



**ASSAM UNIVERSITY
SILCHAR
Department of Biotechnology**

**RPE-701
Syllabus
(Research & Publication Ethics)**

ANNEXURE

Course Title:

- **Research and Publication Ethics (RPE)**-Course for awareness about the publication ethics and publication misconducts.

Course Level:

- 2 Credit course (30 hrs.)

Eligibility:

- M.Phil., Ph.D. students and interested faculty members (It will be made available to post graduate students at later date)

Fees:

- As per University Rules

Faculty:

- Interdisciplinary Studies

Qualifications of faculty members of the course:

- Ph.D. in relevant subject areas having more than 10 years' of teaching experience

About the course

Course Code: CW-701 RPE

Overview

- This course has total 6 units focusing on basics of philosophy of science and ethics, research integrity, publication ethics. Hands-on-sessions are designed to identify research misconduct and predatory publications. Indexing and citation databases, open access publications, research metrics (citations, h-index, Impact Factor, etc.) and plagiarism tools will be introduced in this course.

Pedagogy:

- Class room teaching, guest lectures, group discussion

Evaluation

- Continuous assessment will be done through tutorials, assignments, quizzes, and group discussions. Weightage will be given for active participation. Final written examination will be conducted at the end of the course.

Course structure

- The course comprises of six modules listed in table below. Each module has 4-5 units.

| Modules | Unit title | Teaching hours | Unit wise mark |
|-----------------|--------------------------------|----------------|----------------|
| Theory | | | |
| RPE 01 | Philosophy and Ethics | 4 | 15 |
| RPE 02 | Scientific Conduct | 4 | 15 |
| RPE 03 | Publication Ethics | 7 | 15 |
| Practice | | | |
| RPE 04 | Open Access Publishing | 4 | 10 |
| RPE 05 | Publication Misconduct | 4 | 10 |
| RPE 06 | Databases and Research Metrics | 7 | 10 |
| | Total | 30 | 75 |

| | | | | |
|--|-------------|-----------------------|---|--------------|
| Theory Marks | = 75 | Pass Mark = 38 | Total Marks (Theory + Practical) | = 100 |
| Internal Assessment/Practical Marks | = 25 | Pass Mark = 12 | Total Pass Marks | = 50 |

Syllabus in detail

THEORY

- RPE 01: PHILOSOPHY AND ETHICS (3 hrs.)**
 - Introduction to philosophy: definition, nature and scope, concept, branches
 - Ethics: definition, moral philosophy, nature of moral judgements and reactions
- RPE 02: SCIENTIFIC CONDUCT (5hrs.)**
 - Ethics with respect to science and research
 - Intellectual honesty and research integrity
 - Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP)
 - Redundant publications: duplicate and overlapping publications, salami slicing
 - Selective reporting and misrepresentation of data
- RPE 03: PUBLICATION ETHICS (7 hrs.)**
 - Publication ethics: definition, introduction and importance
 - Best practices / standards setting initiatives and guidelines: COPE, WAME, etc.
 - Conflicts of interest
 - Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types
 - Violation of publication ethics, authorship and contributorship
 - Identification of publication misconduct, complaints and appeals
 - Predatory publishers and journals

PRACTICE

- RPE 04: OPEN ACCESS PUBLISHING(4 hrs.)**

1. Open access publications and initiatives
 2. SHERPA/RoMEO online resource to check publisher copyright & self-archiving policies
 3. Software tool to identify predatory publications developed by SPPU
 4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.
- **RPE 05: PUBLICATION MISCONDUCT (4hrs.)**
 - A. Group Discussions (2 hrs.)**
 1. Subject specific ethical issues, FFP, authorship
 2. Conflicts of interest
 3. Complaints and appeals: examples and fraud from India and abroad
 - B. Software tools (2 hrs.)**

