COURSE TITLE	**CREATIVITY PROBLEM SOLVING AND INNOVATION**
COURSE CODE	**01ME0406**
COURSE CREDITS	**1**

Objective:

1 To develop creative thinking skill in the students using cone of learning components leading to understanding of various strategies for creativity, problem solving and innovation.

Course Outcomes: After completion of this course, student will be able to:

1 Importance of creativity, problem solving and innovation while addressing science, engineering and social issues

2 Demonstrate the ability to contextualize knowledge related to professional engineering practices

3 Demonstrate the functioning effectively as an individual and team member

4 Ability to engage in life-long learning in the context of technological change

Pre-requisite of course: Nil

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
0	0	2	0	30	0	20	0

Contents : Unit	Topics	Contact Hours
Total Hours		

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	**Phase 1** To introduce the subject of the course: this course as a needed skill for your future. Psychology of problem solving; Vertical versus Lateral thinking	2
2	**Phase 2** Strategy of Questioning; Method of questioning; Importance of asking the right question. Who, what, when, where, why, how?	2
3	**Phase 3** Learning and its importance; Sources of learning; Methods of learning. Purpose and value of education in future creativity in real life.	2

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
4	**Phase 4** Strategy of Knowing how to see; Making your thought visible; Visualizing thinking; Mapping of mind, Fishbone diagram.	2
5	**Phase 5** Strategy of Thinking Fluency; Generating all possibilities; more the better; Quantity without screening is helpful; SCAMPER technique; Creative or divergent idea generating thinking versus Critical or convergent idea selection thinking.	2
6	**Phase 6** Strategy of Fusing of ideas; Making novel combinations; Connecting the unconnected.	2
7	**Phase 7** Strategy of Looking at the other side, looking in other world, finding what you are not looking for and following it up.	2
8	**Phase 8** Strategy of Play, Importance of play; Diversion; Unstructured activities for sheer joy, Activities for joy, Let subconscious figure it out, Various puzzles as play or fun.	2
9	**Phase 9** Strategy of Awakening the collaborative spirit, Collaborative thinking, brain storming, Innovation requires collaboration to make it happen.	2
10	**Phase 10** Review Strategies for Creative problem solving methods, Five building blocks as per Fogler & LeBlanc, Stanford D school approach.	2
11	**Phase 11** Strategy for critical thinking for Choosing, Creative or divergent thinking needs follow up by Critical thinking or Convergent thinking in order to choose the solution for implementation, Kepner-Tregoe (K.T.) method with an example, Edward De Bono CoRT thinking process including PMI (Plus, Minus and Interesting), Also Edward de Bono method of decision making called Six thinking hats.	2
12	**Phase 12** Edward de Bono explaining and teaching his ideas having evolved many years ago consisting as CoRT thinking tool, Lateral thinking and the decision making by Six thinking hats method.	2
13	**Phase 13** Strategy for Making; From idea to innovation.	2
14	**Phase 14** Individual presentation	2
Total Hours		**28**

Textbook :

1 Zig Zag, The surprising path to greater creativity, R. Keith Sawyer, willey, 2013

2 Creative Confidence: Unleashing the Creative Potential Within Us All, Tom Kelly and David Kelly, Crown Publishing Group, 2013

References:

1 The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail, The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail, Clayton M. Christensen, Harvard Business Review Press, 2016

2 Thinking, Fast and Slow, Thinking, Fast and Slow, Daniel Kahneman, Farrar, Straus and Giroux, 2011

3 Creativity, Inc.: Overcoming the Unseen Forces That Stand in the Way of True Inspiration, Creativity, Inc.: Overcoming the Unseen Forces That Stand in the Way of True Inspiration, Ed Catmull and Amy Wallace, Random House, 2014

4 Creative problem solving An Introduction, Creative problem solving An Introduction, Donald J. Treffinger, Scott G Isaksen and K. Brian Stead Dorval, Taylor and Francis, 2006

5 The Myths of Innovation, The Myths of Innovation, Scott Berkun, O'reilly, 2010

Suggested Theory Distribution:

The suggested theory distribution as per Bloom’s taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery					
Remember / Knowledge	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Higher order Thinking / Creative**
10.00	10.00	20.00	20.00	20.00	20.00