SEACOM SKILLS UNIVERSITY

Curriculum for Ph.D. Course Work

(Credit Based System)

(Framed in accordance with the University Grants Commission (Minimum Standards and Procedures for Award of Ph.D. Degree) Regulations, 2016, 2022 and Ph.D. Regulations, 2024 of Seacom Skills University)

(w.e.f. 2024-25 Academic Year)

1. GENERAL: This is the curriculum of the Ph.D. Course Work of Seacom Skills University. The syllabus prepared and designed as per the recommendations of University Grants Commission (Minimum Standards and Procedure for Awards of Ph.D. Degree) Regulation, 2009, University Grants Commission (Minimum Standards and Procedure for Award of Ph.D. Degrees) Regulations, 2016 and University Grants Commission (Minimum Standards and Procedures for Award of Ph.D. Degree) Regulations, 2022 and amended thereafter.

2. DEFINITION OF KEY WORDS:

Semester: Each semester will consist of 15 weeks of academic work equivalent to 90 actual teaching days.

Course: "Course" means one of the specified units which go to comprise a programme of study. A component of a programme is usually referred to, as 'Papers'. All courses need not carry the same weight. The courses should define Learning Objectives and Learning Outcomes. A course may be designed to comprise lectures/tutorials/laboratory work/field work/ or a combination of some of these.

Course Work: Course Work means courses of study prescribed by the School/Department/ Centre to be undertaken by a student registered for the Ph.D. Degree.

Compulsory Courses: A course, which should compulsorily be studied by a candidate as a requirement mentioned in University Grants Commission (Minimum Standards and Procedure for Award of Ph.D. Degree) Regulations, 2009, University Grants Commission (Minimum Standards and Procedure for Award of Ph.D. Degrees) Regulations, 2016 and University Grants Commission (Minimum Standard and Procedures for Award of Ph.D. Degree) Regulations, 2022 and amended thereafter are termed as a Compulsory Courses.

Subject Specific Courses: A Courses be offered by the main discipline/ subject of study is referred to as Subject Specific Course.

Credit: "Credit" means the number of hours of instruction required per week over the duration of a semester. A three-credit course in a semester means three one-hour lectures per week, with each one-hour lecture counted as one credit i.e. One Credit is equivalent to one hour of teaching (lecture or tutorial).

Theory / Tutorial : 1 Credit = 1 hr./week

Grade point: A numeric value between 4 and 10 based on percentage of marks obtained in a course.

Letter Grade: It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C ,P , F and AB etc.

Letter Grade	Grade Point
O (Outstanding)	10
A+(Excellent)	9
A (Very Good)	8
B+(Good)	7
B (Above Average)	6
C (Average)	5
F (Fail)	0
AB (Absent)	0

Credit Point: It is the product of grade point and number of credits for a course (Subject).

Credit Point = (Credit × Grade Point)

Semester Grade Point Average (SGPA): It is a measure of performance of work done in a semester. It is the ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.

$$SGPA\ (S_i) = \frac{\sum_{i=1}^{n}(G_i \times V_i)}{\sum_{i=1}^{n}(V_i)}$$

Where V_i is the number of credit of a course; $G_i \times V_i$ is the credit point score in that course and n is the total number of courses in a particular semester.

Cumulative Grade Point Average (CGPA): Cumulative Grade Point Average (CGPA) means a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed upto two decimal places.

$$CGPA = \frac{\sum_{i=1}^{N}(S_i \times V_i)}{\sum_{i=1}^{N}(V_i)}$$

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Where Si is the SGPA of the 'i'th semester; V_i is the total number of credit of that semester and N is the total number of semesters of that programme.

Grade Card: Based on the grades earned, a grade card shall be issued to the students after every semester. The grade card will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned in the final semester.

- Percentage conversion formula from CGPA or SGPA :

> **CGPA or SGPA = [(CGPA or SGPA- 0.5) × 10]**

3. GRADING & DIVISION:

After declaration of the result of each semester, Grade card will be issued to each candidate containing Course Type, Course Code, Course Title, Credit Value, Grade point and letter obtained, Credit Point, and SGPA on the basis of all courses of the relevant Semester.

