

CONTENTS

SL.No.	Description	Pg.No.
1.	Short Title and Commencement	01
2.	Aims and Objectives	01
3.	Branch of Study	02
	(a) D.M.	02
	(b) M.Ch.	03
4.	Eligibility	03
5.	Eligibility Certificate	05
6.	Duration of the Course	05
7.	Duration of completion of the Course	05
8.	Cut-off dates for admission	05
9.	Commencement of the course	06
10.	Registration of candidates	06
11.	Recognition Fee	06
12.	Commencement of Examinations	06
13.	Examination	
14.	Attendance requirements for admission to Examination	06
15.	Condonation of attendance	07
16.	Re-valuation of answer paper	07
17.	Posting and Training in outside canters	07
18.	Number of appearances	08
19.	Maintenance of log book	08

20. Dissertations	09
21. Evaluation of Dissertation	10
22. Migration/Transfer of candidates	11
23. Re-admission after break of study	11
24. Curriculum-syllabus for:	
D.M: Branch I Neurology	13
Branch II Cardiology	18
Branch III Nephrology	21
Branch IV Medical Gastroenterology	27
Branch VII Medical Oncology	32
Branch IX Rheumatology	37
Branch X Clinical Haematology	44
Branch XI Neonatology	
M.Ch: Branch I Cardio Thoracic Surgery	58
Branch II Neuro Surgery	61
Branch III Plastic and Reconstructive Surgery	67
Branch IV Urology	75
Branch V Paediatric Surgery	78
Branch VI Surgical Gastro-enterology	83
Branch VII Surgical Oncology	88
Branch VIII Vascular Surgery	92
Branch IX Endocrine Surgery	

24. Pattern of Examinations:

D.M.

Branch I Neurology

Branch II Cardiology

Branch III Nephrology

Branch IV Medical Gastroenterology

Branch VII Medical Oncology

Branch IX Rheumatology

Branch X Clinical Haematology

Branch XI Neonatology

M.Ch:

Branch I Cardio-Thoracic Surgery

Branch II Neuro Surgery

Branch III Plastic and Re-constructive
Surgery

Branch IV Urology

Branch V Paediatric Surgery

Branch VI Surgical Gastro-enterology

Branch VII Surgical Oncology

Branch VIII Vascular Surgery

Branch IX Endocrine Surgery

25. Marks qualifying for a Pass:

D.M.

Branch I Neurology

Branch II Cardiology

Branch III Nephrology

Branch IV Medical Gastroenterology

Branch VII Medical Oncology

Branch IX Rheumatology

Branch X Clinical Haematology

Branch XI Neonatology

M.Ch:

Branch I Cardio-Thoracic Surgery

Branch II Neuro Surgery

Branch III Plastic and Re-constructive
Surgery

Branch IV Urology

Branch V Paediatric Surgery

Branch VI Surgical Gastro-enterology

Branch VII Surgical Oncology

Branch VIII Vascular Surgery

Branch IX Endocrine Surgery

26. Annexure-I Declaration

(Regulation: 10) 12

**THE TAMIL NADU Dr.M.G.R MEDICAL UNIVERSITY,
CHENNAI-600 032**

REGULATIONS FOR THE POST GRADUATE HIGHER SPECIALITY DEGREE COURSES

In exercise of the powers conferred by Section 44 of the Tamil Nadu Dr.M.G.R Medical University, Chennai, Act, 1987 (Tamil Nadu Act 37 of 1987), the Standing Academic Board of the Tamil Nadu Dr.M.G.R Medical University, Chennai hereby makes the following regulations:-

1. SHORT TITLE AND COMMENCEMENT;

THESE REGULATIONS SHALL BE CALLED “THE REGULATIONS FOR THE DM/M.Ch, POST GRADUATE HIGHER SPECIALITY DEGREE COURSES OF THE TAMIL NADU Dr.M.G.R MEDICAL UNIVERSITY, CHENNAI”.

These regulations shall come into force from the academic year

The Regulations and the Syllabi are as prescribed under these regulations and are subject to modification by the Standing Academic Board from time to time*.

2. AIMS AND OBJECTIVES;

At the end of the course the student should have acquired:-

- (1) Broad understanding of the principles of Basic Medical Sciences related to his/her speciality
- (2) Ability and skills to perform and interpret investigative procedures related to his speciality
- (3) Skills in the clinical diagnosis, planning of investigations and manage common conditions in the speciality by relevant current therapeutic methods:
- (4) Capabilities to take independent decisions in emergency situations, perform required procedures in that particular speciality and manage complications

* 31st Standing Academic Board dated:29.06.2006.

Higher Specialities Syllabus 2006

- (5) Competence in intensive care with practical knowledge of working with resuscitative and monitoring equipments
- (6) Ability to critically appraise published literature, interpret data and to broaden his/her knowledge by keeping abreast with modern developments in the speciality

(7) Ability to search online, use information technology to his/her advantage and critically evaluate medical literature and draw his/her own conclusion.

(8) Ability to teach Post graduates, undergraduate and nursing students in the basic management of the diseases in his/her speciality.

(9) Ability to get acquainted with allied and general clinical disciplines to ensure appropriate and timely referral.

(10) Ability to conduct research.

(11) Ability to become a consultant and capability of organizing speciality Departments.

3. BRANCH OF STUDY

Candidates shall be examined in one of the following branches.

D.M

Branch 1 Neurology

Branch II Cardiology

Branch III Nephrology

Branch IV Medical Gastroenterology

Branch VII Medical Oncology

Branch IX Rheumatology

Branch X Clinical Haematology

Branch XI Neonatology

M.Ch.

Branch I Cardio-Thoracic Surgery

Branch II Neuro Surgery

Branch III Plastic and Reconstructive Surgery *

Branch IV Urology *

Branch V Paediatric Surgery

Branch VI Surgical Gastro-enterology

Branch VII Surgical Oncology

Branch VIII Vascular Surgery

Branch IX Endocrine Surgery

4. ELIGIBILITY

Candidates for admission to the first year D.M/M.Ch Post-graduate Higher Speciality Degree Courses shall be required to have any one of the following qualifications as detailed.

Qualification required for joining D.M. Super Speciality Course:

<u>D.M.</u>			<u>Qualification requirement</u>
Branch	1	Neurology	M.D (Medicine) M.D (Paediatrics)
Branch	II	Cardiology	M.D (Medicine) M.D (Paediatrics)
Branch	III	Nephrology	M.D (Medicine) M.D (Paediatrics)
Branch	IV	Medical Gastro- enterology	M.D (Medicine) M.D (Paediatrics)
Branch	VII	Medical Oncology	M.D (Medicine) M.D (Radio Therapy) M.D (Paediatrics)
Branch	IX	Rheumatology	M.D (Medicine) M.D (Paediatrics)
Branch	X	Clinical Haematology	M.D (Medicine) M.D (Pathology) M.D (Paediatrics) M.D (Bio-Chemistry)
Branch	XI	Neonatology	M.D. (Paediatrics)

* Plastic Surgery changed as “Plastic & Re-constructive Surgery & }

Genito Urinary Surgery changed as “Urology” }

- 31st Standing Academic Board dated: 29.06.2006.
Higher Specialities Syllabus 2006

Qualification required for joining M.Ch., Super Speciality Course

<u>M.Ch.</u>			<u>Qualification required</u>
Branch	I	Cardio-Thoracic Surgery	M.S. (Surgery)
Branch	II	Neuro Surgery	M.S (Surgery) – (3 year course) M.B.B.S. (5 year course)
Branch	III	Plastic & Reconstructive Surgery	M.S (Surgery)
Branch	IV	Urology	M.S (Surgery)
Branch	V	Paediatric Surgery	M.S (Surgery)
Branch	VI	Surgical Gastroenterology	M.S (Surgery)
Branch	VII	Surgical Oncology	M.S (Surgery) M.S (ENT) M.S (Orthopaedics) MD (Obst & Gynae)
Branch	VIII	Vascular Surgery	M.S (Surgery)
Branch	IX	Endocrine Surgery	M.S. (Surgery)

Note: The DNB Candidates have to obtain one year research experience after obtaining the DNB qualification in the subject in a medical institute to consider them at par with MD / MS qualifications awarded by Indian Universities May be considered as per the norms of the Medical Council of India, New Delhi / court directions.

a) He/She having qualified for the Post-graduate degree of this University or any other Universities recognised as equivalent thereto by the authority of this University and the Indian Medical Council and obtained permanent registration from any of the State Medical Councils.

b) The admitting authorities of the Institutions will strictly ensure that every candidate admitted to the D.M/M.Ch Post-Graduate Higher Speciality Degree courses has obtained permanent registration certificates (both for M.B.B.S and Post-graduate Degree) from any one of the State Medical Councils.

* Special Meeting of the Standing Academic Board held on 26.09.1997.

Higher Specialities Syllabus 2006

5. ELIGIBILITY CERTIFICATE

Candidates who have passed any qualifying examination as stated in

Regulation No.4 above other than the Tamil Nadu Dr.M.G.R Medical University shall obtain an Eligibility Certificate from this University by remitting the prescribed fees along with the application form and required documents before seeking admission to any one of the affiliated medical institutions. The application form is available in the University Website www.tnmmu.ac.in.

6. DURATION OF THE COURSE

a) (i) The duration of certified study and training for the D.M/M.Ch Post

Graduate Higher Speciality Degree Courses shall be

three completed years (including the period of examination)
(i.e. completed six academic terms of six months each after
obtaining MD/MS degree or equivalent recognised qualification
in the required subject.)

(ii) The duration of M.Ch. Neuro Surgery course is five years for the
M.B.B.S candidates who are admitted directly. i.e. ten academic
terms of six months each after obtaining M.B.B.S. degree.

b) No exemption shall be given from this period of study and training for
anyother experience gained prior to the admission of the course.

7. DURATION OF COMPLETION OF THE COURSE **

The duration for completion of the course is double the duration of the
course(i.e) 6/10 years (as the case may be) to pass the examination, from the
date of joining the course, otherwise he/she has to get fresh admission.

8. CUT-OFF DATES FOR ADMISSION * 30th Sept. of the year.

The candidates admitted upto 30th September of the academic year shall be
registered for that academic year and shall take up their regular examination
in 1st August at the end of third year. There will not be any admission after
30th September for the academic year even if seats are unfilled.

* XXVI Standing Academic Board dated:16.12.2003

** XXV Standing Academic Board dated:25.06.2003

9. COMMENCEMENT OF THE COURSE *

The academic year for D.M/M.Ch. Post Graduate Higher Speciality Degree
courses shall commence from 1st August of the academic year.

10. REGISTRATION OF CANDIDATES *

A candidate admitted in D.M/M.Ch Post graduate Higher Speciality degree

courses in any of the affiliated Institutions of this University shall register his/her name in this University by submitting the prescribed application form for Registration duly filled in all respects along with the prescribed fee and a declaration in the format (as in Annexure I of the Regulations) to the Academic Officer ** of this University through the Head of the affiliated Institutions within 60 days from the cut-off date prescribed for admission.

11. RECOGNITION FEE

Candidates who have passed the M.B.B.S Degree/Post graduate Degree

from any other University shall remit a recognition fee as prescribed

along with stipulated registration fees.

12. COMMENCEMENT OF EXAMINATIONS *

There shall be two examinations in an academic year: August 1st /February 1st

If the date of commencement of the examination falls on Saturdays, Sundays

or declared Public Holidays, the examination shall begin on the next working day.

The M.Ch Neuro Surgery Part I will be written at the end of first year in five year programme as existing at present and the questions will cover General Surgery only.

For D.M. & M.Ch. students Applied Basic Sciences Paper Examination would be at the end of II year and not in III year. .

13. EXAMINATION

Modification in the Examination is applicable for the candidates who have joined during the academic year 2009-2010 onwards.

M.Ch. and D.M. Examinations will have four papers. The Applied Basic Science Paper would be at the end of II year.

Distribution of Marks for all M.Ch. / D.M. Degree Courses

Theory	400	(Part- I Paper-1 100 Marks at the end of second year Part-II 3 Papers X 100 in the final year)
Dissertation	25	
Log Book	25	(for Certified hand written Log Book)
Clinical Exam	400	
Internal Assessment	50	(5 Theory papers and Practical Examination at the End of 9, 15, 21, 27, 33 months (5X10=50))

Total Marks	900	

**14. ATTENDANCE REQUIREMENTS FOR ADMISSION TO
EXAMINATION**

No candidate shall be permitted to appear for the examination unless he/she has put in a **minimum of 90% attendance** (@) during his/her period of study and training in the affiliated institution recognised by this University and produces the necessary certificate of study, attendance and progress from the Head of the institution.

15. CONDONATION OF ATTENDANCE

There shall be no condonation of lack of attendance for the course.

16. REVALUATION OF ANSWER PAPERS

There shall be no revaluation of answer papers. However re-totalling is allowed in the failed subjects.

17. POSTING AND TRAINING IN OUTSIDE CENTRES *

The Head of the Post-graduate Higher Speciality Departments should make necessary arrangements for their Post-graduate candidates to undergo training in various skills in other centers within and outside the state if advanced facilities are not available in their own institutions or hospitals.

- (a) The Higher Speciality students ***may be*** sent to other institutions for a ***maximum of*** two months which are conducting similar MCI approved Courses in the same University or any other Universities or to a Centres of Excellence within the Country and to other allied departments for four months to acquire more knowledge and also to improve the standards of Higher Speciality courses ***at the discretion of the HOD atleast 6 months prior to examinations.****
- (b) The Higher Speciality students should be allotted to all the units equally by rotation to get training in all the units. *
- (c) The Higher Speciality students should be exposed to Modern Principles of Clinical Epidemiology, Bio-statistics and Research Methodology ***by Medical Epidemiology Unit or Clinical Unit of the college or University.***

* XXVI Standing Academic Board dated:16.12.2003

- (d) The D.M./M.Ch, students should be made to present minimum of two papers in National Conference and one publication in a National/International journal as part of their training Programme I
- (e) For 5 years M.Ch Neuro surgery course 3 presentations and 2 publications are mandatory
- (f) The D.M/M.Ch students should be encouraged to take classes for MD/MS students on various clinical programmes. *
- (g) The M.Ch Urology students may be posted in Gynaecology Department for a minimum of three months to get orientation of Genito Urinary Surgery in female population. *
- (h) The M.Ch Neuro Surgery students shall be posted to Neurology for two months as like other postings. **

18. NUMBER OF APPEARANCES

Candidates who do not pass their final examination within three appearances shall undergo a further period of study and training of minimum 3months duration in a recognised Post graduate Higher Speciality Department in the speciality in an institution approved by the Medical Council of India for every subsequent appearance.

The candidate should submit a certificate of study and training undergone from the concerned Head of the Institution to the Controller of Examinations of this University along with his/her application for admission to every subsequent examination (applicable for candidates who have failed more than 3 times) The failed candidates will be permitted to appear for a maximum of 6 attempts with 3/5 years as the case may be from the date of completion of the course and shall be discharged from the course if he/she fails to fulfill this provision.

19. MAINTENANCE OF HAND WRITTEN LOG BOOK

- a) Every Post-graduate candidate shall maintain a record of skills he/she has acquired during the training period certified by the various Heads of Departments where he/she has undergone training including outside the institution.
- (b) 25 marks are given for maintaining the Log Book.
- (c) When the candidates are sent for external posting the Log Book should be certified for that particular period by the concerned Head of the Department.
- (d) The candidate should also be required to participate in the teaching and training programme of Post-graduate and intern students

* XXVI Standing Academic Board dated:16.12.2003

** 31st Standing Academic Board dated:29.06.2006

Higher Specialities Syllabus 2006

(e) In addition, the Heads of the Departments shall involve their postgraduate candidates in Seminars, Journal Clubs, Group Discussions and participation in clinical, clinico-pathological conferences.

(f) Every Post-graduate candidate should be encouraged to present short title papers in conferences and improve on it and submit them for publication in reputed medical journals. Motivation by the Heads of Departments is essential in this area to sharpen the research skills of the post-graduate candidates.

(g) The Head of the Department shall scrutinize and certify the Hand

Written Log Book every three months.

(h) At the end of the course, the candidate should summarise the contents and get the Hand Written Log Book certified by the Head of the Department.

(i) ***Certified Hand written Log Book*** should be submitted at the time of practical examination for the scrutiny of the Board of Examiners.

(j) The Handwritten Log Book should contain Journal Club details, Clinical Case presentations, Procedures assisted and done independently and Papers published. These details should be mentioned date wise.*

20. DISSERTATIONS:

a) All candidates admitted to undergo D.M/M.Ch Post-graduate Higher

Speciality Degree courses shall be assigned a topic for dissertation/thesis by the head of the concerned Unit and the title of the topics assigned to the candidates be intimated to the Controller of Examinations of this University by the Head of the Department through the Head of the Institution, before end of the first year for 3 years course and at the end of the 2nd year for 5 years M.Ch

(Neurosurgery) course **

b) The dissertation/thesis shall be a bound volume of minimum 50 pages

and not exceeding 75 pages of typed matter (Double line spacing and

on one side only) excluding certification, acknowledgements,

annexures and Bibliography

c) 4 copies of dissertation shall be submitted six (6) months prior to the commencement of the examinations on the prescribed date to the Controller of Examinations of this University.

* 31st Standing Academic Board dated:29.06.2006.

** 28th Standing Academic Board dated:22.12.2004.

Higher Specialities Syllabus 2006

d) Two copies are to be submitted as an electronic version of the entire dissertation in a standard CD format by mentioning the details and technicalities used in the CD format.

e) The concerned Professors/Readers are to supervise and to see that the Dissertations are done properly utilizing the clinical materials of their own department/institution. The students must learn the design and interpretation of research studies, responsible use of informed consent and research methodology and interpretation of data and statistical analysis. They should seek the help of qualified staff members in the conduct of research. They must learn to use the

library and computer based research. This training will help them to develop skills in planning, designing and conduct of research studies.

21. EVALUATION OF DISSERTATION

- a) The dissertation should be approved by the Professor of that branch and the same has to be forwarded to the Controller of Examinations by the Head of the Department through the Dean/Principal of that college six months prior to practical examination and examined by a set of two examiners
- b) 25 marks allotted for the dissertation

- c) Dissertation and Log Book marks will be clubbed with practicals. If the candidate fails in the practical the same Dissertation/Log Book marks will be carried for the next examination.
- d) Two copies of the evaluation report of the dissertation should be submitted by the Examiners to the Controller of Examinations of this University.

