B. Tech. Semester VI

Subject Name: Research and Innovation **Subject Code:** BTMD17608

Type of course: Mandatory

Teaching and Examination Scheme:

Teaching Scheme				Theory Marks			Practical Marks		Total
L	T	P	C	TEE	CA1	CA2	TEP	CA3	100
1	0	0	0	60	25	15	--	--	

Content:

Sr. no.	Topics	Teaching Hours
1.	**Introduction to Research** Meaning of research problem, Sources of research problem, Criteria and Characteristics of a good research problem, Errors in selecting a research problem, Scope and objectives of research problem. Approaches of investigation of solutions for research problem	3
2.	**Literature Survey & Data Collection** Sources of literatures, Effective literature studies approaches, Data collection, analysis, interpretation, Plagiarism analysis, Research ethics	3
3.	**Innovation & Creativity** **Innovation:** Meaning, Concept, Characteristics, Importance, Principles of Innovation, Process of Innovation. **Creativity:** Meaning, Concept, Importance, Creativity Process, Hurdles To Creativity	3
4.	**Tools for Innovation** Creativity Thinking: Traditional V/S Creative Thinking, Individual Creativity Techniques	2
5.	**Intellectual Property** Patents, Designs, Trademark and Copyright. Process of Patenting and Development, Procedure for grants of patents, Scope of Patent Rights. Licensing and transfer of technology. Patent information and databases. Geographical Indications.	2
6.	**Technical Writing and Publishing** Effective technical writing, how to write report, Paper, Develop a Research Proposal Format, Creating technical Poster writing, Presenting and Publishing the Research Findings	2

Reference Text Books:

Sr. No.	Title of book /article	Author(s)	Publisher and details like ISBN	Year of publication	Publication Edition
1.	Research Methodology: A Practical and Scientific Approach	VinayakBairagi, Mousami V. Munot	CRC Press	2018	First
2.	Research Methodology: A Step by Step Guide for beginners	Ranjit Kumar	Sage Publication	Latest	Latest
3.	Innovation Management & New Product Development	Paul Trott	Pitman	2000	First

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
30	**30**	**20**	**10**	**10**	-

Legends: R: Remembrance, **U:** Understanding; **A:** Application, **N:** Analyze, **E:** Evaluate **C:** Create and above Levels.

CO1	Formulate research problems for investigation
CO2	Conduct a survey and identify fruitful innovative model options for solution
CO3	Evaluate different design solutions for a problem
CO4	Identify potential for intellectual property rights in real life application problems
CO5	prepare technical proposals and publications of same

Mapping with POs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1*	PSO 2*	PSO 3*
CO-1	1	3	-	2	-	-	-	-	1	1	1	3	2	2	2
CO-2	-	3	-	3	3	1	-	2	2	2	2	2	2	3	2
CO-3	-	2	-	3	1	1	2	-	2	-	3	1	2	2	3
CO-4	-	1	3	1	-	-	2	1	1	3	2	2	1	2	3
CO-5	-	-	1	2	-	2	1	-	2	1	1	2	2	2	2
Rationale	1	9	4	11	4	4	5	3	8	7	9	10	9	11	12

***PSOs are department specific, so kindly change contents as per department PSOs.**