attending pathologist, physician assistant, technologist, ordering clinicians)

Sr. No	EPA	Competency domains						Expected level of competency				MSF	Assessment
		MK	PC	PBLI	SBP	P	ISC	At the end of 6 months	At the end of 1st year	At end of 2nd years	At end of 3rd years		
1	1	Yes	Yes	Yes		Yes	Yes	I	II	III	IV	Yes	
2	2	Yes	Yes	Yes		Yes	Yes	I	II	III	IV	Yes	
3	3	Yes	Yes	Yes		Yes	Yes	I	II, III	IV	IV	Yes	
4	4	Yes	Yes	Yes		Yes	Yes	I	II	III	IV	Yes	
5	5	Yes	Yes	Yes		Yes	Yes	I	II, III	III	IV	Yes	

MK: Medical Knowledge
PC: Patient care
PBLI: Practice based learning and improvement
SBP: Systems based Practice
P: Professionalism
ISC: interpersonal communication skill

MSF: Multi source Feedback

Log Book

Each student must be asked to present a specified number of cases for clinical discussion, perform procedures, tests, operations, present seminars, review articles from various journals in inter-unit/interdepartmental teaching sessions. They should be entered in a Log Book. The Log books shall be checked and assessed periodically by the faculty members imparting the training. This will in turn be evaluated/assessed by an external reviewer appointed by the university bi- annually during the months of July and January.

Attendance, Progress and Conduct

- A candidate pursuing degree course should work in the concerned department of the institution for the full period as a full time student. No candidate is permitted to run a clinic/laboratory/nursing home while studying postgraduate course.
- Academic term of 6 months shall be taken as a unit for the purpose of calculating attendance
- Every student shall attend symposia, seminars, conferences, journal review meetings, grand rounds, CPC, case presentation, clinics and lectures during each year as prescribed by the department and not absent himself / herself from work without valid reasons.
- Every candidate is required to attend a minimum of 80% of the training during each academic term of the post graduate course. Provided further, leave of any kind shall not be counted as part of academic term without prejudice to minimum 80% attendance of training period every term.
- All the candidates joining the Post Graduate training programme shall work as 'Full Time Residents' during the period of training and shall attend not less than 80% (Eighty percent) of the imparted training during Academic Term of 6 months including assignments, full time responsibilities and participation in all facets of the education process.
- Any student who fails to complete the course in the manner stated above shall not be permitted to appear for the University Examinations.

ASSESSMENT

FORMATIVE ASSESSMENT, i.e. During the training Quarterly written assessment should be conducted on predefined syllabus along with quarterly appraisal. Work place based assessment like Direct Observation of Procedural Skill

(DOPS) should be conducted at the end of monthly posting to assess the practical skills

Topics for assessment is as follows

First year: Hematology, Clinical Pathology, Blood bank, Cytology

Second year: General pathology

Third year: Systemic pathology

Mock examination should be conducted at the end of 34 months of training following University examination pattern

SUMMATIVE ASSESSMENT, i.e. assessment at the end of training

Post graduate required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

Post Graduate Examination

The Post Graduate examination shall be in three parts:-

1. Dissertation

Every post graduate student shall carry out work on an assigned research project under the guidance of a recognized Post Graduate Teacher, the result of which shall be written up and submitted in the form of a Thesis. Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the post graduate student to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

2. Theory:

The examinations shall be organized on the basis of 'Grading 'or 'Marking system' to evaluate and to certify post graduate student's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 50% marks in

'Theory' as well as 'Practical' separately shall be mandatory for passing examination as a whole. The examination for M.D./ MS shall be held at the end of 3rd academic year. An academic term shall mean six month's training period.

There shall be four question papers, each of three hours duration. Each paper shall consists of ten essay questions each question carrying 10 marks. Total marks for each paper will be 100. Questions on recent advances may be asked in any or all the papers*.