* XXVIII Standing Academic Board dated:22.12.2004.

Higher Specialities Syllabus 2006

22. MIGRATION/ TRANSFER OF CANDIDATES

(a) Migration/Transfer of candidates from one recognised Medical college to another recognized Medical College of this University or from another University shall not be granted unless a No Objection Certificate is obtained from the Medical Council of India.

(b) The provision of combination of attendance shall be granted to a transferee for admission to the examinations of this University on satisfactory fulfillment of the regulations of this University.

23. RE-ADMISSION AFTER BREAK OF STUDY

A separate Regulation Book is available for all the UG/PG & P.G. Higher Speciality Degree courses of this University and re-admission and break of Study will be dealt with as per University Regulations.

Higher Specialities Syllabus 2006

ANNEXURE-I

REGULATION-10

DECLARATION

I

Son of / Daughter of

.....

Residing at

.....

And admitted to in I year of(Name of the
course/U.G./P.G.) / Super Speciality Course at

.....

(Name of the College) do hereby solemnly affirm and sincerely state as
follows:

I declare that I shall abide by the rules and regulations prescribed by
the Tamil Nadu Dr.M.G.R.Medical University, Chennai for the

(course) including regulations for re-admission after the break of study.

Date:

Signature of the candidate:

/Countersigned/

Dean/Principal/Director

(Office date seal)

Higher Specialities Syllabus 2006

SYLLABUS FOR D.M. COURSES

BRANCH - I D.M. NEUROLOGY

1. Neuroanatomy: It includes anatomy of central and peripheral nervous system and muscles including microscopic appearance, relevant embryology and its application to the related developmental disorders.
2. Neurophysiology - Physiology of central and peripheral nervous system and muscles.
3. Neuro Biochemistry: The normal biochemistry of the nervous system and muscles; and its application in different neurological disorders.
4. Neuropathology: Pathology of different diseases affecting the nervous system and muscles, including macroscopic and microscopic appearances.
5. Neuro - bacterio - virology - with special reference to the various neurological Disorders.
6. Neurogenetics: Normal as well as the abnormalities in different genetically Inherited neurological disorders.
7. Biostatistics and clinical epidemiology : Fundamentals of biostatistics, ability to conduct a clinical trial independently and interpret the final reports.
8. Neuro immunology : Normal and various abnormalities, seen in neuro Immunological disorders.
9. Neuropsychiatry : Related neuropsychiatric disorders such as non-epileptic Seizure etc.
10. Neuro Psychology.
11. Pediatric Neurology.
12. Neuro radiology including plain X-ray, CT scan, Angiogram, Magnetic Resonance Imaging, Myelogram etc.

13. Electrophysiology : Electrophysiology, nerve conduction studies, EEG including sleep EEG and Video EEG, evoked potentials etc.
14. Other Neurology oriented investigatory procedures in relation to neurology/Neuro ophthalmology etc.
15. Neurosurgery
16. Clinical Neurology
17. Neuro Pharmacology of various neurological disorders.

Ist YEAR

During the first year, the student will be working fully in the Department of Neurology. In the morning time, he/she will be familiarized with clinical neurology, neurological examination, localization and differential diagnosis, relevant laboratory and radiological investigations and pharmacotherapeutics. He/she will attend all the outpatient services and get himself/herself aware of the common neurological problems. In addition, he/she will work in the electrophysiology laboratories and get himself/herself fully familiar with EMG, evoked potential and electroencephalography (EEG). He/she should be competent to handle the equipments and report independently. In the afternoon, he/she will concentrate on the basic sciences and will undertake the research study within three months after admission.

IInd YEAR

The candidate may be sent to the best centre for training and learning the following subjects; This comes under 'visit to other centres'. The total period is for three months or four months depending on the centre.

Following will be the subject and duration of training :-

Neuropathology – 15 days.

Neuro-radiology (including interventional radiology) – 15 days.

Intensive Care in Neurology – 15 days.

Psychiatry – 15 days.

Paediatric Neurology – 30 days.

Neurosurgery – One month.

The Neurosurgery posting is applicable only to those centres where neurology and neurosurgery department are separate and with independent H.O.Ds functioning independently. For example, Madras Institute of Neurology in Madras Medical College is a single department consisting of neurology and neurosurgery. Out-patient department and teaching programmes like Clinical meetings and journal clubs are common to both neurologists and neurosurgeons. Neurosurgery problems and doubts are cleared then and there for the postgraduate students by senior Neurosurgery Faculty Members. Similarly, Neurosurgery postgraduates are attending the operation theatre to do minor procedures like muscle biopsy and nerve biopsy. There is no restriction for neurology postgraduates to follow, observe and learn neurosurgery then and there when necessity arises. The Head of the department is common to both Neurologists and Neurosurgeons. This is being practiced since Prof. B. Ramamurthi's period when he started the department 54 years ago. So the posting of D.M. Neurology postgraduates to neurosurgery may be relevant only to the Centres where Neurosurgery and Neurology departments are functioning separately. So in those centers where neurology and neurosurgery departments are functioning separately, the posting of neurology postgraduates to neurosurgery and vice versa will be decided by the corresponding Head of the department.

IIIrd Year

During the period, the candidate will work in the Neurology department concentrating on clinical and theoretical neurology, clinical psychiatric relevant investigations and medical as well as para medical management of the patients. Besides, he shall handle and report the EEG and EMG by himself.

Examination will be conducted at the end of third year.

Research Study :-

All candidates during the first year within three months of admission into the D.M. Post Graduate Higher speciality degree course shall be assigned a topic for dissertation by the Head of Neurology Department in consultation with the concerned Unit Chief. The title of the topics assigned to the candidates should be intimated to the Controller of Examinations of the University by the Head of the Department through the Head of the Institution before the end of first year. Four copies of dissertation shall be submitted five months prior to the commencement of examination, as in the prescribed date to the controller of Examinations of the University.

Branch-I – D.M Neurology

Theory – 4 papers, 100 Marks each Duration: Three Hours each

Paper I :	Basic Sciences – consisting of Neuro anatomy, Neuro physiology, Neuro chemistry, Neuro pathology, Neuro Microbiology, Parasitology, Immunology, Epidemiology and Genetics.	100
Paper II :	Neurology, Neuro Psychiatry, Neuro Psychology, Paediatric Neurology.	100
Paper III :	Neuro Radiology, Electro Physiology, Neuro Otology, Neuro Ophthalmology and other investigatory procedures.	100
Paper IV :	Recent advances in Neurology.	100

DISTRIBUTION OF MARKS : **

MCQ Objective (Multiple Choice) 20 questions(20x1)	20 Marks
One Essay	20 Marks
Two Essays 15 Marks each (15 x 2)	30 Marks
Six Short notes 5 Marks each (5 x6)	30 Marks
TOTAL	<u>100 Marks</u>

** XXX SAB dated 28.12.2005

PRACTICAL/CLINICAL AND ORAL EXAMINATION

<u>NO. OF CASES</u>		<u>DURATION</u>	<u>MARKS</u>
LONG CASE	One	One Hour	100
SHORT CASE	Two	One Hour (30 Mts. Each)	100
WARD ROUNDS	Four (Minimum)	One Hour.	100
		TOTAL	<u>300</u>
Oral/ Viva Examination			<u>100</u>
		TOTAL	400

Viva includes Pathology slides, specimens, EEG, EMG and other diagnostic records, X-ray, CT scan, MRI, Angiogram and others.

Note: Not more than three candidates will be examined in Practical examinations per day.

DISSERTATION: Approved/Not approved (No Marks)

MARKS QUALIFYING FOR A PASS :

	Maximum Marks	Marks Qualifying for a pass (50%)
Theory	400	200
Practical/Clinical	300	150
Oral	100	50
	----	----
Aggregate	800	400
	----	----

The Viva and Clinical Examination may be conducted on the same day, because all the candidates need not have to be present till the last day of the examination.

Recommended Reading :-

Books and Journals as per the advice of the Head of the Department of Neurology.

BRANCH - II D.M. CARDIOLOGY

SYLLABUS / COURSE CONTENT

1. Applied Anatomy: Heart and great vessels, congenital anomalies; development of heart.
2. Applied Physiology: Cardiac cycle, cardiac output, pressure and volume loops, cardiac contractility, pulmonary circulation, coronary circulation, blood pressure, cardiac failure, acid base balance.
Autonomic control of heart and vasculature, pulmonary function tests and their application to cardiology, interpretation of data on PET.
3. Applied Pathology: Congenital heart disease, rheumatic fever and lesions, myocarditis, cardiomyopathies, pericarditis, constrictive pericarditis, infective endocarditis, coronary artery disease including myocardial infarction, hypertensive heart disease, pulmonary embolism, cardiac tumors.
4. Applied Pharmacology: Cardiac glycosides, anti-hypertensives, diuretics, drugs for coronary artery disease, betablockers, calcium channel blockers, inotropic agents, antibiotics, antiarrhythmic agents.
5. Cardiovascular Imaging: Chest x-ray, ECG, Echo, Nuclear medicine imaging, MRI, CT scan, PET scan.
6. Hemodynamics and interventions: Cardiac catheterization, oxymetry, hemodynamics, angiogram, interventional procedures in cardiology practice.
7. Clinical Cardiology: Congenital, ischemic heart disease, myocardial disorders, pericardial, valvar heart disease, pulmonary hypertension, cardiac tumours, cardiac arrhythmias, other system disorders affecting cardiology.

RECOMMENDED BOOKS

1. Heart Disease: Braunwald, 7th Edition
2. The Heart: Hursts, 11th Edition
3. Valvular Heart Disease: Dalan Alpert, 3rd Edition
4. Cardiovascular Medicine: Topol, 3rd Edition
5. Cardiology: Crawford, 2nd Edition
6. Clinical Examination: Joseph K. Perloff, 5th Edition
7. The science and practice of Paediatric Cardiology: Arthur Garson, 2nd Edition
8. Heart Disease in infants children and Adolescents: Moss and Adams, 6th Edition
9. Nada's Pediatric Cardiology: 2nd Edition
10. Practical Electrocardiography: Marriot: 10th Edition
11. Cardiac Electrophysiology: Zipes and J Alife: 2nd Edition
12. Echocardiography: Harvey Feigenbaun, 6th Edition
13. Principles and Practice of Echocardiography: Arthur E. Weymen, 1st Edition
14. The Cardiac Catheterization Hand Book: Morton J. Kern, 4th Edition
15. Cardiac Catheterization Angiography and Intervention: William Grossman 7th Edition

Theory – 4 papers, 100 Marks each Duration: Three Hours each

DISTRIBUTION OF MARKS : **

PRACTICAL/CLINICAL AND ORAL EXAMINATION

**** XXX SAB dated 28.12.2005**

Note: Not more than three candidates will be examined in Practical Examination per day

DISSERTATION: Approved/Not approved (No Marks)

MARKS QUALIFYING FOR A PASS :

	Maximum Marks	Marks Qualifying for a pass (50%)
Theory	400	200
Practical/Clinical	300	150
Oral	100	50
	----	----
Aggregate	800	400
	-----	-----

The Viva and Clinical Examination may be conducted on the same day, because all the candidates need not have to be present till the last day of the examination.

BRANCH – III D.M. NEPHROLOGY

SYLLABUS

1. Study of Kidney : Gross Anatomy, histology including Electron Microscopy of the Kidney.
2. Physiology of the Kidney: Renal Circulation, Glomerular, tubular functions.
3. Water Electrolyte, Acid base balance, handling of Water sodium, Potassium, Chloride, Calcium, Phosphorus, Magnesium and Organic anions by the Nephrons.
4. Role of Kidneys in regulation of blood pressure, erythropoiesis and production of various hormones.
5. Assessment of patients with the renal problems: History and Clinical Examination, Urine analysis, renal function tests, Uro radiology, renal ultrasonography, C.T. Scan and MRI of the kidney and urinary tract, renal Angiography, renal biopsy technique and interpretation.
6. Electrolyte imbalances including Sodium, Potassium, Chloride, Bicarbonate, Calcium, Phosphorous and Magnesium.
7. Acid Base disorders.
8. Glomerular disease:
 - Structural basis of ultrafiltration
 - Immune mechanisms of glomerular damage
 - Evaluation of proteinuric patient
 - Acute nephritic syndrome
 - Different types, etiology, clinical, bio-chemical, histopathological presentations, Complications and management of Nephritic syndrome.
 - Different types, etiology, clinical, bio-chemical, histopathological presentations, complications and management of the crescent glomerulonephritis.
9. Kidney in systemic diseases
10. Renal tubular disorders.

11. Tubulo interstitial diseases
12. Urinary tract infections
13. Nephrolithiasis
14. Hypertension and kidney
15. Pregnancy and kidney problems
- 16 Inherited disorders of the kidney
- 17 Congenital abnormalities of the kidney and urinary tract
- 18 Acute renal failure
- 19 Chronic renal failure
- 20 Hemodialysis, peritoneal dialysis, vascular access, continuous ambulatory peritoneal dialysis, various types of renal replacement therapy.
- 21 Renal transplantation:

Transplant workup of the donor and the recipient, immunological aspects, technical aspects, drugs, complications and follow-up.
- 22) Nutritional aspects of renal problem
- 23) Critical care Nephrology
- 24) Recent Advances:
- 25) Recent monographs, journals and from other sources.

TRAINING METHODS & AREAS OF TRAINING :

1. The candidates will work in the department and discharge their duties with increasing responsibilities in the decision making process both in clinical and investigative aspects of Nephrology. The candidates will work taking up the responsibility of investigative and therapeutic care of the patients under the guidance of consultants in Nephrology.

2. The candidates will be attending the **out patient clinics** of the department.
- 3 Training in **renal biopsy** and interpretations of biopsy will be given.

4. Dialysis :

Hemodialysis :

The candidates will be posted in the hemodialysis unit by rotation. He will be trained to learn both technical and clinical aspects of Hemodialysis. He will be trained in venous cannulations for the hemodialysis.

Peritoneal dialysis :

The candidate will be trained to perform intermittent peritoneal dialysis and continuous ambulatory peritoneal dialysis.

Continuous renal replacement therapy (CRRT) :

The candidates will be trained to take decisions about the mode of dialytic therapy in critically ill patients.

Other Procedures :

The candidates will also be trained in plasmapheresis, hemoperfusion and water treatment.

Any other recent advances in the technique of management in Nephrology :

Renal transplantation :

The candidate will do the workup of kidney donor and recipient and prepare the recipients for the transplantation and manage them in the Post-operative period and do the long term follow up.

TEACHING PROGRAMME :

The staff members of the department will be primarily responsible for the teaching and in addition the following departments will be involved in teaching programme. They are:

- i. Radiodiagnosis.
- ii. Immunopathology.
- iii. Urology.
- iv. Internal Medicine.

FORMAL TEACHING :

The following teaching exercises are envisaged in the broad schedule of the teaching programme. However the details may change from time to time depending upon the evolving circumstances.

Teaching exercise s	Frequency	Duration
1. Clinical bedside discussion	two times/week	two hours.
2. Seminar	once in two weeks	one hour.
3. Journal Club	once in two weeks	one hour.
4. Topic review	once a week	one hour.
5. Renal histopathology rounds	once in two weeks	one hour.
6. Renal radiology rounds	once in two weeks	one hour.
7. Nephrourology rounds	once in two weeks	one hour.
8. Nephrology-internal Medicine case discussion	once a week	one hour.
9. Nephrology-paediatric Nephrology case discussion	once in two weeks	one hour.

Duration of the course :

Three years

Suggested period of posting :

1. Male ward	8 months.
2. Female ward	8 months.
3. Dialysis unit	7 months.
4. Transplantation	7 months.
5. Consultation service, } renal laboratory, } pathology, micro- } biology, biochemistry, } radiology, immunology, } nuclear medicine }	2 months.
6. Paediatric Nephrology	2 months.
7. Posting in other centres	2 months.

Branch-III – D.M Nephrology**PATTERN OF EXAMINATION**

Theory – 4 papers, 100 Marks each Duration: Three Hours each

Paper I :	Nephrology Basic Sciences	100
Paper II :	Clinical Nephrology, Dialysis, Transplantation	100
Paper III :	Nephrology – Dialysis and Transplantation	100
Paper IV :	Recent Advances	100

DISTRIBUTION OF MARKS : **

MCQ Objective (Multiple Choice) 20 questions(20x1)	20 Marks
One Essay	20 Marks
Two Essays 15 Marks each (15 x 2)	30 Marks
Six Short notes 5 Marks each (5 x6)	30 Marks
TOTAL	100 Marks

PRACTICAL/CLINICAL AND ORAL EXAMINATION

	<u>NO. OF CASES</u>	<u>DURATION</u>	<u>MARKS</u>
LONG CASE	One	One Hour	100
SHORT CASE	Two	30 minutes each (30 Mts. Each)	100
WARD ROUNDS	Four (Minimum)	One Hour.	100
		TOTAL	300
Oral/ Viva Examination			100
		TOTAL	400

Note: Not more than three candidates will be examined in Practical examinations per day.

** XXX SAB dated 28.12.2005

DISSERTATION: Approved/Not approved (No Marks)

MARKS QUALIFYING FOR A PASS :

	Maximum Marks	Marks Qualifying for a pass (50%)
Theory	400	200
Practical/Clinical	300	150
Oral	100	50
	----	-----
Aggregate	800	400
	-----	-----

The Viva and Clinical Examination may be conducted on the same day, because all the candidates need not have to be present till the last day of the examination.

Recommended Reading :-

Books and Journals as per the advice of the Head of the Department of Nephrology

BRANCH IV - D.M. MEDICAL GASTROENTEROLOGY

SYLLABUS

The purpose of the specialty course in Gastroenterology is to train physicians to become independent consultants and, if necessary, academician teachers in the diagnosis, management and investigative research of diseases of the gastrointestinal tract. Needless to say, this training can be given only to those with prior post-graduate training in Internal Medicine or Paediatrics. While many gastrointestinal diseases are common all over the globe, India has others that are either far more common here or are rarely reported from other countries. Further, there are issues such as poverty and levels of hygiene that impinge on decision making in this environment.