Percentage of Marks	Letter Grade	Grade Point (G_i)	Credit Point $(G_i \times V_i)$
90% to 100%	O (Outstanding)	10	$10 \times V_i$
80% to less than 90%	A+(Excellent)	9	$9 \times V_i$
70% to less than 80%	A (Very Good)	8	$8 \times V_i$
60% to less than 70%	B+(Good)	7	$7 \times V_i$
50% to less than 60%	B (Above Average)	6	$6 \times V_i$
40% to less than 50%	C (Average)	5	$5 \times V_i$
Below 40%	F (Fail)	0	0
	AB (Absent)	0	0

4. ELIGIBILITY FOR SUCCESSFUL COMPLETION OF COURSE WORK AND CERTIFICATION:

As per Guideline of UGC, a Ph.D. scholar must obtain a minimum of 55% marks or its equivalent grade in the UGC 10- point scale in the course work to be eligible to continue in the programme and submit his or her thesis. After the successful completion of the course work a Ph.D. scholar will get course work certificate.

Programme Outcomes (PO):

- Student has acquired the necessary domain knowledge in the subject to develop creative and critical self-learning skills to develop research acumen of the highest standard.
- Student has acquired the skill necessary to expand the knowledge of the field to related disciplines by way of analyzing and converting specific knowledge to general and abstracts terms.
- Student has acquired the skill to communicate research findings in different platforms including publication in journals and other digital platforms as specified by the university from time to time.
- Student has acquired the sense of responsibility to carry on research in the field to develop original knowledge and contribute to a higher sense of academic and intellectual calling.
- Student has understood the potential and spirit of the Ph.D. programme as a necessary passage to academic and intellectual growth in order to serve society at large and develop a larger pool of human resource.

Programme Specific Outcomes (PSO):

- Students will be able to utilize their knowledge of using instruments and other analytical techniques for solving their research problems.
- Students will be aware of the consequences of deviating from the standard code of conduct in research laboratories, plagiarism, and paraphrasing, ethical aspects and so on.
- Students will be able to access and extract the desired information from the different scientific databases and resources.
- Students will be able to read and write good research papers.
- The programme will motivate the students to take up the challenges of the scientific research and make them mentally prepare to excel in the respective field of their research work.
- After completion of the programme, students will gain the capacity to serve the various higher academic institutions like Colleges, Universities, and National Research Institutes in various fields of apex academic research.

Ph.D. Course Work Syllabus for Academic Year 2024-25

<table>
<tr><td rowspan="5">1ST SEMESTER</td><td colspan="5" align="center">Compulsory Courses</td></tr>
<tr><td>COURSE CODE</td><td>COURSE TITLE</td><td>CREDITS</td><td>COURSE HOURS</td><td>FULL MARKS</td></tr>
<tr><td>RMY</td><td>Research Methodology</td><td>4</td><td>60</td><td>100</td></tr>
<tr><td>RPE</td><td>Research & Publication Ethics</td><td>4</td><td>60</td><td>100</td></tr>
<tr><td>CAQ</td><td>Computer Applications and Quantitative Methods</td><td>4</td><td>60</td><td>100</td></tr>
<tr><td></td><td colspan="1" align="center">Total</td><td>12</td><td>180</td><td>300</td></tr>
<tr><td rowspan="5">2ND SEMESTER</td><td colspan="5" align="center">Subject Specific Courses</td></tr>
<tr><td>SST</td><td>Subject Specific Theory</td><td>4</td><td>60</td><td>100</td></tr>
<tr><td>SRM</td><td>Subject Specific Research Methodology</td><td>4</td><td>60</td><td>100</td></tr>
<tr><td>RPR</td><td>Review of Published Research and Research Proposal Writing</td><td>4</td><td>60</td><td>100</td></tr>
<tr><td colspan="1" align="center">Total</td><td>12</td><td>180</td><td>300</td></tr>
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Semester wise Credit Distribution

SEMESTER	CREDITS	COURSE HOURS	FULL MARKS
1st Semester	12	180	300
2nd Semester	12	180	300
Total	**24**	**360**	**600**

RESEARCH METHODOLOGY

Course Code: RMY

Course Credits: 04   **Lecture: 60 Hours**

Full Marks: 100

Course Objectives:
The main objective of this course is to introduce the basic concepts in research methodology. This course addresses the issues inherent in selecting a research problem and discusses the techniques and tools to be employed in completing a research project. This will also enable the students to prepare report writing and framing Research proposals.

