



प्रो. रजनीश जैन
सचिव
Prof. Rajnish Jain
Secretary



विश्वविद्यालय अनुदान आयोग
University Grants Commission

(मानव संसाधन विकास मंत्रालय, भारत सरकार)
(Ministry of Human Resource Development, Govt. of India)

बहादुरशाह जफर मार्ग, नई दिल्ली-110002
Bahadur Shah Zafar Marg, New Delhi-110002

Ph : 011-23236288/23239337

Fax : 011-2323 8858

E-mail : secy.ugc@nic.in

D.O.No.F.1-1/2018(Journal/CARE)

December, 2019

Respected Sir/Madam,

University Grants Commission in its 543rd meeting held on 9th August, 2019 approved two Credit Courses for awareness about publication ethics and publication misconducts entitled "Research and Publication Ethics (RPE)" to be made compulsory for all Ph.D. students for pre-registration course work (attached as Annexure).

In view of the above, you are requested to ensure that the above two Credit courses may be made compulsory for all Ph.D. students for pre-registration course work undertaken in your University from the forthcoming academic session.

With regards,

Yours sincerely,

(Rajnish Jain)

TO THE VICE-CHANCELLORS OF ALL UNIVERSITIES

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: CPE- 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 discussions, and practical sessions.

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
Theory		
RPE 01	Philosophy and Ethics	4
RPE 02	Scientific Conduct	4
RPE 03	Publication Ethics	7
Practice		
RPE 04	Open Access Publishing	4
RPE 05	Publication Misconduct	4
RPE 06	Databases and Research Metrics	7
	Total	30

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>
- Beall, 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

YMCA UNIVERSITY OF SCIENCE & TECHNOLOGY, FARIDABAD
DEPARTMENT OF HUMANITIES & APPLIED SCIENCES (HAS)

4th
387

MINUTES OF THE 4TH MEETING OF BOARD OF STUDIES (BOS) HELD ON
20.03.2013 AT 11.00 AM IN THE CONFERENCE HALL IN MECHANICAL
ENGINEERING DEPARTMENT, YMCA UNIVERSITY OF SCIENCE &
TECHNOLOGY, FARIDABAD

The following were present:

- | | |
|---|----------------|
| 1. Prof. Tilak Raj
Dean & Chairman
HAS Department
YMCA University of Science & Technology, Faridabad | Chairman |
| 2. Prof. S.K. Chakarvarti
Professor & Assoc. Dean R&D
MRIU, Faridabad | Outside Expert |
| 3. Prof. Musheer Ahmad
Professor in Maths
JMI, New Delhi | Outside Expert |
| 4. Dr. Anuradha Sharma
Assistant Professor (Physics)
HAS Department
YMCA University of Science & Technology, Faridabad | Member |
| 5. Dr. Divya Jyoti
Assistant Professor (English)
HAS Department
YMCA University of Science & Technology, Faridabad | Member |
| 6. Ms. Jyoti Grover
Assistant Professor (Maths)
HAS Department
YMCA University of Science & Technology, Faridabad | Member |
| 7. Dr. Maneesha Garg
Assistant Professor (Physics)
HAS Department
YMCA University of Science & Technology, Faridabad | Member |
| 8. Ms. Reena Garg
Assistant Professor (Maths)
HAS Department
YMCA University of Science & Technology, Faridabad | Member |

(Handwritten signatures and initials)
Maneete
@MS
Renuka
M. Garg
Garg

9. Dr. M.K. Yadav Member
 Assistant Professor (Physics)
 HAS Department
 YMCA University of Science & Technology, Faridabad

10. Dr. Renuka Gupta Member
 Assistant Professor (Environmental Sciences)
 HAS Department
 YMCA University of Science & Technology, Faridabad

At the outset, Prof. Tilak Raj, Dean & Chairman, HAS Department and Chairman of the Board of Studies (BOS) warmly welcomed the experts and the members. He introduced the outside experts to all the members as it was their first meeting. He also appreciated the interest shown by outside members who took pain to attend this meeting for the healthy discussion on the development of the department.