Use of plagiarism software like Turnitin, Urkund and other open source software tools
 - **RPE 06: DATABASES AND RESEARCH METRICS (7hrs.)**
 - A. Databases (4 hrs.)**
 1. Indexing databases
 2. Citation databases: Web of Science, Scopus, etc.
 - B. Research Metrics (3 hrs.)**
 1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score
 2. Metrics: h-index, g index, i10 index, altmetrics

References

- Bird, A. (2006). *Philosophy of Science*. Routledge.
- MacIntyre, Alasdair (1967) *A Short History of Ethics*. London.
- P. Chaddah, (2018) *Ethics in Competitive Research: Do not get scooped; do not get plagiarized*, ISBN:978-9387480865
- National Academy of Sciences, National Academy of Engineering and Institute of Medicine. (2009). *On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition*. National Academies Press.
- Resnik, D. B. (2011). What is ethics in research & why is it important. *National Institute of Environmental Health Sciences*, 1–10. Retrieved from <https://www.niehs.nih.gov/research/resources/bioethics/whatis/index.cfm>
- Bcall, J. (2012). Predatory publishers are corrupting open access. *Nature*, 489(7415), 179–179. <https://doi.org/10.1038/489179a>
- Indian National Science Academy (INSA), *Ethics in Science Education, Research and Governance*(2019), ISBN:978-81-939482-1-7. http://www.insaindia.res.in/pdf/Ethics_Book.pdf

Ph.D Course Work Syllabus 2022
School of Life Sciences, AUS
Paper No. RPE – 701
(Common paper for Biotechnology/Microbiology/Life Science and Bioinformatics)
Total Marks: 100; Credits: 02

Paper title: RESEARCH AND PUBLICATION ETHICS (RPE)

THEORY

UNIT 1: PHILOSOPHY AND ETHICS (3 HRS)

1. Introduction to philosophy: definition, nature and scope, concept, branches
2. Ethics: definition, moral philosophy, nature of moral judgements and reactions.

UNIT 2: SCIENTIFIC CONDUCT (5 HRS)

1. Ethics with respect to science and research
2. Intellectual honest and research integrity
3. Scientific misconducts: falsification, fabrication, and plagiarism.
4. Redundant publications: duplicate and overlapping publications, salami slicing
5. Selective reporting and misrepresentation of data.

UNIT 3: PUBLICATION ETHICS (7 HRS)

1. Publication ethics: definition, introduction and importance
2. Best practices/standards setting initiatives and guidelines: COPE, WAME, etc.
3. Conflicts of interest
4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types
5. Violation of publication ethics, authorship and contributor ship
6. Identification of publication misconduct, complaints and appeals
7. Predatory publishers and journals

PRACTICE

UNIT 4: OPEN ACCESS PUBLISHING (4 HRS)

1. Open access publications and initiatives
2. SHERPA/RoMEO online resource to check publisher copyright and self-archiving policies.
3. Software tool to identify predatory publications developed by SPPU
4. Journal finder/ journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggested, etc.

Unit 5: PUBLICATION MISCONDUCT (4 HRS)

A. Group Discussions (2 hrs)

1. Subject specific ethical issues, FFP, authorship
2. Conflicts of interest
3. Complaints and appeals: examples and fraud from India and abroad

B. Software tools (2 hrs): Use of plagiarism software like Turnitin, Urkund and other open source software tools.

Unit 6: DATABASES AND RESEARCH METRICS (7 HRS)

A Databases (4 hrs)

1. Indexing databases
2. Citation databases: Web of Science, Scopus, etc.

B. Research Metrics (3 hrs)

Impact Factor of journal as per journal citation report, SNIP, SJR, IPP, Cite Score.
Metrics: h-index, g index, i10 index, altmetrics

Ph.D Course Work Syllabus 2022
School of Life Sciences, AUS
Course Title: Research methodology
Paper No. CW – 702
(Common paper for Biotechnology/Microbiology/Life Science and Bioinformatics)
Total Marks: 100
Credits: 04

UNIT 1

1. Statement of research problem, formation of objectives, types of research-basic and applied.
2. Formulation of hypothesis and design of experiments.
3. Review of literature, basic concepts.
4. Laws and theories related to research problem.