Course Outcomes:
- Students who complete this course will be able to understand and comprehend the basics in research methodology and applying them in research/ project work.
- This course will help them to select an appropriate research design.
- With the help of this course, students will be able to take up and implement a research project/ study.
- The course will also enable them to collect the data, edit it properly and analyze it accordingly.
- The Students will develop skills in qualitative and quantitative data analysis and presentation.
- Students will be able to demonstrate the ability to choose methods appropriate to research objectives.

Unit 1: Introduction to Research Methodology   **8 Hours**
- Research: Definition, importance, meaning and characteristics; Steps in research
- Research Problem: Identification, selection and formulation

Unit 2: Types and Methods of Research   **8 Hours**
- Different patterns of research- inductive & deductive, comparison & contrast, spatial, chronological, cause & effect;
- Quantitative & Qualitative approach; Collection of information and evaluation

Unit 3: Review of literature and Bibliography and References   **14 Hours**
- Review of literature
- Bibliography
- Style of referencing

Unit 4: Objectives and classification of the research   **8 Hours**
- Objectives and classification: Selection of the topic, Identifying Objectives of the Study, preparing research questions

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Unit 5: Sources of Data   **8 Hours**
- Primary and Secondary Sources
- Different resources: Library, Field and Other sources

Unit 6: Methods of collecting data   **14 Hours**
- Field work and field methods;
- Designing an Interview
- Note taking etc.

Suggested Readings:
- B A Prasad Sharma and P. Satyanarayan. Ed.(1983): Research Methods in Social Sciences, New Delhi: Sterling
- Bridget Somek and Cathy Lewin (2005): Research Methods in the Social Sciences, New Delhi: Sage
- B.N Ghosh (1984): Scientific Method and Social Research, New Delhi: Sterling.
- C. R Kothari (2004): Research Methodology: Methods and Techniques. New Delhi: New Age International.
- Roger Pierce (2008): Research methods In Politics: A Practical Guide, New Delhi: Sage
- S P Gupta (2012): Statistical Methods, New Delhi: Sultan Chand & Sons
- William J.Goode and Paul K. Hatt (1952): Methods in Social Research, New York: Mc Graw-Hill Book Co.

RESEARCH & PUBLICATION ETHICS

Course Code: RPE

Course Credits: 04   **Lecture: 60 Hours**

Full Marks: 100

Course Objectives:

The main objectives of this course are to understand the philosophy of science and ethics, research integrity and publication ethics. To identify research misconduct and predatory publications.

Course Outcomes:

- At the end of the course the student will have awareness about the publication ethics and publication misconducts
- Able to understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact Factor, etc.).
- The student will able to understand the usage of plagiarism tools.

Unit 1: Philosophy & Ethics   **8 Hours**

- Introduction to philosophy: Definition, nature and scope, concept, branches
- Ethics: Definition, moral philosophy, nature of moral judgments and relations

Unit 2: Scientific Conduct   **8 Hours**

- 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

Unit 3: Publication Ethics   **14 Hours**

- 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 contribution
- Identification of publication misconduct, complaints and appeals
- Predatory publishers and journals

Unit 4: Open Access Publishing   **8 Hours**
- Open access publications and initiatives
- SHERPA/RoMEO online resource to check publisher copyright & self-archiving policies
- Software tool to identify predatory publications developed by SPPU
- Journal finder/ journal suggestion tools viz. JANE, Elsevier Journal Finder, Spinger Journal Suggested etc.

Unit 5: Publication Misconduct   **8 Hours**
  A. Group Discussions
- Subject specific ethical issues, FFP, authorship
- Conflicts of interest
- Complaints and appeals: examples and fraud from India and abroad.
  B. Software tools
- Use of plagiarism software like Turnitin, Urkund, DrillBit and other open source software tools.

Unit 6: Data bases and Research Metrics   **14 Hours**
  A. Data Bases (7 hrs)
- Indexing databases
- Citation databases: Web of Science, Scopus etc.
  B. Research Metrics (7 hrs)
- Impact factor of journal as per journal citation report, SNIP, SIJ, IPP, Cite score
- Metrics: h-index, g-index, i10 index, alt-metrics

Suggested Readings:
- Nicholas H. Steneck. Introduction to the Responsible Conduct of Research. Office of Research Integrity. 2007.
- The Student's Guide to Research Ethics By Paul Oliver Open University Press, 2003
- Responsible Conduct of Research By Adil E. Shamoo; David B. Resnik Oxford University Press, 2003
- Ethics in Science Education, Research and Governance Edited by Kambadur Muralidhar, Amit Ghosh Ashok Kumar Singhvi. Indian National Science Academy, 2019. ISBN : 978-81-939482-1-7.
- Anderson B.H., Dursaton, and Poole M.: Thesis and assignment writing, Wiley Eastern 1997.
- Bijorn Gustavii: How to write and illustrate scientific papers? Cambridge University Press. 7. Bordens K.S. and Abbott, B.b.: Research Design and Methods, Mc Graw Hill, 2008.
- Graziano, A., M., and Raulin, M.,L.: Research Methods – A Process of Inquiry, Sixth Edition, Pearson, 2007.

