M.Phil. / Ph.D.

Coursework Syllabus

of

Botany/Zoology/Microbiology/Biotechnology

(w.e.f. 2018)

Revised as per Ministry of Human Resource Development, UGC New Delhi, Notification 5th May, 2016, (Minimum Standards and Procedure for award of M.Phil./Ph.D. Degrees) Regulation – 2016

Re-Accredited Grade 'A' by NAAC

DEPARTMENT OF BIOSCIENCES
SAURASHTRA UNIVERSITY
RAJKOT – 360 005
M. Phil. / Ph.D. COURSEWORK

RESEARCH METHODOLOGY

Unit – 1. Fundamentals of Research Methodology

1.1 Basic Research Methodology: Research problem, Aims & Objectives, Hypotheses testing. Literature collection: Types & sources of research literature, reviews and its documentation
1.2 Experimental designing, setting up detailed methodologies & protocol, sampling methods, Strategies for execution of the protocols, statistical validation
1.3 Research design & Data collection, data analysis

Unit – 2. Research Ethics & Plagiarism

2.1 Research Misconduct, rules and regulations in India. Data Management Mentoring, mentor-mentee responsibilities, Authorship Guidelines, Publication and Peer Review, plagiarism, Collaboration
2.2 Reporting and representing research, Representing images, Bias, Conflicts of Interest
2.3 Ethical use of animal subjects, CPCSEA regulations, Protection of Human subjects, Stem Cells, The Ethics of Plant Use, transgenic crops, Agricultural Ethics
2.4. Eco-sourcing code of practice, radioactive, chemical and biohazard safety, waste management and disposal, Social Responsibility and Whistleblowing

Unit – 3. Quantitative Methods in Biology: Biostatistics

3.1 Significance tests: Student’s ‘t’ test: Hypotheses, acceptance and rejections, significance levels.
3.2 Analysis of Variance: General principles, completely randomized and random-block design ANOVA.
3.3 Regression and correlation – bivariate regression analysis.
3.4 Chi-Square and its applications.

Unit – 4. Computational Biology & IPR

4.1 Databases for Biological studies: Nucleotide & Protein Databases – Primary and secondary databases, macromolecules 3D structure databases.
4.2 Sequence alignment-Basic terminologies, Local, Global, Pairwise and multiple sequence alignments, Phylogenetic tree-Databases and Tools, Primer designing tool
4.3 Databases including plant, animal and microbial diversity and genome databases
4.4 Overview of IPR: Types, Patents, Trademarks, Copyright and Related Rights, Patents & their specifications, Invention in context of prior art, Patent databases & Searching, International Databases.