



HINDUSTAN

INSTITUTE OF TECHNOLOGY & SCIENCE
(DEEMED TO BE UNIVERSITY)

Generic Training for Researchers

Introduction

Generic (or transferable) skills are those which the researchers should develop over the course of their study (i.e. career management, problem solving, teamwork and leadership) in addition to their research skills which will enhance their employability whether in or out of academia. A Research degree is the beginning of a career with a research viewpoint and with new thinking and analytical skills. Future opportunities will require people not only with high level research skills but also who are good managers, decision makers, thinkers and communicators.

The training programme is a series of events designed to support all researchers by introducing a variety of research skills and techniques that will help them to progress successfully through the research degree studies and also equip the researcher for a future career. The various sessions are designed so as to bring together researchers from varied disciplines, to foster discussion and to develop research and transferable skills associated with the processes of effective career management.

The training program aims to enhance the effectiveness of the researchers by building their understanding, skills and confidence in communication, planning and time management, leadership and assertiveness. The program includes information on strategies for carrying out literature review, structure and positioning of the literature review chapter and the skills involved in the whole process. A good literature review expands upon the reasons behind selecting a particular research question. Methods of mitigating the risks are explored within the policy and legal framework governing the health and safety aspects of research conducted at the University. Scientific writing standards required for the researchers are dealt with. The intricacies of setting

out and defending a thesis are discussed and guidance given on titles, structure and style. Focus is also on the understanding of the viva examination, the role of supervisor and the confidence in facing viva-voce. It is important that researchers develop an understanding of how to communicate research to various types of media. To facilitate this a session is framed to have a discussion with the experienced senior colleagues on the tips to publish research outcomes in journals and conferences.

At the end of the generic training component of the programme the researchers would be able to demonstrate original, independent and critical thinking, apply effective project management through the setting of research goals, set realistic and achievable career goals, identify and develop ways to improve employability and appreciate the need for and show commitment to continued professional development .

Summer /Winter School

The summer / winter school is held in June or December and is open to all researchers in the University. It is an excellent opportunity to meet other part time researchers, to share ideas and thoughts and to develop new research skills.

Proposed Sessions

- 1.** How to be an Effective Researcher
- 2.** Significance of Literature Review
- 3.** Research Methodology
- 4.** Health and safety in research
- 5.** Importance of Planning
- 6.** Research oriented writing skills
- 7.** Statistical Analysis for Researchers
- 8.** Ethics in Research

9. ENDNOTE

10. Editing a PhD Thesis using LaTeX

11. To prepare a Research Degree Submission

12. Viva and process of Research Degree Examination

13. Publicizing your research

How to be an Effective Researcher

The session aims to enhance the effectiveness of the researchers by building their understanding, skills and confidence in

- Communication
- Planning and time management
- Problem solving
- Leadership
- Assertiveness.

It also helps individuals to understand their own learning and working styles.

By the end of the session, the researcher would have

- Developed a personalized approach to prioritization
- Explored the current distribution of time and energy
- Understood the ways to improve the use of time and energy
- Learnt the methods for simplifying and clarifying communication

Significance of Literature Review

A literature review is a critical and in depth evaluation of previous research. It is a summary and synopsis of a particular area of research, allowing anybody reading the paper to establish why they are pursuing this particular research program. A good literature review expands upon the reasons behind selecting a particular research question.

A literature review is the key to identifying and explaining:

- Extent of work already completed in the researcher's chosen field of research
- Importance of research in the field
- Scope of unexplored concepts

This session will introduce researchers to the importance, purpose, content and sources of the literature review as part of research. The session will also include information on strategies for carrying out the literature review, structure and positioning of the literature review chapter and the skills involved in the whole process. The researcher will also get an idea of how to go about mining the vast amount of literature published.

Research Methodology

Research methodology is a way to systematically solve the research problem. It is necessary for the researcher to know not only the research methods/techniques but also the methodology. Research methodology has many dimensions and research methods do constitute a part of the research methodology. Anyone involved in the collection and analysis of primary data will find this session to be of interest, as it provides the fundamental basis for all researchers. This session will cover data collection methods and simple analysis. It will examine aspects of survey as to how researchers can structure them so as to make them attractive to their target respondents. It will also outline further possible data analysis methods and explain how to get help with the quantitative aspects of your research.