COMPUTER APPLICATIONS AND QUANTITATIVE METHODS

Course Code: CAQ

Course Credits: 04   **Lecture: 60 Hours**

Full Marks: 100

Course Objectives:
This course give an understanding of how computing technology presents new ways to address problems; and to use computational thinking to analyze problems and to design, develop and evaluate solutions. This course is designed to analyze survey data and mine text data so that student can get the most out of their research and survey projects. This course also aims to provide an extensive knowledge and necessary communication skills for developing a research report and disseminating it through presentations and publications.

Course Outcomes:

- This course aims to introduce the fundamental statistical concepts and procedures.
- It also aims to introduce the use of varies statistical tests using computer applications.
- Analyze a given problem and develop an algorithm to solve the problem.
- Design, develop and test programs using effective software.
- Developing an effective plan for writing a research report.
- The research student is required for both writing and presentation skills for review articles and research proposals.
- The research student to write and present his/her research topic in scientific manner.
- Enable to take assist with complex research data analysis tools.
- The course also intends to build awareness of research strategies, methodological and technological limitations of statistical techniques and applications.

Unit 1: Operating Systems and Office Management using Computer Application
10 Hours
- Basics of Operating System- DOS, WINDOWS, UNIX, LINUX
- Internet, Data uploading and downloading, e-mail, e-journal
- Office Management- MS-Word, MS-Excel, MS-Power Point, and Latex/ WINEDIT.
- Basics of Programming-C, C++, Software Packages

Unit 2: Communication of Research Findings and Articles Writing   10 Hours
- Communication Skills (Writing and Oral)-Listening, Speaking and Reading,
- Presentation Skills, Seminar Presentation
- Interview Skills and Viva-Voce
- Articles Writing and Formatting
- Thesis Guideline, Formatting of Thesis
- Research Proposal writing and its formatting etc.
- ShodhGanga

Unit 3: Pedagogical Aspects   8 Hours
  - Pedagogical aspects in using ICT tools during subject teaching/research assistantship for conducting tutorial or laboratory work and evaluations.
  - Aspects of developing curriculum and educational content in teaching and research.

Unit 4: Introduction to SPSS and Data analysis using SPSS   8 Hours
  - Introduction to SPSS: Definition, Objective and features.
  - Introductory idea about Data analysis using SPSS, Data entry, creating variables.

Unit 5: Probability and Distribution   8 Hours
  - Probability Distribution, Distribution of Free Approaches
  - Binominal, Poison and Normal distribution
  - Test for goodness for fit of a proposed distribution

Unit 6: Correlation, Regression, Sampling, Applications of Central Tendency and Forecasting of Techniques   8 Hours
  - Introduction of central tendency and central dispersion
  - Correlation of coefficient- Simple linear, multiple linear and partial, co-efficient of determination and non-determination, calculation of standard of estimate.
  - Regression-Simple, multiple and stepwise, time series analysis.
  - Sampling-Definition, theory, types, techniques and steps

Unit7: Analysis and Use of Data and Parametric Test   8 Hours
  - Analysis of Data-Testing of Hypothesis, Techniques and use of Statistical Packages
  - Theory of Estimation-point and interval testing of hypothesis-large and small sample test.
  - Parametric test, T-test, F-test, Chi-square test, ANOVA
  - Use of Data-Summary, Paraphrasing and Quotations

Suggested Readings:
  - Rajaraman V-Fundamentals of computers, Prentice Hall of India Pvt. Ltd. ,New Delhi
  - Peter Nortons, "Introduction to Computers", TMH,2004
  - E Balaguruswamy, "Programming with C", Tata McGraw-Hill Education, 2008.
  - A. Leon and M. Leon, Introduction to Computers with MS-Office, TMH.
  - Sushila Madan, Introduction to Essential tools, JBA, 2009
  - Goon A.M., Gupta M.K. and Das gupta B. (2001): Fundamentals of Statistics (Vol.2), World Press.
  - Goon A.M., Gupta M.K. and Das gupta B. (2002): Fundamentals of Statistics, Vol. I & II, 8th Edn. The World Press, Kolkata.
  - Mukhopadhyay,P(2011):Applied Statistics, 2nd edition revised reprint, Books and Allied(P)Ltd.
  - Montogomery, D. C. and Runger, G.C. (2008): Applied Statistics and Probability for Engineers, 3rd Edition reprint, Wiley India Pvt. Ltd.

