



MAHATMA GANDHI UNIVERSITY
of
MEDICAL SCIENCES & TECHNOLOGY
JAIPUR

Syllabus

Fellowship in Advanced Reproductive Technology (IVF) (One Year Program)

Edition 2020-21

Notice

1. Amendments made by the Board of Management of the University in Rules / Regulations of the Courses shall automatically apply.
2. The University reserves the right to make changes in the syllabus/books/ guidelines, fee structure or any other information at any time without prior notice. The decision of the University shall be binding on all.
3. The Jurisdiction of all court cases shall be Jaipur Bench of Hon'ble Rajasthan High Court only.

Syllabus

Fellowship in Advanced Reproductive Technology (IVF)(Code)

(One Year Program)

Rules & Regulations

1. TITLE OF THE COURSE

The title of the course shall be “**Fellowship in Advanced Reproductive Technology (IVF)**”.

2. DURATION OF COURSE/ TRAINING

The course shall be of one-year duration from the date of commencement of academic session.

3. ELIGIBILITY FOR ADMISSION:

MD/MS/DNB (Gynae) DGO with 3 years experience.

Other Eligibility Condition: The candidate should be registered with either the National Medical Commission (NMC) or Medical Council of the domicile State.

4. CRITERIA FOR ADMISSION

Selection for Fellowship Programme shall be done by an Admission Board of the University strictly on merit. It will consist of two-step process –Written Entrance Examination followed by Counseling / Personal Interview (PI).

5. RESERVATION POLICY

Reservation shall be applicable as per policy of the State Government of Rajasthan.

6. ENROLMENT AND REGISTRATION

Every candidate who is admitted to Fellowship Programme in Mahatma Gandhi Medical College & Hospital shall be required to get himself/herself enrolled and registered with the Mahatma Gandhi University of Medical Sciences & Technology (**MGUMST**) after paying the prescribed eligibility and enrolment fees.

The candidate shall have to submit an application to the MGUMST through Principal of College for the enrolment/eligibility along with the requisite original documents and the prescribed fees within two months of his/her admission or up to November 30 of the year of admission whichever is later without late fees. Then after, student will have to pay applicable late fees as per prevailing University Rules.

No candidate shall be allowed to appear in University examination without his/her enrolment with the University.

7. MIGRATION RULES

No student, once admitted to the course and enrolled by the University, will be permitted to migrate to any other Course/ University.

8. ATTENDANCE

Minimum 80% attendance is mandatory, both, for theory and practical classes. Student with deficient attendance will not be permitted to appear in University examination.

9. ELIGIBILITY TO APPEAR FOR UNIVERSITY EXAMINATION

- i. **Logbook:** Every candidate shall maintain a logbook for recording his/her participation in the Training Program conducted in the department. The record will include academic activities as well as the presentations and procedures carried out by the candidate. The logbook shall be verified and certified by the Department Head and Principal of College.
- ii. The candidate before commencement of the University theory paper examination shall—
 - a. attend at least one the Conference
 - b. present at least one paper and one poster in a conference.
 - c. publish at least one article in a journal.

10. CONDUCTION OF THE UNIVERSITY EXAMINATION:

University examination shall be conducted twice in a year; that is Main and Supplementary Examination.

Supplementary Examination -

There shall be a supplementary examination conducted by the University within 4-6 months of the Main Examination for those candidates who do not pass at the Main examination.

11. SCHEME OF EXAMINATION

The examination shall be held at the end of the Course. The examination shall consist of Theory and Clinical/Practical & Oral.

The examinations shall be organised on the basis of 'Marking system' to evaluate and to certify candidate's level of knowledge, skill and competence.

(1) **Theory:**

There shall be two theory papers of 3 hours duration and 100 marks each. The theory examination shall be held in advance before the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the commencement of the Clinical/Practical & Oral examination.

Paper-I and Paper-II will be set by two different external examiners from outside of the state.

Each theory paper shall consist of –

2 Essays	2 x 20 =	40 Marks
10 Short Notes	10 x 6 =	60 Marks
Total		100 Marks

The external examiner, who is paper setter for Paper-I shall evaluate the answer books of Paper-I. The answer books of Paper-II shall be evaluated by the Head of the Department.