After deliberations on each item, the following decisions were taken:

Item No. 4.1: To confirm the minutes of previous BOS meeting held on 24th April, 2012.

The minutes of the previous BOS meeting held on 24th April, 2012 were circulated to all the members. The minutes were confirmed by the BOS without any modifications.

Item No. 4.2: To approve the list of examiners for various courses of B. Tech. and M. Sc. for the session 2013-14.

The following list of the internal and external examiners for different courses of B. Tech. and M. Sc. for the session 2013-14 was approved.

Internal Examiners

- (1) Dr. Anuradha Sharma (Physics)
- (2) Dr. Sonia Bansal (Physics)
- (3) Dr. Maneesha Garg (Physics)
- (4) Dr. Manikant Yadav (Physics)
- (5) Dr. Neetu Gupta (Maths)
- (6) Ms Jyoti Grover (Maths)
- (7) Ms. Reena Garg (Maths)
- (8) Dr. Divya Jyoti (EOC)
- (9) Dr. Renuka Gupta (EVS)
- (10) Ms. Bindu Mangla (Chemistry)

Jyoti
[Signature]
[Signature]
[Signature]
[Signature]
[Signature]

External Examiners

PHYSICS

1. Dr S. K. Chakarvarti
Professor & Assoc. Dean R&D
MRIU, Faridabad
2. Dr K. K. Gupta
Principal
Aggarwal College, Ballabgarh
3. Dr J. K. Quamara
HOD, Physics Department
NIT, Kurukshetra
4. Dr Y. Shridharbabu
Professor
Echelon Institute, Faridabad
5. Dr S. S. Tyagi
Director
BSAITM, Faridabad
6. Dr. Ajit Singh
Associate Professor
Aggarwal College, Ballabgarh
7. Dr. Shyam Kumar
Dean, R & D; Professor in Physics
Kurukshetra University, Kurukshetra
8. Dr Azad Singh
Principal
Women's Polytechnic College, Faridabad
9. Dr S. K. Singh
Professor in Physics
DCRUST, Murthal
10. Prof. S. C. Mishra
Department of Physics
Kurukshetra University, Kurukshetra
11. Prof. A. Agamker
Department of Physics
CDLU, Sirsa

[Handwritten signature]

[Handwritten signature]

[Handwritten initials]

[Handwritten signature]

[Handwritten signature]

[Handwritten signature]

12. Dr. Y. K. Mathur
Department of Physics
PDM, Bahadurgarh
13. Dr Mohd. Mudassir Husain
Associate Professor
Department of Applied Sciences and Humanities,
Faculty of Engineering and Technology,
Jamia Millia Islamia - Jamia Nagar, New Delhi - 110025
14. Dr. A. K. Srivastava
Principal Scientist
National Physical Laboratory
Dr. K. S. Krishnan Road, New Delhi - 110012
15. Sakshi Gupta
Scientist C
Ministry of Defence
LASTEC
Metcalfe House
Delhi-110054
16. Vijay Kumar Sharma
Department of Physics,
Shyam Lal College (University of Delhi) Delhi, India
17. Dr. Rajesh Tripathi
Associate Professor
Galgotia University, Greater Noida

Maths

1. Dr. Musheer Ahmad
Professor
Department of Mathematics
Faculty of Engineering Technology
Jamia Millia Islamia - Jamia Nagar, New Delhi - 110025
2. Dr. Hassan Sahid
Professor
Department of Mathematics
Faculty of Natural Sciences
Jamia Millia Islamia - Jamia Nagar, New Delhi - 110025

[Handwritten signature]

[Handwritten signature]

[Handwritten signature]

[Handwritten signature]