COURSE CODE	COURSE TITLE	CREDITS	COURSE HOURS	FULL MARKS
SST	Subject Specific Theory	4	60	100
SRM	Subject Specific Research Methodology	4	60	100
RPR	Review of Published Research and Research Proposal Writing	4	60	100

Subject Specific Courses: A Course offered by the main discipline/subject of study is referred to as Subject Specific Course.

SUBJECT SPECIFIC THEORY

Course Code: SST

Course Credits: 04   **Lecture: 60 Hours**

Full Marks: 100

Course Objectives:
The primary objective of studying a subject-specific theory in research is to provide a rigorous, structured, and coherent framework for understanding, analyzing, and interpreting research data within a particular field of study, thus enabling a more in-depth investigation of a specific phenomenon.

Course Outcomes:

- A subject-specific theory serves as a foundational framework for understanding and organizing knowledge related to the research topic, offering a structured way to approach complex research problems.
- A theory helps researchers formulate relevant research questions, identify key variables, and design appropriate data collection methods.
- A theory can help researchers identify areas where existing knowledge is incomplete or contradictory, leading to the development of new research questions and potentially leading to advancements in the field.
- A theory helps in explaining the why and how of a particular phenomenon within a particular body of literature

- Advance Post-Graduate level of Study.
- Detailed study on interested research area or broad research area.
- Studying the relevant literature on the proposed research topic.
- Subject specific study required for completing the Doctoral Research Programme.

SUBJECT SPECIFIC RESEARCH METHODOLOGY

Course Code: SRM

Course Credits: 04   **Lecture: 60 Hours**

Full Marks: 100

Course Objectives:

This course involves choosing the most appropriate research designs, data collection techniques, and analysis methods to address specific research questions within that domain. Because different discipline Science, Engineering & Technology, Humanities and Management may require distinct methodologies due to their subject matter, research questions, and the nature of the data they work with.

Course Outcomes:

- The specific methods used for data collection and analysis will depend on the research question, the nature of the study subject, and the available resources.
- This course teaches about subject specific Methods and Techniques like Surveys, experiments, statistical data validation and analysis, and large-scale comprehensive data analysis.
- Choosing the right methodology is crucial for the validity, reliability, and overall success of a research project.
- Research methodologies should always be conducted ethically, respecting the rights and privacy of participants.
- Summarize the research finding by using graphical representation with the help of application of research methodology.

REVIEW OF PUBLISHED RESEARCH AND RESEARCH PROPOSAL WRITING

Course Code: RPR

Course Credits: 04   **Lecture: 60 Hours**

Full Marks: 100

Course Objectives:

This course will help the researcher to define the contents and to plan and execute his/her research project and to inform potential collaborators about the topic and the expected quality of the research.

Course Outcomes:

- This course summarizes the approach and purpose of your research and help to focus your research.
- It helps to demonstrate the quality and importance of your research as well as your ability to conduct the proposed research.

  - Research Proposal Writing.
  - Writing a Review Report on the interested topic or area in the Specific Subject and student need to give a Presentation/Seminar of the same.

Course Specific Outcomes (CSO):

- Students after completing the six month course will have an elementary knowledge about the different disciplines of the subject.
- The Ph.D. course work is framed to inculcate the research scholars with basic, applied and instrumental knowledge.
- Students will be equipped with background status and innovation in research work and future perspectives of the selected topics of research.
- Students would be taught different aspects about the importance of literature review, accessing scientific databases, laboratory safety and code of conduct with the view of preparing them for taking up research problems.
- Students would be made aware of the research ethics, scientific temper, intellectual property rights and code of conduct for pursuing career in research and development.
- Students would be taught about the different skills and techniques, statistical tools and, so that they could apply these in their field of research depending upon their requirements.

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