- **Paper I** - General Pathology
- **Paper II** – Haematology / Clinical Pathology / Cyto Pathology, Blood banking Transfusion Medicine and Immunohematology.
- **Paper III – Systemic Pathology-I** Cardio vascular system, Respiratory system, Gastro intestinal System including Liver & Biliary tract, Pancreas, Renal system, Male and female genital system and Breast.
- **Paper IV - Systemic Pathology-II :** Central and Peripheral nervous system, endocrine system, Musculo-skeletal system, Reticulo-endothelial system, (Lymphnodes, Spleen and Thymus), Dermato-pathology and Ophthalmic Pathology, Bone, Joints and soft tissues.

* The topics assigned to the different papers are generally evaluated under those sections. However a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics.

- Number of questions in each paper**: 10**
- Marks for each question Total marks: **10 X10= 100**

3. Practicals/Clinical and Oral/viva voce Examination:

The practical/clinical examination should consist of the following and should be spread over two days.

I. Clinical Pathology:

- Discussion of a clinical case history.
- Plan relevant investigations of the above case and interpret the findings.
- Two investigations should be performed including at least one biochemistry exercise/clinical pathology exercise like CSF, pleural tap etc. analysis and complete urinalysis.

II. Hematology:

- Discuss haematology cases given the relevant history. Plan relevant investigations
- Perform complete hemogram and at least two tests preferably including one coagulation exercise
- Identify electrophoresis strips, osmotic fragility charts etc. Interpretation of data from auto analysers, HPLC and flow cytometry.
- Examine report and discuss around ten cases given the history and relevant blood smears and/or bone marrow aspirate smears and bone marrow biopsy interpretation.

III. Transfusion Medicine:

- Perform blood grouping
- Perform the necessary exercise like cross matching.
- Coomb's test, gel cards interpretation.

IV. Histopathology:

- Examine report and discuss 20 cases histopathology and 5-8 cytopathology cases, given the relevant history and slides.
- Perform a Haematoxylin and Eosin stain and any special stain on a paraffin section. Should be conversant with histopathology techniques including cryostat.

V. Autopsy:

- Given a case history and relevant organs (with or without slides), give a list of anatomical diagnosis in a constructive autopsy case.

VI. Gross Pathology

- Describe findings of gross specimens, give diagnosis and identify the sections to be processed. The post graduate student should perform grossing in front of the examiners for evaluation.

VII. Others:

- Identify histochemical and immuno-histochemistry stains
- Teaching exercise 10min

Practical examination schedule

Total 200 Marks Duration 2 days.

DAY 1:

a. Autopsy / Reconstructed autopsy (organ systems) and discussions on it - 18Marks.
b. Gross and morbid anatomy. 8Specimens x 4 marks – 32 Marks.
c. Haematology and Cytology slides. 8+7 x 2 marks – 30 Marks.
d. Histopathology techniques: - 30 Marks
    1. H & E stains: Discussion on Histopathological techniques - (10 Marks)
    2. One Special staining – Discussion on technique and interpretation. – (5 Marks).
    3. Cytology staining – Discussion on technique and interpretation. - (5 Marks).
    4. One Slide of IHC with history. Discussion & interpretation - (5 Marks).
    5. Intraoperative consultation: Frozen section / imprint slide- (5 Marks).

e.Topic allotment for Pedagogy exercise.

Day: 2.

a) Histopathology slides. 20 slides x 2.5 - 50 Marks.
b) Clinical pathology & Haematology case history given. Discussion & interpretation. - 25 Marks.
c) Blood bank and hematology techniques / discussion - 15 Marks

C.VIVA-VOCE: Total 100 Marks

1) Viva-Voce Examination: (80 Marks)

Students will be examined by all the examiners together about student's comprehension, analytical approach, expression and interpretation of data. Student shall also be given case reports, charts for interpretation. It included discussion on dissertation.
Critical evaluation of Published articles.

