

SYLLABUS

PRE - Ph.D. COURSE

IN

CHEMISTRY



Effective from July 2022 onwards

PT. RAVISHANKAR SHUKLA UNIVERSITY
RAIPUR - 492 010, CHHATTISGARH

Sharma
Chairman
Prof. Manish Parva

Baloni
Dr. Shikha Bhatia
External Member (Research Institute)

Prasad
Prof. Goutam Kumar Prasad
External member (Academia)

Chatterjee
Dr. Soumitra Chatterjee
External member (Academia)

Choudhary
Dr. Anurag Choudhary
External member (Academia)

Ghosh
Prof. K. K. Ghosh

Kant
Prof. Manas Kant Dubi

Rao
Prof. Manish K. Rao

Karbiyal
Dr. Indrapal Karbiyal

Four large handwritten signatures in black ink, corresponding to the names listed above, are written across the bottom of the page.

PRE - Ph.D. COURSE

DURATION: SIX MONTHS


M.M.: 200

COURSES		MARKS
C O U R S E I	1. PHILOSOPHY AND ETHICS, SCIENTIFIC CONDUCT, IUPAC RULE OF NOMENCLATURE	20
	2. RESEARCH METHODOLOGY	20
	3. INSTRUMENTATION TECHNIQUES	20
	4. SAMPLING & MODELING	20
	5. STATISTICAL ANALYSIS	20
C O U R S E II	6. PROJECT BASED ON REVIEW OF RESEARCH WORK	50
	7. SEMINAR	50
	TOTAL	200


Chairman
Prof. Manoj Kumar


External Member (Research Institute)
Dr. Shakti Bhatia


External member (Academic)
Prof. Anura Kumar Dixit


Member (Industry/Other)
Dr. Anoop Choudhary


Member
Dr. Anil Kumar Choudhary


Prof. K. K. Ghosh


Prof. Manas Kanti Das


Prof. Anish K. Das


Dr. Indrapal Kishor

PRE - Ph.D. COURSE

COURSE - I

RESEARCH AND PUBLICATIONS ETHICS (RPE)

M.M. - 100

UNIT-I PHILOSOPY AND ETHICS, SCIENTIFIC CONDUCT:

Philosophy and Ethics:

- Introduction to philosophy: definition, nature and scope, concept, branches
- Ethics: Definition, moral philosophy, nature of moral judgement and reactions


Scientific Conduct:

- Ethics with respect to science and research
- Intellectual honesty and research integrity
- Scientific misconduct: Falsification, Fabrication and Plagiarism (FFP)
- Redundant Publications: duplicate and overlapping publications, salami slicing
- Selective reporting and misrepresentation

UNIT-II RESEARCH METHODOLOGY & COMPUTERS IN RESEARCH

Purpose of research; Research project Conceptualization, choice of methods; Elements of a research proposal, operationalization choices and illustrations. Research design: formulation, pre-testing of research instruments and procedures, units of analysis, time dimension. Experimental design and use of indicators in research. Survey Research: Guidelines for asking question and questionnaires construction, Self- administered questionnaires, Interview and other survey methods; their strength and weaknesses. Sampling: the logic of sampling, concepts and terminologies, population and Sampling frames , types of sampling design .Field studies : steps in the conducting field study ; evaluation research: how to carry out evaluation research .

Knowledge of Basic computers applications for research work and applications, knowledge of National and International Journals, Impact Factor, Citation-Index, h-Index, SCI Journal, Plagiarism.



Prof. Ananda Das



External Member (Research Institute)
Dr. Sushil Das



External member (Asst. Prof.)
Prof. Ananta Kumar Das



Dr. Suman Choudhury
Member (University of ...)



Dr. Bipin Chandra Das
Member



Prof. K. K. Ghosh



Prof. Manoj Kumar Das



Prof. Manoj K. Das



Dr. Indrajit Karbiel

UNIT-III INSTRUMENTAL TECHNIQUES

Principle, instrumentation and application of electro-analytical, spectrophotometry, fluorimetry, AAS, and NMR techniques. Principle instrumentation and application of chromatography and MS techniques.

UNIT-IV SAMPLING AND MODELING

Measurement and sampling techniques of air/water pollutants using air monitors in selected atmospheric receptors. Statistical approach in environmental monitoring and analysis using selected parameters (correlation and regression analysis, factor analysis etc.) and graph plotting (Boxplot, histogram etc.)

UNIT-V STATISTICAL ANALYSIS

Various types of errors – precision and accuracy- significant figures, various statistical tests on the accuracy of results, positive and negative deviation from accurate results the binomial distribution, the Gaussian distribution - the normal distribution of random errors, mean value, variance and standard deviation, reliability interval, deviations, from the Gaussian law of error distribution, student's t-test, F-test, Q-test, Graphical methods- Linear regression line, standard deviation, correlation coefficient-Multiple linear regression (one variable with two other variables).

COURSE - II

M.M. : 100

- I. **PROJECT BASED ON REVIEW OF RESEARCH WORK** M.M.-50
(Use of plagiarism software, software tool to identify predatory publisher and journals, data base and research matrices)
- II. **SEMINARS** M.M.-50
(Group Discussion, subject specific issue)

BOOK SUGGESTED:


1. Ahuja & Jespersen, Modern Instrumental Analysis, 1st Edition, Elsevier Science, 2006.



Prof. Shashi Arora



External Member (Research Institute)
Dr. Shaad Bhatia



External member (Academia)
Prof. Gopinath Kanna Arora



External Member (Academia)
Dr. Gopinath Choudhary



External Member (Academia)
Dr. Anupam Singh



Prof. K. K. Ghosh



Prof. Manas Kumar Deb



Prof. Manish K. Rai



Dr. Indrajit Karthik

2. Douglas A. Skoog; F. James Holler; Stanley R. Crouch, Principles of instrumental Analysis, Cole Pub Co., 2006.
3. John Creswell, Research Design: Qualitative, Quantitative, and Mixed Methods Approaches (Hardcover), 2008
4. John W. Creswell, Qualitative Research & Evaluation Methods , 2008
5. Thesis and Assignment Writing – J. Anderson, B.H. Dursten and M.Poole, Wiley Eastern (1977).
6. A Hand Book of Methodology of Research – P. rajamal and P. Devadoss, R.M.M.Vidya Press (1976).
7. instrumental Methods of Analysis – H.H. Willard, L.L.Merritt, J.a.Dean, F.A. Settle, CBS Publishers & Distributors, 1986.
8. Practical Process, Research and Development – Neal G. Anderson, Amazow



Prof. Anil Kumar



External Member (Research Institute)
Dr. Shakti Bhatia



External member (Academic)
Prof. Gyan Kumar Bhatia



Member (Industry)
Dr. Suman Chandra



Member (Industry)
Dr. Anil Kumar



Prof. K. K. Ghosh



Prof. Manoj Kumar Das



Prof. Manoj K. Das



Dr. Indrajit Karthik