Definition:

The term “gastrointestinal diseases” includes diseases of the gastrointestinal lumen from the mouth to the anal canal (though the diseases of the mouth are usually left to other specialists), diseases of the liver and biliary tree, diseases of the pancreas and of the peritoneum. There are diseases from other systems which often manifest with gastrointestinal symptoms and these too come under the purview of the gastroenterologist.

The Skills:

The skills that are critical for a qualified gastroenterologist are the following:

- 1) Clinical skills: This includes skills arriving at a diagnosis, judicious planning and interpretations of investigations, decision making and optimizing treatment in sufferers from specific gastrointestinal diseases and maintaining a “follow-up” on patients. It also includes preventive therapy in close relatives or communities affected by or under threat of a particular disease. Further, gastroenterologists in India need to be trained to balance the financial constraints that patients have against the use of expensive investigative tools and therapies, while keeping patients fully informed about the illnesses they suffer from and the options available. The best way to acquire these skills is to work full time in the gastroenterology training centre and be available for emergencies on rotation. One of the most fruitful ways of becoming a competent consultant is to offer to see the consultation requests from other departments on behalf of the gastroenterologist consultant concerned, provided the case is discussed with him/her before offering advice to the requesting department.

- 2) **Manual skills:** Endoscopic procedures are a major part of investigative and therapeutic gastroenterology. All gastroenterologists should have hands-on training in the basic upper and lower gastrointestinal endoscopic procedures and in less specialized therapeutic procedures such as oesophageal dilatation, sclerotherapy, variceal ligation and percutaneous endoscopic gastrostomy. It is desirable that, in their specialty training period, gastroenterologists should also be trained in routine diagnostic pancratico-biliary endoscopy. This gives them a base from which they can pursue a career in specialized gastroenterology later on, if they so wish. Trainees should also know how to do non-endoscopic procedures such as percutaneous liver biopsy and pneumatic dilatation safely. In centers where ultrasonography is available with the gastroenterologist, ultrasound guided procedures may be added to the list of desirable skills. Gastroenterologists in some centers also do transjugular liver biopsies and angiographic procedures but this is best developed in a radiology department and is not something that a trainee gastroenterologist should avidly look forward to. Motility studies and pH monitoring studies are becoming more commonplace and students are well advised to learn these skills in addition to endoscopy.
- 3) **Research skills:** This includes the capacity to identify research problems, frame research questions, know how to find sources of the requisite background information and sift the “chaff from the wheat” from this information, plan studies, execute them, analyze the data and write a report on the findings and their interpretation. The University now requires the submission of a Dissertation or report on a research project by each candidate training in gastroenterology.

Theoretical knowledge

The acquisition of knowledge has been emphasized before this. Prospective trainees often ask what the syllabus for the DM gastroenterology course is. What they mean to ask is what textbooks they should read. Textbook or theoretical knowledge without adequate hands-on experience leads to very lopsided and defective training. It is impossible to have comprehensive knowledge about everything in gastroenterology and common diseases require a greater depth of information than rare ones. The well trained gastroenterologist will find that knowledge of the principles of the basic sciences (i.e. anatomy, physiology, biochemistry, pathology, microbiology, virology, immunology and molecular biology) will be of immense benefit only if it is used in the light of what he/she sees in clinical practice. Similarly, clinical knowledge without understanding the basis of investigations and disease can be dangerous.

In order to acquire the necessary knowledge, one could read “from cover to cover” the standard textbooks of which there is a wide selection in the market and which are commonly used by students in the subject. However, only some of this information will remain and the retention will be more likely if it is seen in conjunction with actual clinical scenarios.

Two additional steps need to be taken. The first is to keep abreast of the clinically relevant papers in the major gastroenterological journals (Gastroenterology, Gut, Hepatology, Journal of Gastroenterology and Hepatology) and the papers on gastroenterology in general journals such as the Lancet and the New England Journal of Medicine. This list is not exhaustive and any journal which is indexed can be a source of information. The internet is a major blessing in this regard and search engines will now do what labour intensive searches in the Index Medicus did in the past years. The second is to make frequent consultations with allied specialists such as surgeons, radiologists, intensive medicine specialists, oncologists, pathologists and microbiologists and virologists. It is worthwhile observing and understanding interventional procedures in Radiology besides studying images and X-rays.

It is now recommended that students spend time outside the department of gastroenterology and this could be in departments such as named above. If these facilities are lacking in their own institutions, they may visit other academic centers and non academic centers of excellence.

While it is no longer necessary for students to work routinely in laboratories doing minor tests such as stool examinations, it is strongly recommended that they familiarize themselves with the techniques of all the tests that they frequently use. This will allow them to understand the principles of those investigations and become aware of the margins for error.

Deficiencies in the training department

If there are deficiencies in the department where a candidate has been accepted for training, it is mandatory that the candidate be sent to other institutions or departments to make up the deficiencies.

Branch-IV – D.M. Medical Gastroenterology**PATTERN OF EXAMINATION**

Theory – 4 papers, 100 Marks each Duration: Three Hours each

Paper 1 : Basic Sciences applied to the Speciality 100

Paper II : General Gastroenterology including
Paediatric and Preventive Gastroenterology 100

Paper III : Hepatobiliary, Pancreatic Diseases 100

Paper IV Recent Advances in the Speciality 100

DISTRIBUTION OF MARKS : **

MCQ Objective (Multiple Choice) 20 questions(20x1) 20 Marks

One Essay 20 Marks

Two Essays 15 Marks each (15 x 2) 30 Marks

Six Short notes 5 Marks each (5 x6) 30 Marks

TOTAL 100 Marks

PRACTICAL/CLINICAL AND ORAL EXAMINATION

	<u>NO. OF CASES</u>	<u>DURATION</u>	<u>MARKS</u>
LONG CASE	One	One Hour	100
SHORT CASE	Two	30 minutes each	100
WARD ROUNDS	Four (Minimum)	One Hour.	100
		TOTAL	<u>300</u>
Oral/ Viva Examination			100
		TOTAL	<u>400</u>

** XXX SAB dated 28.12.2005

Note: Not more than three candidates will be examined in Practical examinations per day.

DISSERTATION: Approved/Not approved (No Marks)

MARKS QUALIFYING FOR A PASS :

	Maximum Marks	Marks Qualifying for a pass (50%)
Theory	400	200
Practical/Clinical	300	150
Oral	100	50
	----	----
Aggregate	800	400
	-----	-----

The Viva and Clinical Examination may be conducted on the same day, because all the candidates need not have to be present till the last day of the examination.

Recommended Reading :-

Books and Journals as per the advice of the Head of the Department.

BRANCH – VII D.M. MEDICAL ONCOLOGY

SYLLABUS/CURRICULUM:

1) Basic Scientific Principles:-

As foundations for treating malignant disease, the trainee should understand the biology of cancer, principles of therapy and proper conduct and interpretation of clinical research.

A. Cancer Biology: - Trainees should know the biology of normal cells and the basic processes of carcinogenesis. They should have an understanding the gene structure, organization, expression and regulation. A fundamental understanding of the cell cycle, its control by oncogenes and its interaction with chemotherapy is important. They should understand tumour cell kinetics, proliferation and programme cell death and the balance between cell death and cell proliferation.

Syllabus reading to include:

1. Essentials of Molecular Biology - Basic Principles. Genomics and Cancer, signal transduction, Immunology, Cytogenetics, Cell Cycle, Apoptosis, invasion and metastases, angiogenesis and carcinogenesis, - Genetics, viral physical and Chemical.
2. Epidemiology - epidemiologic methods, descriptive and analytical epidemiology
3. Principles of cancer management surgical Oncology, Medical Oncology, Radiation Oncology and Biologic therapy.
4. Cancer Chemotherapy
5. Pharmacology of Cancer Biotherapeutics - interferons interleukins, hormonal therapy, differentiating agents, monoclonal antibodies, antiangiogenic factors.
6. Clinical Trials.
7. Cancer Prevention - tobacco related cancers, diet chemoprevention.
8. Cancer Screening

9. Cancer Diagnosis - Molecular pathology and Cytology, Imaging, Endoscopy, Laparoscopy
10. Specialised techniques - minimal access surgery, Vascular access, isolated perfusion, intensity modulated radiation therapy.
11. Systemic Oncology:
 - Head and Neck Cancer
 - Long Cancer
 - Mediastinal neoplasms
 - Gastrointestinal tract cancer
 - Cancers of the Genitourinary system
 - Gynaecologic cancer
 - Breast cancer
 - Endocrine Malignancies
 - Musculoskeletal turnouts
 - Mesothelioma
 - Cancer of the skin
 - Malignant Melanoma
 - Central nervous system - malignancies
 - Paediatric malignancies
 - Lymphomas and leukemia
- 12) Pereneoplastic syndromes
- 13) Cancer of the unknown primary site
- 14) Peritoneal carcinomatosis
- 15) Cancer in immunosuppressed host
- 16) Oncologic emergencies - SVC syndrome, spinal cord compression, metabolic emergencies, urologic emergencies
- 17) Treatment of metastatic cancer - brain, lung, bone, liver, malignant effusions and ascitis
- 18) Haemopoetic therapy - transfusion, grown factors, autologous and allogenic stem cell transplantation
- 19) Infection in the cancer patient

- 20) Supportive care and quality of life - pain management, nutritional support, sexual problems, genetic counselling, psychological issues, community resources, care of the terminally ill patient.
- 21) Adverse effects of treatment - neuses and vomiting. Oral complications, pulmonary toxicity, cardiac toxicity, hair loss, genital dysfunction, second cancers, miscellaneous toxicity.
- 22) Rehabilitation of the cancer patient.
- 23) Oncology nursing including venous access.
- 24) Ethical issues in oncology
- 25) Information systems in Oncology.
- 26) Alternative methods of cancer treatment.
- 27) Newer approaches in cancer treatment - Gene therapy, molecular therapy, cancer vaccines, image guided surgery, heavy particles in radiation therapy.
- 28) Reconstructive surgery.

PATTERN OF EXAMINATION

Theory – 4 papers, 100 Marks each Duration: Three hours each

Paper - I	Applied Basic Sciences (Radiation Physics, Tumour Biology, Biochemistry, Bio-metry, Immunology and Pharmacology).	100
Paper - II	General Oncology including Tumour Pathology, Radiology and Nuclear Medicine.	100
Paper - III	Medical Oncology including Therapy, Epidemiology and Rehabilitation.	100
Paper - IV	Recent Advances in Medical Oncology	100

DISTRIBUTION OF MARKS **

MCQ (Multiple Choice Questions) 20 questions (20 x1)	20 Marks
One Essay	20 Marks
Two Essays 15 Marks each (15 x 2)	30 Marks
Six Short notes 5 Marks each (5 x 6)	30 Marks
TOTAL	<u>100 Marks</u>

PRACTICAL/ CLINICAL AND ORAL EXAMINATION

	<u>No. OF CASES</u>	<u>DURATION</u>	<u>MARKS</u>
LONG CASE	One	One Hour	100
SHORT CASE	Two	One Hour	100
-		(30 Mts Each)	
WARD ROUNDS	Four	One Hour	100
	(Minimum)		
		Total	<u>300</u>
Oral/Viva Examination			100
		Total	<u>400</u>
			—

Note: Not more than three candidates will be examined in Practical examinations per day.

DISSERTATION : Approved/Not approved
(No Marks)

** SAB dated 28.12.2005

MARKS QUALIFYING FOR A PASS

	Maximum Marks	Marks Qualifying for a pass (50%)
Theory	400	200
Practical/Clinical	300	150
Oral	100	50
Aggregate	<u>800</u>	<u>400</u>

BRANCH - IX D.M. RHEUMATOLOGY

Curriculum – D. M. Rheumatology - Three Years Course:

The schedule of Postings and training programme for three years period of study: year wise training programme for D. M. Rheumatology

First Year :

Rheumatology Department	
Out-patient/Wards/Laboratory	One Year.

Second Year :

Peripheral Postings –	
Nephrology	One Week.
Dermatology	One Week.
Pathology	One Week.
Orthopaedics	One Week.
Radiology	Four Weeks.
Ophthalmology	One Week.
Physical Medicine & Rehabilitation	One Week.
 Tuberculosis Research Center	 Two Weeks.

(for learning Immunological Investigation).

Students who are posted outside should attend Theory classes, Journal club and case presentation daily at the Department of Rheumatology in the afternoon.

Rheumatology Department:

OP/Wards/ <u>Laboratory</u>	Nine Months.
2 months	

Third year :

Rheumatology Department -	
OP/Wards/ <u>Laboratory</u>	One year
2 months	

Besides the above, Synovial aspirations, Intra articular injections, Arthroscopy, interpretation of X-rays, CT Scan, M.R.I. and Ultrasound are to be undertaken.

DISSERTATION :

Every D.M. Rheumatology student should do a Dissertation in Rheumatology and Immunology and submit as per the Tamil Nadu Dr. M.G.R. Medical University Regulations. Submission of Dissertation to the University is mandatory for appearing for the D.M. Rheumatology University Examination.

1. Basic Principles in Rheumatology:-

- a) Biology of Joints
- b) Articular Structures:- Hands - Wrists - Elbows – Shoulders - Neck - Low Neck - Spines - Hip joint and Pelvis Girdle - knees - ankles feet.
- c) Connective tissue:- Normal and Pathological synovial tissue - collagen - collageneses - proteoglycans - mediators derived from poly - unstructured fatty acids - prostaglandins – thromboxanes - leukotrienes - mediators of acute and chronic inflammation - vascular endothallum - inter leukins - from redicals - nitric oxide - spoptosis.
- d) Formation and resorption of bone - bone as a tissue and an organ.
- e) Muscle: Anatomy - contractile proteins - Sceffold proteins – ultrastructure of the muscle fibre - neuro muscular junction – physiology of motor unit- excitation - contraction coupling – bio-chemistry of contraction – muscle energy metabolism – pharmacology of the motor unit.
- f) Nerve: Neuropathies of special interest in Rheumatology – laboratory investations - pain both ways
- g) Synovial physiology
- h) Collagen in normal and diseased connective tissue :-

Chondrocyte structure and function - articular cartilage.

2. Diagnostic Procedures:-

- a. Synovial fluid
- b. Aspiration and injection of joints and soft tissue
- c. Rheumatoid factor - latex, rose, waaler, Elisa, Nephelometry
- d. Antinuclear antibodies and L.E. cell phenomenon
- e. Antiphospholipid antibodies
- f. Nuclear, Nuclear and Cytoplasmic antibodies - ANCA
- g. Anti Streptococcal antibodies
- h. Acute phase reactants
- i. Synovial biopsy
- j. Radiology of joints
- k. Radio Isotopic assessment of joints and bones - C.T.; MRI in Rheumatology - Ultrasonogram of joints and soft tissues.
- l. Arthrography - Thermography - Arthroscopy
- m. HLA Typing
- n. Immuno Fluorescence
- o. Elisa
- p. Immunoblotting
- q. Polymerase Chain Reaction (PCR)
- r. Neuromuscular testing, Electrophysiology
- s. Biological markers of rheumatic diseases

(1) Differential approach to major rheumatic syndrome:

Examination of Joints:- Acute and chronic monarticular arthritis -

Polyarthritis – temporomandibular joint diseases shoulder and neck pain - low back pain - foot pain - the fibro-myalgia syndrome - skin and rheumatic diseases - eye and rheumatic diseases - neurologic manifestations - cardiac manifestations, pulmonary manifestations of connective tissue diseases - arthritis and gastro intestinal and liver diseases - nutrition and rheumatic diseases - Psychosocial aspect of rheumatic diseases - kidney and rheumatic diseases.

2. Clinical Pharmacology in Rheumatic diseases:-

Developing a clinical trial design - salicylates - nonsteroidal anti inflammatory drugs - anti malarias - gold compounds - D. Penicillamine –

methotrexate - glucocorticoids - Sulfasalazine - immunoregulatory agents - cytotoxic agents - therapeutic apheresis - Ionizing radiation - antilymphocyte antibodies - Cyclosporine A and other agents NSAID gastropathy - antihyperuricemic drugs - biologic agents - tetracyclines - intravenous - immunoglobulin - autologous - stemcell transplantation - leflunomide - antiTNF alpha therapy.

3. Specific articular and connective tissue diseases:-

Rheumatoid arthritis - Felty's syndrome - Sjögren's syndrome - spondyloarthropathy - ankylosing spondylitis - Reiter's syndrome, reactive arthritis - HLA B 27 related and non-related arthritis - Adult Still's disease. Psoriatic arthritis - enteropathic arthritis - systemic lupus erythematosus - mixed connective tissue disease - overlap syndromes - vasculitic syndrome - vasculitis and related disorders - polyarteritis - vasculitis associated with rheumatic diseases - hypersensitivity - vasculitis - Churg - Strauss Vasculitis - Wegener's Granulomatosis - Takayasu's arteritis, Cogan's syndrome - Kawasaki's disease - giant cell arteritis - polymyalgia rheumatica - Behçet's disease Scleroderma - localized fibrotic disorders - eosinophilic fasciitis - scleroderma - inflammatory disease of muscle - polymyositis - dermatomyositis - gout and related disorders of purine metabolism - diseases associated with deposition of calcium pyrophosphate or hydroxyapatite - osteoarthritis - R. Polychondritis - amyloidosis - serocoidosis - iron storage disease - multicentric reticulohistiocytosis - Ochronosis - infectious arthritis - bacterial arthritis - mycobacterial and fungal infections - Lyme disease - viral arthritis hemophilic orthopathy - Hemoglobinopathies and arthritis - arthropathies associated with endocrine disorders - hypertrophic osteoarthropathy - neuropathic joint disease musculoskeletal syndrome associated with malignancy - heritable disorders of structural proteins - metabolic bone disease - osteoporosis osteonecrosis osteomalacia involving joints - rheumatic fever - childhood S.L.E. and dermatomyositis - Scleroderma, vasculitis, antiphospholipid antibody syndrome, soft tissue rheumatism - rheumatic complications of drugs - neutrophilodermatosis - ANCA related vasculitis - panniculitis - hyperlipidemias - tumours and tumor like lesions involving joints - hypermobility syndromes, reflex sympathetic dystrophy - familial Mediterranean fever - Paget's disease.