2) Pedagogy Exercise: (20 Marks)

A topic be given to each candidate along with the Practical Examination on the first day. Student is asked to make a presentation on the topic on the second day for 8 to 10 Minutes.
M.D (Pathology) Theory,Practicals, Viva-voce

Total examination

Maximum Marks: 400+ 200+ 100= 700

	I	**II**	**III**	**IV**
Theory	100	100	100	100
Day 1		**Day 2**		
Excercise	**Marks**	**Excercise**	**Marks**	
Autopsy	18	Histopathology slides	50	
Gross morbid anatomy	32	Clinical pathology & Haematology case	25	
Haematology and Cytology slides	30	Blood bank and hematology techniques	15	
Histopath techniques	30			
Total	**110**		**90**	
Theory: 400		**Practical: 200**	**Viva: 100**	

Passing criteria

Minimum of 40% marks in each theory paper and not less than 50% cumulatively in all the four papers for degree examinations. Obtaining of 50% marks in Practical examination shall be mandatory for passing the examination as a whole in the said degree examination as the case may be.

Recommended Books (latest edition)

1. Robbins &Cotran Pathologic Basis of Diseases
2. Rosai and Ackerman's SurgicalPathology
3. Atlas and Text of Haematology by TejinderSingh
4. Orell's Atlas of AspirationCytology
5. Dacie's Practical Haematology
6. Koss book of Cytopathology

Referral Books:

1. Novak's Gynecologic and Obstetric Pathology with Clinical and Endocrine Relations by Edmund R. Novak
2. Bone Pathology by H.Jaffe
3. MacSween's Pathology of the liver
4. Iochim's Lymph Node Pathology
5. Text Book on Breast Pathology by Tavasoli
6. Text Book on Thyroid Pathology by Geetha Jayaram
7. Theory and Practice of Histological Techniques by Bancroft
8. Gray's Diagnostic Cytopathology

9. Sternberg's Diagnostic Surgical Pathology
10. Wintrobe's Haematology
11. Heptinstall's Pathology of the Kidney
12. Lever's Dermato-pathology
13. Enzinger's Soft Tissue Tumours

Annexure

Postgraduate Students Appraisal Form Pre / Para /Clinical Disciplines

Name of the Department/Unit:

Name of the PG Student:

Period of Training : FROM_____TO _____

Sr. No.	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
		1 2 3	4 5 6	7 8 9	
1.	Journal based/recent advances learning				
2.	Patient based /Laboratory or Skill based learning				
3.	Self-directed learning and teaching				
4.	Departmental and interdepartmental learning activity				
5.	External and Outreach Activities / CMEs				
6.	Thesis/Research work				
7.	Log Book Maintenance				

Publications Yes/No

Remarks*_____

_____

*REMARKS: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.

SIGNATURE of ASSESSEE SIGNATURE OF CONSULTANT

SIGNATURE OFHOD

Department of pathology Sri Devaraj Urs Medical College, Kolar RL Jalappa Hospital and Research Centre	WORK PLACE – BASED ASSESSMENT FORM CYTOLOGY Direct observation of practical skills (DOPS)

Trainee's Name:	
Assessor's Name:	

YEAR OF TRAINING 1 2 3

Brief outline Procedure, Indicating focus for assessment (Refer to topics in curriculum), Tick category of cases or write in space below.	

☐ FNAC Procedure ☐ PAP staining of slides ☐ MGG staining of slides

☐ FNAC Reporting Procedures ☐ Pap smear reporting ☐ Fluid processing

Complexity of procedure ☐ low ☐ Average ☐ High

	Please grand the following areas using the scale provided. This should relate to the standard expected of the end of the appropriate stage of training	Below expectations		Borderline	Meets expectations	Above expectations		Unable to comment
1	Understand principles of procedure/ reporting	1	2	3	4	5	6	
2	Demonstrate appropriate preparation of pre- procedure (consult the medical record to verify pertinent clinical history, confirm proper specimen orientation, correlate radiographic and other studies)							
3	Complies with health and safety requirement (e.g. use of personal protective equipment, Biomedical waste management)							
4	Technical ability and correct tissue sampling/ special investigation (eg: Distribute tissue for ancillary studies as needed)							
5	Communications skills (Written documentation and /or verbal communication with peers and technicians)							
6	Professionalism (e.g. punctuality, compliance with human tissues Act, ethical, reliable)							
7	Seeks help where appropriate							
8	Overall ability to perform procedure/ Reporting							

