

Guidelines:

It is expected that,

1. The student does work equivalent to about ten (10) laboratory experiments throughout the semester in the third year.
2. One bears in mind that the project work is a practical course and it is intended to develop a set of skills pertaining to the laboratory work apart from the cognition of students. Therefore, the guides should not permit projects that involve no contribution on part of student.
3. The project must have a clear and strong link with the principles of basic physics and/or their applications.
4. The theme chosen should be such that it promotes better understanding of physics concepts and brings out the creativity in the students.
5. The evaluation of the project work must give due credit to the amount of the project work actually done by a student, skills shown by the student, understanding of the physics concepts involved and the final presentation at the time of viva voce.
6. It is also recommended that a teacher will look after Four (4) projects at one time.
7. Practical examination will be conducted semester wise.
8. The student can perform an Experimental/Theoretical/Computational Project in Physics or interdisciplinary areas under the supervision of one or more guides.
9. The student can learn the basics of the topic chosen for project, to learn how to do literature survey and set up the basic experimental/theoretical and computational techniques needed for the project.
10. The department encourage to students for projects both in experimental and theoretical areas of Physics in collaboration with other institutes and industry.

The Project work shall consist of the following Criteria.

1. Project work is mandatory for all the T. Y .B. Sc. students.
2. All the T. Y. B. Sc. students will be have to complete the Project work prescribed by the Board of Studies in Physics of Savitribai Phule Pune University during the Vth Semester.
3. The Project work shall consist of the following Criteria.
 - It is expected that students must finalize the Title of Project, Aim and objective, Significance, Literature survey, Materials required, Method and Application etc.
 - Introduction to foundations of Project Work.
 - Introduction of Project Research Methodology.
 - Study of Data Collection Methods.
 - Project Problem Writing and Presentation Skills.

Evaluation weightage:

- Project-I: Semester End University Examination : 35 Marks
- Internal Examination: 15 Marks


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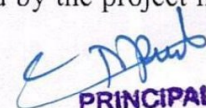
It is expected that,

1. The student does work equivalent to about 10 laboratory experiments throughout the semesters in the third year.
2. One bears in mind that the project work is a practical course and it is intended to develop a set of skills pertaining to the laboratory work apart from the cognition of students. Therefore, the guides should not permit projects that involve no contribution on part of student.
3. The project must have a clear and strong link with the principles of basic physics and/or their applications.
4. The theme chosen should be such that it promotes better understanding of physics concepts and brings out the creativity in the students.
5. The evaluation of the project work must give due credit to the amount of the project work actually done by a student, skills shown by the student, understanding of the physics concepts involved and the presentation of the final report at the time of viva voce.
6. The viva voce should be conducted at the time of evaluation of project work at least for twenty minutes per student. Extra care must be taken in the evaluation of projects done in a pair or group. Delegation of the work done by individuals must be sought from the students in such cases.
7. Any ready-made material used in the report (such as downloaded pages from the web) must be clearly referred to and acknowledged.
8. It is also recommended that a teacher will look after 4 projects at one time.
9. Any non-adherence to this norm should attract a penalty by way of deduction in the marks awarded to a student. It is recommended that the College will provide consumables/contingencies for every project, to the tune of Rs. 750 /- each. (*If the students paid extra fee other than laboratory fee then college will provide financial assistance for the Project work.)

The Project work shall consist of the following Criteria.

- 1) Working model (Experimental or Concept based simulation/Demonstration Related to Physics).
- 2) Understanding of the project.
- 3) Experimental Details.
- 4) Data collection and Data Analysis.
- 5) Innovation.
- 6) Outcomes/Result.
- 7) Conclusion.

Note: At the time of project practical examination, the candidate must submit the certified project report by the project in-charge and HOD. A candidate will be allowed to appear for the Project practical examination only if the candidate submits a project completion report duly certified by the project in-charge and Head of the department.


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The Project work shall include:

Models based / Demonstrated Applications / Review articles / Simulation on PC on any concept in Physics / Comparative & differentiative study / Improvement in the existing experiment (Design and fabrication concept) / Extension of any regular experiments / Attempt to make experiment open-ended / Thorough survey of existing active components / devices, ICs, methods, means, technologies, generations, applications etc. / any innovative projects using the concept of Physics / Interdisciplinary areas.