- 3. Dr. Mohamad Sohail
Associate Professor
Department of Mathematics
Faculty of Engineering & Technology
Jamia Millia Islamia - Jamia Nagar, New Delhi - 110025
- 4. Dr. Kaur
PGT Khalsa College,
DU Delhi
- 5. Dr. Wali Mohammad Chaudhary
Professor
Department of Applied Sciences
Faculty of Engineering Technology
Jamia Millia Islamia - Jamia Nagar, New Delhi - 110025
- 6. Dr. H.C. Taneja
Professor
Department of Mathematics
Faculty of Natural Sciences **DTU**
Jamia Millia Islamia - Jamia Nagar, New Delhi - 110025
- 7. Dr. Kuldeep Bansal
Department of Maths
Guru Jambheshwar University of Science & Technology, Hissar
- 8. Dr. G. D. Mishra
Amity University, Noida
- 9. Dr. Deepankar Sharma
D.J. College of Engineering & Technology, Modinagar

Essentials of Communication (EOC)

- 1. Ms. Shubha Wadhwa
Echelon Institute, Faridabad
- 2. Ms. Rekha Tulli
Aggarwal College, Ballabhgarh
- 3. Ms. Kamal Sikka
Aggarwal College, Ballabhgarh

[Handwritten signature]

[Handwritten signature]

[Handwritten signature]

Environmental Studies (EVS)

1. Dr. V. K. Garg
Department of Environmental Sc. & Engg
Guru Jambheshwar University of Science & Technology, Hisar
2. Dr. Hardeep Rai Sharma
Assistant Professor, Institute of Environmental Studies
Kurukshetra University, Kurukshetra
3. Ms Meena Kapahi
Associate Professor (EVS)
Mechanical Engineering Department
Manav Rachna College of Engg. (MRCE), Faridabad

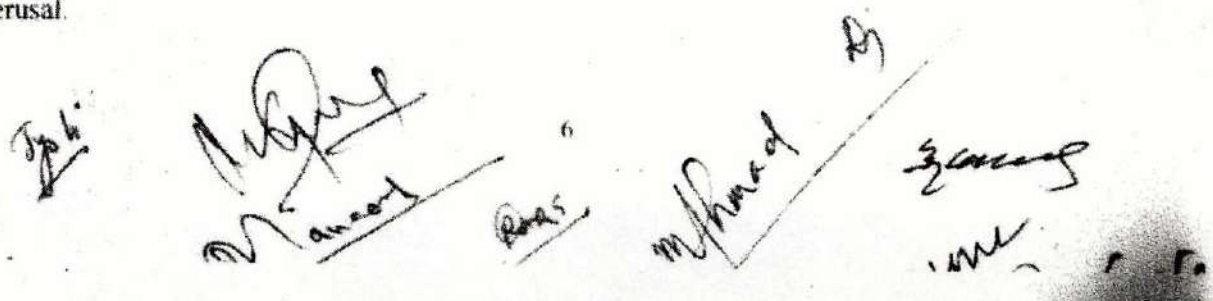
Chemistry

1. Dr. K. K. Verma
Department of Chemistry
MDU, Rohtak
2. Dr. A. P. Gupta
Department of PSCT,
DTU, New Delhi
3. Dr. Narender Kumar
Department of Chemistry,
Govt. PG Nehru College, Faridabad
4. Dr. D. K. Singh
Department of Chemistry
HBTI, Kanpur

For any emergency, the Chairman is authorized to act as required.

Item No. 4.3: To consider the revised syllabi for MSc Physics (specialization in Electronics) and MSc (Mathematics).

Regarding this agenda item, the revised syllabi for MSc Physics (specialization in Electronics) and MSc (Mathematics) were presented before the Board of Studies as contained in Annexure A. It has been resolved by BOS that one day workshop should be organized involving outside experts to give suggestions in the redesigning the syllabi. It was suggested that all the prepared existing syllabi may be sent prior to the workshop to the outside experts for their perusal.


 A collection of handwritten signatures and initials at the bottom of the page. From left to right, there is a signature that looks like 'Joh', a large signature that appears to be 'Anand', a signature that looks like 'Ravi', a signature that looks like 'M. Ahmad', and a signature that looks like 'S. Singh'. There are also some smaller initials and marks scattered around.

