



Pt. Ravishankar Shukla University

Raipur (C.G.), India 492010

CURRICULUM & Syllabus

(Based on CBCS & LOCF)

Pre. Ph. D. Course Work

Session: 2025-26

टीप:- सत्र 2024-25 के पाठ्यक्रम को सत्र 2025-26 के लिए यथावत प्रभावशील किया जाता है।

Approved by
Board of Studies

: Chemistry

Dates

: 15.05.2025

Name of chairman

: Prof. Kamlesh Kumar Shrivastava — K. Shrivastava

Name of Members

: Prof. Kallol K. Ghosh (Head, SoS in Chemistry & CBS) *K. Ghosh*
: Prof. M. K. Deb (Head, SoS in Environmental Science) *M. K. Deb*
: Prof. N. K. Karade (External Members, RTM university) *N. K. Karade*
: Prof. Shamsh Pervez *Shamsh Pervez*
: Prof. M. K. Rai *M. K. Rai*
: Dr. M. L. Satnami *M. L. Satnami*
: Dr. Bhanushree Gupta *Bhanushree Gupta*
: Dr. Ajita Dixit *Ajita Dixit*
: Shree Hemant Deshmukh *Hemant Deshmukh*
: Shree B. L. Yadav *B. L. Yadav*
: Dr. Indrapal Karbhal *Indrapal Karbhal*
: Dr. Shobhana Ramteke *Shobhana Ramteke*

K. Shrivastava Online

Prof.
Kamlesh
K. Shrivastava,
Chairman

Prof. N. K.
Karade
(External
member)

Prof. Kallol K.
Ghosh
(member)

Prof. M. K.
Deb
(Member)

Prof. Shamsh
Pervez
(Member)

Dr. M. L.
Satnami

Dr. Bhanushree
Gupta
(Member)

Dr. Ajita Dixit
(Member)

Shri H.
Deshmukh
(Member)

Shri B. L.
Yadav
(Member)

Dr.
Indrapal
Karbhal
(Member)

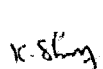
Dr. M. K. Rai
SOS in
chemistry

RE - 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

 Online
 











Prof. K. Kamlesh, Chairman
 Prof. N. K. Karade (External member)
 Prof. Kallol K. Ghosh (member)
 Prof. M. K. Deb (Member)
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 Shri H. Deshmukh (Member)
 Shri B. L. Yadaw (Member)
 Dr. Indrapal Karbhal (Member)
 Dr. M. K. Rai SOS in chemistry

PRE - Ph.D. COURSE

COURSE – I

RESEARCH AND PUBLICATIONS ETHICS (RPE)

M.M. - 100

UNIT-I PHILOSOPHY 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.

K. Shrivastava Online



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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)

K. Shing Online

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BOOK SUGGESTED:

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

K. S. Shrivastava Online

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Dr. M. K. Rai SOS in chemistry