Evaluation weightage:

- Semester End University Examination : 35 Marks
- Internal Examination: 15 Marks



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DSEC-II: CH-505: Industrial Chemistry - I**[Credit -2, 36 L]**


Chapter No.	Title of Topic/Chapter	No. of lecture
1	Modern Approach to Chemical Industry	06
2	Manufacture of Basic Chemicals	07
3	Sugar and Fermentation Industry	07
4	Soap and Detergents Industry	08
5	Dyes and Pigments	08
Total		36

1. Modern Approach to Chemical Industry**(6 L)**

Introduction, basic requirements of chemical industries, chemical production, unit process and unit operations, Quality control and quality assurance, process control, research and development, human resource, safety measures, classification of chemical reactions, batch and continuous process, Conversion, selectivity and yield, copy-right act, patent act, trademarks.

Ref. No.-7, Relent pages, Ref. - 10: [www.wikipedia.org/wiki/copyright_act_of1976/patent act/trademark](http://www.wikipedia.org/wiki/copyright_act_of1976/patent_act/trademark)

Aims and Learning objectives: The students are expected to learn;

- Importance of chemical industry,
- Meaning of the terms involved,
- Comparison between batch and continuous process,
- Knowledge of various industrial aspects

2 Manufacture of Basic Chemicals**(7 L)**

- Ammonia: Manufacture of ammonia by modified Haber-Bosch process, Physico-chemical principles involved and uses of ammonia.
- Nitric acid: Manufacture of nitric acid by Ostwald's process, Physico-chemical principles involved and uses of nitric acid.
- Sulphuric acid: Manufacture of sulphuric acid by contact process, Physico-chemical principles involved and uses of sulphuric acid.

Reference No.-1: Page No. 731 to 761, 809 to 844, Reference-3: 1128-1175, 1253-1263

Aims and Learning objectives: The students are expected to learn

- Concept of basic chemicals,
- Their uses and manufacturing process.
- They should also know the physico-chemical principals involved in manufacturing process

3. Sugar and Fermentation Industry

(7 L)

- a. Sugar:** Introduction, manufacture of cane sugar, extraction of juice, purification of juice, Sulphitation and carbonation, evaporation, crystallization, separations of crystals, refining, grades, recovery of sugar from molasses, by-product of sugar industry,

Reference No.-1: Page No.1208- 1218

- b. Fermentation Industry:** Introduction, importance, conditions favorable for fermentation, Characteristics of enzymes, short account of some fermentation processes, Alcohol beverages, Manufacture of beer, manufacture of spirit, manufacture of wines, manufacture of vinegar, manufacture of power alcohol, ethyl alcohol from molasses.

Reference No.-1: Page No. 1176-1184

Aims and Learning objectives: The students are expected to learn

Sugar Industry: The students are expected to learn

- i. Importance of sugar industry,
- ii. Manufacture of direct iii. Consumption (plantation white) sugar with flow diagram.
- iii. Cane juice extraction by various methods,
- iv. Clarification by processes like carbonation, vi. Sulphitation, vii. Phosphatation, etc.
- v. Concentration of juice by using multiple effect evaporator system,
- vi. Crystallization of sucrose by using vacuum pan.

Fermentation Industry- The students are expected to learn

- i. Importance,
- ii. Basic requirement of fermentation process,
- iii. Manufacturing of ethyl alcohol by using molasses and fruit juice.

4. Soap and detergents

(8 L)

(a) Soap: Soap and Fatty Acids: Introduction, Chemistry, Manufacturing Technology, Raw Materials, Functional Properties of Soap, Manufacturing Processes, Saponification Reactor, Cooling, Soap Separator, Soap Extraction, Centrifugation, Neutralization, Direct Neutralization, Carbonate Neutralization, Partial Neutralizing with Soda Ash, Carbon Dioxide Separation, Raw Material Dosing, Caustic Soda, Completion of Neutralizing with Caustic Soda, Neutralization Soap Viscosity,

Reference-5: 980-997, Reference-1: 1243 -1250

- (b) Detergents: Synthetic Detergents: Introduction, Characteristic Features of Surfactants, Raw Materials for Surfactant Production, intermediates for Surfactant Production, Anionic Surfactants, Non-ionic Surfactants, Amphoteric Surfactants, Cationic Surfactants, Detergent Additives, Production of Synthetic Detergents, and Washing action of soap and detergents.



