NGB (DU) Ph.D. Program

Ph.D. Course Work

Syllabus

Version 2nd / 2019

2020-21

Contents

Ph.D. Program NGB (DU)

Program Outcomes

After duly selecting fresh Ph.D. Scholars to the extent of existing vacancies and accordance with Ph.D. ordinance as per Combined Research Entrance Test (CRET), all such students of various subjects undergo one semester compulsory common course work of four modules. These modules are designed to enable them appreciate why, where, which, what and how to conduct Research in the line with current UGC Guidelines. For this, they are armed with all necessary knowledge and skills of current trends.

Module Ist - Part A delves the fundamentals of Research Methodology (RM) right from the stage of problem definition upto how to publish a good Research Paper and an Excellent Thesis. Aspects like types of Research, Measurement Scales, Design, Collection - Coding - Tabulation of Data, Analysis, Inferencing, Interpretations, Discussions and Societal Benefit. **Module Ist - Part B** deals with Research & Publication Ethics (RPE) to caution them in regard to every step of Research Methodology what are likely misconduct and how to adhere to Good Academic Research Practices (GARP) 2020 published by UGC. The ethical misconduct dealt with relate primarily to impersonification, publication of data, Plagiarism, conflicts of interests, misuse of data and in formations, falsification of results etc. Pros and cons of ICT developments in this regard are to be explained.

Module IInd - Computer Applications Trains the students in theory and Practice of Modern Computers and their most popular MS Office / Open Office packages for document preparation, data storage and analysis and final presentations involving all digital forms of communications - texts, images, audio, video as well as all parts of their combination.

Module IIIrd - Gram Pravas is conducted in the form of field survey projects mode making all the scholars aware of the current status of our village life - problems vis a vis modernization developments, efficacy of ongoing government welfare schemes etc. Here they learn how to collect primary data and utilize them in their Ph.D. work where so possible to fulfill the mission of our village university of "Happy Rural Life". This will arrest ongoing population flooding from rural areas to cities / metros.

Module IVth - is an elective paper wherein the Ph.D. scholars may choose their own Master Degree Subject specifics in continuation of specialization of their departments in our university and inline with NET / JRF syllabus. Alternatively they may opt the IInd alternative - "Advance Computer Application" course of Artificial Intelligence (AI), Artificial Neural Network (ANN) and Machine Learning in solving of their Research problem as per current trend. These tools have proved their usefulness in large spectrum of subjects, Interdisciplinary and Multidisciplinary areas.

Paper - I   (6 Credits)
PART-A : RESEARCH METHODOLOGY   (4 Credits)

Course Outcome

As a core course, this module prepares students of all 26 subjects to handle researches in their own subject, in Inter Disciplinary and Multi Disciplinary areas including Thrust Areas of Research notified by our University. The students are armed in this course with fundamentals of why, which, what where and how to do Research leading to a Ph.D. Degree. Starting from an introduction to Research Methodology, objectives and types of the good research, how to define the research problem, get insights of designing research in overall and sample surveys where so relevant, emphasis is laid on how to collect, collate and describe data using appropriate measurement scales in their tabular / graphical representations. Then parametric tests like z, t, F, posthoc ANOVA and non parametric tests like X^2 tests are discussed with their merits and limitations along with correlation / regression analysis for testing the hypotheses. Finally how to write a research report, research papers and thesis with thorough presentation of State of Art literature review using UGC CARE LIST Journals, International Journals, SHODH GANGA, DELNET resources including Govt. and Private Sector Websites, Blogs etc. is explained with practical examples available at Central Library of our University and on Internet.

SYLLABUS

Unit I - Introduction to Research:

Fundamental of research, Scope of Research, Types of Research, Sources of Research Problem, Qualities of good research problem, Identification of good problem, Scientific research characteristics and steps of scientific research, Scientific research problems.

Unit II - Research Methods & Design:

(a) Traditional Methods **-** Historical, Institutional, Legal, Philosophical, Comparative, Ethical methods etc.

(b) Modern Methods - Survey of Literature, Sampling method, Questionnaire, Schedule etc, Interview method and Focus Group discussion, Observation Method, Case Study method, Content analysis, Statistical Method, Experimental Method, Brainstorming Techniques etc.

Research Design Basic Principles; Need to research Design; Features of good design; Important concepts relating to research design; Observation and Facts; Laws and Theories; Prediction and explanation, Induction, Deduction, Development of Models.