Item No. 4.4: To consider and approve the syllabi for MSc Physics (specialization in Electronics) and MSc (Mathematics) Entrance examination.

It was informed to the Board of Studies that the admission to MSc Physics (specialization in Electronics) and MSc (Mathematics) will be made by the University through entrance test from the session 2013-14. The BOS discussed in detail the syllabi for the entrance examination for both the programmes, prepared by Dr Anuradha Sharma and Dr Neetu Gupta as contained in Annexure B. After deliberations, the BOS approved the same with some minor modifications. It was suggested that marks distribution for every unit in the prepared syllabi should be uniform. The scheme for the entrance exam should also be added revealing questions will be of multiple choice with no negative marking.

Item No. 4.5: To consider the recommendations of DRC regarding registration of Ph. D. candidates who have completed pre-Ph. D. course work for the session 2012-13.

In total, there are 02 candidates for Ph.D. registration for the session 2012-13. They have successfully completed their course work and presented their synopsis before the DRC on 26th Feb, 2013. The BOS approved their registrations with the university as a research scholar. The DRC minutes including the list of these scholars along with their topic of research and respective supervisors are attached.

Item No.4.6: To reconsider the starting of Ph.D. programme in Environmental Sciences.

The Board of Studies deliberated in detail on the above mentioned agenda. The BOS approved the starting of Ph.D programme in the Environmental Sciences in the faculty of Humanity and Applied Sciences. As per the experts suggestion the lab facilities for the same will be arranged from the surrounding Universities/Institutes

Item No. 4.7: Any other item with the permission of Chairman (HAS)


(A)The proposal for revision of Essentials of Communication (ECC) syllabus was presented by Dr. Divya Jyoti for consideration. After deliberations, the BOS suggested to conduct a one day workshop to review the revision of the syllabus. The BOS suggested to start Smart Lab for the B.Tech. students also.

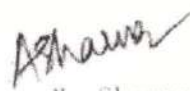
Handwritten signatures and initials at the bottom of the page, including "Maneet", "Ashwini", "Ashwini", "Ashwini", and "Ashwini".

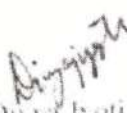
(B) The syllabus for Ph.D. Entrance Examination in Environmental Sciences was presented in the BOS and same is approved in anticipation of the final approval for start of Ph.D programming by the University


20.3.13
Prof. Tilak Raj


Prof. S.K. Chakarvarti


Prof. Musheer Ahmad


Dr. Anuradha Sharma

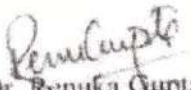

Dr. Divya Jyoti


Mrs. Jyoti Grover


Dr. Maneesha Garg


Ms. Reena Garg


20.3.13
Dr. M.K. Yadav


Dr. Renuka Gupta

YMCA UNIVERSITY OF SCIENCE & TECHNOLOGY, FARIDABAD.

MINUTES OF THE SECOND MEETING OF ACADEMIC COUNCIL HELD ON
15-7-2010 AT 4:00 P.M IN THE MULTIMEDIA CENTER, YMCA UNIVERSITY
OF SCIENCE & TECHNOLOGY, FARIDABAD.

The following members are present:-

1. Shri Mohinder Kumar IAS, :In Chair
Hon'ble Vice Chancellor,
YMCA University of Science & Technology, Faridabad.
2. Prof. K. Vasudeva, Ex-Professor (IIT Delhi) :Member
H.NO. 732, Sec-14, Faridabad
(Nominee of Hon'ble Vice Chancellor)
3. Dr. Sandeep Grover, :Member
Dean, Faculty of Management Studies.
YMCA University of Science & Technology, Faridabad.
4. Dr. Tilak Raj, :Member
Controller of Examinations
YMCA University of Science & Technology, Faridabad
5. Shri Rajesh Ahuja :Member
Controller of Finance
YMCA University of Science & Technology, Faridabad.
6. Shri P.N Bajpai :Member
Liberian
YMCA University of Science & Technology, Faridabad.
7. Dr. A.K Sharma, :Member/
Dean Faculty (E&T) & Registrar Secretary
YMCA University of Science & Technology, Faridabad.