4. Medical orthopaedics and rehabilitation:-

Sports Medicine - entrapment neuropathies - chronic pain syndromes and management - Physiotherapy - occupational therapy - health outcome assessment - rehabilitation of patients with rheumatic diseases

5. Reconstructive surgery in rheumatic disease:-

Principles of reconstructive surgery - pre-operative evaluation –
choice of procedure - post operative management and follow-up –
surgery in children

6 Special problems in rheumatic diseases:

Development of new anti rheumatic drugs -management of rheumatic disability
- pain and rheumatic disease.

PATTERN OF EXAMINATION :

Theory -4 papers, 100 Marks each Duration: Three hours each

Paper – I	Applied Basic Sciences and Diagnostic Procedures in Rheumatology and Clinical Immunology.	100
Paper – II	Clinical Rheumatology and Clinical Immunology.	100
Paper – III	Clinical Pharmacology, Rehabilitation Surgery, Special problems relating Rheumatic Diseases, Paediatric Rheumatology, Pregnancy and Rheumatic Diseases.	100
Paper – IV	Recent Advances in Rheumatology and in Immunology.	100

Distribution of Marks : *

MCQ (Multiple Choice Questions) 20 Questions(20x1)	20 Marks	.
One Essay	20 Marks	
Two Essays 15 Marks each (15 x 2)	30 Marks	
Six short notes 5 Marks each (5 x6)	30 Marks	
TOTAL	<u>100 Marks</u>	

Practical/Clinical and Oral examination **

	<u>No. OF CASES</u>	<u>DURATION</u>	<u>MARKS</u>
LONG CASE	One	One Hour	75
SHORT CASE	Two (30 Mts Each)	One Hour	75
WARD ROUNDS	Four (Minimum)	One Hour	50
			<u>200</u>
Practical			100
Oral/Viva Examination			100
			<u>-----</u>
	Total		400
			<u>-----</u>

PRACTICAL :-

The candidate can be asked to do less time consuming tests like latex agglutination tests like Rheumatoid factor, C.Reactive protein, Anti Streptolysin O titre. And the knowledge of the principles and methodology of any one of the following tests can be evaluated :-

1. Rose – Waaller Test.
2. Immuno fluorescence Tests.
3. Enzyme Linked Immuno Sorbent Assay (ELISA).
4. Single Radial Immuno Diffusion.
5. Electrophoresis.
6. S.D.S PAGE.
7. Immuno Blot.
8. H.LA Typing / Cross Matching.

-
- XXX SAB dated 28.12.2005

** 31st SAB dated 29.06.2006

9. Synovial Fluid Analysis.
10. Crystal Identification.

ORAL:-

1. Pathology Slides.
2. X-ray, Ultrasound, CT & MRI interpretation.
3. Clinical Oriented Problems.
4. Topic Discussion.
5. Discussion about dissertation.

Note: Not more than three candidates will be examined in Practical Examination per day.

DISSERTATION; Approved/Not approved

MARK S QUALIFYING FOR A PASS :

	Maximum Marks	Marks Qualifying for a pass (50%)
Theory	400	200
Practical	300	150
Oral/Viva	100	50
Aggregate	<u>800</u>	<u>400</u>

BRANCH X – D.M CLINICAL HAEMATOLOGY

India must produce specialists in Haematology who are able to integrate the laboratory aspects and clinical management of the patient with haematologic disorders. There have been numerous advances in Haematology over the past two decades which makes it necessary for the country to have post-graduate training in the speciality. The Haematology laboratory is now expected to provide rapid, accurate and reproducible results for large numbers of samples and this is possible with automation. Molecular techniques are now no longer research tools but necessary for ante natal diagnosis and clinical decision making. Blood banking has come a long way with component therapy and single donor apheresis. Bone Marrow transplantation now provides a cure for many hitherto incurable diseases and a competent haematologist is necessary to offer this type of treatment. The doctor who undergoes post-graduate training in haematology should possess the necessary clinical and laboratory skills to be able to manage patients with primary haematological problems and interact as a consultant for haematology problems from other specialities and be competent in laboratory haematology and transfusion medicine.

Departments involved in the training programme:

- i) Clinical Haematology
- ii) Clinical pathology and Blood Bank
- iii) Biochemistry
- iv) General Pathology
- v) Nuclear Medicine
- vi) Radiotherapy

I. Practical Laboratory Training:

A. General Laboratory Haematology:

- a) Proper use and care of common laboratory instruments such as the light microscope, Centrifuge, water baths, freezers, weighing balance etc.,
- b) Weighing of solids, preparation of molar and N. solutions, preparation and use of buffers. Familiarization with the practical concepts of pH, molarity, normality, osmolality, normal values and reference ranges
- c) The nature and uses of distilled and deionized water.

- d) Blood collection of samples venupuncture and finger prick methods sample collection, types of anticoagulants, containers and the effects of delay in processing and storage.
- e) Determination of blood counts (Haemoglobin, haematocrit, total WBC and platelets) manually and calculation of red cell indices.
 - i) use of automated electronic blood cell counters including principles and practice.
 - ii) interpretation of peripheral blood counts.
 - iii) preparation of blood films - manual and automated techniques.
 - iv) Staining of peripheral blood films with Romanowsky and other dyes by manual and automated techniques.
 - v) Review of normal and abnormal blood films with emphasis on
 - a) Morphology of red cells, White cells and Platelets.
 - b) Performance of WBC differential count.
 - c) Subjective assessment of platelet count.
 - d) Diagnostic interpretation of abnormal films.
 - vi) Preparation of smears of bone marrow aspirates and biopsy imprints (touch preparations)
 - vii) Preparation and staining of thin and thick blood films for malaria parasites.
 - viii) Supravital staining of reticulocytes; manual and automated counting of reticulocytes.
 - ix) Performance of bone marrow aspiration and trephine needle biopsy.
 - x) Staining (Romanowsky dyes and Prussian Blue for iron) and diagnostic valuation of smears of bone marrow aspirate.

B. Cyto Chemistry:

Performance of the following staining procedures viz. Kleihauer acid elution technique for HbF: PAS: Sudan Black, Myeloperoxidase, specific and non-specific and dual esterases, acid phosphatase and iron staining.

C. Laboratory Investigation of Haemolytic Anaemias with particular reference to the Haemoglobinopathies (including the thalasaemias) red cell Enzymopathies. Red cell membrane disorders and Immune Haemolytic anaemias;

- I. HbS solubility test
- II. Screening for unstable hemoglobin (heat instability and Isopropanol tests)
- III. Supravital staining for HbH inclusions
- IV. Principles and practice of separation and identification of normal and abnormal hemoglobin by electrophoresis and chromatography
- V. Quantitation of normal HbA, HbF and HbA₂ and abnormal HbS, D,E,C etc. hemoglobin by densitometry and chromatography - HPLC
- VI. Quantitation of HbF by alkali denaturation and Cellular distribution of HbF by the Kleihauer elution technique.
- VII. Heinz body preparation
- VIII. Screening for red cell G6PD deficiency and quantitative estimation of red cell G6PD activity.
- IX. Screening for red cell pyruvate kinase (PK) Deficiency .
- X. Screening for other red cell enzymopathies and assay of Red cell PK activity.
- XI. Standard hypotonic saline osmotic fragility test, acid Glycerol lysis, time (AGLT) and autohaemolysis tests.
- XII. Sucrose lysis and Ham's acidified serum tests for PNH, Urine hemosiderin
- XIII. Direct and indirect antiglobulin (Combs) tests, warm and cold autoantibody (Cold agglutinin) titre, Donath Land-steiner cold auto antibody screening and titration.

B) Miscellaneous bio chemical tests on red cells, Plasma and Urine:

- i) Principles of procedures for estimation of plasma bilirubin and haptoglobin and significance of results, screening for meth-hemalbumin, meth-hemoglobin and Sulph-hemoglobin
- ii) Screening for cryoglobulins and Cryofibrinogen; principles of immunoglobulin estimation and immuno electrophoresis
- iii) examination of urine for Hb, red cells, haemosiderin, urobilinogen and bilirubin
- iv) Principles of estimation and significance of serum ferritin, Iron and TIBC.
- v) Principles of estimation and significance of red cell folate, Serum folate and serum cobalamin.

C) Cytogenetics - Cyrogenetics:

Familiarisation with Cytogenetic techniques, understanding the principles of cytogenetics and appreciating the relevences and significance of chromomes in diagnostic haematology, interpreting the results of chromosome preparation of haemopoietic cells.

D) **Laboratory Investigation of Bleeding Disorders:**

a) Platelets

- Performance of Ivy bleeding time, template bleeding time and platelet count; study of platelet morphology
- Principles, practice and interpretation of platelet aggregometry tests
- Platelet associated immunoglobulin (PIAIg) and circulating antiplatelet antibodies

b) Screening and coagulation factor abnormalities:

- Prothrombin time and Stypven time
- Activated partial thromboplastin time
- Thrombin time and reptilase time
- Plasma fibrinogen
- Correction studies with normal plasma, adsorbed plasma, aged serum and factor deficiency plasmas
- FDP and D- Dimers
- Assays of clotting factors particularly factors viii and ix
- urea solubility test for factor XIII

c) Euglobulin lysis time and other relevant tests of plasma, fibronolytic activity.

E) **Laboratory Investigation of Thrombotic disorders:**

- i) assays of plasma AT III, protein C, protein S.
- ii) screening for lupus anticoagulant and activated protein C resistance - principles of screening tests and interpretation of results
- iii) Laboratory monitoring of anticoagulant (heparin and oral anti-coagulant) therapy
- iv) techniques for the detection of anticardiolipin antibodies;

F) Transfusion Medicine:

1. a) ABO blood grouping (forward and reverse), Rh typing (Phenotypes and genotypes), screening of antibody in sera of donors and recipients, antibody identification following elution by various techniques.
- b) Blood group compatibility (cross matching testing)
- c) Investigation of ABO, Rh and other immunohaemolytic diseases of the new born.
- d) practical aspects in the selection of blood for normal exchange transfusion.
2. Donor recruitment.
3. Clinical evaluation and laboratory screening of donors prior to phlebotomy.
4. Phlebotomy of donors
5. Blood component preparation and storage
6. Practical and administrative procedures involved in issuing and transfusing blood
7. Principles of the cell separator and its use for blood component preparation and therapeutic apheresis.
8. Practical steps in the laboratory investigation of transfusion reactions.

G. Flow Cytometry:-

A working knowledge of the principles and practice of flow cytometry, sample preparation and interpretation of the clinical significance of common leucocyte immunophenotypes.

I. Laboratory Organizations:

- a) Laboratory space distribution, ordering, citing and installation of Laboratory equipment; work flow procedures and handling of samples.
- b) Staffing - technical and non-technical.
- c) Use of computers and generation of laboratory statistics.
- d) Health and safety measures - personnel safety
- e) Waste disposal
- f) Quality assurance (Internal and External) measures
- g) Pre-analytical variables : request forms, patient information, patient preparation, effects of medication and blood transfusion, sample

collection, anticoagulants, containers, sample labeling, identification, transport, processing and storage.

h) Analytical variables inter laboratory harmonization, data handling and statistical analysis.

i) Post analytical variables: computer interfacing security and recording of results, turn around time.

j) Laboratory Equipment:-

A working knowledge of the mechanics of the various laboratory instruments including their operation, calibration and basic maintenance is desirable.

II. Histo pathology Module:

Practical laboratory training and related theory should cover the following areas:

- a) General processing of tissues
- b) Techniques of cytology including cytopin in relation to body fluid of patients with haematological disorders.
- c) Immunocytochemistry relevant to haematology
- d) Electron microscopy of haemopoietic cells
- e) Anatomical pathology of the bone marrow - review of biopsy material.

III. Bio-chemistry Module:

Laboratory Techniques - Practical hands on experience and related theoretical background in the following:

- a) Separative procedures - Electrophoretic techniques, Chromatography
- b) Immunochemical methods
- c) Radio Immunoassays

IV. HLA Module for Haematologists:

Demonstration and understanding the Principles of:

- a. Separation of lymphocytes using density gradient centrifugation.
- b. The Microlymphocytotoxicity test and its application in HLA typing, cross matching and antibody screening.
- c. The mixed lymphocyte reaction : One way and two way cultures.
- d. iscellaneous investigations (on request) including mitogen and antigen induced lymphocyte transformation and neutrophil function assays.

V. Molecular Biology

Understanding the principles involved in the molecular diagnosis of Haematological disorders:

- a. DNA Separation
- b. PCR - Polymerase Chain Reaction
- c. RFLP and southern Blotting
- d. Sequencing

VI. Nuclear Medicine:

- a. Measurement of blood volume, red cell mass, red cell survival studies.
- b. Screening techniques applicable to blood disorders.

VII. Medical Statistics:

A) Study design, statistical methods, survival curves, data collection and storage, interpretation and analysis.

B) Clinical Haematology Training:

With appropriate guidance and under supervision, the post-graduate student will be responsible primarily for the acquisition of knowledge in all areas of Haematology and Transfusion Medicine. Such knowledge will be acquired and demonstrated through Seminars, case presentations, Journal clubs, Tutorials, proper use of the library for "Suggested Reading" and formal reviews of selected major topics. Faculty should be present at these various exercises so as to provide the appropriate input. When necessary, faculty may be required to review certain subjects in the form of formal lectures, however lectures will not play a dominant role in the theoretical component of the training Programme. Clinical experience will be acquired by the trainee by day to day management of all patients admitted to the haematology service. Faculty will be involved in teaching of trainees in the ward rounds and out patient clinics.

2. Red Cell Disorders:

Clinical evaluation of a patient with anaemia, history, physical examination, appropriate laboratory investigations and management, Comparative epidemiological significance of 'nutritional' and other anaemias in the population and the national programmes for control.

2. Iron deficiency anaemia:

Epidemiology, iron deficiency as a community health problem, causes in the population, control strategies in the population. Evaluation of the individual patient interpretation of serum iron, TIBC, transferrin, ferritin, indications for and interpretation of ferrokinetic studies, management including iron replacement.

3. Megaloblastic anaemia:

Clinical and laboratory evaluation, clinical recognition, evaluation and management of complications of vitamin B12 deficiency, investigation of aetiology and management. Understanding the role of Vitamin B12 and folate in cellular metabolism and the interaction of disease and drugs with the metabolism of folate.

4. Hemolytic anaemia:

Evaluation of a patient with haemolysis and investigation of its causes;

i) Thalassaemia: Principles of control of the thalassaemia syndromes in the population, screening strategies, antenatal diagnosis, genetic counselling, clinical and laboratory diagnosis of alpha and beta thalassaemia syndromes. Management of thalassaemia intermedia and major transfusion regimes, chelation, role of splenectomy and bone marrow transplantation.

ii) Sickle cell disease: Evaluation management of the steady state, management of painful crises, management of chronic complications, clinical and haematological features of the various sickle cell diseases, clinical and haematological effects of the interaction of thalassaemia with sickle cell anemia; therapeutic role of bone marrow transplantation.

iii) Inherited enzymopathies (Red Cell G6PD deficiency) evaluation and management of acute haemolytic crises.

iv) Acquired haemolytic disorders, immune haemolytic anaemia management with immunosuppression, role of intravenous immunoglobulin, plasmapheresis, splenectomy, Clinical and laboratory evaluation (including aetiological diagnosis) of patients suffering from acquired intravascular haemolysis.

5. Aplastic anaemia:

Aetiology, evaluation and management including immunosuppression (antilymphocyte globulin etc) and supportive therapy. Role of bone marrow transplantation in treatment of the individual patient; preparation for bone marrow transplantation.

6. Red Cell Aplasia:

Diagnostic evaluation and treatment of congenital and acquired forms. Transient erythroid aplasia including the pathogenetic role and biology of the human B19 parvovirus.

C) White Cell Disorders:-

1) Neutropenia:- Clinical evaluation of neutropenic patient, role of surveillance microbiology, antimicrobial therapy in neutropenia, role of growth factors, principles in providing a sterile environment for the neutropenic patient.

2) Functional disorders of neutrophils: Neutrophil function, laboratory tests for evaluation and management of patient with chronic neutrophil dysfunction, role of growth factors and bone marrow transplantation.

3) Leukaemia:- Clinical evaluation, diagnostic confirmation by morphology, immunophenotyping, special stains, cytogenetics and electronmicroscopy. The trainee must be familiar with the principles of leukemia management and the various protocols available. He/she should be familiar with the statistical tools used to evaluate therapy protocols, survival curves etc. He/she should be thoroughly familiar also with the pharmacology of antimitotic drugs and their toxicity and very well versed in the supportive and management of patients with all types of leukaemia.

4) Myeloproliferative disorders (MPD):

Classification, systematic diagnostic evaluation of erythrocytosis including polycythaemia vera, interpretation of blood volume studies with radionuclides, familiarity with current management strategies of MPD including the use of interferons.

5) Lymphom: Classification of lymphomas - principles in staging. Management of the different types of lymphomas.

6) Immuno deficiency disorders: Trainees must be able to order systematically the appropriate investigative scheme for a patient with congenital or acquired immuno-deficiency, they must understand the principles of management with immunoglobulin replacement, interferons, bone marrow transplantation and be familiar with the haematological manifestations (and their therapy) of AIDS.

7) Multiple Myeloma and other paraproteinaemias: Clinical and laboratory evaluation of a patient with a monoclonal gammopathy. Interpretation of quantitative immuno-globulin levels, serum protein electrophoretic strips and immunoelectrophoresis patterns, concept of monoclonal gammopathy of undetermined significance, management of myeloma and Waldenstrom's macroglobulinaemia.

D) HAEMOSTASIS - (Trainees should be thoroughly grounded in the general clinical (history and physical signs) approach to the patient with a bleeding tendency.

1. Thrombocytopenia:

Thorough understanding of platelet kinetics and evaluation with radionuclides. Evaluation and investigation of the aetiology of thrombocytopenia. The student should be conversant with the spectrum of management including immunosuppression, intravenous immunoglobulin.

2. Inherited platelet function disorders:

Clinical evaluation, laboratory diagnostic strategies and management.

3. Inherited coagulation factor deficiencies:-

Laboratory diagnosis of haemophilia, genetics and antenatal diagnosis, principles of factor replacement factor replacement schedule in a patient with haemophilia who needs surgery, management of complications. Principles management of patients with inhibitors.

4. Acquired bleeding disorders:-

Vitamin K deficiency and supplementation; DIC its course and management, management of haemorrhagic complications of liver disease and renal failure.