Developing research plan   Exploration, Description and Experimentation Determining experimental and sample designs.

Unit III: Tools & Techniques of Data Collection analysis and Interpretations:

I.   Meaning of Population and Sample; Sampling Methods- Random, Stratified, Purposive

II.   Tool of Data Collection: (a) Primary, Secondary and Tertiary Data   (b) Schedule (c)   Observation (d) P.R.A.

III. Type of Data (a) Primary, Secondary and Tertiary Data (b) Construction and adaptation of instruments, Administration of questions and tests, Tabulation of data (c) Data organization in SPSS and Excel (d) Graphical representation of data.

IV. Analysis of Data (a) Measure of Central tendency; Standard Deviation & Standard error; Measure of variability, Correlation and its computation; ANOVA   (b)   Discussion and Interpretation of results (c) Testing of Hypotheses; Logical and Statistical Techniques like chi Square test (X^2) and Student t-test.

Unit IV: Synopsis, Reporting and Thesis Writing

What is synopsis? How to write synopsis? Qualities of good synopsis; Reporting and thesis writing- Structure and components of reports/scientific reports; Type of report Technical Reports and thesis;   Significance; Different steps in the preparation; Layout, structure and language of typical reports;   Illustrations and tables; Bibliography, referencing and footnotes; Oral presentation - Planning - Preparation - practice - Making Presentation; Use of visual aids; Transparencies/PowerPoint for effective Communication; Criteria for the evaluation of the research report.

Unit V: Application of result; Ethics & Future

Environmental and Societal impact; Ethical issues in Research; Ethical Committees; Copy right; Royalty; Intellectual property right and patent Law; Trade Related aspects of Intellectual Property Right; Reproduction of published material; Plagiarism; Citation and acknowledgement; Reproducibility and   Accountability; Preparation of Projects; Society oriented research linkages; Capacity building; Research Collaborations (MOU); Research Visits.

REFERENCES:

1.   Garg, B.L., Karadia, R., Agarwal, F. And Agarwal, U.K., 2002 An Introduction to Research Methodology, RBSA Publishers.

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3.   Sinha, S.C. and Dhiman, A.K. 2002. Research Methodology, Ess Ess Publications. 2 volumes.

4.   Trochim, W.M.K., 2005. Research Methods; the concise knowledge base, Atomic Dog Publishing. 270p.

5.   Wadehra, B.L. 2000. Law relating to patents, trademarks, copyright designs and geographical indications. Universal Law Publishing.

6.   Bagchi, Kanak Kanti (2007) Research Methodology in Social Sciences: A Practical Guide. Delhi, Abhijeet Publications.

7.   Sharma, B.A.V., etal., (2000) Research Methods in Social Sciences, New Delhi, Sterling Publishers.

8.   B.A.V. Busha, C.H. and Harter, S.D. (1980) Research Methods in Librarianship, New York, Academic Press

9.   Cooper,R. Donald and Pamela S. Schindler (2003) Business Research Methods, Delhi, Tata McGraw-Hill.

10.   Flyvbjerg, Bent (2001) Making Social Science Matter: Why Social Inquiry Fails and How it can Succeed Again, United Kingdom, Cambridge University Press.

11.   Ghose, B.N. (1999) Scientific Method and Social Research, New Delhi. Gilbert, Nogel (1993) researching Social life, New Delhi, Sage Publication.

12.   Goodde and Hatte (1952) Methods in Social Research, New York, McGraw-Hill.

13.   Gopal, M.H.(1970) An Introduction to Research Procedures in Social Sciences, Bombay, Asia Publishing House.

14.   Henn. Malt, Mark Weinstein and Nick Foard (2006) A Introduction to Social Research, New Delhi, Vistaar Publications.