Reference-5: 1006-1029, Reference-1: 252 – 1279

Aims and Learning objectives: The students are expected to learn

- i. Different types of soap products,
- ii. Chemistry of soap.
- iii. Raw materials required for soap manufacture
- iv. Meaning of the term's Surfactants, Types of surfactants
- v. Raw materials for detergents
- vi. Detergent builders, additives
- vi. Washing action of soap and detergents



5. Dyes and Pigments

(8 L)

(a) Dyes: Introduction, qualities of good dye, Colour constituents (Chromophore, auxochrome), classification of dyes according to their application, Synthesis and uses of following dyes: Nitroso dye-martius yellow, Azo dyes-Methyl orange and aniline yellow, Triphenylmethane dye-Crystal violet, Phthalein dye - Phenolphthalein, Xanthane-Fluorescein, Antha-quinnoe-Alizarin and Indigo dyes - Indigo.

Reference -1: pp 1545-1595

(b) Pigments: Introduction, classification and general properties of pigments.

Inorganic pigments:

- i) Zinc oxide pigments (Fundamentals and properties, Raw materials, Direct process (American process), Precipitation process)
- ii) Iron oxide pigments (Fundamentals and properties, Production of iron oxide pigment by precipitation process),

Reference-9: 80-87, 97 to 109.

Aims and Learning objectives: The students are expected to learn

Dyes - Students should know about

- i. Dyes: introduction,
- ii. Dye intermediates,
- iii. Structural features of a dye;
- iv. Classification of dyes,
- v. Synthesis, Structures, properties and applications of dyes

Pigments: Students should know about

- i. Introduction,
- ii. Classification and general properties of pigment
- iii. Production processes of zinc oxide and iron oxide

References:

1. Industrial Chemistry, B. K. Sharma, Goel publishing House, 18th Ed. (2014)
 2. Riegeal's Hand book of industrial chemistry, James A. kent. 9th Ed. CBS publishers
 3. Advanced Inorganic Chemistry, Satyaprakash, Tuli, Basu pages 458-463.
 4. Advanced Inorganic Chemistry, Satyaprakash, Tuli, Basu pages 830-849
 5. Handbook of Industrial Chemistry and Biotechnology, James A. Kent, Tilak V. Bommaraju, Scott D. Barnicki, Thirteenth Edition, Springer.
 6. Inorganic Pigments by Gerhard Pfaff, Publisher-De Gruyter, 1st Ed.
 7. Shreeve's chemical process industries 5th Edition, G.T. Austin, TATA McGraw-Hill Edition, chemical engineering series
 8. Industrial Chemistry, Part-II, R. K. Das, Kalyani Publisher, Second Ed.
 9. Inorganic Pigments by Gerhard Pfaff, Publisher-De Gruyter, 1st Ed.
- www.wikipedia.org/wiki/copyright_act_of1976 , www.wikipedia.org/wiki/patentact and www.wikipedia.org/wiki/trademark

Industrial visit:

Visit to any one of the Chemical / Pharmaceutical / Polymer / Research Institutes / Sugar Factories / waste water treatment plant, etc. is essential and a systematic report is to be submitted by the student to the Department of Chemistry.

DSEC-II: CH-506: Inorganic Chemistry Practical - I**[Credit -2, 73 L]**

Total 12 experiments to be completed.

A. Gravimetric estimations (Any 3)

1. Gravimetric estimation of Fe as Fe₂O₃. Ref-1: 457
2. Gravimetric estimation of Ba as BaSO₄ using homogeneous precipitation method. Ref-1: 448
3. Gravimetric estimation of Nickel as Ni – DMG. Ref-1: 462
4. Analysis of sodium bicarbonate from mixture by thermal decomposition method. Ref.-6
5. Determination of water of crystallization by thermal decomposition. Reference-5
6. Analysis of Food/Pharmaceutical sample for ash and sulphated ash example-Aspirin, Ref. -2.

B. Inorganic preparations (Any 3) (Ref-7, 8, 9)

Preparation of inorganic complexes and spot tests for metal ions and ligands:

1. Preparation of hexamminenickel(II) chloride, [Ni (NH₃)₆]Cl₂.
2. Preparation of Potassium trioxalatoferrate(III), K₃[Fe(C₂O₄)₃].
3. Preparation of Manganese (III) acetylacetonate, [Mn(acac)₃].
4. Preparation of tris(glycinato)nickelate(II), [Ni(gly)₃]⁻
5. Preparation of Potassium dioxalatocuprate(II), [Cu(C₂O₄)₂]²⁻.

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C. Inorganic Qualitative Analysis (6 Expts.)