Nomenclature of Papers:

Paper-I : Human Reproduction (Basic Sciences)

Paper-II : ART & Clinical Embryology

(2) Clinical / Practical and Oral:

Clinical/Practical examination shall be conducted by one External and one Internal Examiner to test / aimed at assessing the knowledge and competence of the candidate for undertaking independent work as a specialist / teacher. Practical examination shall consist of carrying out special investigative techniques for Diagnosis and Therapy. Candidates shall also be examined in procedures in surgical disciplines. Oral examination may be comprehensive enough to test the candidate's overall knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty, which shall form a part of the examination.

One Long Case		70 Marks
Two Short Cases	2 x 40 =	80 Marks
Oral Examination		50 Marks
Total		200 Marks

12. RESULT:

For passing Fellowship Examination, a candidate will be required to obtain at least 40% marks in each theory paper, 50% marks in the aggregate of both the theory papers and 50% marks in the aggregate of Clinical / Practical and Oral examination separately. A candidate failing in any theory paper or in the aggregate of theory papers or Clinical / Practical & Oral examination shall have to repeat the whole Fellowship examination.

A candidate shall be permitted a maximum of 4 attempts or for 2 years to complete Fellowship Program from the date of admission of the course.

13. APPOINTMENT OF EXAMINER& PAPER SETTER

- a. All the examiners, paper setters, theory examination answer books evaluators, Internal and External Examiners for Practical examinations shall be appointed by the President of the University out of the panel submitted by the Head of the department through the Dean of the concerned Faculty
- b. Qualification of the Paper Setter/External Examiner:
P.G. in Broad Specialty (MD/MS/DNB) / Super specialty (DM/MCh) in the concerned subject with 5 years of PG Teaching experience.
- c. Qualification of the Internal Examiner:
P.G. in Broad Specialty (MD/MS/DNB) / Super specialty (DM/MCh) in the concerned subject with 3 years of PG Teaching experience.
- d. Paper setter can be an examiner

14. GRACE MARKS

No grace marks will be provided in Fellowship Program examinations

15. REVALUATION / SCRUTINY

No Revaluation shall be permitted in the Fellowship Programs examinations. However, the student can apply for scrutiny of the answer books as per University Rules.

CURRICULUM

FELLOWSHIP IN ADVANCED REPRODUCTIVE TECHNOLOGY (IVF)

(One Year Program)

GOALS

The fellowship in Reproductive Medicine has been designed as a comprehensive one year training programme in all aspects of Reproductive Medicine including Embryology, Endocrinology Radiology Laparoscopy, Andrology, Foetal Medicine and clinical psychology.

AIM

The aim of this course is to provide the candidate with every opportunity to gain proficiency in clinical workup, diagnosis and evidence based management of infertile couple. It also encourages research work relevant to the subspecialty. After completing the course, the candidate will be expected to work independently as a consultant / clinician in Reproductive Medicine.

OBJECTIVE

The practice of Reproductive Medicine involves the following major subgroup of patients

- a. Infertile couple with female factor like anovulation, tubal factor, endometriosis , endocrine abnormality etc.
- b. Infertile couple with male factor like sexual dysfunction, obstructive azoospermia, non obstructive azoospermia, oligoasthenoteratozoospermia (OATS) etc.
- c. Infertile couple with combined factor.
- d. Third party reproduction like oocyte donation, sperm donation, surrogacy etc.

COURSE OF STUDY

PAPER-I : HUMAN REPRODUCTION (BASIC SCIENCES)

Anatomy: Comprehensive knowledge of the regional anatomy of the pelvis which includes female and male reproductive organs. Hypothalamus, pituitary and adrenal glands.

Physiology: Comprehensive knowledge of human physiology with particular reference to the female and male reproductive system.

Genetics and molecular biology: Detailed knowledge of sexual differentiation and Chromosomal abnormalities involved in reproduction.

Embryology: Comprehensive knowledge of gametogenesis, fertilization, implantation and embryo development. Development of the reproductive organs and abnormalities associated with it. Knowledge of common foetal malformations.

Pathology: Detailed knowledge of the cytopathology and histology of the female and male reproductive tract and endocrine glands related to reproduction.

Biochemistry: Knowledge of the metabolism and function of neurotransmitters, receptors, autocrine and paracrine factors.

Immunology: Detailed Knowledge of immune mechanisms and of the principles of reproductive immunology.

Pharmacology: Comprehensive knowledge of the properties, pharmacodynamics, actions, interactions and hazards of pharmacological agents which are used in reproductive medicine and particularly the compounds which could have a deleterious effect on the reproductive tract and adverse epigenetic influence.

Gynecology of Infertility: Knowledge of epidemiology, etiology, investigations and management of female and male infertility after complete workup.