PART-B : RESEARCH AND PUBLICATION ETHICS

(2 Credits)

Course Outcome

After completing the core course of 1) Research Methodology (RM), the course of RM is reviewed here for its every chapter on the basis of UGC booklet available on the UGC website "Good Academic Research Practices (GARP)" already notified and adopted by our University using Internet resources as practical examples. Contrasting philosophies for research, ethical misconducts in researches are discussed threadbare Misinterpretations & Impersonifications Fabrication of Data, Plagiarism, conflicts of interest, misuse of techniques for data collection, Coding, Collation, description / representation, analysis and falsification of results, etc. Coming to publications stage, predatory journals vis a vis UGC CARE LIST Journals, their Impact Factor (IF), metrics of Research Journals and researchers, indexing databases etc. are reviewed with emphasis on avoiding use of redundant Journals in literature survey as well as for purposes of publications of research papers. For its implementation, role of recently instituted "Annual Research Integrity Assessment Committees (ARIAC)" meetings by our University to spot ethical misconducts right on the time of ongoing Ph.D. work being conducted by all Ph.D. Scholars is emphasized as executed by their "Departmental Research Committee (DRC's)" to regulate the research work in line with Govt. Academic Research Practices (GARP) 2020 booklet published by UGC, GOI.

SYLLABUS

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	Database and Research Metrics	7
	Total	**30**

DETAILED SYLLABUS

Theory

- ### RPE 01: PHILOSOPHY AND ETHICS (3 hrs.)
    1. Introduction to philosophy; definition, nature and concept, branches
    2. Ethics; definition, moral philosophy, nature of 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 misconduct; 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 (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 behaviour and Vice versa, types
    5. Violation off publication ethics, authorship and contributor ship
    6. Identification of publication misconduct, complaints and appeals
    7. 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 tool viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.

- ### RPE 05: 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 (2hrs.)

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

- **RPE 06 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.)
  1.   Impact Factor of Journal as per JournalS Citation Report, SNIP, SJR, IPP, Cite Score.
  2.   Metrics : h-Index, g index, i10 index altmetrics.

REFERENCES
1.   Good Academic Research Practices 2020 : https://ugc.ac.in
2.   https://www.google.com
3.   https://scholar.google.com
4.   https://in.linkedin.com
5.   https://delnet.in

COMPUTER APPLICATIONS

(4 Credits)

Course Outcome

With ICT pervading every field of Knowledge, each Ph.D. scholar has to be familiarized with knowledge of fundamentals of present day computers/Laptops/Desktops/Android Phones and use of MS-Office or open office and other basic packages required for completing his/her Ph.D. degree. This Course arms the student to familiarize with present day Computers, their capabilities in hardware and software with emphasis on operating system, document preparation package, database package, presentation package etc. It enables the Scholars to prepare his/her presentations, write research papers, Poster presentations in Seminar & Conferences. They will acquire basic skills for Storage of Primary & Secondary data with full analytical power, thesis writing and its Final presentation before the Panel of Examiners.

SYLLABUS

Unit - I: Definition and Characteristics, Windows and Linux (Latest Version) Microsoft Word 2007

Definition and Characteristics of Computers: Classification of Computers; Application of Computers;   Hardware; Software; Functional Units of a Computer System; Computer Architecture; Bit, Nibble and Byte. ***Windows:*** Introduction to Windows Operating System; Windows Features; Starting Windows; Parts of Windows Screen; Shortcuts in Winodows; Windows Applets;

Windows : My Computer; Working with files and Folders; what is MS-DOS? Booting Process; The DOS Directory Structure; Referencing Group of files; Command Syntax; Types of Commands;

Microsoft Word (Latest Version): Introduction to Word; Starting Word; What is Mail Merge ?; Word Tables.

Unit II: Microsoft Excel; *(Latest Version)*

Excel Features; Entering data into a Cell; Entering Numbers; Spreadsheets Operations; Freezing Window Panes; Excel Offers Several Methods for Selecting Cells; Erasing the Content of A Cell; Formatting Cells from the Home Tab; The Format Painter; Formulas and Functions; Using Logical Functions; Date and Time Functions; Math and Trigonometric Functions; Statistical Functions; Copying Formulas; Charts; Creating a New Embedded Chart; Type of Charts; Formatting Chart Elements from the Format tab.

Unit - III:Microsoft PowerPoint *(Latest Version)*

What is Presentation? Introduction to PowerPoint; Starting PowerPoint; PowerPoint Views; Save a Presentation; Exiting PowerPoint; Working with Slides.