1. Inorganic Qualitative analysis (5 mixtures) [1 simple water soluble mixture, 2 mixtures containing borates and 2 mixtures containing phosphates]

(DST manual green chemistry monograph procedure must be followed strictly) Ref.-4

2. Limit test for iron, chloride and sulphate from pharmaceutical raw materials. Ref.-2; pp - 220

OR

2. Qualitative and confirmatory tests of inorganic toxicants of any four ions (Borate, copper, hypochlorite or nitrate or nitrite, Sb or Bi, Iodate, H_2O_2). Reference-3

References:

1: Vogel's textbook of Inorganic Quantitative Analysis, Jeffery, Basset, Mendham Deney, 5th Ed, Longman Scientific Technical, USA (copublished with John Wiley Sons)

2: Indian Pharmacopoeia, Vol-2; 2007

3: Basics of Analytical toxicology, World Health Organization

4: Green Chem - [PDF Document] – FDOCUMENTS; (<https://fdocuments.in/document/green-chem.html>)

5: <https://www.studocu.com/ec/document/universidad-de-investigacion-de-tecnologia-experimental-yachay/fisica-matematica/otros/the-gravimetric-analysis-of-barium-chloride-hydrate/8364963/view>

6: https://effectiveness.lahc.edu/academic_affairs/sfcs/chemistry/Shared%20Documents/Decomposing%20Baking%20Soda.pdf

7: Experimental Inorganic Chemistry, Mounir A. Malati, Horwood Series in Chemical Science (Horwood Publishing, Chichester) 1999.

8: Experiments in Chemistry, D. V. Jahagirdar, Himalaya Publishing House

9: Journal of chemical education: Synthesis of cis- $Cu(gly)_2$ Trans- $Cu(gly)_2$ and cis- $ni(gly)_2H_2O$ and their characterization using thermal and spectroscopic technique – a Capstone laboratory experiment.

Structure of Practical Examination [35 Marks; Time: 3 hours]

Q1. Gravimetric estimation/Inorganic preparation/Inorganic Qualitative analysis.... 30 M

Q2. Viva-Voce 05 M


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Savitribai Phule Pune University
T.Y.B.Sc. (Computer Science) - Sem - VI
Course Type: SECC - IV Course Code: CS - 3611
Course Title : Project

Teaching Scheme 03 Lect/ week/Batch Batch Size : 20	No. of Credits 2	Examination Scheme IE : 15 marks UE: 35 marks
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Project Guidelines:

- Students should work in a team of minimum 3 and maximum 4 students.
- Students can choose a project topic and implement the same using any language/technology covered in the curriculum so far. The operating environment must be linux.
- The student group will work independently throughout the project work including: problem identification, information searching, literature study, design and analysis, implementation, testing, and the final reporting.
- Project guide must conduct project presentations (minimum 2) to monitor the progress of the project groups.
- At the end of the project, the group should prepare a report which should conform to international academic standards. The report should follow the style in academic journals and books, with clear elements such as: abstract, background, aim, design and implementation, testing, conclusion and full references, Tables and figures should be numbered and referenced to in the report.
- The final project presentation with demonstration (UE) will be evaluated by the project guide (appointed by the college) and one external examiner (appointed by the University).

Recommended Documentation contents:

Abstract

Introduction

- motivation
- problem statement
- purpose/objective and goals
- literature survey
- project scope and limitations

System analysis

- Existing systems
- scope and limitations of existing systems
- project perspective, features
- stakeholders
- Requirement analysis - Functional requirements, performance requirements, security requirements etc.

System Design

- Design constraints
- System Model: Using OOSE
- Data Model
- User interfaces

Implementation details

- Software/hardware specifications

Outputs and Reports Testing

- Test Plan, Black Box Testing or Data Validation Test Cases, White Box Testing or Functional Validation Test cases and results

Conclusion and Recommendations

Future Scope

Bibliography and References

Project Related Assignments

Guidelines:

- The project assignments are a compulsory part of the project course and should be carried out by each project group.
- Project assignments are to be given by the guide for continuous internal evaluation.
- The project assignments are to be allotted to each group separately by the project guide on the basis of the implementation technology. A suggested list of assignments is given below.
 1. Project Time management: plan (schedule table), Gantt chart, Roles and responsibilities, data collection, Implementation
 2. Simple assignments to evaluate choice of technology
 3. Assignments on UI elements in chosen technology
 4. Assignments on User interfaces in the project
 5. Assignments on event handling in chosen technology
 6. Assignments on Data handling in chosen technology
 7. Online and offline connectivity
 8. Report generation
 9. Deployment considerations
 10. Test cases
- Each student within the group must work actively and contribute to the assignments, project work and report writing.

Evaluation guidelines:

IA (15 marks)			UE (35 marks)		
First presentation	Second presentation	Assignments	Project Logic/ Presentation	Assignments and Project Documentation	Viva
05	05	05	20	10	05