PG DIPLOMA IN ENVIRONMENTAL MOLECULAR DIAGNOSTICS
(Non-Semester)
(With effect from the academic year 2013-14)

Eligibility for the Course

Candidates for admission to PG Diploma In Environmental Molecular Diagnostics could possess a Bachelors degree in Zoology, Botany, Chemistry, Biochemistry, Microbiology Biotechnology/Environmental/ Animal/plant Food sciences, Dietetics & Nutrition, Bioinformatics, BE in Chemical Engineering & Biotechnology; B.Tech in Biotechnology & Bioinformatics/Nanotechnology; BDS; MBBS; B.Sc in Agri/Agri Biotechnology; B.V.Sc., B.F.Sc., Pharm and BPT.

Duration of the Course

One year PG Diploma In Environmental Molecular Diagnostics course non-semester for One Year duration

Examination

All the theory paper are of 3 hours duration each for maximum of 100 marks with passing minimum of 50 marks

Practical examinations are also for 3 hours duration for a maximum of 100 marks and passing minimum of 50 marks.

Question Paper Pattern

Maximum marks: 100
Time: 3 hours

Part A (5 x 3 = 15)
Five short answer questions (One question from each unit)

Part B (5 x 8 = 40)
Paragraph questions (Total questions 8, out of which answers are to be given for any five questions;

Part C (3 x 15 = 45)
Total questions 5, out of which answers are to be given for any Three questions;

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<tr>
<th>S.No</th>
<th>Theory &amp; Practicals</th>
<th>Maximum Marks</th>
<th>Minimum Marks</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>Environmental Micro Biology</td>
<td>100</td>
<td>50</td>
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<td>2.</td>
<td>Molecular Diagnostics</td>
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<td>3.</td>
<td>Environmental Forensics</td>
<td>100</td>
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<td>4.</td>
<td>Molecular Epidemiology</td>
<td>100</td>
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<tr>
<td>P1</td>
<td>Practical - I Molecular Diagnostics</td>
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<tr>
<td>P2</td>
<td>Practical – II Molecular Diagnostics</td>
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<td>50</td>
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</tbody>
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UNIT – I: Microorganisms


UNIT – II: Microbial Environments


UNIT –III: Deduction, Enumeration and Identification


UNIT – IV: Remediation of Organic and Metal Pollutants


UNIT – V: Water and Foodborne pathogens


REFERENCES:

PAPER – II: MOLECULAR DIAGNOSTICS

UNIT–I: MICROBIAL & VIRAL DIAGNOSTICS


UNIT II: MOLECULAR DIAGNOSTICS OF DISEASES


UNIT III: CANCER DIAGNOSTICS


UNIT IV: FOETAL DIAGNOSTICS:


UNIT V: CYTOGENETIC DIAGNOSTICS

Karyotyping and chromosomal banding– Molecular diagnosis of syndromes - Klinfelter, Downs’ and Turners’ - Molecular cytogenetics: FISH, Fiber FISH and m–FISH-Clinical applications.

REFERENCES:


PAPER – III: ENVIRONMENTAL FORENSICS

UNIT- I

Principles of Forensics Biology Scope of Forensic biology Branches of forensic Biology component of environmental forensics – setting of forensic lab – Applications – Enforcement agencies public and private – Natural Institute of Criminology and Forensic Science.

UNIT: II

Environmental factors of forensics – crime scene- infects- maggots- larval stage analysis- level of decay and deterioration- forensic evidence – Food poison as evidence – Forensic entomology.

UNIT: III


UNIT: IV


UNIT: V


REFERENCES:

UNIT: I


UNIT: II


UNIT: III


UNIT: IV

History and Geography of warm infections; Tapeworms - Schistosomiasis – Filariasis – Vectors and Modes of Transmission –Diagnosis and Detection – Indian status – Global scenario.

UNIT: V

Tools in molecular epidemiology – PCR – RAPD -PCR-RTPCR-PFGE-16sRNA-16s DNA analysis- Microarray based screening – multilocus enzyme typing (MLET) and multilocus sequence typing (MLST).

REFERENCES:


PAPER – V: PRACTICAL - I MOLECULAR DIAGNOSTICS - I

1. Human Genomic DNA Extraction from Blood
2. Bacterial DNA extraction.
3. Viral DNA /RNA Extraction (Kit)
5. HIV detection by RT-PCR (Demo).
6. PCR diagnosis of Mycobacterium tuberculosis.
7. PCR–RFLP for pathogens.

PAPER – VI: PRACTICAL - II MOLECULAR DIAGNOSTICS - II

1. DNA extraction from soil
2. DNA extraction from buccal wash
3. mRNA extraction and cDNA synthesis
4. Fingerprinting for leptospiral pathogen.
5. Western blotting.
6. Southern blotting - demo
7. Immunoflourescent Technique for cancer marker