5. Thrombotic disorders:-

Classification and laboratory diagnosis of inherited thrombotic disorders, evaluation of haemostasis in the acquired thrombotic disorders, clinical use and monitoring of anticoagulants.

6. Transfusion Medicine:

a. Blood component preparation and clinical use:

Collection of blood, correct techniques for venupuncture, plastic systems, anticoagulants and additives and their effect on storage stability, centrifugation, preparation of platelets fresh frozen plasma and cryoprecipitate, storage of components, principles of fractionation. Quality assurance. A thorough understanding of the clinical indications for the proper use of specific blood components.

b. Diagnosis and management of transfusion - related complications:

Febrile transfusion reactions - laboratory investigations, diagnosis, management of prevention diagnosis and management of haemolytic transfusion reactions. Infections transmitted by transfusion complications of transfusion.

c. Cell Separation principles:-

The trainee must understand the principles of cell separation and plasmapheresis. Principles of the machine, continuous versus intermittent flow techniques, replacement fluids for plasmapheresis, current status and indication in various diseases should also be known and understood.

4. Techniques of leucodepletion:-

Problems related to white cells in donor and techniques of removal. Principles of filter design and use.

e. Irradiation of blood components:-

Biology of irradiation of blood and components; transfusion graft versus host disease (GVHD) indications for irradiation of blood. Use of equipment.

f. Management of alloimmunisation in relation to transfusion:-

Techniques for prevention of alloimmunisation; role of ultra violet radiation and photosensitizers, management of patients with red cell and platelet alloantibodies.

E) Bone Marrow Transplantation:-

- 1) Current Indications: The student should be familiar with the current indications and results of bone marrow transplantation in various diseases.
- 2) Donor Selection: HLA typing and HLA in bone marrow transplantation. Screening of the donor.
- 3) Conditioning regimens: The trainees must be familiar with the different conditioning regimes, principles of their use in different disorders and complications.
- 4) Harvesting and manipulation of bone marrow:- Bone marrow collection, red cell, or plasma reduction, peripheral blood stem cell

mobilization, collection and cryopreservation. Transfusion of marrow, Purging of marrow - T cell depletion.

5) Transplantation immunology: Histocompatibility, graft versus host disease – diagnosis and management, Immune reconstitution following transplantation

6) Management of the post transplant patient.

F) Haematological Oncology:-

- 1) Cell Cycle - Cell Kinetics
- 2) Principles of Chemotherapy
- 3) Oncogenesis
- 4) Cytogenetics in relation to haematological malignancy
- 5) Use of growth factors

G) Consultation Haematology:

- 1) Haematological complications of pregnancy and the interactions of the pregnant state with disorders of the Haemopoietic system.
- 2) Haematological complications of systemic disease.
- 3) Haematological problems of the intensive care patient.

H) Bone Marrow Aspiration and Trophine Biopsy:

Accumulation and consolidating experience in this practical procedure and in diagnostic interpretation.

I) Neonatal Haematology:

The candidate should be familiar with haematological problems in the new born and should be able to interact with the neonatologist regarding management.

PATTERN OF EXAMINATION

Theory – 4 papers, 100 Marks each Duration: Three hours each

Paper - I	Applied Basic Sciences – Structure and function of haemopoietic System, Molecular biology and Genetic aspects of haemopoiesis	100
Paper – II	Laboratory Haematology	100

Paper - III	Clinical Haematology	100
Paper - IV	Recent Advances in Haematology	100

DISTRIBUTION OF MARKS **

MCQ (Multiple Choice Questions) 20 questions (20 x1)	20 Marks
One Essay	20 Marks
Two Essays 15 Marks each (15 x 2)	30 Marks
Six Short notes 5 Marks each (5 x 6)	30 Marks
TOTAL	100 Marks

PRACTICAL/ CLINICAL AND ORAL EXAMINATION

	<u>No. OF CASES</u>	<u>DURATION</u>	<u>MARKS</u>
CLINICAL			
LONG CASE	One	One Hour	75
SHORT CASE	Two	One Hour (30 Mts Each)	75
WARD ROUNDS	Four (Minimum)	One Hour	50
<u>Practical</u>			
Lab & Haematology			
haemostasis			
haemolytic			
blood banking			
morphology peripheral blood and bone marrow			

Total			300
Oral/Viva Examination			100
Total			<u>400</u>

Note: Not more than three candidates will be examined in Practical examinations per day.

** XXX SAB dated 28.12.2005

DISSERTATION : Approved/Not approved
(No Marks)

MARKS QUALIFYING FOR A PASS

	Maximum Marks	Marks Qualifying for a pass (50%)
Theory	400	200
Practical/Clinical	300	150
Oral	100	50
Aggregate	<u>800</u> -----	<u>400</u> -----

BRANCH XI D.M. Neonatology

1. AIM

The aim of the DM Programme is to provide advanced training in Neonatology to produce competent super-specialists who are able to provide clinical care of the highest order to the newborn infants, and serve as future teachers, trainers, researchers and leaders in the field of Neonatology.

2. LEARNING OBJECTIVES

After completing the DM (Neonatology) course, the student will be able to :

1. Analyse neonatal health problems scientifically, taking into account the biological basis as well as the socio-behavioural epidemiology of perinatal-neonatal disease, and advise and implement strategies aimed at prevention of neonatal morbidity and mortality.
2. Provide primary, secondary and tertiary care to all newborn infants including intensive care of the highest standard to the critically sick and the very low birth weight neonates using advanced therapeutic and supportive modalities and skills.
3. Implement a comprehensive follow up and early intervention programme for the 'at risk' newborn infants, and plan, counsel and advise rehabilitation of the Neuro developmentally challenged infants.
4. Take rational decisions in the face of ethical dilemmas in neonatal-perinatal practice.
5. Exhibit communication skills of a high order and demonstrate compassionate attributes befitting a caring neonatologist.
6. Plan and carry out research in neonatal health in clinical, community and laboratory settings.
7. Teach newborn care to the medical and the nursing students as well as grassroots health functionaries, and develop learning resource materials for them.

8. Plan, establish and manage level II and level III neonatal units independently.

9. Use and maintain the essential neonatal equipment and keep abreast with advances in newborn care technology.

10. Organize newborn care in the community and at the secondary level of health system, and play the assigned role in the national programmes aimed at the health of mothers and their infants.

11. Work as a productive member of the interdisciplinary team consisting of Obstetricians, Paediatricians, Paediatric Surgeons, other doctors, nurses, and grassroots functionaries providing care to the pregnant mother, the fetus and the newborn in any setting of health care system.

12. Seek and analyse new literature and information on neonatology, update the concepts, and practise evidence-based neonatology.

3. Definition:

The term “Neonatology ” includes diseases of the foetus and neonate including the maternal influences on the fetus and perinatal interventions.

4. SYLLABUS FOR D.M. NEONATOLOGY COURSE

A - POSTINGS

1 Overview

The total period of DM course is 36 months. Of this, at least three fourths (27 months) will be spent in the newborn service, 6 months will be meant for essential rotations in related specialties and the rest 3 months will be apportioned for either optional rotations or for the newborn service.

2. Newborn services (27 months)

The candidates will have at least 27 months of posting in the newborn services at concerned institutions. The candidates must get adequate exposure to Neonatal follow up, neonatal emergencies, delivery room care of neonates and acquisition of practical skills (specified in Annexure I).

3. Essential Rotations (6 months)

- Perinatology – obstetrics (Dept. of Obstetrics-Gynaecology) : 2 months
- Neonatal surgery (Dept of Pediatric Surgery) : 1 month
- Community neonatology: 1 month
- Perinatal Cardiology and functional echocardiography: 15 days
- Ultrasonography and imaging: 15 days
- Child development clinic: 1 month

4 . Optional rotations (3 months)

The candidates can undertake up to 2 months' elective rotation at the parent or other institutions in the country or abroad at centres approved by the Government.

The departments will have the flexibility of additional rotations for up to 1 month in the above mentioned disciplines or in other relevant areas (such as neonatal Cardiac Surgery, Genetics, Perinatal-pathology, Anaesthesiology, Neonatal Ophthalmology, etc.) depending upon the strength of the disciplines and functional requirements at the concerned institutions. [Under no circumstances however, would the training in neonatal services be of less than 27 months i.e three fourths of the total course.

B - LEARNING OPPORTUNITIES

- Learning in D.M. Neonatology will essentially be self-directed and will take place while working in various areas and through interactions in the rounds.
- Following minimum formal sessions are recommended in order to facilitate and supplement the efforts of the faculty and students :
 - Journal club (once in 2 weeks)
 - Perinatal round (once in 2 weeks)
 - Perinatal Mortality meet (once in a month)
 - Physiology round (once in 2 weeks)
 - Seminar (once in 2 weeks)
 - Clinical case discussion (once a week)
 - Neonatal Surgery Rounds
 - Neonatal Morbidity and mortality meet (once a week)
 - Radiology rounds
 - In addition, depending on the strength of the institutions sessions or Imaging, Pathology, Microbiology, as well as interdepartmental Seminars may be undertaken.

C - RESEARCH

1. The candidates will be required to submit one thesis during the course of D.M. programme. Progress on dissertations will be reviewed every semester and feedback given to the candidates. The candidate will make at least 3 formal presentations to the Department, viz. (i) Protocol, (ii) Mid-course progress and (iii) Final report. Thesis will be submitted at least six months before the completion of the course.

2. Two papers (pertaining to the thesis or otherwise) for publication in indexed journal(s) before appearing for the final D.M. examination.
3. The candidate must attend Continuing Education Symposia, Workshops and Conferences including meetings of the National Neonatology Forum, workshops Neonatal resuscitation and ventilation etc.

D - TEACHING EXPERIENCE

The candidates will be regularly involved in the teaching of undergraduate Medical/Nursing students and Paediatrics Postgraduate students. Their teaching skills will be assessed and shall form part of the internal assessment.

E - SKILL ACQUISITION

LIST OF SKILLS:

CLINICAL

- Neonatal examination, anthropometry and developmental assessment
- Neonatal resuscitation
- Neonatal ventilation : CPAP, IMV; newer modes of ventilation
- Blood sampling : Capillary, venous, arterial
- Insertion of peripheral venous, umbilical venous and umbilical arterial catheters
- Monitoring : invasive, non-invasive
- Enteral feeding (katori-spoon, gavage, breast)
- Lactation management
- Parenteral nutrition

- Lumbar puncture and ventricular tap
- Exchange transfusion
- Bed side tests: shake test, sepsis screen, hematocrit, urine examination, CSF examination, Kleihauer technique, Apt test etc.
- Neonatal drug therapy
- Nursery housekeeping routines and asepsis procedures
- Universal precautions
- Handling, effective utilization and trouble shooting of neonatal equipment.

COMMUNICATION

- Communication with parents, families and communities

EDUCATION/TRAINING

- Teaching skills : lectures, tutorials
- Participatory and small group learning skill
- Principles of educational objectives, assessment and media
- Preparing learning resource material
- * Understanding Ethical Dilemmas

SELF-DIRECTED LEARNING

- Learning needs assessment, literature search, evaluating evidence

RESEARCH METHOD

- Framing of research question, designing and conducting study,
analyzing and interpreting data and writing a paper.
- * Health Research Methodology and Biostatistics

F - ACADEMIC KNOWLEDGE ACQUISITION

Contents for DM Neonatology Course

A) BASIC SCIENCES

B) • Basic genetics

- Foetal and neonatal immunology
- Mechanism of disease
- Applied Anatomy and Embryology
- Feto-placental Physiology
- Neonatal adaptation
- Development and maturation of lungs, respiratory control, lung functions, ventilation, gas exchange, ventilation perfusion.
- Physiology and development of cardiovascular system, developmental defects, physiology and hemodynamics of congenital heart disease.
- Fetal and intrauterine growth.
- Development and maturation of nervous system, cerebral blood flow, blood brain barrier.
- Fetal and neonatal endocrine physiology

- Developmental pharmacology
- Developmental hematology, bilirubin metabolism
- Renal physiology
- Physiology of gastrointestinal tract, digestion, absorption.
- Electrolyte balance
- Metabolic pathways pertaining to glucose, calcium and magnesium
- Biochemical basis of inborn errors of metabolism

B) GENERAL TOPICS

- Research methodology
- Biostatistics
- Ethics in perinatology/neonatology
- Principles of education (objectives, curriculum, assessment and use of media)
- Computer, information technology, internet

C) PERINATOLOGY

- Perinatal and neonatal mortality, morbidity, epidemiology.
- High risk pregnancy: detection, monitoring and management.
- Fetal monitoring, clinical, electronic; invasive, and non-invasive
- Intrapartum monitoring and procedures
- Assessment of foetal risk, and decision for termination of pregnancy

- Diagnosis and management of foetal diseases
- Medical diseases affecting pregnancy and foetus, psychological and ethical considerations
- Foetal interventions.
- Foetal origin of adult disease

D) NEONATAL RESUSCITATION

E) NEONATAL VENTILATION

F) BLOOD GAS AND ACID BASE DISORDERS

G) NEONATAL ASSESSMENT AND FOLLOW UP

- Assessment of gestation, neonatal behaviour, neonatal reflexes
- Developmental assessment, detection of neuro-motor delay, early stimulation techniques
- Immunization

H) BODY SYSTEMS

i) RESPIRATORY SYSTEM

- Neonatal airways: physiology, pathology; management
- Pulmonary diseases: Hyaline membrane disease, transient tachypnea, aspiration pneumonia, pulmonary air leak syndromes, pulmonary haemorrhage,
- *Developmental defects
- Oxygen therapy and its monitoring
- Pulmonary infections

- Miscellaneous pulmonary disorders.

ii) Cardiovascular system

- Fetal circulation, transition from fetal to neonatal physiology
- Examination and interpretation of cardiovascular signs and symptoms
- Special tests and procedures (Echocardiography, angiography)
- Diagnosis and management of congenital heart diseases
- Rhythm disturbances
- Hypertension in neonates
- Shock: pathophysiology, monitoring, management.

iii) Gastrointestinal system

- Disorders of liver and biliary system.
- Bilirubin metabolism
- Neonatal jaundice: diagnosis, monitoring, management, phototherapy, exchange transfusion.
- Prolonged hyperbilirubinemia
- Kernicterus
- Congenital malformations
- Necrotising enterocolitis

iv) Nutrition

- Fetal nutrition
- Physiology of lactation
- Breast feeding

- Lactation management, breast milk banking, maternal medications and nursing
- Parenteral nutrition
- Vitamins and micronutrients in newborn health

v) Renal system

- Developmental disorders
- Renal functions
- Fluid and electrolyte management
- Acute renal failure (diagnosis, monitoring, management).

vi) Endocrine and metabolism

- Glucose metabolism, hypoglycemia, hyperglycemia
- Calcium disorders
- Magnesium disorders
- Thyroid disorders
- Adrenal disorders
- Ambiguous genitalia
- Inborn errors of metabolism

vii) Hematology

- Physiology
- Anemia
- Polycythemia
- Bleeding and coagulation disorders
- Rh hemolytic disease

viii) Neurology

- Clinical neurological assessment
- EEG, ultrasonography, CT scan
- Neonatal seizures
- Intracranial hemorrhage
- Brain imaging
- Hypoxic ischemic encephalopathy
- Neuro-muscular disorders
- Degenerative diseases
- CNS malformation

ix) Surgery and orthopaedics

- Diagnosis of neonatal surgical conditions
- Pre and post operative care
- Neonatal anaesthesia
- Metabolic changes during anaesthesia and surgery
- Orthopaedic problems

x) Neonatal infections

- Intrauterine infections
- Superficial infections
- Diarrhea
- Septicemia
- Meningitis
- Osteomyelitis and arthritis

- Pneumonias
- Perinatal HIV
- Miscellaneous infective disorders including HBV and candidemia

xi) Neonatal Imaging

X-rays, ultrasound, MRI, CT Scan etc.

xii) Neonatal ophthalmology

- Developmental aspects
- Retinopathy of prematurity
- Sequelae of perinatal infections

xiii) Neonatal dermatology

I) TRANSPORT OF NEONATES

J) NEONATAL PROCEDURES

K) DEVELOPMENTAL ASSESSMENT AND FOLLOW UP

L) ORGANIZATION OF NEONATAL CARE

M) COMMUNITY NEONATOLOGY

- Vital statistics, health system;
- Causes of neonatal, perinatal death
- Neonatal care priorities
- Care at secondary level of care
- Care at primary health centre
- Role of different health functionaries
- National programmes

G - ASSESSMENT

1 Overview of DM Assessment

- A maximum of 900 marks will be awarded. The candidate must obtain at least 50% (i.e. 450) marks to pass the examination (Table 1).
- Of the 900 marks, 50 marks will be for the Internal Assessment. The breakup of Internal Assessment marks is shown in Table 2.
- A total of 800 marks, will be assigned to the Final Examination (Theory 400, Practical 400). It will be essential to pass theory and practical both separately in the Final Examination by securing at least 50% marks in each.

Table 1 Overview of DM Assessment

Internal assessment	50	Theory	400
Dissertation	25	Practical	400
Log Book	25		
	100		800
TOTAL 900 marks			

2 Internal assessment [50 marks]

The outline of internal assessment is shown hereunder.

Continuous assessment with five theory and practical evaluations in the month of 9, 15, 21, 27, 33 months (5X10=50)

3 - Final Examination

3.1 *Final assessment* will be carried out by two EXTERNAL EXAMINERS and two INTERNAL EXAMINERS. The summary of the examination is shown in Table 3.

