सरदारवल्लभभाईराष्ट्रीयप्रौधोगिकीसंस्थान, सूरत
SARDAR VALLABHBHAI NATIONAL INSTITUTE OF TECHNOLOGY, SURAT
भौतिकी विभाग
DEPARTMENT OF PHYSICS

SVNIT

Ref. No: DoP/Meeting/DAAC/ 41 0 /2023-24/   **Date**: 05.07.2023

Minutes of the 43rd DAAC of the Department of Physics, S.V.N.I.T. Surat held on 4th July 2023 at 04:00 PM in the Office of HoD, DoP.

The following members were present in the meeting:

Dr. D. R. Roy	Associate Professor	Head and Chairman
Prof. K. N. Pathak	Professor	Member
Dr. A. K. Rai	Associate Professor	Member
Dr. Dimple V. Shah	Associate Professor	Member
Dr. V. A. Kheraj	Associate Professor	Member
Dr. L. K. Saini	Assistant Professor	Member
Dr. Shail Pandey	Assistant Professor	Member
Dr. Dipika Patel	Assistant Professor	Member
Dr. H. Pandey	Assistant Professor	Member
Dr. M. Karmakar	Assistant Professor	Member
Dr. V. K. Ojha	Assistant Professor	Member
Dr. S. K. Yadav	Assistant Professor	Member
Dr. Y. A. Sonvane	Assistant Professor	Member Secretary

05-07-2023

Member Secretary, DAAC
Department of Physics

Chairman, DAAC & HoD
Department of Physics

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Minutes of 43rd DAAC, Department of Physics held on 04-07-2023

Item 1	To confirm the minutes of the 42nd DAAC meeting, DoP
Resolution 1	It is resolved to confirm the minutes of 42nd DAAC meeting, DoP.
Item 2	To discuss 'Vocational Training / Professional Experience (Optional) (Mandatory for Exit) PHV01/PHP01' courses to be offered by the Department of Physics.
Resolution 2	The item is discussed in length and it is unanimously resolved to propose 'Projects' under 'Professional Experience (PHP01)'course by individual faculty/Group of faculty with various defined relevant problems for the First year students. The final list of projects for PHP01 course will be communicated in due course.
Item 3	To consider 'PH601/PH602 Research Methodology for Science' as the departmental course for PhD students.
Resolution 3	The proposed syllabus is discussed & recommended for consideration from the academic year 2023-24 for Ph.D. students. The syllabus for PH601/PH602 is enclosed as Annexure-I.

The meeting ended with thanks to the members.

05-07-2023

Member Secretary, DAAC
Department of Physics

05.07.2023

Chairman, DAAC and HoD
Department of Physics

Sardar Vallabhbhai National Institute of Technology (SVNIT) Surat

Ph.D. – I (Physics), Semester – I / II Research Methodology in Science PH601/ PH602	Scheme	L	T	P	Credit
		4	0	0	4

1.	Course Outcomes (COs):
CO1	To identify and formulate a research problem for a given specialisation with good research ethics.
CO2	To perform statistical analysis of the sample data collected using various sampling techniques and statistical softwares.
CO3	To apply hypothesis testing techniques using different sampling distributions/tests.
CO4	To compile information to prepare an effective research report and paper.
CO5	To prepare and present a research poster and oral presentation effectively to the peers.

2.	Syllabus	
	Foundation of Research	**06 Hours**
	Meaning of research, Objectives, Motivation, Utility, Characteristics and Types. Characteristics of scientific methods, understanding the language of research: Concept, Construct, definition, Variable. Scientific Research Process. Steps of research, methods of research, research ethics, Introduction to Intellectual Property Rights (IPR).	
	Problem Identification & Formulation:	**12 Hours**
	Definition and formulating the research problem, Necessity of defining the problem, Importance of literature review in defining a problem. Literature survey: primary and secondary; web sources; critical literature review. Research question, Investigation question, Hypothesis testing, Qualities of a good hypothesis, Null hypothesis and Alternative Hypothesis.	
	Research Design:	**08 Hours**
	Concept and importance in research, features of a good research design, Exploratory Research Design: Concept, types and uses, Descriptive Research Design: Concept, types and uses. Experimental Design: Concept of independent and dependent variables. Biased and unbiased research design.	
	Sampling Fundamentals:	**08 Hours**
	Need for sampling, Steps in sampling design, Different types of sample designs, Complex random sampling designs, Important sampling distributions (of mean, proportion, t-, F-, and Chi-square distribution), Central limit theorem, Concept of standard error, Estimating population mean and proportion, Determination of sample size through confidence level, probability estimation and probability distributions.	

Subject Code:##nXX; ##: Department Identity, n: Year, XX: Subject Sequence number XX: last digit 0 (subject offered in both ODD and EVEN semesters, XX: 01 to 30 – last digit ODD and EVEN for ODD and EVEN semesters (Mandatory Core), XX: 31 to 50 (Optional Core), XX: 51 to 99 (Elective), Subjects list for Minor and Honor (M/H#1-4), Subjects list for Specialization track (#1-4)EG: Engineering Subject, SC: Science Subject (offered combinedly by departments) (SVNIT Surat)

Sardar Vallabhbhai National Institute of Technology (SVNIT) Surat

Measurement, Data, and Analytics	**08 Hours**
Structured and unstructured data, Scales of measurement, Population and sample, Descriptive statistics, Data visualization. Probability and random variables, Sampling and estimation, Hypothesis testing, Analysis of variance (ANOVA), Correlation, and Regression analysis. Data Analytics: Elements of association, Clustering, and Classification. Brief introduction to various open-source/commercially available software packages, e.g. ORIGIN, MS Office, etc.	
Interpretation of Results, Research Documentation and Presentation	**06 Hours**
Understanding of interpretation of results, Steps of interpretation; Elements of preparing a research paper and a thesis: Abstract, Keywords, Symbols and Abbreviations, Introduction, Materials and Methods (Theoretical/Experimental), Results and Discussion, Conclusions, Citations and References/Bibliography, Table of Content (ToC), Scope of future work and Appendixes. Elements of good English writing. Ethical issues related to publishing, Plagiarism and Self-plagiarism, Plagiarism detection software's (Turnitin, etc.). Types of presentation: Poster, Oral and Invited talk.	
Students Assignments, Discussion and Review	**08 Hours**
(a) Read, evaluate and present a good journal paper in relevant field of research; (b) Conduct literature review for a specific research topic and prepare a report with citations; (c) To write a sample research paper and thesis proposal.	
	(Total Contact Time: 56 Hours)

3.	Books Recommended
1	C. R. Kothari and G. Garg, Research Methodology: Methods and Techniques, 4th Edition, New Age International, 2019.
2	D. Napolean and B. B. S. Narayanan, Research Methodology – As Theoretical Approach, Laxmi Publications, 2014.
3	B. L. Garg, R. Karadia, F. Agrawal and U. K. Agrawal, An Introduction to Research Methodology, RBSA Publishers, 2002.
4	P. R. Bevington and D. K. Robinson, Data Reduction and Error Analysis for the Physical Sciences, 3rd Ed. by McGraw – Hill (2003).
5	H. S. Asthana and B. Bhushan, Statistics for Social Sciences (With SPSS Applications), 2nd Edition, PHI Learning, 2016.

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