Semester – III				
Project				
Code : 17PCHP31	Hrs / Week : 4	Hrs / Sem : 60	Credits : 4	

Format for preparation of project report

1. Identification of the problem

Students are given the freedom of choosing the topic of the project. It may be theoretical or practical.

2. Arrangement of contents

The sequence in which the project report material should be arranged and bound should be as follows:

- Cover page and Title page
- Bonafide Certificate
- > Abstract
- Table of contents
- ➢ List of Tables
- ➢ List of Figures
- List of Symbols, Abbreviations & Nomenclature
- > Chapters
- Appendices
- Books for Reference

3. Page dimension and binding specifications

- The dimension of the project report should be in A4 size. The project report should be bound using flexible cover of the thick white art paper. The cover should be printed in black letters and the text for printing should be identical.
- > Total number of pages should not exceed 70.

4. Typing instructions

- > The impression on the typed copies should be black in colour.
- One and a half spacing should be used for typing the general text. The general text shall be typed in the Font style "Times New Roman" & Font size 12.

Semester – I				
Elective I	lective I B Chemical Instrumentation			
Code: 19PCHE11		Hrs / Week : 4	Hrs / Sem : 60	Credits : 4

Vision:

To impart the students with basic principles and concepts in Instrumental techniques.

Mission:

- > To understand the nature and Choice of methods of measurements.
- > To learn the limits of detection and amplification.
- > To demonstrate the concepts of Operational amplifiers.

Course outcome:

CO No.	Upon completion of this course, students will be able to	PSO addressed	CL
CO - 1	demonstrate automatic operation and computer control	1,5	Ар
CO - 2	precise control of current and voltage.	6,8	Ар
CO - 3	differentiate modulation and demodulation	5	An
CO - 4	point out limitation on amplifier performance	1	Cr
CO - 5	predict binary logic concepts, logic gates and multi- vibrators	7	Un
CO - 6	distinguish visual, filter and spectrophotometers.	6	Ар
CO - 7	control noise level in a system.	1,7	Cr
CO - 8	interpret the optimal value of adjustable parameters	7,8	Ev

Semester – I					
Elective I	B	Chemical Instrumentation			
Code: 19PCHE11		Hrs / Week : 4	Hrs / Sem : 60	Credits : 4	

Unit I Measurement and Instrumentation

Introduction - The nature of a measurement - Choice of a method of measurement - Control of variables - Basic design patterns - General properties of modules -Propagation of uncertainity - Single channel design - Limit of detection and amplification - Automatic operationand computer control.

Unit II Operational amplifiers

The operational amplifiers - Limitations on amplifier performance - Mathematical operations - Differentiation - Integration - Measurement of current and voltage - Precise control of current and voltage.

Unit III Signal-to-Noise Optimisation

Sensitivity and detection limits - Noise - Minimising Noise in a system - Signal averaging - Modulation: Chopping - Demodulation: Phase sensitive detection - Other methods of Optimising Signal-to-Noise ratio.

Unit IV Digital Electronics

Binary logic concepts - Logic gates - Multivibrators - Counters - Wave shaping - Analog to digital convertors - Instruments and Digital computers.

Unit V Instrumentation for Optical Absorption Spectrometry

Visual Photometres - Filter Photometers - Spectrophotometer - Double beam Spectrophotometer - Recording Spectrophotometers - Optimal value of adjustable parameters - Multiple internal reflection assembly - Rapid scanning spectrometer - Non dispersive Photometers - Photometric titration equipment - Fourier transform Spectrometers.

Text book:

- Strobel H A, Chemical instrumentation A systematic approach to Instrumentational analysis, 2nd Edition, Addison- Wesley Publishing company Inc, Phillipines, 1973. Books for reference:
- 1. Jeffery G H, Bassett J, Mendham J and Denney R C, Vogels Textbook of Qualitativechemical analysis, 5th Edition, Longman Scientific and technical, Essex, 1989.
- 2. Skoog D A, Hollar F J, Crouch S R, Principles of Instrumental analysis, 6th Edition, Thompson Brooks/ Cole, Belmont CA, 2007.