Unit IV: Introduction to Internet and E-Mail

Hardware requirement; to connect to the Internet; Types of Connections; Internet Service Providers; Internet Addressing; Resource Addressing; The World Wide Web; E-Mail

Unit V: Networking Concepts

What is a Networks?; Uses of Computer Networks; Network Topologies; Network Hardware and Software;

MODULE 4: GRAM PRAVAS

Course Outcome

This module aims to expose Ph.D. Scholars how to collect, collate, analyze primary field data acquired through practical experiences in regard to the realities of Indian villages by door to door contact with village households, get current status of their economic, educational and social levels in view of the govt. claims and schemes, set-up awareness indicator and its efficacy vis a vis their aspirations as citizens of Modern India. It's theme (Anx 1) is to be responded with the primary data as per Anx 2 to submit their project report answering in detail all the points of checklist [Anx 2] forming a database and be motivated to involve wherever so possible need-based research for execution of New Education Policy-2020 of GOI.

Annexure-1

THEME OF THE GRAM PRAVAS MODULE

1. Title of the Practice : Gram Pravas

2. Objectives of the Practice : Accountability of the Universities towards the society and the Nation has been a long cherished desire of the University Grants Commission. This aspect has remained nearly untouched as regards the concern of the Universities towards rural masses. Our Gram Pravas program has yielded wonderful results in this area.

3. The Context : We are fully aware that our villages have still to get benefits of the Govt. schemes designed and meant for them. It is responsibility of the Universities to make an audit on this account and do everything necessary to bring the results of the Govt. schemes close to villages and the villagers. Ours is a rural University, therefore, we are deeply concerned about this aspect.

4. The Practice : Gram Pravas is a new and novel experiment made by the University and has been quite successful. This program includes : i. going to villages periodically and interacting with village folks, -men, women and children. ii. learning from them their traditional skills iii. transferring to them the latest knowledge and technology iv. collecting first hand information of the status of execution of the Government's Welfare schemes; v. enquiring about their well being and extending to them all possible help for solving their problems. Each Participating student has to submit a report to his coursecoordinator after every Gram Pravas, which has to be reviewed by the course-coordinator and a subject expert for advising the students to improve their functioning in the next Gram Pravas. At the

end of the semester, the student may have to undergo a Viva-voce test for evaluation. Course content of a particular Gram Pravas has to be designed on the basis of the level of the student and also the main course he is persuing. To start with, we have made it compulsory for Ph.D. Course Work students. Slowly this practice is to be made compulsory for all streams of the students.

5. Evidence of Success: Initially, the Gram Pravas program was introduced with a pinch of hesitation regarding interest of the students in this program. To our surprise, the students both girls and boys successfully completed all the twelve Gram Pravas programs designed for them for their one semester course and came out with excellent reports fully illustrated with photographs and audio recorded dialogues. Their reactions to what they saw in the villages show the depth of their concern and their sensitiveness.

6. Problems Encountered and Resources Required: Cooperation from the Govt. machinery is one point that may immensely enhance the quality of the Gram Pravas programmes. This may come in the form of transport facility and participation of the Govt. officials and workers of the village level. Lack of toilets and bathroom facilities in the villages and the village schools was one of the major problems faced by the students, particularly girls.

7. Notes :
i.   It is recommended that Gram Pravas programmes be made compulsory for all teaching institutions at all levels in one form or the other.
ii.   Nehru Gram Bharati Vishwavidyalaya may be promoted as a nodal agency for promotion of the Gram Pravas Programme.
iii.   All Adarsh Grams adopted by Sansads and Vidhayaks must be covered by Gram Pravas programme of the Universities.

Annexure-2
Checklist for preparation of Gram Pravas
FINAL PROJECT REPORT FOR COMPLETION OF Ph.D. COURSE WORK TO BE SUBMITTED BY EACH AND EVERY Ph.D. SCHOLAR

Gram Pravas (Research in Action & Action Research) **of minimum 3 villages visited by Ph.D. Scholar vis a vis his/her own village or a nearby village if resident of an urban area.**
I.   The essential purpose is to examine in the field in participatory mode the need-base of the households living in villages **as currently and as aspired for completion in future 5-10 years.**

II.   In view of the above, the derivative purpose is to examine the outcome of schemes & programs implemented by the government at the centre & state levels in rural areas over time **Their efficiency and shortcomings in achieving the aims.**

III.   The related purpose is to examine the benefits that the households received & improved their livelihood **vis a vis the future expectations.**

IV.   The other questions include whether workers migrate from village & if yes, under what conditions? **How to examine and report it in terms of numerical indicators**

Keeping in mind the above, the university proposes the following study contents:

(i)   What is the village? What is the rural zone?