PLEASE COMMENT TO SUPPORT YOUR SCORING:

SUGGESTE DEVELOPMENTAL WORK:
(particular areas scoring 1-4)

Outcome: Satisfactory unsatisfactory

Date of assessment:	

Signature of assessor:	

Signature of resident:	

Department of pathology Sri Devaraj Urs Medical College, Kolar RL Jalappa Hospital and Research Centre

WORK PLACE – BASED ASSESSMENT FORM HISTOPATHOLOGY Direct observation of practical skills (DOPS)

Trainee's Name:	
Assessor's Name:	

YEAR OF TRAINING -1 2 3

Brief outline Procedure, Indicating focus for assessment (refer to topics in curriculum), Tick category of cases or write in space below.	

☐ Grossing of Specimen ☐ Autopsy procedures ☐ Systematic Assessment of Biopsy

☐ Reporting Procedures section ☐ handling and reporting of frozen

Complexity of procedure ☐ low ☐ Average ☐ High

	Please grand the following areas using the scale provided. This should relate to the standard expected of the end of the appropriate stage of training	Below expectations		Borderline	Meets expectations	Above expectations		Unable to comment
1	Understand principles of procedure/ reporting	1	2	3	4	5	6	
2	Demonstrate appropriate preparation of pre- procedure (consult the medical record to verify pertinent clinical history, confirm proper specimen orientation, correlate radiographic and other studies)							
3	Complies with health and safety requirement (e.g. use of personal protective equipment, Biomedical waste management)							
4	Technical ability and correct tissue sampling/ special investigation (eg: Distribute tissue for ancillary studies as needed)							
5	Communications skills (Written documentation and /or verbal communication with peers and technicians)							
6	Professionalism (e.g. punctuality, compliance with human tissues Act, ethical, reliable)							
7	Seeks help where appropriate							
8	Overall ability to perform procedure/ Reporting							

PLEASE COMMENT TO SUPPORT YOUR SCORING:

SUGGESTE DEVELOPMENTAL WORK: (particular areas scoring 1-3)

Outcome: Satisfactory unsatisfactory

Date of assessment:	

Signature of assessor:

Department Of Pathology
Sri Devaraj Urs Medical College, Kolar
R L Jalappa Hospital and Research Centre

WORK PLACE – BASED ASSESSMENT FORM
HEMATOLOGY AND CLINICAL PATHOLOGY
Direct Observation Of Practical Skills (DOPS)

Resident's Name:	
Assessor's Name:	

YEAR OF TRAINING -1 2 3

Brief outline Procedure, Indicating focus for assessment (refer to topics in curriculum), Tick category of cases or write in space below.

☐ Reporting peripheral smear ☐ Retic stain ☐ Bone Maroow Aspirate smear reporting

☐ Semen Analysis ☐ Urine microscopy ☐ Others (.....)

Complexity of procedure ☐ Low ☐ Average ☐ High

	Please grand the following areas using the scale provided. This should relate to the standard expected of the end of the appropriate stage of training	Below expectation		Borderline	Met expectation	Above expectation		Unable to comment
		1	2	3	4	5	6	0
1	Understand principles of procedure/ reporting							
2	Demonstrate appropriate preparation of pre- procedure (consult the medical record to verify pertinent clinical history, correlate radiographic, biochemical and other studies)							
3	Complies with health and safety requirement (e.g. use of personal protective equipment, Biomedical waste management)							
4	Technical ability and suggests special investigation if needed.							
5	Communications skills (Written documentation and /or verbal communication with peers and technicians)							
6	Professionalism (e.g. punctuality, compliance with human tissues Act, ethical, reliable)							
7	Seeks help where appropriate							
8	Overall ability to perform procedure/ Reporting							