An L

At the onset, Shri Mahender Kumar, IAS, Hon'ble Vice Chancellor and Chairman of Academic Council warmly welcomed all members and expressed his great desire towards growth and development of the University. He highlighted its high reputation in the state and surrounding NCR area which must be preserved at all cost.

The following decisions were taken item wise:

Item No. AC/02/01 :Progress on the starting of new P.G courses in the University for Session 2010-11.

It was informed to the Academic council that though the academic council had approved 4 new courses of M.Tech and 2 new courses of HAS i.e M.Sc. (Maths) and M.Sc(Physics), yet the AICTE has approved only 2 M.Tech courses from this session as under:-

- | | |
|--|----------|
| 1. M.Tech in Electronics Engg.(VLSI Tech.) | 18 seats |
| 2. M.Tech in Electronics & Communication Engg. | 18 seats |

It was further intimated that there are already 6 M.Tech courses being run by the University. Accordingly a prospectus has already been made available from 6-7-2010 onwards. The last date of receipt of applications is 26-7-2010. The same form is applicable for candidates who want to apply for Ph.D Courses.

While considering the scheme and syllabi of 2 new M.Tech courses of Electronics Engg. i.e VLSI and ECE, Prof. K.Vasudeva pointed out certain deficiencies therein. The Registrar clarified several points and also assured that the syllabi shall be sent to concerned department for removal of discrepancies. After deliberation, the schemes and syllabi contained in Annexure 'A' and 'B' of the agenda were approved in principle to start the two courses from session 2010-11.

Aut

Item No. AC/02/02 : **To consider and approve guidelines & ordinance for admission to Ph.D Programmes in the University from the year 2010-11.**

The council considered and approved the ordinance/rules of Ph.D programmes to be started in the University from the session 2010-11, as proposed in the agenda with the following amendment in eligibility criteria for Part time Ph.D admission in Clause 5.

1. The applicant should be working in an educational institution /organization or Industry and must produce No Objection Certificate from his/her employer on or before date of interview. However, the outsider candidates will have to take the entrance test alongwith candidates for regular Ph.D.

Item No. AC/02/03 : To allow exemption of Entrance Test to internal faculty for admission to Ph.D programme.

The Academic Council accorded its post facto approval to grant exemption to the internal candidates for appearing in Entrance Test for admission to Ph.D, as proposed in the agenda, on the pattern of G.J.U Hissar.

Item No. AC/02/04 : To consider and approve the start of two P.G. Courses i.e M.Sc(Maths) & M.Sc. (Physics) along with Ph.D Courses from session 2010-11.

The Academic Council considered and approved schemes and syllabi of following courses:

- | | |
|-----------------------------------|----------|
| 1.M.Sc(Maths) | 30 seats |
| 2.M.Sc (Physics) with Electronics | 30 seats |

The draft proposal of Ph.D Ordinance and the syllabi of entrance test for various disciplines were also approved.



Item No. AC/02/05 : Any other item with the permission of the chair.

The Academic Council considered the case of Ms. Shruti Garg D/o Sh.Satish Garg who has been allowed by the Vice Chancellor of G.J.U Hissar to be shifted to the YMCA University of Science & Technology, Hissar to join in the 3rd Sem of MCA, as special case. After deliberations, she has been allowed by the council, to join in this University in the 3rd Sem of MCA from session 2010-11.

The meeting ended with a vote of thanks to the chair.