Table 3 : Summary of final DM Examination

Theory	400	Practical	400
Paper I	100	Long case I	100
Paper II	100	Long case II	100
Paper III	100	Short case I	50
Paper IV	100	Short case II	50
Log Book	25	OSCE/Spots	50
Dissertation	25	Viva Voce	50
Internal Assessment	50		
	500		400

NB : Candidate must pass in theory and practical independently by obtaining at least 50% marks in theory (Part I & II separately) as well as in practical's

3.2 Final Theory Examination (300 marks): This will have three papers of 100 marks each. The broad areas covered in these papers will be as follows:

Paper I : Applied Basic sciences as applied to Neonatology (40) and Perinatology (40); research methods (100 marks)

Paper II: Clinical neonatology 10 x 10 (100 marks)

Paper III: Clinical neonatology and Neonatal Intensive Care Including Neonatal transport 10 x 10 (100 marks)

Paper IV: Community neonatology (2 Q); national MCH programmes(1Q); allied disciplines (3Q); neurodevelopment follow up(2Q), Reason Advances (2Q); rehabilitation etc. 10 x 10 (100 marks)

Theory examination will consist of (DISTRIBUTION OF MARKS):

Structured essay questions with emphasis on problem-solving exercises- ten Essay 10 Marks each for all papers and parts of Theory examination

3.4 Final Practical Examination (300 marks)

- Long case I (a neonate receiving intensive care) (100 marks)
- Long case II (100 marks)
- Short case I (50 marks)
- Short case II (a follow up high risk newborn) (50 marks)
- Objective Structured Clinical Examination (OSCE) (50 marks) or if not possible, spots examination
- Structured Viva Voce (two parts) (50 marks)
 - Patient management problems (20 marks)
 - General viva (including radio- imaging Investigations i.e. ultrasound/CT/MRI records, interpretation of ABGs' neurophysiological records such as BERA, EEG; national programmes, policy (30 marks)

BRANCH - I M.Ch., CARDIO - THORACIC SURGERY

SYLLABUS:

Applied Anatomy and Developmental Anatomy of the chest wall Diaphragm : Pleura, Lungs, Mediastinum, Oesophagus, Heart, Pericardium, Great Vessels and its branches, Congenital Cardio-vascular and Thoracic anomalies.

Applied Physiology – Respiration, Pulmonary function tests, Blood Pressure, Cardiac cycle, Cardiac output, Production of heart sounds and murmurs, Physiology of Extracorporeal Circulation and Hypothermia, Cardiac metabolism, Acid base balance, Fluid and Electrolytes Balance, Physiology of Oesophagus, Gastro Oesophageal reflux.

Applied Pathology Thoracic injuries, Chest wall tumours, Emphysema, Pleural tumours, Pulmonary suppuration, Congenital and Great vessels, Benign strictures of Oesophagus, Cancer of Oesophagus, Achalasia Cardia Reflux Oesophagitis, Diaphragmatic hernia.

Applied Bacteriology – Thoracic infection, Pulmonary infections, Bacterial and fungal endocarditis, infections during open heart surgery, intra thoracic infection.

Clinical examination and management including chest injuries, chest deformities and tumours of the chest wall.

Infection of the pleura and tumours of the pleura.

Pulmonary tuberculosis, lung abscesses, bronchiectasis, lung cysts and lung tumours, techniques and complication of pulmonary resections, mediastinal tumours.

Congenital anomalies of Oesophagus.

Foreign body in Oesophagus, Benign strictures of Oesophagus, Peptic Oesophagitis : Hernia, Corrosive strictures of the Oesophagus, Cancer of Oesophagus and Diaphragmatic hernia.

Diseases of the Pericardium, Myocardium and endocardium, Rheumatic heart diseases, Diseases of the conducting system of the heart, coronary diseases.

Detailed knowledge of the treatment of all cardiac surgery problems.

Detailed knowledge of extra corporeal circulation.

Detailed knowledge of Recent Advances in Cardiac Surgery – Heart Transplant, Lung Transplant, Myocardial revascularization, Laser surgery, Robotic surgery – Computer Aided Surgical Developments – Genetic Engineering Cardiac Disease Treatments, Cloning, etc.

Video assisted Thoracic Surgery : Principles, Indications, Techniques and Complications.

PATTERN OF EXAMINATION:-

Theory -4 papers 100 Marks each Duration : Three hours each

Paper I	Applied Basic Sciences	100
Paper II	Thoracic and Cardio Vascular Surgery-I	100
Paper III	Thoracic and Cardio Vascular Surgery-II	100
Paper IV	Recent Advances in Thoracic and Cardio Vascular Surgery	100

DISTRIBUTION OF MARKS **

MCQ (Multiple Choice Questions) 20 questions(20 x1)	20 Marks
One Essay	20 Marks
Two Essays 15 Marks each (15 x 2)	30 Marks
Six short notes 5 Marks each (5 x6)	30 Marks
Total	<u>100 Marks</u>

** XXX SAB dated 28.12.2005

PRACTICAL/CLINICAL AND ORAL EXAMINATION

	<u>No. OF CASES</u>	<u>DURATION</u>	<u>MARKS</u>
LONG CASE	One	One Hour	100
SHORT CASE	Two (30 Mts Each)	One Hour	100
WARD ROUNDS	Four (Minimum)	One Hour	100
X-rays –Pathological Specimens			
Instruments			
	Total		<u>300</u>
Oral/Viva Examination			<u>100</u>
	Total		<u>400</u>

DISSERTATION ; Approved/ Not approved (No Marks)

MARKS QUALIFYING FOR A PASS

	Maximum Marks	Marks Qualifying for a Pass (50%)
Theory	400	200
Clinical	300	150
Oral/Viva	100	50
Aggregate	<u>800</u>	<u>400</u>

BRANCH-II M.Ch. NEURO SURGERY

Part I: 5 yrs. – General Surgery.

Part II: 5 yrs. + 3 yrs.

There shall be a syllabus for Parts I and II.

There will be no set syllabus for Part III.

I) THE SYLLABUS FOR PART-II "NEUROBASICS" – Paper-I

The syllabus will include Basic General Sciences such as Physics, Chemistry, Electricity and Electronics, Computer Sciences, Statistics etc. In addition to Basic Neuroscience such as Neuro-anatomy, Neurophysiology, Neuropathology, Neurochemistry, Neuroparmacology.

- a. The candidates should have a working knowledge of BASIC GENERAL SCIENCES with a view to enable them in handling various neuro-investigative and neurosurgical instrumentation and equipment effectively and also to prepare and assess papers and publications in the field. A minimum working knowledge of A/C electricity D/C electricity. Physics of light and sound electromagnetics, Ultrasound, LASER etc. as applicable to neurosciences will form the General Science content of Part I. The knowledge in these areas will be assessed both in the theory papers as well as by Viva Voice.
- b. Knowledge of Basic Neuroanatomy will include development of the nervous system including genetics malformation of the nervous system. Conventional descriptive anatomy, systemic anatomy, regional anatomy, cross sectional anatomy (relevant to X-ray Tomography C.T. Scan, Magnetic Resonance Imaging etc.) and also three dimensions anatomy of various operative approaches to the Central Nervous System, including micro-surgical anatomy will form the content of the Neuroanatomy for Part -I
- c. NEUROPHYSIOLOGY: The neurophysiological content of Part-I will include a detailed knowledge of Physiology of the nervous system including cerebral blood flow and CBF dynamic electrophysiology (EEG, Nerve Conduction studies, KMG, Evoked Potentials) including all the recent advances such as Brain Mapping and Multi-modality Evoked Potentials such as BAER = (Brainstem) SSEP, VEP Cranial and peripheral nerve stimulation - Preoperatively and intraoperatively. A minimum working knowledge of handling the instrumentation and interpretation of different results will be insisted upon.

- d. **NEUROCHEMISTRY:** The neurochemistry content of the Part-I will include a detailed General Principles of Neurochemistry with special reference to normal tissue constituents, neurotransmitter, neuroreceptorology and neurooncology, neurochemical aspects of neurological and neurosurgical illnesses, biochemistry of tumour of the central nervous system including tumour markers, neurochemical aspects of head injuries and spinal cord injury. MR and MR spectroscopy etc. a minimum working knowledge of interpretation of common laboratory results will be insisted upon.
- e. **NEUROPATHOLOGY:** The neuropathology content of Par-I will include General Pathology of nerve cells, neuroglia, blood vessels, cranial and peripheral nerves and their mechanisms, patho-physiology of birth injuries, concussion, contusion, intracranial haematoma, haemorrhages, cerebral oedema, intracranial hypertension. Vascular injuries infective complications, sequels of head injuries etc. Pathology of infections, disease of the nervous system with special reference to Postmeningitic sequelae, vascular, nutritional and metabolic toxic disorders of the nervous system. Aneurysms and angiomatous (arteriovenous) malformations, pathology of brain and spinal cord tumours and peripheral nerve tumours including tumours of pituitary, pineal gland and spinal column in detail with special reference to histogenesis, gross pathology, micropathologic aspects, microscopic appearances tissue culture, special diagnostic procedures including cytology techniques. Immunology of brain tumours including current concepts in monoclonal antibodies and targeting for diagnosis and therapy. The pathology content will include also minimum bacteriology, minimum microbiology, including virology and parasitology with special reference to agents that effects the nervous system in our area/country.
- f. **NEUROPHARMACOLOGY:** The candidate should have a detailed pharmaceutical knowledge of the various aspects of the drugs and pharmaceuticals commonly used in disinfectants, antibiotics, anticonvulsants, anti-oedema measures such as diuretics, antidepressants, analgesics, antipyretics, and antiparkinson, chemotherapy drugs, antipsychiatrics, cardio-vasoactive respiratory supportive drugs including drug assay, monitoring drug inneraction protocols of clinical trials etc.

II) Syllabus for Part-II "NEURODIAGNOSTICS" INCLUDING CLINICAL NEUROLOGY:

The candidate should have a detailed working knowledge of clinical examination of the neurological/neurosurgical patient including neonates and infants and unconscious patients. A thorough knowledge of the Physical signs including their neuroanatomical and neurophysiological basis, brief historical vignettes, methods of elicitation, interpretation and inference including fallacies

knowledge of various coma scales and their relatives merits and deficits, a detailed knowledge of the evaluation of the Physical signs during various developmental stages, details regarding Brain Death (Cerebral death and brainstem death) etc. are all essential.

A detailed knowledge of the differentiation of some common medical neurological disorders which can closely mimic neurosurgical conditions is essential Eg., Microcephaly Vs. Craniosynostosis; Cervical spondylosis Vs. Anterior Horn Cells Disease, Medical Dementia Vs. N.P.H. etc.

A working knowledge of the various medical neurological disorders, particularly more prevalent in our region, is also required. A minimum working knowledge of neurodegenerative disorders, neuro-muscular disease, genetic diseases, paroxysmal disorders etc. is a must.

A detailed working knowledge of the various diagnostic procedures including a historical vignette, the instrumentation/equipment, methodology, documentation and interpretation of results will be required. A thorough knowledge of choice of the investigative procedure in a given patient - Decision making in Neurodiagnostics -- is also essential. The candidate should have a reasonable understanding of the stroke, complications fallacies, cost-effectiveness etc. of the various neurodiagnostic procedures.

The neurodiagnostic procedures in this context would include access to various parts of the CNS including ventricles, subarachnoids space, neurovasculature, neural parenchyma etc. in the course of Neuro-ophthalmological neuro-etiological workup, L.P. V.P. cisternal Tap, EEG, Nerve conduction studies, EMG, electrocorticography, neuroradiology including plain x-rays, x-ray tomography, angiography including venography and venous sinography, Pneumoencephalography, ventriculography, myelography, cisternography, cyscography, orbitography, interventional radiology, radioneculoide angiography, encephalography, and neuroscintigraphy, ultrasonography (neonates, infants, transcranial intraoperative and interventional), C.T. scanning, MR Imaging including MR angiography and cisternography etc. The candidate should have adequate hand-on experience with the various investigative procedures of day-to-day use.

The syllabus listed above (Part II) will be completed in one year i.e. during the IInd year of the course. The examination will be included in the final year along with 3 yrs. M.Ch. Neurosurgery Course.

M.Ch Neurosurgery – Part I will be written at the end of first year in Five year programme and the questions will cover General Surgery only. There will be no Part II at the end of third year from the batch of students admitted from 2005 onwards. *

-
- 31st SAB dated:29.06.2006

The candidate should be posted for one month in Neurology Unit at the end of second year.

The candidate should be sent for one month to another higher neuro surgical centres at the end of IV year.

III) Syllabus for Part-II – Paper-III: There will be no set syllabus for Part-III.

The candidate appearing for Part-II is expected to have a thorough knowledge of the (a) main historical landmarks (b) neurodiagnostics including Clinical Neurology (c) theoretical aspects, practical ward procedures, special investigatory methods, clinical features, diagnosis and differential diagnosis, preoperative and postoperative assessment and care and details of operative techniques of all surgical diseases of the nervous system and (d) recent advances and basic research methods in neurosurgery and all special surgical tools involving optics, LASER, Ultrasonic, cryogenics, RF current, endoscopy etc., Radiosurgery, Intervention Neuro radiology.

A broad acquaintance of the classical monograph in neurosurgery and recent neurosurgical literature will be expected.

The candidate is expected to attain a high degree of clinical judgement, operative skill and efficiency in postoperative management and to conduct diagnostic and operative procedures independently.

The examiners shall also bear in mind in the evaluation of the results of the Part-III examination whether the candidate is of such high merit as to be able to teach and train other neurosurgeons in course of time and whether his skill, knowledge, clinical acumen and surgical judgement is of such high order that decisions and management regarding neurosurgically ill patients can be entrusted safely to him.

The syllabus will be completed in one year - in final year.

The M.Ch. Neuro Surgery students shall be posted to Neurology for two months as like other postings. *

* 31st S.A.B. dated:29.06.2006.

PATTERN OF EXAMINATION :-

<u>PART-I: 5 yrs. (M.Ch.,) Course at the end of first year :</u>	<u>Maximum Marks</u>	<u>Minimum Marks</u>
Paper – I : Applied Basic Sciences In Relation to General Surgery	100	125
Paper – II : General Surgery	100	
Oral	50	

PART-II for Both 5 yrs. M.Ch., & 3 yrs. M.Ch., Courses :

Theory - 4 Papers 100 Marks each Duration: Three hours each

Paper – I	: Neuro Basic Sciences	100
Paper – II	: Clinical Neurology & Neuro Radiology	100
Paper – III	: Neurosurgery	100
Paper – IV	: Recent Advances in Neuro Surgery	100

DISTRIBUTION OF MARKS**

MCQ (Multiple Choice Questions) 20 questions (20 x 1)	20 Marks
One Essay	20 Marks
Two Essays 15 Marks each (15 x 2)	30 Marks
Six short notes 5 Marks each (5 x 6)	30 Marks
TOTAL	100 Marks

PRACTICAL/CLINICAL AND ORAL EXAMINATION

	<u>NO. OF CASES</u>	<u>DURATION</u>	<u>MARKS</u>
LONG CASE	One	One Hour	100
SHORT CASE	Two	One Hour (30 Mts. Each)	100
WARD ROUNDS	Four (Minimum)	30 Mts.	100
		TOTAL	300
Oral/Viva Examination			<u>100</u>
		TOTAL	<u>400</u>

** XXX SAB dated 28.12.2005

Note: Not more than three candidates will be examined in Practical examinations per day

DISSERTATION; Approved/ Not approved (No Marks)

MARKS QUALIFYING FOR PASS.

	Maximum Marks	Marks Qualifying for a pass (50%)
Theory	400	200
Clinical	300	150
Oral	100	50
	-----	-----
Aggregate	<u>800</u>	<u>400</u>

BRANCH - III M.Ch. PLASTIC AND RECONSTRUCTIVE SURGERY

Scope

The qualification of M.Ch. in Plastic and Reconstructive Surgery should signify adequate training and practical competence to undertake major plastic surgery with safety at the level of a prior specialist-consultant and as medical teachers. The term Plastic and Reconstructive Surgery is used in its wider sense, including all its such areas termed reconstructive surgery, crainofacial surgery, hand surgery, aesthetic surgery, microvascular surgery and surgery for management of burns and their sequelae.

a. Written:

Four papers each of three hours duration :

Paper – I : Applied Basic Sciences, principles and general techniques including applications of anatomy to Plastic Surgery, Genetics physiology, Biophysics, Biochemistry, Pharmacology, Microbiology, Pathology, Anaesthesiology, Radiotherapy, Orthodontics, Physiotherapy, Occupational therapy, Speech therapy, Nursing, Historical aspects of plastic surgery, grafts and flaps, wound healing, asepsis, dressing techniques, infection control, suture materials, powered instruments, ventilatory support and causes of morbidity and mortality.

Paper–II : Practice of plastic surgery in burns, head injuries, maxillofacial and craniofacial injuries, methods of providing skin cover for defects, replacing loss of other tissues, analysis and planning treatment of complex deformities, oral and skin cancers and general plastic surgery.

Paper–III: Operative surgery and special aspects of reconstruction, aesthetic surgery, microvascular, hand, cranio-maxillofacial surgery and endoscopic procedures.

Paper – IV : Recent Advances.

b. Clinical & Table Viva :

Long Case : In one hour, the candidate should make his/her clinical assessment, diagnosis and treatment plan. The examiners should lead the discussion to test the candidate's performance as a consultant faced with full responsibility for the patient's care.

Short Case : A selection of 4 short cases covering a wide range of plastic surgical problems should be given to the candidate.

Table Viva: This covers the candidates familiarity with pathological specimens, photographs, X-rays, appliances, dental models and instruments of relevance to plastic surgical work should be tested. Surgical anatomy, operative surgery and practical details of plastic surgical procedures, his/her work record, and final evaluation of his/her competence as a plastic surgeon.

METHODOLOGY OF THE CURRICULUM

Cognitive :

1. Seminars to review a subject.
2. Journal clubs to review relevant articles.
3. Tutorials with consultants and guest lectures.
4. Providing a well-stocked library.

Improving clinical judgement :

1. Comprehensive teaching ward rounds.
2. Treatment planning sessions.
- 3 Collaboration with allied specialists, orthodontist, speech therapist, radiotherapist, physiotherapist lectures to be arranged.
4. Surgical audit – monthly morbidity and mortality meeting.
- 5. Where a department is deficient in a sub-speciality of Plastic Surgery, it is mandatory that the trainee spends 3 months in a department having the sub-speciality under supervision of the consultant.**

Developing Skills :

1. Develop daily departmental program including emergencies.
2. Graduated increasing responsibility.

3. Familiarity with construction of simple splints for hand and burn injuries and dental models and appliances.
4. Experimental microvascular Surgery training
5. Knowledge of information retrieval using computers.
- 6 Knowledge of clinical photograph / documentation.
7. Knowledge of clinical epidemiology.

Develop critical faculties :

1. Maintain records and analyse data.
2. Presentations at clinical meetings, conferences.
3. Write scientific papers.
4. Thesis-research and investigate with limited objective clinical problems.
5. Ethical basis of practice of Plastic Surgery.