The researcher will be introduced to a range of data elicitation techniques and research methods within a qualitative methodology framework.

Health and safety in research

The session is mandatory for researchers whose research involves laboratory work or field work. The following points would be focused on during the session.

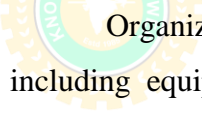
- What are the hazards involved in your research?

- Have you thought about the risks?
- What are your legal responsibilities?
- Better understanding of legal implications of research

The session will guide the researchers to review their research activities, identify the associated hazards and the level of risk involved. Methods of mitigating the risks will be explored within the policy and legal framework governing the health and safety aspects of research conducted at the University.

By the end of the session the researcher will be able to identify the hazards associated with his research, problems that need to be encountered and the steps that could be implemented to minimize the occurrence of hazards.

Importance of Planning



Organizing and planning a research project can involve dealing with a multitude of issues including equipment, external companies and organizations, technical staff, testing regimes, access to data sources, funding etc. Often researchers are faced with their programme being pushed off course because of events that could have been foreseen with some planning.

The session aims to introduce researchers to the tools and techniques of project and risk management and offers an opportunity to explore, evaluate and plan the activities necessary to successfully complete the research. It will involve discussions on quality, cost and duration factors in the monitoring and control of research. The session is intended to be participatory and will involve group activities.

As an outcome of the session the researcher will be able to identify the key activities and structure of his research studies, plan, evaluate and identify the risks involved and be able to manage time effectively.

Research oriented writing skills

All scientists must write. Information must be published in order to be readily accessible and the career prospects depend largely on the written output. The technical writing course aims to improve participants' writing skills by describing and using a procedure which ensures that written work is clear, concise and effective. Overall the focus is to improve the scientific writing standard of the researchers.

- Planning your writing – strategies and techniques for researchers
- Language of critical thinking in writing
- Writing chapter introductions
- Writing chapter conclusions

At the end of the course the participants will be able to:

- Recognize common inaccuracies in scientists writing and know how to avoid them.
- Be aware of the importance of writing clear, concise English and to understand various ways of achieving this.
- Know how to write the different components of a research paper
- Be able to prepare clear, informative tables and figures.

Statistical Analysis for Researchers

Statistical methods can summarize or describe a collection of data that is particularly useful in communicating the results of experiments and research. In addition, data patterns may be modeled in a way that accounts for randomness and uncertainty in the observations. These models can be used to draw inferences about the process or population under study. Data analysis is the application of one or more statistical techniques to a set of data as collected from experiments, sample surveys and observational studies.

The session will focus on:

- Descriptive Statistics
- Hypothesis Testing
- Chi – Square test of Independence
- Correlation Studies/ Regression
- Tests of Difference

Ethics in Research

Ethical behavior, confidentiality and anonymity are fundamental cornerstones of research. All researchers must meet the standards prescribed by the University. This session will discuss issues surrounding ethical considerations in research and the University's regulations. The session will also explore different methods for protecting the identity of the participants and commercially sensitive work.

The session will enable researchers to :

- Be more confident in planning, conducting and reporting on research that has ethical issues
- Understand the University requirements for ethical approval of research studies.
- Have the opportunity to discuss challenging ethical issues

EndNote

EndNote is the market leader in commercially available reference management software packages. It allows the user to search and import references automatically from preferred online databases, provides quick access to references and gives the user the ability to cite them instantly when writing a document for publication. This integrated writing solution saves users countless hours of typing and interpreting style requirements for publications, making EndNote an essential tool for research, writing and publishing.

The session will focus on:

- How to organize the references in EndNote using groups
- Find specific references in EndNote by using the Search Tool
- How EndNote Web can be used alongside EndNote
- Writing a paper with the help of EndNote

At the end of the presentation, the participants will have a 'hands-on session'.

