



## 1.1.2

### List of Employability/ Entrepreneurship/ Skill Development Courses with Course Contents

Colour Codes		
Name of the Subjects	Yellow	
Employability Contents	Green	
Entrepreneurship Contents	Light Blue	
Skill Development Contents	Pink	



**List of Courses Focus on Employability/ Entrepreneurship/  
Skill Development**

**Department : Zoology**

**Programme Name : Pre- Ph.D. course work**

**Academic Year : 2017-18**

***List of Courses Focus on Employability/ Entrepreneurship/Skill Development***

Sr. No.	Course Code	Name of the Course
01.	Paper II	Analytical and Separation Techniques
02.	Paper III	Aquaculture and Fisheries



## Scheme and Syllabus

### Scheme of Pre Ph.D. Course work of Zoology

Code	Subject	End Semester exam	Passing marks (%)
101	Research methodology and Scientific communication	100	60
102	Analytical and Separation techniques	100	60
103	Optional (Any One) <ul style="list-style-type: none"><li>Advances in insect Biology and Pest management</li><li>Endocrinology</li><li>Aquaculture and fisheries</li><li>Neuroscience</li></ul>	100	60
		300	180

*Prof. K. K. K.*

*M. K. K.*

*[Signature]*



Paper-II ANALYTICAL AND SEPARATION TECHNIQUES

Unit-I Biochemical Techniques

Introduction and types of Chromatography, Paper, thin layer, gas, Gel filtration, Ion exchange, HPLC, FPLC and affinity chromatography. Applications of Chromatographic techniques in Biology.

Unit-II

Electromagnetic spectrum, Beer Lambert's Law, Photometry, UV/VIS Spectrophotometry, ESR and NMR spectroscopy, Mass Spectroscopy (LC-MS, GC-MS), Florescent spectroscopy. Applications of different spectroscopic techniques in Biology.

Unit-III Molecular techniques

Paper and Gel Electrophoresis, Polyacrylamide gel electrophoresis (native and SDS), agarose gel electrophoresis, 2D electrophoresis, Blotting-Southern, western and Northern blotting, Immuno blotting, Immuno electrophoresis, DNA fingerprinting and ELISA.

Unit-IV

DNA microarray, Protein Microarray, Microarray analysis, DNA chip, DNA probes, Flow cytometry, Karyotyping and Idiogram. Histological and Histochemical methods, Cryostatic Photomicrography.

Unit-V

Detection and measurement of radioactivity, GM counter, Scintillation counter, Autoradiography, safety measures in handling radioisotopes, RIA, non radiolabelling. Introduction to bioinformatics tools.

M. K. Sharma

S. K. Singh

Dr. K. K. Singh



**PAPER-III: AQUACULTURE AND FISHERIES**

**UNIT-I**

Basics of aquaculture. Introduction – India and world aquaculture-Role, status and importance of aquaculture.

**UNIT-II**

Capture fisheries, Major inland capture fishery resources in India – Lake and reservoir fisheries. Nursery system in Estuaries and Brackish water and its fishery resources in India.-Marine major and minor fishery resources in India and world. Fin and shell fishes.

**UNIT-III**

Culture fisheries, Monoculture – Poly culture – Extensive, Intensive – integrated fish farming – Paddy cum fish culture – fish and prawn culture in fresh water ponds – Fin fish and shell fish culture in Brackish water ponds – Ornamental fish culture.

**UNIT-IV**

Live Feed culture, Taxonomy of live feeds – General collecting method – Culture and Nutritional value of Rotifers, Artemia, Copepods and Daphnia – Molluscan culture and its status. Culture of Zooplankton.

**UNIT-V**

Recent techniques in Aquaculture. Cryopreservation techniques for live feeds – Bio-enrichment technique. Applied genetics of cultivated fishes – Regulation of vitellogenesis in shell and fin fishes.

M. Tubas  
Shr

Dr. Kumar