Syllabus for M.Ch., (Plastic and Re-constructive Surgery) Course

General Principles :-

1. History of Plastic Surgery and its broad scope at the present time.
2. Anatomy and functions of skin.
3. Split skin grafts and full thickness skin grafts, their take and subsequent behaviour.
4. Local skin flaps.
5. Pedicled skin flaps and tubes.
6. Unstable scar and scar contracture.
7. Care of wounds, dressing, techniques and splints.
8. Wound healing.

9. Grafts – fat, fascia, tendon, nerve, cartilage, bone.
10. Infective skin gangrene.
11. Hospital infections.
12. Suture instruments.
13. Surgical instruments.
14. Implant materials used in Plastic Surgery.
15. Principles of genetics and general approach to the management of congenital malformations.
16. Flaps – Fasciocutaneous muscle, musculocutaneous, osteomyocutaneous.
17. Local anaesthesia, nerve blocks, regional anaesthesia.
18. Principles of anaesthesia for infants, adults, hypothermia, hypotensive anaesthesia.
19. Tissue expansion.
20. Keloid, hypertrophic scars.
21. Endoscopy in Plastic Surgery.

Face :-

1. Growth and development changes in face, anatomy of facial skeleton.
2. Structure and development of teeth.
3. Leprosy deformities of face.
4. Temporomandibular joint dysfunctions.
5. Fractures – nose, maxilla, mandible, zygoma, orbit – early management and treatment of sequelae.
6. Corrective Rhinoplasty.
7. Reconstructive Rhinoplasty.
8. Facial paralysis.
9. Reconstruction of external ear.
10. Reconstruction of eyelids, ptosis.
11. Congenital deformities of face and jaw bone.

Cleft Lip and Palate and Craniofacial Anomalies :-

1. Embryology of head and neck (excluding central nervous system).
2. Regional anatomy of head and neck.
3. Embryogenesis of cleft lip and palate.
4. Cleft lip and palate, alveolar clefts.
5. Velopharyngeal incompetence.
6. Orthodontics, speech therapy in cleft lip and palate.
7. Principles of craniofacial surgery.
8. Rare craniofacial clefts, Tessier's clefts.
9. Craniosynostosis, hypertelorism, craniofacial microsomia.

Tumours of Head and Neck and Skin :-

1. Vasoformative lesions of the skin and adenexa.
2. Jaw tumours.
3. Cancer of upper Aerodigestive system.
4. Reconstruction of mandible.
5. Reconstruction of maxilla.
6. Malignant and benign tumours of head and neck.
7. Tumour of skin.
8. Principles of prosthetic replacement of Jaw defects.

Trunk :-

1. Reconstruction of full thickness defects of the abdomen and thorax.
2. Decubitus ulcer.
3. Breast reconstruction.

Aesthetic Surgery :-

1. Chemical peeling and dermabrasion.
2. Blepharoplasty.
3. Face lift.
4. Abdominoplasty.
5. Body contouring, liposuction.
6. Reduction mammoplasty.
7. Augmentation mammoplasty.
8. Laser therapy.
9. Aesthetic Rhinoplasty.

Lower Extremity :-

1. Functional anatomy of foot.
2. Lymphedema.
3. Reconstructive surgery of lower extremity.
4. Leprosy deformities of leg and foot.

Genito Urinary :-

1. Embryology of the male and female external genitalia.
2. Anatomy of the male and female external genitalia.
3. Hypospadias.

4. Epispadias and ectopic vesicae.
5. Reconstruction of external genitalia.
6. Vaginoplasty.
7. Trans-sexualism (intersex).

Hand :-

1. Embryology of upper extremity.
2. Functional anatomy of hand.
3. Examination of hand.
4. General principles of hand surgery.
5. Treatment of acute hand injuries.
6. Finger tip injuries.
7. Flexor tendon injuries.
8. Extensor tendon injuries.
9. Principles of reconstruction in mutilating hand injuries.
10. Fractures of hand and dislocation of hand – metacarpal, phalanges.
11. Nail injuries, grafting.
12. Pollicisation.
13. Thumb reconstruction.
14. Peripheral nerve injuries, electrodiagnostic tests.
15. Brachial plexus injury.
16. Innervated flaps.
17. Vascular malformations of upper extremity.
18. Lymphedema in upper extremity.
19. Ischaemic conditions of upper extremity.
20. Vasospastic disorders of hands.
21. Nerve compression syndromes.
22. Surgery for spastic and tetraplegic hand.
23. Problems of small joints.
24. Dupuytren's disease.
25. Principles and treatment of old and neglected hand deformities.
26. Rheumatoid arthritis of hand.
27. Hand infections.
28. Congenital deformities of hand, finger, thumb.
29. Tendon transfers for radial, ulnar and median nerve injury.
30. Leprosy deformity of hand.
31. Benign and malignant tumours of hand.
32. Rehabilitation of hand, prosthesis.

Microvascular :-

1. Principles of microsurgery and its applications in plastic surgery.
2. Replantation and revascularisation surgery.
3. Microvascular tissue transfers.

Burns :-

1. Thermal burns.
2. Electrical burns.
3. Chemical burns.
4. Radiation burn.
5. Pathophysiology of burn shock.
6. Nutrition in burns.
7. Facial burns.
8. Tangential excision and sequential excision.
9. Reconstruction of burn hand and upper extremity.
10. Post burn contractures – treatment of sequelae.
11. Burn wound infection, sepsis.
12. Principles of planning in event of burn disaster.
13. Organisation of Burns Unit.

PATTERN OF EXAMINATION :

Theory-4 Papers, 100 Marks each Duration: Three hours each

Paper – I	Applied Basic Sciences and General Principles in Plastic surgery.	100
Paper – II	Plastic Surgery Regional	100
Paper – III	Plastic Surgery Applied	100
Paper – IV	Plastic Surgery as applied to Allied Sciences and Recent Advances in Plastic Surgery.	100

DISTRIBUTION OF MARKS **

MCQ (Multiple Choice Questions)	20 questions (20x1)	20 Marks
One Essay		20 Marks
Two Essays	15 Marks each (15 x2)	30 Marks
Six short notes	5 Marks each (5 x6)	30 Marks
TOTAL		<u>100 Marks</u>

Practical/Clinical and Oral Examination

	<u>No. OF CASES</u>	<u>DURATION</u>	<u>MARKS</u>
LONG CASE	One	One Hour	100
SHORT CASE	Two	One Hour (30 Mts Each)	100
WARD ROUNDS	Four (Minimum)	One Hour	100
TOTAL			<u>300</u>
Oral/ Viva Examination			<u>100</u>
TOTAL			<u>400</u>

Note : Not more than three candidates will be examined in practical examination per day.

DISSERTATION : Approved/Not approved (No Marks)

MARKS QUALIFYING FOR A PASS

	Maximum Marks	Marks Qualifying for a pass (50%)
Theory	400	200
Clinical	300	150
Oral	100	50
Aggregate	<u>800</u>	<u>400</u>

** XXX SAB dated 28.12.2005

BRANCH - IV M.Ch. UROLOGY :

It will cover wide spectrum of the diseases of Urogenital system and retroperitoneum. Apart from the clinical aspect of these subjects, candidate has to acquire in depth knowledge of the related subjects like Applied Anatomy, Embryology, Physiology, Bio-chemistry, Pharmacology, Pathology, Genetics and Immunology.

1. Anatomy and Embryology of Genito Urinary tract, adrenals and retroperitoneum.
2. Applied Physiology and bio-chemistry, Immunology, Microbiology and genetics pertaining to Urology.
3. Investigative Urology and Genito Urinary radiology and imaging including nuclear medicine.
4. Male infertility, andrology, microsurgery and urological endo-crinology.
5. Sexual dysfunction - investigations and management.
6. Perioperative care, management of urological complications and care of the critically ill patients.
7. Urodynamics bladder and urethral dysfunction due to all pathologies.
8. Genito Urinary trauma.
9. Urolithiasis - medical, bio-chemical and surgical aspects – open Surgical and endourological procedures.
10. Uro - Oncology - Adult and Paediatric.
11. Reconstructive Urology.
12. Paediatric Urology - congenital malformations and acquired diseases.
13. Urinary tract infection.
14. Obstructive Uropathy.
15. Renal transplantation (including transplant immunology, medical and surgical aspects).
16. Renovascular hypertension.
17. Gynaecological Urology.
18. Operative Urology - Open and endoscopic and laparoscopic.
19. Endourology - Establishment of Percutaneous nephrostomy (PCN), stenting both antegrade and retrograde, Ureterorenoscopy (URS), percutaneous nephrolithotripsy (PCNL), Extracorporeal shock wave lithotripsy (ESWL) and retrograde intrarenal surgery (RIRS)
20. Diathermy, lasers, fibre optics, instruments, catheters, endoscopy etc.,
21. Retroperitoneal diseases and management.
22. Medical aspects of the kidney diseases - Nephrology as applied to Urology.

- 23 New modalities in management of urological diseases.
 24 AIDS.
 25 Sexually transmitted diseases (STD).

PATTERN OF EXAMINATION *

Theory-4 Papers, 100 Marks each Duration: Three hours each

Paper – I	Basic Sciences Applied to Urology	100
Paper – II	General Adult & Paediatric Urology	100
Paper – III	Regional Systemic Urology	100
Paper – IV	Recent Advances in Urology	100

DISTRIBUTION OF MARKS **

MCQ (Multiple Choice Questions) 20 questions (20x1)	20 Marks
One Essay	20 Marks
Two Essays 15 Marks each (15 x2)	30 Marks
Six short notes 5 Marks each (5 x6)	30 Marks
TOTAL	<u>100 Marks</u>

Practical/Clinical and Oral Examination

	<u>No. OF CASES</u>	<u>DURATION</u>	<u>MARKS</u>
LONG CASE	One	One Hour	100
SHORT CASE	Two	One Hour (30 Mts Each)	100
WARD ROUNDS	Four (Minimum)	One Hour	100
		TOTAL	<u>300</u>
Oral/ Viva Examination			<u>100</u>
		TOTAL	<u>400</u>

** XXX SAB dated 28.12.2005

* 31st SAB dated 29.06.2006

Note : Not more than three candidates will be examined in practical examination per day

DISSERTATION : Approved/Not approved (No Marks)

MARKS QUALIFYING FOR A PASS

	Maximum Marks	Marks Qualifying for a pass (50%)
Theory	400	200
Clinical	300	150
Oral	100	50
Aggregate	<u>800</u>	<u>400</u>

BRANCH - V M.Ch PAEDIATRIC SURGERY

Curriculum for M.Ch. Paediatric surgery Training Program:

A. Operative Surgery:-

The basic requirement and the minimal operative experience required during the 3 year training program are outlined here below. The operative experience would be acquired through progressively graded surgical responsibility starting from the investigative, history writing, preoperative and the post-operative management, to the assisting at surgery (initially in infants and children and then the new borns during the first and the second year of training) and then leading to the independent operative responsibility with minimal supervision during the last year of training). The log book should have nearly the following number of operative procedures.

1. All Indexed Neonatal Surgical cases : N = 50

- Esophageal atresia and TEF
- Anorectal malformations (low and high)
- Exomphalos and Gastroschisis
- Duodenal Atresia/obstructions
- Diaphragmatic Hernia
- Hirschsprung's disease (Colostomy and Primary Pull-through)
- NEC
- Spina Bifida
- Intestinal Obstruction (Atresia, Stenosis, Malrotation)
- Congenital Hypertrophic Pyloric Stenosis
- Mechanical Ileus and Intestinal Volvulus
- Neonatal tumors
- Neonatal surgical jaundice

2. Gastrointestinal surgical problems: N 50

- Colostomy making and closure
- Esophageal replacement
- Anti gastroesophageal reflux surgery
- Gastrostomy
- Pull through procedures for ARA
- Pull through procedures for Hirschsprung's disease
- Intestinal obstruction, resections
- Intussusception
- Splenectomy

Patient VID anomalies
 Umbilical Hernia
 Appendectomy
 Biliary stricture
 Choledochal cysts
 Surgery on the pancreas (Pancreatitis, tumours, pseudocysts)

3. Pediatric Urological Cases : N 50

Pyelolithotomy
 Pyeloplasty
 Ureteric reimplant
 Ureterolithotomy
 Ureterostomy
 Cystolithotomy
 Cystoscopy
 Nephrectomy
 Nephrostomy
 Orchiectomy for tumors, Exploration
 Posterior urethral valves fulguration
 Urinary diversion
 Operation for tension of testes
 Circumcision
 Orchidopexy
 Hypospadias repair.

4. Pediatric Thoracic Cases : N 50

Oesophageal dilatation
 Foreign body removal
 Esophagoscopy
 Pleural drainage
 Pulmonary resection
 Thymectomy for excision of duplication Cyst, CAM, tumor
 Pneumonectomy
 Decortication and pleural toilet

5, Pediatric Oncology Cases : N = 20

Hepatoblastoma
 Neuroblastoma
 Rhabdomyosarcoma

Wilm's tumour
 Overian tumors
 Testicular Tumors
 Soft tissue sarcomas
 Sacro Coccygeal teratomas

6. Paediatric Endoscopic Procedures : N = 50

Cystoscopy
 Bronchoscopy
 Esophagoscopy

7. Pediatric laparoscopy procedures: N =20

Diagnostic and Therapeutic.

8. General Pediatric Surgical cases : N =50

Inguinal hernia
 Circumcision
 Cut downs, abscess drainage, others
 Thyroglossal cysts
 Excision of lymphanglomas

9. Paediatric Plastic Surgical cases : N = 50

Hypospadias
 Cleft lip and Palate.

10. Pediatric neurosurgical cases : N = 50

Spina Bifida and Hydrocephalus.

Note: The number of cases mentioned as above is only for a guidelines. The total number mentioned are desirable, however, may not be feasible in all the centers offering M.Ch. training course.

To compensate for the loss an exchange program with the well established centers with a sizeable work load in pediatric surgery, is compulsory for 2 months.

B. Non-operative areas of Training:

The non-operative component of the structured M.Ch. training program in pediatric surgery is also equally important and should include:-

Technique of Resuscitation of the New born

Antenatal diagnosis and counselling (intervention if possible)

Orientation with Internet and the Computer technology

Management of Day care Surgery

Pediatric Transplants (Liver, Kidney, Pancreas)

Surgical Embryology, genetics and the gene therapy

Pediatric Chemotherapy regiments for solid tumours

Problems of babies with prematurity and small for date physiology of the new born and the drug schedules for the new borns, and the blood exchange transfusions

Organizational capabilities to host conferences, Symposie, workshops, etc.

Membership of National and International Pediatric Surgical associations and subscribing to the established journals in the speciality.

Knowledge about the progress made in Pediatric Surgery during the past few decades.

(Transplants, Endoscopy, Lasers, Laparoscopy, Tumor markers, antenatal diagnosis, gene therapy).

PATTERN OF EXAMINATION *

Theory-4 Papers, 100 Marks each Duration: Three hours each

Paper – I	Basic Sciences applied to Paediatric Surgery	100
Paper – II	Neonatal Surgery and Urology	100
Paper – III	Regional and Systemic Paediatric Surgery	100
Paper – IV	Recent Advances in Paediatric Surgery	100

* 31st SAB dated 29.06.2006

DISTRIBUTION OF MARKS **

MCQ (Multiple Choice Questions)	20 questions (20x1)	20 Marks
One Essay		20 Marks
Two Essays	15 Marks each (15 x2)	30 Marks
Six short notes	5 Marks each (5 x6)	30 Marks
TOTAL		<u>100 Marks</u>

Practical/Clinical and Oral Examination

	<u>No. OF CASES</u>	<u>DURATION</u>	<u>MARKS</u>
LONG CASE	One	One Hour	100
SHORT CASE	Two	One Hour (30 Mts Each)	100
WARD ROUNDS	Four (Minimum)	One Hour	100
TOTAL			<u>300</u>
Oral/ Viva Examination			<u>100</u>
TOTAL			<u>400</u>

Note : Not more than three candidates will be examined in practical examination per day

DISSERTATION : Approved/Not approved (No Marks)

MARKS QUALIFYING FOR A PASS

	Maximum Marks	Marks Qualifying for a pass (50%)
Theory	400	200
Clinical	300	150
Oral	100	50
Aggregate	<u>800</u>	<u>400</u>

** XXX SAB dated 28.12.2005

BRANCH – VI M.Ch SURGICAL GASTRO-ENTEROLOGY

Scope of Training :-

Surgical Gastroenterology – This would involve :

- a. Diseases of gastrointestinal tract and allied organs with special reference to surgical disorder.
- b. Gastrointestinal and allied organ trauma.
- c. Gastrointestinal and allied organ oncology.
- d. Clinical epidemiology relevant to Gastrointestinal practice.
- e. Organ transplantation.
- f. Stoma care.
- g. Nutrition – enteral and parenteral.

Relevant medical Gastroenterologic.

Relevant radiology including interventional techniques, ultra sonography, nuclear medicine, CT and MRI.

Basic sciences as applied to surgical Gastroenterology.

Diagnostic upper and lower Gastrointestinal Endoscopy including some therapeutic procedures such as oesophageal varices injection, banding, dilatation and stenting of oesophageal strictures, polypectomy, etc.

Surgical skills relevant to surgical Gastroenterological practice including minimally invasive surgery.

Intensive care, ventilatory care and monitoring of sick patients.

Maintenance of records.

Information retrieval, use of computers in medicine, Internet...

Surgical audit.

Clinical, applied and basic research including elements of biostatistics.

There should be extramural rotation, where necessary, to take care of geographical variations in disease pattern. There will also be scope for an elective training in some aspects of surgical Gastroenterology. For this one month posting in medical Gastroenterology and two months posting in other tertiary centers is necessary.

Course Content :-

Knowledge :

Applied basic science knowledge relevant to the field of surgical Gastroenterology.

Diseases of the Gastrointestinal tract and allied organs such as liver, spleen, hepatobiliary tract, Pancreas, etc., with special reference to those of surgical importance.

Trauma to the Gastrointestinal tract and allied organs.

Recent advances at applicable to the field of Gastroenterology.

Investigation of the Gastrointestinal tract – procedures, applications, interpretations.

Bio-statistics as applicable to clinical research.

Principles of clinical epidemiology.

Skills :

Decision-making, clinical diagnosis, planning, interpretation and executing investigative procedures, management of Gastrointestinal and allied organ problems.

Diagnostic and therapeutic Endoscopy (only listed procedures).