Endocrinology: Comprehensive knowledge of gynaecological and andrological endocrinology including its applications in reproductive medicine.

Reproductive Genetics: Detailed knowledge of genetic disorders related to female and male reproduction (infertility, recurrent abortions, etc).

Pediatric and adolescence: Detailed knowledge of normal and abnormal sexual development and of specific disorders affecting young females and males and adolescents.

Disorders of menstruation: Comprehensive knowledge of normal menstruation and of the pathophysiology of menstrual disorders, their investigations and management

Ultrasound: Detailed knowledge and competence in ultrasound in all aspects:-

- a) Pelvic ultrasound in women and ability to diagnose pathological conditions of female genital tract
- b) Scrotal ultrasound
- c) Follicle monitoring
- d) Ultrasound guided invasive procedures.

PAPER-II: ART & CLINICAL EMBRYOLOGY –

Andrology: Comprehensive knowledge of normal and abnormal spermatogenesis, as well as of testicular, epididymal and accessory sexglands patho-physiology. Comprehensive knowledge of erection and ejaculation, as well as their physiopathology.

Andrology laboratory: Semen analysis, processing of semen for various procedures – intrauterine insemination, IVF/ICSI. Processing samples of testicular / epididymal sperms for ICSI and sperm function tests.

Assisted reproductive technology: Evolution of different technologies in ART. Controlled ovarian stimulation, oocyte retrieval and embryo transfer techniques. Comprehensive knowledge of endocrine therapy, especially ovarian stimulation and its complications (OHSS). Comprehensive knowledge of the ART: IUI, IVF, ICSI, PESA, TESA, TESE. Comprehensive knowledge of gamete and embryo donation. Comprehensive knowledge of pre-implantation genetic diagnostic techniques and genetic aspects of male & female infertility.

Embryology laboratory: Culture media, oocyte identification, insemination, fertilization and cleavage check, blastocyst culture, embryo hatching, techniques of intra-cytoplasmic sperm injection, cryopreservation and its principles. Semen freezing /embryo freezing/oocyte freezing with slow freeze techniques or vitrification. Quality control and quality assurance in embryology Lab.

Comprehensive knowledge of reproductive surgery and competence in common fertility enhancing endoscopic surgeries (both hysteroscopy and laparoscopy).

Statistics and epidemiology: Knowledge of evidence based medicine pertaining to human reproduction as well as the knowledge of meta-analysis or guidelines on diagnosis or management of various conditions given by important medical bodies such as RCOG, ASRM, ESHREE or Cochrane.

Psychosomatic: Knowledge of psychosexual and stress related disorders. Detailed knowledge of the psychopathology and management of psychosexual disorders and the influence of stress conditions such as ejaculation disorders, impotence and vaginismus.

Ethics and law: Detailed knowledge of ethical and national legal issues involved in reproductive medicine and ART.

Recent advances in the field of Reproductive Medicine and embryology.

ASSESSMENT

- Periodical internal assessment (Two per year), both in theory and clinical should be made for every candidate.

- Internal assessment will be made on day to day work of the trainee.

POSTINGS IN VARIOUS UNITS

The trainee will undergo a clinical rotation in different subspecialty as follows.

- Reproductive medicine – 10 months. (parent unit)
- Embryology lab. – 4 weeks
- Radiology and fetal medicine – 2 weeks
- Centre for Advanced Gynae Endoscopy Surgery (CAGES) – 2 weeks

TEACHING AND TRAINING METHOD

The fundamental components of the teaching programme include.

- 1) Case presentation & discussion - once a week.
 - 2) Seminar - once a week.
 - 3) Journal club – once a week.
 - 4) Faculty lecture teaching – twice a month.
 - 5) Clinical assessment – once in six month.
 - 6) Rotation training in subspecialty.
 - 7) Interesting and difficult case discussions.
- The daily rounds include bedside discussions including examination, investigation and management plan.
 - The candidate will maintain a daily training record / log book for recording following
 - 1) Clinical attendance.
 - 2) Attendance at departmental meetings and seminars.
 - 3) Record of case presentation and other academic activities.
 - 4) Record of the cases done or assisted by candidate in O.T

This record will be checked and signed regularly by the teacher. The record book is intended as a means of continuous self –assessment

REFERENCE BOOK & JOURNALS

Books -

1. Textbook of Assisted Reproductive Techniques David K. Gardner, Ariel Weissman, Colin M. Howles, Zeev Shoham
2. Principles and Practice of Assisted Reproductive Technology, Vol. 2, Lab. Aspects of IVF & Andrology, - Kamini Rao.
3. Infertility Diagnosis, Management & IVF – Dr. Anil Dubey.
4. A Practical Guide to Setting Up an IVF Lab, Embryo Culture Systems and Running the Unit Alex C Varghese, Peter Sjoblom, K. Jayaprakasan, April 2013.

