



List of Revised Courses

Department : Pure and Applied Physics

Programme Name : Ph.D.

Academic Year : 2022-23

List of Revised Courses

Sr. No.	Course Code	Name of the Course
01.	Paper-I	Research Methodology & Computer applications



Minutes of Meetings (MoM) of Board of Studies (BoS)

Academic Year : 2022-23

School : School of Physical Sciences

Department : Pure and Applied physics

Date and Time : Mar. 10, 2022, 2pm-5 pm

Venue : e-Class room



Department of Pure and Applied Physics

Guru Ghasidas Vishwavidyalaya
(A Central University established by the Central Universities Act, 2009)
Koni, Bilaspur - 495 009, Chhattisgarh, India
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Minute of the Meeting of Board of Studies (BOS) held on 10.03.2022

An online meeting of DRC of the Department was convened through Google meet (meeting link: <https://meet.google.com/bmf-aeor-mzi>) for external expert and offline presence of internal members in e-class room of the department) on 10.03.22 at 02:00 pm. In the meeting, the following members of the BOS:

1. Dr. M. N. Tripathi, Chairman
2. Prof. P. K. Bajpai, member
3. Prof. D. C. Gupta, External Member (Professor & Head, School of Studies in Physics, Jiwaji University, Gwalior)
4. Dr. A. K. Singh, Member
5. Mr. P. Rambabu, Member

were present. In addition, the following faculty members of the department were also present as special invitees

1. Dr. R. P. Patel
2. Dr. M. P. Sharma

Agenda Item-01: Approval of the curriculum framework, course structure and draft of the syllabi of the First Semester B.Sc. (Hons.) Physics and B.Sc. (Hons.) Electronics program as per LOCF based CBCS scheme

Resolution: The draft syllabus and curriculum framework for B.Sc. (Hons.) Physics and B.Sc. (Hons.) Electronics programs as per the guidelines and scheme directed by the University were discussed at length. The LOCF based curriculum framework and the course structure along with examination scheme was approved. Further, the syllabus designed by faculty members for first semester for both the programs were also approved.

Agenda Item 02: Approval of the curriculum framework, course structure and draft of the syllabi of the First Semester M.Sc. (Physics) and M.Sc. (Electronics) program as per LOCF based CBCS scheme


Resolution: The draft syllabus, course structure alongwith examination scheme for the M.Sc. (Physics) and M.Sc. (Electronics) programs as per University guidelines were discussed in detail. The PO/CO for learning outcome and new features aligned with the NEP 2020 as has been suggested by the University in the curriculum such as open elective has been incorporated. The course structure of both the programs, examination scheme and first semester syllabi were approved.

Agenda Item 03: Approval of the modification in Paper-I of the Pre-PhD course work as per UGC guideline





Resolution: The two units consisting of “Philosophy and ethics” and “Ethics in Science and Research Publication” have been incorporated in Pre-PhD course work first paper and the same has been discussed with the faculty members of the both Departments of the School of Studies of Physical Sciences. The draft syllabus for paper-I for Pre-PhD students at the school level is placed before the BOS for consideration and it was approved.


The meeting ended with thanks to chair.


(Dr. M. N. Tripathi)
Chairman, BOS

(Prof. D. C. Gupta)
External Expert


(Prof. P. K. Bajpai)
Member, BOS


(Dr. A. K. Singh)
Member, BOS


(Mr. P. Rambabu)
Member, BOS



Scheme and Syllabus

Pre-PhD Course Work (Physics)

Examination Scheme

Course Code	level	Course name	Credit	Remarks
	School level	Research Methodology & Computer Applications	04	Common to all
	Department level	Experimental, Theoretical techniques & Instrumentation in Physics Research	04	Common to Physics Candidates
	Paper –III (Optional) Any one of the followings	III A: Advanced Materials III B Spectroscopic Techniques III C Advances in Plasma Physics III D: Advance Nuclear Physics III E: Advanced Astronomy and Astrophysics	04	Any course

Pre-PhD Course Work (Electronics)

Examination Scheme

Course Code	level	Course name	Credit	Remarks
	School level	Research Methodology & Computer Applications	04	Common to all
	Department level	Basic Electronic instrumentation & Electronic material characterization	04	Common to Physics Candidates
	Paper –III (Optional) Any one of the followings	III	04	Any course



Syllabus Paper I

Research Methodology & Computer applications

Objective- • To acquaint the research scholars with the nature, scope and limitations of various methods of conducting educational research.

- To develop an understanding of process of conducting educational research.
- To develop an ability of appropriate selection, development and use of various tools of research
- To acquaint the students with various techniques of sampling and to develop an ability of selecting appropriate sample for a research study.

Mode of study includes: Assigning the topic to students based on their basic background and presentation in the form of seminar which will be followed by discussion and submission of the write-up. This will be evaluated by group of teachers.

Unit 1: Research methodology

Definition of Research, Components of Research Problem, Various Steps in Scientific Research : Hypotheses, Research Purposes, Research Design, Literature searching Literature Survey, defining the question and formulating hypothesis/ hypothesizes, Collection of research data, tabulating and cataloging. Sampling and methods of data analysis.

Unit 2: Errors in measurements and statistical methods:

Types of errors; mean deviation, standard deviation and probable errors; propagation of errors with summation, difference, product and quotient Probability Theories - Conditional Probability, Poisson Distribution, Binomial Distribution and Properties of Normal Distributions, Estimates of Means and Proportions; Chi-Square Test, Association of Attributes - t-Test - Standard deviation - Co-efficient of variations. Correlation and Regression Analysis, plotting of graphs.

Unit3: Laboratory practices and safety guidelines:

Safe working procedure and protective environment, Laboratory safety measures, Handling radiation, Chemical hazards and their types, Safe chemical use, Proper storage and disposal of hazardous materials, Bio-hazardous and other toxic experimental materials, Maintenance of equipment.

Unit 4: Computer applications in scientific writing skills

Applications of Microsoft Excel, power point and origin for data processing and data analysis, research paper – presentation using power point (which include texts, graphs, pictures, tables, references etc.) (oral in power point/poster);

Curve fitting, Method of least square fit, least square fit (straight line) to linear equations and equation reducible to linear equations. Non-linear curve fitting, back ground correction and mathematical manipulation in data using origin.

Structure and Components of Research Report, Types of Report: research papers, thesis, Research Project Reports, Pictures and Graphs, citation styles, writing manuscript in Latex, Steps to better writing.

Unit 5: Ethics in Science:

The source of ethical issues in science: examples from different disciplines. Ethical issues in science research and reporting: objectivity and integrity, the problem of plagiarism and related issues, international norms and standards. Scientific temper and virtues, expectations from scientific community.

IPR and Patent regime: Recording and storage/retention of recorded materials. Management and use responsibilities in proper utilization of the facilities. Socio-legal issues, originality

Outcomes - Research methods courses offer students the opportunity to learn the various aspects of the research process, framing useful research questions, research design, data collection, analysis, writing and presentation.



References:

1. "How to write and Publish" by Robert A. Day and Barbara Gastel, (Cambridge University Press).
2. "Survival skills for Scientists" by Federico Rosei and Tudor Johnson, (Imperial College Press).
3. "How to Research" by Loraine Blaxter, Christina Hughes and Malcolm Tight, (Viva Books).
4. "Probability and Statistics for Engineers and Scientists" by Sheldon Ross, (Elsevier Academic Press).
5. "The Craft of Scientific Writing" by Michael Alley, (Springer).
6. "A Students's Guide to Methodology" by Peter Clough and Cathy Nutbrown, (Sage Publications).