Editing a Ph.D Thesis using LaTeX

LaTeX is a widely used open source NON-WYSIWYG (What You See Is What You Get) document preparation system based on TEX, a markup language. LaTeX is a powerful type-setting environment used by researchers to prepare high quality typographical documents such as research articles, Ph.D thesis and scientific and engineering textbooks. It has elegant features to overcome the inherent difficulties present in a regular word processor in preparing documents involving complex mathematical formulae and various floating objects such as tables and figures that need to be properly placed. Expertise in LaTeX enables the researchers to save time and effort in creating high quality documents with greater control over the structure of their documents. The session on LaTeX is designed for beginners, which will cover the following topics:

- Introduction to LaTeX
- Setting up LaTeX on Windows Computer
- Basic structure of LaTeX documents
- Essential LaTeX commands
- Type-setting LaTeX
- Handling floating objects such as Tables and Figures
- Indexes, Bibliography, footnotes, etc
- Setting up your document format
- Hands-on Session

To prepare a Research Degree Submission

The intricacies of setting out and defending a thesis will be discussed and guidance given on titles, structure and style.

The session will provide researchers with:

- An opportunity to understand the role of the thesis
- An understanding of how to go about choosing a thesis and writing a dissertation
- Tips on the content of the thesis
- Suggestions on titles, style and structure for dissertation
- An understanding of the expectation of the examiners of a research degree submission.

The researchers will have a clear idea of writing a thesis at the end of this session.



Viva and process of Research Degree Examination

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If there is anything that makes researchers shiver, it is the thought of the two to three hour interrogation on the research or research degree viva.

This session will provide researchers with:

- Greater understanding of what the viva examination is attempting to do and the format of a typical viva - voce
- Confidence in facing viva-voce
- Clear idea on how to prepare for viva-voce
- The role of supervisor in the viva

The researcher will be able to face the viva –voce more confidently and with an open mind. Moreover he will be equipped to face tricky situations and how to overcome it.

Publishing your research

Communicating your research to a wide variety of audiences is an increasingly important aspect of all researchers' roles. The aim of the session is to introduce the many ways in which the research work can be communicated to the academic world and beyond. It is important that researchers develop an understanding of how to communicate research to various types of media. This would be organized as an open forum style session in which senior colleagues from different disciplines will transfer and share their experience on publishing the research findings and outcomes in journals, at conferences and in dealing with the media.

The outcome of the session would be to raise the profile of the research, build confidence in dealing with the media and define tools and techniques used in communicating with the media.



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S.No	Session Titles	Relevant to Year		
		1	2	3
1.	<i>How to be an Effective Researcher</i>	✓		
2.	<i>Significance of Literature Review</i>	✓		
3.	<i>Research Methodology</i>	✓		
4.	<i>Health and safety in research</i>	✓	✓	✓
5.	<i>Importance of Planning</i>	✓	✓	
6.	<i>Research oriented writing skills</i>	✓	✓	✓
7.	<i>Statistical Analysis for Researchers</i>	✓	✓	✓
8.	<i>Ethics in Research</i>	✓	✓	
9.	<i>ENDNOTE</i>	✓	✓	
10.	<i>Editing a PhD Thesis using LaTeX</i>		✓	✓
11.	<i>To prepare a Research Degree Submission</i>		✓	✓
12.	<i>Viva and process of Research Degree Examination</i>		✓	✓
13.	<i>Publicising your research</i>		✓	✓

This chart is only a guide

Programme

Sessions conducted in the month of May/June

S.No	Seminar Topics	No of Days
	Module 1	
1.	How to be an Effective Researcher	
2.	Significance of Literature Review	2
3.	EndNote	
	Module 2	
1.	Research Methodology	2
	Module 3	
1.	Health and safety in Research	
2.	Importance of Planning	1
3.	Ethics in Research	

Sessions conducted in the month of December/January

S.No	Seminar Topics	No of Days
	Module 1	
1.	Statistical Analysis for Researchers	2
	Module 2	
1.	Research Oriented Writing Skills	
2.	Editing a Ph.D Thesis using LaTeX	2
3.	To prepare a Research Degree Submission	
	Module 3	
1.	Viva and process of Research Degree Examination	1
2.	Publicising your Research	