PLEASE COMMENT TO SUPPORT YOUR SCORING:

SUGGESTED DEVELOPMENTAL WORK:
(particular areas scoring 1-3)

Outcome: Satisfactory unsatisfactory

Date of assessment:	

Signature of assessor:	

Signature of resident:	

EVALUATION OF JOURNAL CLUB PRESENTATIONS

Name of the Student: Name of the Faculty / Observer:

Date:

Sl. No	Items for observation during presentation	Below Average 1	Average 2	Good 3	Very Good 4
1	Article chosen was				
2	Extent of understanding of scope and objectives of the paper by the candidate				
3	Whether cross references have been consulted				
4	Whether other relevant publication consulted				
5	Ability to respond to questions on the paper / subject				
6	Audio – Visual aids used				
7	Ability to defend the paper				
8	Clarity of presentation				
9	Any other observation				
	Total Score				

Professor & HOD of Pathology

EVALUATION OF SEMINAR PRESENTATIONS

Name of the Student: Name of the Faculty / Observer:

Date:

Sl. No	Items for observation during presentation	Below Average 1	Average 2	Good 3	Very Good 4
1	Whether other relevant publications consulted				
2	Whether cross reference have been consulted				
3	Completeness of Preparation				
4	Clarity of Presentation				
5	Understanding of subject				
6	Ability to answer questions				
7	Time scheduling				
8	Appropriate use of Audio-Visual aids				
9	Overall Performance				
10	Any other observation				
	Total Score				

Professor & HOD of Pathology

EVALUATION OF SHORT TOPIC PRESENTATIONS

Name of the Student: Name of the Faculty / Observer:

Date:

Sl. No	Items for observation during presentation	Below Average 1	Average 2	Good 3	Very Good 4
1	Whether other relevant publications consulted				
2	Whether cross reference have been consulted				
3	Completeness of Preparation				
4	Clarity of Presentation				
5	Understanding of subject				
6	Ability to answer questions				
7	Time scheduling				
8	Appropriate use of Audio-Visual aids				
9	Overall Performance				
10	Any other observation				
	Total Score				

Professor & HOD of Pathology

PEDAGOGY: MICROTEACHING PROGRAM

PEERS / PEER STUDENTS OBSERVATION SHEET

NAME OF PG STUDENT:
TOPIC:
DATE:

SKILL	TEACHER'S ACTION	PERFORMANCE			
		E	G	A	P
Set Induction	1.1 Aroused interest in the beginning by relation to previous learning, throwing new idea, questioning 1.2 Specified the objectives of presentation				
Planning	2.1 Organized material in logical sequence 2.2 Used relevant content matter				
Presentation	3.1 Changed the pace of presentation by shifting emphasis, joke etc. 3.2 Used specific example to illustrate main ideas. 3.3 Used non-verbal cues, eye contact etc.				
Pupil Participation	4.1 Allowed questions from student 4.2 Asked question 4.3 Solicited / raised questions 4.4 Rewarded pupil effort				
Use of AV Aids	5.1 Used proper AV aids 5.2 Used the aid(s) effectively				
Closure	6.1 Summarized most important points at the end of lesson				
Lesson on the whole was effective					

Professor & HOD of Pathology

Feedback on Pathology postgraduate external posting

- **Name of the postgraduate: ……**
- **Duration of external posting: From…….. to ……**
- **Number of days absent: ……..**

Particulars	**Excellent**	**Good**	**Satisfactory**	**Needs Improvement**	**Unsatisfactory**
Punctuality to the posting					
Zeal to learn					
Subject seminar presentation					
Journal club presentation					
Works as a team member					
Follows rules/regulations/guidelines of the Department					
Attitude & Behavior					
Communication Skills					
Total Score					

Do you have any additional comments about Postgraduate performance

Strengths:

Opportunities for Development:

Name & Signature of Professor & HOD