UNIT 2

1. Intellectual Property Rights (IPR) issues and Biosafety.
2. Ethics in Science and Technology, Plagiarism.
3. Impact of research on environment; Benefits of research to human community.
4. Preparation of research proposal, report and scientific paper.

UNIT 3

1. Introduction to databases (Pubmed) for literature.
2. Application of MS-office in research, Data analysis using MS-Excel.
3. Softwares: Mendeley, End note for references, Plagiarism detection tools.
4. Power Point presentations and Software for Graphics.

UNIT 4

1. Applications of statistics in research, measures of central tendency (mean, mode, median), measures of dispersion (standard deviation, variance, coefficient of variation).
2. Levels of significance in biological data analysis and their interpretations.
3. Formulation of hypothesis, type I and type II errors, parametric and nonparametric tests, simple correlation and regression analysis.
4. Tests of significance, chi-square test, t-tests and their applications, using software for statistical analysis.

Ph.D Course Work Syllabus 2022
Department of Biotechnology, AUS
Paper No. CW – 703
(Paper for Biotechnology)
Total Marks: 100
Credits: 04

METHODOLOGY

UNIT 1

1. Principles and applications of spectrophotometry & NMR.
2. Principles and applications of Chromatography, GC-MS.
3. Principles and applications of PCR, DNA sequencing.
4. Principles and applications of flow cytometer.
5. Gene cloning- vectors, restriction endonucleases, Genetically Modified Organisms (GMOs), Genetically Modified Microorganisms (GMMs) and their applications.

UNIT 2

1. DNA markers and their applications. Biotechnological approaches for disease diagnosis.
2. Plant transgenesis and tissue culture, transgenesis in animals
3. Metagenomics, Bioremediation and applications of biotechnology in controlling climate change.
4. Identification of bacteria on the basis of ribosomal gene sequence analysis. Assessment of microbial diversity by molecular techniques.
5. Biodegradation of recalcitrant compounds (lignin- pesticides), bioinoculants-biopesticides and bioinsecticides.

RESEARCH AREA SPECIFIC

UNIT 3

1. Scientific databases and retrieval of data: Nucleotide databases, protein databases and literature databases.
2. Tools for alignment of nucleotide and protein sequences- local alignment and multiple alignment.
3. Writing of Research Proposal, Report and Research Paper: Meaning and types - Stages in preparation - Characteristics - Structure - Footnotes and Bibliography- use of Endnote. Checklist for a good proposal/report/research paper. Ethical, legal, social and scientific issues in Biological Research. IPR, patents and Biosafety.
4. Principles and applications of Atomic absorption spectrophotometry, Flow cytometry, Western blotting, ELISA, PAGE, SDS-PAGE, Agarose gel electrophoresis, 2D-gel electrophoresis, microarray analysis, mass spectrometry.
5. Isolation and purification of DNA. Commonly used vectors for gene-cloning, DNA manipulating enzymes, construction of genomic and cDNA libraries. Applications of Quantitative Real Time PCR

UNIT 4

1. Introduction to applications of statistics in biology.
2. Measures of dispersion, Simple correlation and Regression analysis.
3. Tests of significance; F-test, paired t-test and unpaired t-test, Chi-square test and its applications.
4. Analysis of variance (ANOVA)
5. Design of experiments (CRD and RBD designs) for Biotechnology.

Ph.D Course Work Syllabus 2022
Department of Biotechnology, AUS
Paper No. CW – 704 (Term Paper)
(Paper for Biotechnology)
Total Marks: 100
Credits: 06

Term paper is to be assigned in the beginning of the semester to each Ph.D student for its submission to the department. The paper may include preparation of Protocol, Review of Literature, Methodology or any relevant topic of Research.