**REGISTRAR &
MEMBER/SECRETARY**



जे. सी. बोस विज्ञान एवं प्रौद्योगिकी विश्वविद्यालय, वाए एम सी ए, फरीदाबाद
J.C. BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA
SECTOR -6, MATHURA ROAD, FARIDABAD, HARYANA-121006
(Established vide Haryana State Legislative Act No. 21 of 2009)
'A' GRADE NAAC Accredited

DEPARTMENT OF ENVIRONMENTAL SCIENCE AND ENGINEERING

SCHEME OF PRE-PH.D. (COURSE WORK) EXAMINATION

Code	Nomenclature	Credits	L-T-P	Max. Marks	Internal Assessment	External Assessment
PHD-100A	Research Methodology	04	4-0-0	100	25	75
CPE-RPE	Research and Publication Ethics	02	2-0-0	100	25	75
PHDE- 01	Environmental Pollution Management	04	4-0-0	100	25	75

Rpt
(Dr. Renuka Gupta)
Chairperson, ERS

PHD - 100A : RESEARCH METHODOLOGY**Pre-PhD (Common Subject)****No. of Credits:** 4**L | T | P | Total**

4 | 0 | 0 | 4

Sessional Marks: 25 Marks**External Marks:** 75 Marks**Total Marks:** 100 Marks**Course Objectives:**

- Understand research process in order to plan a research proposal
- Learn methods to devise and design a research set-up
- Plan and perform data collection methods and its analysis
- Conclude research in report writing

Course Outcomes:

The research scholar shall be able to:

- CO1 Plan a research proposal and design the research.
CO2 Collect data through experiments or surveys as per research requirement.
CO3 Understand and apply sampling and sampling distributions.
CO4 Understand and perform quantitative and qualitative data analysis.
CO5 Write research report with proper citations.

Unit 1 Introduction to Research: Definition, need and purpose of research, types of research, research process, approaches to research, planning a research proposal, literature review.

Unit 2 Measurement Scales: Indexes vs. Scales, Types of Scale, construction of Scale, Bogardus social distance scale, Thurstone Scale, Likert Scale, Semantic Differential Scale, Guttman Scale.

Unit 3 Data Collection Methods: Experiments and Surveys, Experiments: Classical Experiments, Independent & Dependent Variables, Pre-Testing & Post Testing, Double Blind Experiment, Subject Selection, Variation on Experiment Design. Survey Research: Topics appropriate for survey research, Guidelines for asking questions, Questionnaire Construction, Strengths & Weakness of Survey Research, Types of Surveys.

Unit 4 Sampling: Types of sampling methods: Non-Probability Sampling, Probability Sampling, Theory & Logic of Probability Sampling, Sampling Distributions & Estimates of Sampling Error.

Unit 5 Data Analysis: Qualitative v/s Quantitative data analysis, Qualitative Data Analysis: Discovering Patterns, Grounded Theory Method, Semiotics, Conversation Analysis, Qualitative Data Processing. Quantitative Data Analysis: Quantification of Data, Univariate Analysis, Bivariate Analysis, Multivariate Analysis, Regression Analysis, Description Analysis. Hypothesis. Multiple Attribute Decision Making.

Unit 6 Report Writing, Ethical Issues and Outcomes: Report Preparation, Structure of Report, Report Writing Skills, Citations, Research Papers, Intellectual Property Rights, Plagiarism, Patent, Commercialization, Ethical Issues.

References:

1. Research Methodology by R. Panneerselvam, PHI.
2. Research Methodology by C.R. Kothari & Gaurav Garg, New Age Publishers.
3. Research Methodology by Deepak Chawla and Neena Sondhi, Vikas Publishing.
4. The practice of social research by Earl Babbie, Cengage.
5. Multiple Attribute Decision Making, Gwo-Hshiung Tzeng and Jih-Jeng Huang, CRC Press
6. Research Methodology by Ranjit Kumar, Sage Publications.

CPE-RPE: RESEARCH AND PUBLICATION ETHICS**Pre-PhD (Common Subject)****No. of Credits:** 4**L | T | P | Total**

2 | 0 | 0 | 2

Sessional Marks: 25 Marks**External Marks:** 75 Marks**Total Marks:** 100 Marks**THEORY****RPE 01: 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

RPE 02: SCIENTIFIC CONDUCT (5 hrs.)