Ability to perform simple and complex operative procedures on the Gastrointestinal tract and associated organs including minimally invasive surgery.

Monitoring of the sick patients.

Counseling patients and relatives regarding Gastrointestinal problems.

Ability to carry out research, scientifically review research and present research findings to an audience.

Ability to teach undergraduates and postgraduates in the field of surgical Gastroenterology.

Teaching / Learning Activities :

Ward / OPD patient management.

Assisting / performing operative procedures.

Long and short topic presentations.

Ward rounds, case presentations and discussions.

Combined ward rounds with Medical Gastroenterologist.

Clinicoradiological and clinicopathological conferences.

Journal club.

Research review.

Guest and in-house lectures.

Conferences, seminars and CME's.

Participation in workshops, etc.

Teaching undergraduates / postgraduates / paramedical staff.

Surgical audit (patient care review meeting).

Biomedical equipments use and maintenance.

Structured Training Programme – Scheme :

- | | |
|-------------|---|
| First year | <ul style="list-style-type: none"> - Outpatient / inpatient patient care. - Endoscopy. - Familiarization with use of computers in medicine. - Assisting of Operation Theatre including emergencies. - Gastrointestinal Endoscopy – 4 weeks. - Anaesthesia / intensive care – 4 weeks. - Starting research project. |
| Second year | <ul style="list-style-type: none"> - Outpatient / inpatient patient care. - Peripheral rotations. - Radiology: RT / Oncology – optional. - Pathology' Nuclear Medicine. - Independent operative procedure of average technical difficulty. - Minimally invasive surgery – assisting and supervised work. |
| Third year | <ul style="list-style-type: none"> - Outpatient / inpatient patient care. - Assisting and performing complex surgical procedures. - Finalization and submission of research projects. - Achieving competence in minimally invasive surgery and Endoscopic procedures. |

Wherever considered necessary extramural rotation of 8 – 12 weeks must be encouraged at other recognized centers for a wider exposure to choices of therapy and other operative procedure particularly in view of differences in geographical incidence of disease.

Research Training :

The candidate will be trained in the ability to

- a. Frame a research question.
- b. Plan a study to answer the question.
- c. Collect the relevant information and
- d. Evaluate appropriately the collected data to arrive at an informed conclusion.

The candidate should become conversant with the reporting of these results as a research paper. In journals and as a presentation in conferences.

The activities would consist of :

- Planning and organizing relevant animal / clinical studies to be submitted as a dissertation at the end of the course for evaluation and defense.
- Presentation of at least 2 papers in national / international conferences and
- Attendance at least one national conference.

If possible, the candidate may publish his research work in indexed journals.

PATTERN OF EXAMINATION :

Theory-4 Papers 100 marks each Duration 3 hours each

Paper – I	Basic Sciences as applied to Gastro-enterology (Applied Anatomy, Applied Physiology, Microbiology and Clinical Pharmacology).	100
Paper – II	Surgical Gastro-enterology - General	100
Paper – III	Surgical Gastro-enterology related to Hepato Biliary & Pancreatic diseases	100
Paper – IV	Recent Advances in Surgical Gastro-enterology and Proctology.	100

Distribution of Marks **

MCQ (Multiple Choice Questions) 20 questions (20 x 1)	20 Marks
One Essay	20 Marks
Two Essays 15 Marks each (15 x 2)	30 Marks
Six short notes 5 Marks each (5 x 6)	30 Marks
TOTAL	----- 100 Marks -----

** XXX SAB dated 28.12.2005

Practical and Oral Examination

	<u>No. OF CASES</u>	<u>DURATION</u>	<u>MARKS</u>
LONG CASE	One	One Hour	100
SHORT CASE	Two	One Hour (30 Mts Each)	100
WARD ROUNDS	Four (Minimum)	One Hour	100
		TOTAL	300
Oral/Viva Examination			100
		TOTAL	400

Note: Not more than three candidates will be examined in practical examination per day.

DISSERATION: Approved/Not approved (No Marks)

MARKS QUALIFYING FOR A PASS

	Maximum Marks	Marks qualifying for a pass (50%)
Theory	400	200
Clinical	300	150
Oral	100	50
	800	400

BRANCH - VII M.Ch. SURGICAL ONCOLOGY

SYLLABUS :-

1. Essentials of Molecular Biology - Basic Principles, Genomics and Cancer, Signal transduction, Immunology, Cytogenetics, Cell Cycle, Apoptosis, invasion and metastases, antigenesis, and Carcinogenesis - Genotoics, viral, physical and Chemical.
2. Epidemiology - epidemiologic methods, descriptive and analytical epidemiology.
3. Principles of Cancer management surgical oncology, Medical Oncology, Radiation Oncology and Biologic Therapy.
4. Cancer Chemotherapy
5. Pharmacology of Cancer Biotherapeutics - Interferone interleukins, hormonal therapy, differentiating agents, monoclonal antibodies, anti-angiogenic factors.
6. Clinical Trials
7. Cancer Prevention - tobacco related cancers, diet chemoprevention.
8. Cancer Screening
9. Cancer Diagnosis - Molecular pathology and Cytology, Imaging, Endoscopy, Laparoscopy
10. Specialised techniques - minimal access surgery, Vascular access, isolated perfusion, intensity modulated radiation therapy.
11. Systemic Oncology:
 - i. Head and Neck Cancer
 - ii. Lung Cancer
 - iii. Medistinal neoplasma
 - iv. Gastrointestinal tract cancer
 - v. Cancers of Genitourinary system
 - vi. Gynaecologic cancer
 - vii. Breast cancer

- viii. Endocrine Malignancies
- ix. Musculoskeletal turnouts
- x. Mesotheloma
- xi. Cancer of the skin
- xii. Malignant Melanoma
- xiii. Central nervous system malignancies
- xiv. Paediatric malignancies
- xv. Lymphomes and leukemias -
- 12. Pareneoplastic syndromes
- 13. Cancer of the unknown primary life
- 14. Peritonsal carcinomatosis
- 15. Cancer in immunosuppressed host
- 16. Oncologic emergencies - SVC syndrome, spinal cord compression, Metabolic emergencies, urologic emergencies
- 17. Treatment of metastetic cancer - brain, lung, bone, liver, malignant Effusions and asocitis.
- 18. Haemopoetic therapy - transfusion, grown factors, autologous and Allogenic stem cell transplantation
- 19. Infection in the cancer patient
- 20. Supportive care and quality of life - pain management, nutritional support, sexual problems, genetic counselling, osychological issues, community resources, care of the terminally ill patient.
- 21. Adverse effects of treatment - neuses and vomiting. Oral complications, Pulmonary toxicity, cardiac toxicity, hair loss, gonadal dysfunction, second cancers, miscellaneous toxicity.
- 22. Rehabilitation of the cancer patient
- 23. Oncology Nursing including various access
- 24. Ethical issues in Oncology
- 25. Information systems in Oncology
- 26. Alternative methods of cancer treatment
- 27. Newer approaches in cancer treatment - Gene therapy, molecular therapy, cancer vaccines, image guiced surgery, heavy particles in radiation therapy.
- 28. Reconstructive Surgery

PATTERN OF EXAMINATION

Theory – 4 Papers 100 Marks each Duration: Three hours each

Paper - I	Basic Sciences as applied to Surgical Oncology	100
Paper-II	Surgical Oncology - I	100
Paper-III	Surgical Oncology - II	100
Paper-IV	Recent advances in Surgical Oncology	100

DISTRIBUTION OF MARKS **

MCQ (Multiple Choice Questions) 20 questions (20 x1)	20 Marks
One Essay	20 Marks
Two Essays 5 Marks each (15 x 2)	30 Marks
Six short notes 5 Marks each (5 x 6)	30 Marks
TOTAL	<u>100 Marks</u>

PRACTICAL/CLINICAL AND ORAL EXAMINATION

	<u>No. OF CASES</u>	<u>DURATION</u>	<u>MARKS</u>
Long case	One	One hour	100
Short cases	Two	One hour	100
		(30 Mts Each)	
Ward rounds	Four	One hour	100
	(minimum)		----
		Total	300
Oral/Viva examination			<u>100</u>
		Total	<u>400</u>

** XXX SAB dated 28.12.2005

Note: Not more than three candidates will be examined in practical examinations per day.

DISSERTATION; Approved/Not approved (No Marks)

MARKS QUALIFYING FOR A PASS :

	Maximum Marks	Marks Qualifying for a pass (50%)
Theory	400	200
Clinical	300	150
Oral	<u>100</u>	<u>50</u>
Aggregate	<u>800</u>	<u>400</u>

BRANCH - VIII M.Ch. VASCULAR SURGERY

CORE SYLLABUS :

1. Surgical approach to Vascular Problem.
2. Haemodynamics and Diagnosis of arterial and venous diseases – Basic techniques and application and vascular laboratory.
3. Fundamental Therapeutic & Technical Considerations.
4. Arterial Diseases :-
 Arterial wall pathology in atherosclerosis, Buerger's diseases, Atherogenesis, Non-specific aorto-arteritis, Arterial Aneurysms, Fibromuscular dysplasia, Uncommon Arteriopathies, etc.
 - a. Acute Limb Ischemia : Arterial Thromboembolism, Drug abuse, Vascular injuries, etc.
 - b. Chronic Limb Ischemia : Management and reconstructive surgeries for occlusive arterial disease, Extra anatomic bypass, Lumbar and cervical sympathectomies, Diabetic foot and its management, etc.
5. Venous Diseases :-
 Chronic venous insufficiency – diagnosis, management, post-phlebitic sequelae, varicose veins, perforator, incompetence, Deep venous valvular incompetence, etc.
6. Diagnosis and Management of extra cranial cerebrovascular diseases.
7. Diagnosis and surgical management of portal hypertension.
8. Diagnosis and surgical management of reno-vascular hypertension.
9. Diagnosis and management of visceral ischemic syndrome.
10. Management of Arterio venous malformation – Congenital and Acquired.

11. Diagnosis and the management of Neuro-vascular conditions involving upper extremities (thoracic outlet syndrome).
12. Vascular Grafts.
13. Management of Lymphoedema.
14. Extremity amputations for vascular diseases.
15. Noninvasive vascular laboratory (Duplex Scan, CT Scan, MRI, etc.,).
16. Interventional radiological techniques and its application in vascular diseases.
17. Endovascular techniques and recent advances.

PATTERN OF EXAMINATION

Theory - 4 papers 100 Marks each Duration: Three hours each

Paper– I	Basic Sciences *	
	applied to Vascular Surgery	100
Paper – II	Vascular Surgery *	100
Paper – III	Vascular and Endo Vascular Surgery *	100
Paper – IV	Recent Advances in Vascular Surgery. *	100

DISTRIBUTION OF MARKS **

MCQ (Multiple Choice Questions) 20 questions (20 x1)	20 Marks
One Essay	20 Marks
Two Essays 15 Marks each (15 x 2)	30 Marks
Six short notes 5 Marks each (5 x 6)	30 Marks

TOTAL	<u>100 Marks</u>

* 31st S.A.B. dated:29.06.2006

** XXXth S.A.B. dated:28.12.2005

PRACTICAL/CLINICAL AND ORAL EXAMINATION

	<u>No. OF CASES</u>	<u>DURATION</u>	<u>MARKS</u>
Long case	One	One hour	100
Short cases	Two	One hour	100
		(30 Mts Each)	
Ward rounds	Four	One hour	100
	(minimum)		-----
		Total	300
Oral/Viva examination			<u>100</u>
		Total	<u>400</u>

Note: Not more than three candidates will be examined in practical examinations per day.

DISSERTATION; Approved/Not approved (No Marks)

MARKS QUALIFYING FOR A PASS :

	Maximum Marks	Marks Qualifying for a pass (50%)
Theory	400	200
Clinical	300	150
Oral	<u>100</u>	<u>50</u>
Aggregate	<u>800</u>	<u>400</u>

BRAMCH IX - M.Ch. Endocrine Surgery

Physiology of specific glands

Thyroid: The role of iodine in the normal function of the thyroid including pathways of iodine metabolism. The physiology of TSH and Thyrotropin releasing factor. The functions of T3 and T4. Role of thyroglobulin in thyroid physiology. Thyroid hormone release. The principles underlying the functioning of the pituitary thyroid axis. Tests of thyroid function including the use of isotope uptake tests. Thyroid antibodies and their significance. An understanding of the physiological impact of Graves' disease on normal bodily functions. Mechanisms of ophthalmic manifestations of Graves' disease. Physiology of thyroid crisis. Effects of calcitonin.

Parathyroid glands: An understanding of the metabolism of minerals especially calcium, magnesium and of phosphate. The activity of PTH on kidney, gut and bone. D Vitamins and their function. The measurement of PTH and an appreciation of the different terminal Components. Reabsorption of phosphate. The functions of nephrogenic cyclic AMP in parathyroid physiology.

The pituitary: Structure, Cells of origin, the basic metabolism and function of anterior pituitary hormones with no feedback loops (growth hormone and prolactin) and those with feed back loops (LH, TSH and ACTH). Hypothalamic pituitary pathways and related releasing substances. Corticotrophin releasing factor and its relationship to ACTH. Physiology of ACTH and TSH including diurnal variation. ACTH changes in response to stress, illness and trauma. Knowledge of the function and significance of ADH, Growth Hormone and Oxytocin.

Adrenal cortex: The biosynthesis of glucocorticoids. Physiology of glucocorticoids including their relevance to immunological mechanisms and wound healing. Metabolism of cortisol and knowledge of those metabolites which are measured in clinical practice. The physiology of adrenal androgens and the effects of pathological overproduction. The mineralocorticoids. The biochemistry and precursors of aldosterone. An understanding of the renal angiotensin mechanisms. The action of aldosterone on distal tubule function. Aldosterone response to alterations in electrolyte levels. Knowledge of tests of adrenal cortical function test of adrenal responsiveness, the dexamethasone test. The ACTH stimulation test.

Adrenal Medulla: Metabolic pathways of adrenaline and nor adrenaline production. The assessment of adrenal medullary activity. An understanding of the effects of excess catecholamine on cardiovascular and intestinal function and on carbohydrate metabolism.

Endocrine gastroenteropancreatic system: An appreciation of the physiology of gastrin. Insulin, glucagons, pancreatic polypeptide, VIP, secretin and somatostatin. The identification of cells of origin of gut hormones by immunocytochemistry. The pathophysiology and regulation of overproduction of insulin, gastrin, pancreatic polypeptide, serotonin and gut kinases.

For specific conditions:

Knowledge of pathophysiology and pathology
Outline of medical investigations
Details of imaging
Methods of biopsy
Interpretation of histological and cytological specimens
Treatment options. Surgical vs. other.
Preoperative preparation
Anesthetic and pharmacological peculiarities
Operative techniques and strategies
Postoperative care including substitution therapies
Additional and adjuvant treatment
Prognosis and strategies for follow up
Counseling and screening in familial diseases.

Specific topics:

Pituitary	Tumors of Pituitary (Cushing's disease, Acromegaly, prolactinoma) Clinical presentation Investigations to confirm the diagnosis Medical and surgical management Trans sphenoidal Hypophysectomy Management of complications of surgery
------------------	---

Thyroid	Management of various thyroid disorders Thyrotoxicosis Including Etiology Medical and radioisotope therapy Management of eye disease Surgical strategies Organization of follow up Monitoring of replacement therapy Thyrotoxicosis in Pregnancy Thyrotoxicosis in Childhood Ectopic thyroid Lingual thyroid Dyshormonogenic Goiter Thyroiditis Solitary nodule Multinodular Goiter Retrosternal Goiter Thyroid malignancy of all types Medullary carcinoma and MEN type1&2 Technique of thyroidectomy Techniques of block dissections of neck Complications of thyroidectomy Management of RLN palsy suppressive thyroxin therapy
Parathyroid	Primary, secondary and tertiary Hyperparathyroidism Investigation of hypercalcaemia Management of acute hypercalcaemia Strategies in parathyroidectomy Technique of parathyroidectomy Management of HPT in renal patients Management of HPT in MEN patients Management of recurrent and persistent HPT Parathyroid auto transplantation Parathyroid carcinoma Management of Hypocalcaemia
Adrenal	Cushing's disease and syndrome Investigations Indications for adrenalectomy Nelson's syndrome Conn's Syndrome Virilising Adrenal Tumours Incidentalomas

Phaeochromocytoma
Pharmacological and anesthetic management of
phaeochromocytoma
Surgical management of phaeochromocytoma
MEN type2
Other adrenal endocrine tumors
paraganglioma
Adrenal malignancy
Strategies and routes for adrenalectomy
Replacement therapy
Management of Adrenal Tumours

Neuroendocrine tumors of the gut and pancreas

Insulinomas
Gastrinomas and ZE Syndrome
Glucagonomas
VIPomas
MEN1 and other familial endocrine tumors
Carcinoids/neuroendocrine tumors of
Foregut, midgut and hindgut
Carcinoid syndrome
Surgical management of Neuroendocrine tumors of
the gut and pancreas

Special postings at the discretion of the HOD:

In allied specialities like Nuclear Medicine, Oto Rhino Laryngology, Neuro Surgery, Surgical Oncology & Medical Endocrinology for a period of **two months**.

In a sister department within the country or outside the country for a period of **one month** without any financial commitment to the Government.

M.Ch. Endocrine Surgery will also follow the same pattern of other M.Ch. Degree Examination.

This will also have four papers.
Every paper shall have two sections

Section one is for **Essays** which will have **two questions**, each carrying 20 marks
(Total 40)

And

Section Two is for short notes which will have **ten questions**, each carrying 6 marks
(Total 60)

The focus in each paper will be as follows:

Theory -4 papers 100 Marks each Duration: Three Hrs. each

Paper I : Basic Sciences as applied to Endocrine Surgery
(Applied Anatomy, Physiology, Biochemistry,
Pharmacology and Pathology)

Paper II : Endocrine Surgery – General

Paper III: Endocrine Surgery – Focused to Thyroid & Thyroid related diseases.

Paper IV: Recent Advances in Endocrine Surgery and Investigations for
Endocrine Diseases.

----- **Distribution of Marks for all M.Ch. / D.M. Degree Courses**

Practical	400
Dissertation	25
Log Book	25 (for Certified hand written Log Book)

Theory	400
Internal Assesment	50

Total Marks	900
--------------------	------------