(ii)   Rural-urban links: The one in question vis a vis the ideal one

(iii)   Physical infrastructure in villages (like roads, electricity, water supply, public ponds, grazing areas, animal husbandry facilities etc.)

(iv)   Public institutions in village like Panchayat, Primary school, Primary health centre, Post-office, Banks, Internet café's and internet connectivity etc.

(v)   Public utilities & law and order: Its efficiency, loopholes etc.

(vi)   Resource mapping of the village (like Agri/Horticulture, crop areas, water bodies, plantations ….), specialized facilities, expert's availability…….

(vii)   Social mapping (including social relations, culture, rituals, on social homogeneity etc……..)

(viii) Social system (by caste, community, gender), complementary professions.

(ix)   Demographic mapping (by birth, death, litracy, marriage, profession….)

(x)   Actual living & expectations of people in village vis a vis their sustainability

(xi)   Status of elderly people and their care regular check up by doctor's, public and private sector dispensaries etc.

(xii)   Overall village outcome (transformation, sense of happy rural life etc…)

SPECIFIC SUBJECT

As decided by the HOD of the Concerned Department in Continuation of Master Degree Syllabus Inline with NET / JRF Exam

or

Paper IV B. Elective
(Also Core Paper for Computer Science Subject)
Advanced Computer Applications:
Artificial Intelligence, Neural Networks
And Machine Learning

(4 Credits)
(M. Marks 100)

Course Outcome

Introduction to AI, ANN & Machine Learning:- To develop semantic based and context aware systems to acquire, organize, process, share and use the knowledge embedded in text, images, audio, video & multimedia contents so as to achieve semantic interoperability between web-resources and services like searching semen research papers forming State of Art Reviews of literature on any selected Ph.D. Topic of any subject / Multi Disciplinary Topic in Arts or Natural Language Processing in English, Hindi, Sanskrit etc. or pattern recognition or classification etc. in any of Sciences, Management, Commerce, Education etc.

SYLLABUS

1. Meaning and definition of the syllabuses AI, Physical Symbol System, Hypothesis, Problem Solving Agents, Production Systems, various search techniques and analysis BFS, DFS, heuristic BDS, Genetic Algo etc.
2. Probabilistic Reasoning: Representation, Baysian Networks and making simple decision, reinforcement learning, methods of knowledge representation, syntax and semantics, expert systems e.g. Mycin and AI Shell, Machine Learning, Forward and Backward Reasoning, Rules based and Case based inferencing with examples like of Family Tree Searches using PROLOG.
3. Network based representation and Reasoning, Semantic Networks, Conceptual Graphs, Frames, Description Languages (DL), Concept Language (CL), Concept Dependencies (CD), Scripts, Reasoning using CD, Natural Language Processing and Machine Translation using Python and examples of Google English Hindi and Hindi to English Translator: Present Challenges.
4. Reasoning in uncertain environments Fuzzy Logic, Fuzzy Sets, Bayes Theorem and Bayesian Networks, Hidden Markov Model.
5. Artificial Neural Networks (ANN's) their Taxonomy, Feed Forward and Recurrent Networks with supervised and unsupervised Learning Laws, Kernel Methods for Pattern Analysis, Statistical Learning Theory, Support Vector Machines (SVM), Relevance Vector Machines for Classification and Regression.

Evaluation*:

Component	Python Lab Test	S/V/Q	EE
Max. Marks	20	10	70

* 75% Attendance is compulsory both for theory and lab practicals separately.
S/V/Q=Seminar/Viva/Quiz,   EE=End Sem Exam.

Lab Practicals in Python:
1. Introduction to Python Programming Languages with built in Libraries and their typical uses.
2. Basic Data Types, conditional and Control Structures with Example Programs.
3. String, List, Dictionary Set, File Handling etc. using OOPs, Regular Expression and Exception Handing, Linear and Binary Searches.
4. SQL and Database Connectivity using Python.
5. GUI Application Case Study, Text Processing, Use of NUMPY, PANDA and MatPlotLib based Programming.
6. Machine Learning for Regression, Classification, Clustering and Association, Deep Learning Case study.
7. Natural Language Processing (NLP).

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6. Satish Kumar, Neural Networks A Classroom Approach, Tata McGraw-Hill.
7. S.Haykin, Neural Networks A Comprehensive Foundation, Prentice Hall.
8. M. Negnevitsky, Artificial Intelligence: A Guide to Intelligent Systems, Addison Wesley.
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