1. Ethics with respect to science and research
2. Intellectual honesty and research integrity
3. Scientific misconducts: Falsification, Fabrication and Plagiarism (FFP)
4. Redundant publications: duplicate and overlapping publications, salami slicing
5. Selective reporting and misrepresentation of data

RPE 03: PUBLICATION ETHICS (07 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, concepts, problems that lead to unethical behaviour and vice versa, types
5. Violation of publication ethics, authorship and contributor ship
6. Identification of publication misconduct, complaints and appeals

PRACTICE**RPE: 04: OPEN ACCESS PUBLISHING (04 hrs.)**

1. Open access publications and initiatives
2. SHERPRA/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 Suggested, etc.

RPE 05 : PUBLICATION MISCONDUCT (04 hrs.)**A. Group Discussion (02 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 (02 hrs.)

Use of plagiarism software like Turnitin, Urkund and other open-source software tools

RPE 06: DATABASE AND RESEARCH METRICS (07 hrs.)

A. Databases (04 hrs.)

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

B. Research Metrics (03 hrs.)

1. Impact Factor of journal Citation Report, SNIP, SJR, IPP, Cite score
2. Metrics: h-index, g index, i10 index, almetrics

REFERENCES

1. Birs, A. (2006). Philosophy of Science. Routledge.
2. MacIntyre, Alasdair (1967) A short History of ethics. London.
3. P. Chaaddah, (2018) Ethics in Competitive Research: Do not get scooped; do not get plagiarized, ISBN: 978 – 9387480865
4. National Academy of Science, National Academy of Engineering and institute of medicine. (2009). On being a scientist: A guide to Responsible Conduct in Research & why is it important. National institute of Environmental Health Sciences, 1-10. Retrieved from <http://www.niehs.nih.gov/research/resources/bioethics/whatis/index.com>
5. Beall, J. (2012). Predatory publishers are corrupting open access. Nature, 489 (7415), 179 – 179. <http://doi.org/10.1038/489179a>
6. 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>

PHDE-01: ENVIRONMENTAL POLLUTION MANAGEMENT**No. of Credits: 4****L | T | P | Total**

4 | 0 | 0 | 4

Sessional Marks: 25 Marks**External Marks:** 75 Marks**Total Marks:** 100 Marks**Unit 1: Current Environmental Issues & Trends**

Global Environmental Issues: Climate Change, Ozone layer depletion, Biodiversity Conservation. National Environmental issues: Water Pollution Management, Air Pollution, Vehicular pollution management, E-waste, Desertification Issues, Wild Life and Forest Management.

Unit 2: Recent Advances in Pollution Management

Bioremediation, Biosorption and bioaccumulation, Wastewater Treatment, Solid Waste Management, Nanotechnology for Pollution prevention

Unit 3: Policies for Environmental Protection

Earth Summit, United Nations Framework for Climate change, Carbon trading, National Environmental Policy, Ecomark Scheme, ISO 14000

Unit 4: Instrumentation in Environmental Research

Principles and application of Spectrophotometry (UV-Visible spectrophotometry, Atomic absorption spectrophotometry, Flame photometry), Colorimetry, Laser fluorimetry, FTIR Spectroscopy, Chromatographic techniques (Paper chromatography, thin layer chromatography, Gas-Liquid Chromatography, High Pressure Liquid Chromatography, Ion-exchange Chromatography, Column chromatography)

References:

1. Analytical Techniques – SK Sahani
2. Principles of Biophysical Chemistry –Uppadahay and Nath
3. Elements of Biostatistics in Health Science- W. Daniell.
4. Environmental Chemistry-Mannahan
5. Introduction to Environmental engineering & Science- Gilbert Masters
6. Modern methods of Chemical analysis- Robert, Shields, Cairns, William
7. Inside ISO 14000- D. Soyre

RCPD
H