## Course Booklet Information

<table>
<thead>
<tr>
<th>SI No</th>
<th>Particulars</th>
<th>Information to be filled</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Course Picture/Logo</td>
<td><img src="image" alt="Course Picture/Logo" /></td>
</tr>
</tbody>
</table>
| 2.    | Course Coordinator and other Team Members Name    | Dr. Indrajit Saha (Course Coordinator)  
Dr. Sagarika Pal  
Dr. Kinsuk Giri  
Dr. Arpan Kumar Mondal |
| 3.    | Brief profile of the Course Coordinator and other Team Members | Dr. Indrajit Saha is a faculty member in the department of Computer Science and Engineering, NITTTR, Kolkata. He received his Ph.D degrees in Computer Science and Engineering and Bioinformatics from Jadavpur University, India and Polish Academy of Sciences, Poland. He has co-authored of more than 50 research papers in various International Journals and Conferences. Currently, he is a Principal Investigator of a bilateral project between India and Poland funded by DST, India on Breast Cancer research. His research interest includes Education Technology, Computational Intelligence, Computational Biology, Machine Learning, Image Processing and Pattern Recognition.  
Dr. Sagarika Pal is a faculty member in the Department of Electrical Engineering and her area of interest includes Sensors, Measurement, Process Control, Mechatronics, PLC and Automation. She graduated in Instrumentation Engineering and received her post graduate degree with specialization in Measurement and Instrumentation from the University of Calcutta. She was awarded doctoral degree in Engineering from Jadavpur University, Kolkata. She has published more than 40 papers in various National, International Journals and Conference Proceedings and is a life member of Institution of Engineers (India), Forum of Scientists, Engineers and Technologists (FOSET) and IEEE. |
Dr. Kinsuk Giri is an Assistant Professor in the Department of Computer Science and Engineering, NITTTR, Kolkata. He was awarded Ph.D. (Science) in 2013 in Numerical and Computational Astrophysics from S. N. Bose National Centre for Basic Sciences, Kolkata. After his PhD, Dr. Giri joined as a MOST Postdoctoral Fellow at National Tsing Hua University, Taiwan. During his research and academic career, he published 30+ papers in reputed international journals and conferences and has made several academic visits to Italy, Sweden, Russia, Japan, France, Taiwan, China, Turkey, Nepal.

Dr. Arpan Kumar Mondal is a faculty member in the Department of Mechanical Engineering, NITTTR, Kolkata. He has done his doctoral study in Mechanical Engineering at Indian Institute of Technology Guwahati. He has many publications in reputed International Journals and Conferences. His areas of interests include Technical Education, Computational Welding Mechanics, Application of optimization in manufacturing, Composites and Bio-materials for artificial implants.

<table>
<thead>
<tr>
<th>4. Course Coordinator and other Team Members Designation &amp; Affiliation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. I. Saha, Assistant Professor, Department of Computer Science and Engineering, National Institute of Technical Teachers’ Training and Research, Kolkata</td>
</tr>
<tr>
<td>Dr. S. Pal, Assistant Professor, Department of Electrical Engineering, National Institute of Technical Teachers’ Training and Research, Kolkata</td>
</tr>
<tr>
<td>Dr. K. Giri, Assistant Professor, Department of Computer Science and Engineering, National Institute of Technical Teachers’ Training and Research, Kolkata</td>
</tr>
<tr>
<td>Dr. A. K. Mondal, Assistant Professor, Department of Mechanical Engineering, National Institute of Technical Teachers’ Training and Research, Kolkata</td>
</tr>
</tbody>
</table>
### 5. Course Coordinator and other Team Members Picture

Dr. I. Saha  
Dr. S. Pal  
Dr. K. Giri  
Dr. A. K. Mondal

### 6. Objective of the course

After successful completion of the course the participants will be able to:
- Explain the basic concept of problem based learning strategies in classroom
- Identify the implementation issues involved in problem based learning
- Solve problems in Science and Engineering
- Explain the strategies for assessment and evaluation in problem based learning

### 7. Type of Course

<table>
<thead>
<tr>
<th>Course Type</th>
<th>Certificate</th>
</tr>
</thead>
</table>

### 8. Intended Audience:

- Faculty members of Technical Institution

### 9. No of Credits

| Credits | 2 |

### 10. Course Duration

| Duration | 8 weeks |

### 11. Start date & End date of the Course

| Date       | 10/12/2018 to 01/02/2019 |

### 12. Course Plan

**Week 01:**
- Module 1: Introduction to Problem Based Learning
  - Traditional vs. Cognitive Learning
  - Behavioural Learning
  - Cognitive Learning
  - Constructivist Learning
  - Why PBL?

**Week 02:**
- Module 2: Implementation Issues in Problem Based Learning
  - Introduction to Implementation Issues in PBL
  - Factors Not Limited To Tutorial Room
  - Role of Tutors
  - Role of Students

**Week 03:**
- Module 3: Developing Problems and Tutorial Process
  - Principles of Problem Design
  - Seven Steps of Problem Design
  - PBL Tutorial Process
  - PBL Curriculum
  - Online PBL
Week 04:--
Module 4: Assessment and Evaluation
Introduction to Assessment and Evaluation
Components of Assessment and Evaluation in PBL
Different forms of Assessment in PBL
Characteristics of assessment and evaluation in PBL
Grading Criteria in PBL

Week 05:--
Module 5: PBL Applications and Research Trends
Case Study in Computer Science and Engineering

Week 06:--
Module 5: PBL Applications and Research Trends
Case Study in Electrical Engineering

Week 07:--
Module 5: PBL Applications and Research Trends
Case Study in Mathematical Science

Week 08:--
Module 5: PBL Applications and Research Trends
Case Study in Mechanical Engineering

13. Pre-requisites:-
Pre-requisites of the course.
Any teacher or potential teacher of technical institution may enrol for the programme

14. Exam Date:-
It will be after completion of each module

15. Learning outcome

Module 1
1. Explain Instruction, Learning and their relationship
2. Describe the Behavioural, Cognitive, Constructivist Learning Theories
3. Explain PBL History, Objectives, Benefits and Disadvantages
4. Describe Different Types of PBL Taxonomy

Module 2
1. Identify the basic issues of implementation of PBL
2. Explain the role of the different stakeholders involved in PBL process
3. Identify factors involved outside the PBL classroom
4. Identify the characteristics of good tutor
5. Describe the skills required for tutoring in PBL
6. Identify the characteristics of student in PBL
7. Describe the skills required for students in PBL classroom
Module 3
1. Identify the characteristics of good problems
2. Design good problems
3. Identify the possible sources of problems
4. Explain seven basic steps for problem designing
5. Describe the PBL tutorial process
6. Explain problem based learning curriculum
7. Describe the different modes of PBL curriculum
8. Explain modes of online PBL and its pros and cons

Module 4
1. Explain the basic concepts of Assessment and Evaluation
2. Explain how to plan for assessment in PBL
3. Describe different forms of assessment in PBL
4. Identify the characteristics of evaluation tools in PBL
5. Explain the grading criteria for PBL

Module 5
1. Identify the steps for PBL method design and implementation
2. Create a problem scenario according to learning objectives mentioned in the curriculum
3. Motivate the student to identify the problem
4. Guide the students to understand the steps necessary for analysing the problem
5. List the topics for knowledge building associated with the problem
6. Guide the students to be able to clarify the quarries generated while solving the problem
7. Validate the knowledge developed by the student in the learning environment