

# I.K. GUJRAL PUNJAB TECHNICAL UNIVERSITY

Estd. Under Punjab Technical University Act, 1996  
(Punjab Act No. 1 of 1997)

Ref. No. : IKGPTU/Reg/N/

Dated :

## NOTIFICATION

Sub: **Regarding Pre-Ph.D Course work.**

This is for information of all concerned that Pre-Ph.D course work from 2016-17 will be conducted in the IKGPTU main campus Kapurthala in regular mode. The PhD course work will consists of minimum 15 credits. The structure of the course work is as under.

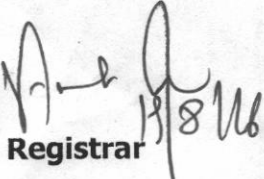
Sr. No.	Nature of course	Name of course	Credits	Remarks
1.	Core	1. Research Methodology	4	The syllabus of RM should be formulated faculty wise such as Engineering, Science, Management/ Humanities and Life sciences
		2. Subject related theory paper	4	Discipline specific related to advancements in theoretical methods for research
		3. Presentation	3	Discipline specific
2.	Interdisciplinary	4. Elective	4	From list of subjects from allied fields
	<b>Total Minimum credits</b>		<b>15</b>	

-Sd-  
Registrar

Endorsement No: IKGPTU/REG/N/ 4244-4251

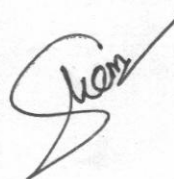
Dated: 22.08.2016

1. Secretary to Vice Chancellor: For kind information of Vice Chancellor
2. Dean (P&D)
3. Dean (RIC)
4. Dean (Academics)
5. Finance Officer
6. Controller of Examination
7. DR (Computers): For uploading on website
8. File Copy

  
Registrar

## SCHEME OF COURSES

S.NO.	Name Course	Code	L-T-P	Credits
1	Research Methodology	PHS900	3-1-0	4
2	Theoretical methods in Physics	PHS901	3-1-0	4
3	Techniques in Experimental Physics	PHS902	3-1-0	4
4	Advanced Condensed Matter Physics	PHS903	3-1-0	4
5	Computational Physics	PHS904	3-1-0	4
6	Nano Materials	PHS905	3-1-0	4



# Physics

## PHS900 Research Methodology

1. Introduction to Research, Objectives of research, motivation in research, types of research, significance of research, research methods vs methodology, research process in flow chart, criteria of good research, problems encountered by researchers in India.
2. Difference between TEX and LATEX, basics of using latex, latex input files, input file structures, layout of the document, titles, chapter and sections, cross references, foot note, environments, typesetting, building blocks of a mathematical formula, matrices, tables, including encapsulated postscript graphics, bibliography, downloading and installing LATEX packages.
3. Introduction to origin, basics of importing and exporting data, working with Microsoft excel, graphing, statistics in origin, hypothesis testing, power and sample size, basic linear regression and curve fitting.
4. Error Analysis and Basic Statistics Measuring errors, uncertainties, parent and sample distributions, mean and standard deviation of distribution, types of probability distribution, instrumental and statistical uncertainties, propagation of errors, specific error formulas, method of least square fitting.
5. Multivariate analysis: Multiple regression, multiple discriminant analysis, multiple analysis of variance, canonical correlation analysis, Factor analysis cluster analysis, path analysis. Computational techniques.
6. Survey of literature: The students will be required to review literature in their respective disciplines and submit an assignment for evaluation.

### References:

1. Research Methods for Science by Michael P. Marde
2. The not so short introduction to LATEX by Tobian Oetiker, Hubert Partl, Hrene Hyna and Elisabeth Schlegl
3. T.Veerarajan and T. Ramachandran "Numerical methods" Tata McGraw Hill, New Delhi, 2008
4. Data reduction and error analysis for physical sciences by Philip R. Bevington and D. Keith Robinson