5. Practical Manual of In Vitro Fertilization: Advanced Methods and Novel Devices Nagy, Zsolt Peter; Varghese, Alex C; Agarwal, Ashok (Eds) September 2011.
6. A Textbook of in Vitro Fertilization and Assisted Reproduction: the Bourn Hall Guide to Clinical and Laboratory Practice Peter Brindsen 3rd Edition 2004.
7. Quality & Risk Management in the IVF Laboratory David Mortimer February 2008.

Journals

1. Journal of Human Reproductive Sciences (JHRS)-ISAR.
2. Fertility Sciences Research (IFS)
3. Journal of Reproductive Health and Medicine
4. Fertility and sterility.
5. Human Reproduction
6. Asian Pacific Journal of Reproduction
7. International Journal of Women's Health and Reproduction Sciences

LOG BOOK (FORMAT-Annexure-1)

S. No.	Exercise
1.	Postings In Various Units
2.	Out Patient Procedures
3.	Sonography
4.	Sonography Assisted Procedures
5.	Endoscopic Surgeries
6.	Operative Hysteroscopy
7.	Operative Laparoscopy
8.	Microsurgery
9.	Other Surgeries
10.	Intrauterine Insemination
11.	Oocyte Retrieval
12.	Embryo Transfer
13.	Surgical Sperm Retrieval
14.	Lab Procedures
15.	Clinical Case Presented
16.	Seminars / Symposia
17.	Journal Club
18.	CME / Conference Attended
19.	Title of Papers Presented / Published
20.	Teaching Experience
21.	Awards & Special Achievements
22.	Miscellaneous

MODEL PAPER

FART(IVF)-Code

ShortName

Fellowship in Advanced Reproductive Technology (IVF)
Main -Examination Month, Year

Paper-I

Human Reproduction (Basic Sciences)

Time : Three Hours
Maximum Marks :100

Draw diagrams wherever necessary
Attempt All Questions

- Q.1. Elaborate on [2x20=40]
- i. Describe the development of mullerian system. Classify its defects according to ASRM classification. Discuss the clinical implication & then management
 - ii. Describe physiology of menstrual cycle. Anatomical & Endocrinal changes involved in it. Write down patho physiology of PCOS.
- Q.2. Write Short Notes on (any ten) [10x6=60]
- i. Define Luteal phase defect and write a note on Clinical correlation.
 - ii. Development of Ovary.
 - iii. Endocrinal control of spermatogenesis.
 - iv. Management of patient with secondary Amenorrhea.
 - v. WHO classification of ovulatory disorders.
 - vi. Unexplained infertility.
 - vii. Elaborate the methods of semen preparation.
 - viii. Semen analysis- WHO criteria 2010-its interpretation.
 - ix. Steps of implantation.
 - x. Non obstructive Azoospermia.
 - xi. Hypothyroidism and infertility.
 - xii. OATS.

MODEL PAPER

FART(IVF)-Code

ShortName

Fellowship in Advanced Reproductive Technology (IVF)

Main - Examination Month, Year

Paper-II

ART & Clinical Embryology

Time : Three Hours

Maximum Marks :100

Draw diagrams wherever necessary

Attempt All Questions

Q.1. Elaborate on [2x20=40]

- i) Enlist the causes and endocrine evaluation in a case of Azoospermia. Write down the different techniques of surgical sperm retrieval with their advantages and disadvantages.
- ii) Define ovarian reserve and different tests of ovarian reserve assessment. Write down protocols used in patients of poor ovarian reserve with their advantages and limitations.

Q.2. Write Short Notes on (any ten) [10x6=60]

- i) OHSS.
- ii) Methods of assessment and increment of endometrial receptivity.
- iii) Grading of oocytes and embryos.
- iv) Factors influencing the results of IVF.
- v) RIF and its clinical implications.
- vi) Quality control measures in ART lab.
- vii) LAH.
- viii) ICMR guidelines for donor oocyte and surrogacy.
- ix) PGS in ART.
- x) ICSI
- xi) SET and non invasive methods of selection.
- xii) Ovulation induction protocols in IUI.