# SILVER OAK UNIVERSITY

## College of Technology

**Bachelor of Technology**

**Information Technology**

**Course Name: Problem Based Learning-I**

**Course Code:1010003391**

**Semester:5th**

## Prerequisite:

Basics of Engineering Science

## Course Objectives:

1. Problem based learning (PBL) is an instructional approach where students learn by solving challenging, open-ended problems. The problems are authentic tasks and are solved in socially and contextually based teams of students.
2. Problem based learning (PBL) is a style of learning in which the problems act as the context and driving force for learning.
3. The students rely on their current knowledge of the problem, identify the "information they need to know to solve the problem, and the strategies they use to solve the problem".
4. All learning of new knowledge is done within the context of the problems. In Problem based learning, the problems are encountered before all the relevant knowledge has been acquired and solving problems results in the acquisition of knowledge and problem- solving skills.

## Teaching Scheme:

| Teaching Scheme | | | | |
|---|---|---|---|---|
| L | T | P | Contact Hours | Credit |
| 0 | 0 | 2 | 2 | 1 |

## Contents:

| Unit | Topics | Teaching Hours | Weightage % |
|---|---|---|---|
| 1 | **Understanding the Concept of Problem Based Learning** Work through the orientation materials, Read the syllabus, course calendar, and course requirements information, Post an introductory message. | 4 | 10 |
| 2 | **Identify the Problem Based Learning** Review of the Standards-Focused Problem Based Learning Model, Review of sample problems, Discussion and assignment. | 4 | 10 |
| 3 | **Module 1: Begin with the End in Mind** Work through all portions of the module, Discussion and assignment. | 4 | 10 |
| 4 | **Module 2: Craft the Driving Question** Work through all portions of the module, Discussion and assignment. | 4 | 10 |
| 5 | **Module 3: Map the Problem** Work through all portions of the module, Discussion and assignment. | 4 | 10 |
| 6 | **Module 4: Map the Problem** | 4 | 10 |

| | | | |
|---|---|---|---|
| | Work through all portions of the module, Discussion and assignment. | | |
| 7 | **Develop a PBL Unit: Part #1 (report / (presentation)**<br>Work independently on unit | 8 | 20 |
| 8 | **Final Review of Problem**<br>Complete and submit PBL unit evaluation form for self and peer(s). | 4 | 20 |

## Course Outcomes:

| Sr. No. | CO Statement | Unit |
|---|---|---|
| **CO-1** | Describe the Appropriate Problem Statement based on the area of interest and as per the market requirement. | 1,2,3 |
| **CO-2** | Generate the Solution with the Proposed Problem Statement. | 4,5 |
| **CO-3** | Build the Mathematical Model and/or Prototyping of Problem Based Learning. | 6 |
| **CO-4** | Develop one research paper on the basis of the proposed Problem Statement (Students Problem Based Learning concept must be showcased in Techfest / Project Exhibition / Other Competitions) | 6,7 |
| **CO-5** | Verify their project/problem model / Test report with standard testing lab / research lab/any other manner. | 7 |
| **CO-6** | Identify the Future Scope or Research Scope of Problem Based Learning. | 7,8 |

## Teaching & Learning Methodology:

The various methods or tools to teach the above subject:

1. Lectures with discussions, question and answer sessions, informal quizzes, video sessions where students have an opportunity to clear concepts and doubts
2. E – Resources for the virtual learning environment. Practical sessions for developing skills which are required in occupation
3. Occasional Flipped classroom exercise for students for development of presentation skills.

## List of Experiments: Total Hours: 28

| Sr. No. | Practical Name |
|---|---|
| 1 | Smart Campus – Resource Availability / Voice based Assistance of Library / Smart Attendance System / Smart Transportation / Parking Slots / Canteen / Clubs. |
| 2 | Water Harvesting - Purification and Generation / Rechargeable Ground Water / Water Conservation / Clean Water and Sanitation |
| 3 | Noise/Air Pollution – Sustainable Cities and Communities / Global Warming / Organizations / On Roads / Public Places |
| 4 | Social Awareness – 100 % Literate Campus / Tobacco free Campus / 0 Accidental Zone / Fire Safety Educational Awareness Programs |
| 5 | Holistic, Culture, Education |
| 6 | Entrepreneurship |
| 7 | Community based issues |
| 8 | Policy |
| 9 | Environmental |
| 10 | Child Developments |
| 11 | NSS and NCC based topics |
| 12 | Heritage |
| 13 | No Poverty |

| | |
|---|---|
| 14 | Zero Hunger |
| 15 | Good Health and Well-Being |
| 16 | Gender Equality |
| 17 | Decent Work and Economic Growth |
| 18 | Reduced Inequality |
| 19 | Responsible Consumption and Production |
| 20 | Peace, Justice and Strong Institutions. |

## Books Recommended:


1. John F. Barell “Problem-Based Learning: An Inquiry Approach”.
2. José A. Amador (Author), Libby Miles (Author), Calvin B. Peters (Author) “The Practice of Problem-Based Learning: A Guide to Implementing PBL in the College Classroom”.
3. Dr. Wendy J. Flint,” Problem-based Learning: Welcome to the "Real World": A Teaching Model for Adult Learners”
4. Barbara J. Duch (Editor), Susan E. Groh (Editor), Deborah E. Allen (Editor),” The Power of Problem-Based Learning”
5. Diane L. Ronis (Author),” Problem-Based Learning for Math & Science: Integrating Inquiry and the Internet”
6. David Boud (Author), Grahame Feletti, “The Challenge of Problem Based Learning”.


## List of Open-Source Software/learning website:

1. https://my.pblworks.org/resources
2. https://www.hunschool.org/resources/problem-based-learning
3. https://www.advance-he.ac.uk/knowledge-hub/problem-based-learning-uk-physical-sciences-subject-centre
4. https://www.ucd.ie/t4cms/Problem-based%20Learning%20Module%20Handbook.pdf
5. https://onlinelibrary.wiley.com/doi/pdf/10.1046/j.1365-2923.1997.00671.x
6. https://www.researchgate.net/publication/260795623_The_Effects_of_Problem_Based_Learning _on_Self_Directed_Learning_Skills_among_Physics_Undergraduate
7. https://www.en.aau.dk/digitalAssets/66/66555_pbl_aalborg_modellen-1.pdf
8. https://files.eric.ed.gov/fulltext/EJ1112940.pdf

## CO-PO-PSO Matrix:

| Co. No. | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO-1** | 2 | 2 | 3 | 1 | 1 | 1 | | | 1 | 2 | 2 | 3 | 2 | |
| **CO-2** | 1 | 1 | 1 | | | | | | 2 | 1 | 1 | 2 | 3 | 1 |
| **CO-3** | 1 | 2 | | | | | | | 2 | 1 | | 1 | 2 | 2 |
| **CO-4** | | | 3 | 2 | | 1 | 1 | | 3 | 1 | 3 | 2 | 2 | 1 |
| **CO-5** | | | | | | | | 2 | 3 | 2 | 3 | 2 | 2 | 2 |
| **CO-6** | 1 | | | | | | | | 1 | 2 | 3 | 2 | 3 | 1 |