



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad -500 043

MASTER OF BUSINESS ADMINISTRATION

COURSE DESCRIPTOR

Course Title	MANAGEMENT OF TECHNOLOGY			
Course Code	CMBB06			
Programme	MBA			
Semester	I			
Course Type	Core			
Regulation	IARE - R18			
Course Structure	Lectures	Tutorials	Practical Work	Credits
	4	-	-	4
Chief Coordinator	Mr. M.R.S. Surya Narayana Reddy Assistant Professor, MBA			
Course Faculty	Mr. M.R.S. Surya Narayana Reddy Assistant Professor, MBA			

I. COURSE OVERVIEW:

The present course is designed in such a way that it gives an overview of concepts of Management of technology. The aim of this course is to help students develop a strong conceptual foundation for managing technological innovation. It introduces concepts and frameworks for analyzing how firms can create, commercialize and capture value from technology-based products and services. Particular consideration is given to the forces affecting the nature and rate of technological innovation and the managerial options available to both established and entrepreneurial organizations.

II. COURSE PRE-REQUISITES:

Level	Course Code	Semester	Prerequisites
-	-	-	-

III. MARKSDISTRIBUTION:

Subject	SEE Examination	CIA Examination	Total Marks
Management of Technology	70 Marks	30 Marks	100

IV. DELIVERY / INSTRUCTIONAL METHODOLOGIES:

✓	Chalk & Talk	✗	Quiz	✓	Assignments	✗	MOOCs
✓	LCD / PPT	✓	Seminars	✗	Mini Project	✓	Videos
✗	Open Ended Experiments						

V. EVALUATION METHODOLOGY:

The course will be evaluated for a total of 100 marks, with 30 marks for Continuous Internal Assessment (CIA) and 70 marks for Semester End Examination (SEE). Out of 30 marks allotted for CIA during the semester, marks are awarded by taking average of two CIA examinations or the marks scored in the make-up examination.

Semester End Examination (SEE): The SEE is conducted for 70 marks of 3 hours duration. The syllabus for the theory courses is divided into five units and each unit carries equal weightage in terms of marks distribution. The question paper pattern is as follows. Two full questions with “either” or “choice” will be drawn from each unit. Each question carries 14 marks. There could be a maximum of two sub divisions in a question.

The emphasis on the questions is broadly based on the following criteria:

50 %	To test the objectiveness of the concept.
50 %	To test the analytical skill of the concept OR to test the application skill of the concept.

Continuous Internal Assessment (CIA):

For each theory course the CIA shall be conducted by the faculty/teacher handling the course as given in Table 4. CIA is conducted for a total of 30 marks, with 25 marks for Continuous Internal Examination (CIE) and 05 marks for Alternative Assessment Tool (AAT).

Table 1: Assessment pattern for CIA

Component	Theory		Total Marks
	CIE Exam	Alternative Assessment Tool(AAT)	
CIA Marks	25	05	30

Continuous Internal Examination (CIE):

Two CIE exams shall be conducted at the end of the 9th and 18th week of the semester respectively. For Theory Courses, during a semester there shall be two midterm examinations. The midterm examination shall be in two parts, i.e., Part ‘A’ and Part ‘B’ with duration of 2 hours. Part ‘A’ of the question paper shall be compulsory and will consist of 5 questions, each question carries one mark. At least one question should be given from each of the units. In part ‘B’ four out of five questions have to be answered where, each question carries five marks.

Alternative Assessment Tool (AAT):

In order to encourage innovative methods while delivering a course, the faculty members have been encouraged to use the Alternative Assessment Tool (AAT). This AAT enables faculty to design own assessment patterns during the CIA. The AAT enhances the autonomy (freedom and flexibility) of individual faculty and enables them to create innovative pedagogical practices. If properly applied, the AAT converts the classroom into an effective learning center. The AAT may include seminars, assignments, term paper, report writing, micro-projects, five minutes video, Massive Open Online Courses (MOOC) etc. However, it is mandatory for a faculty to obtain prior permission from HOD and spell out the teaching/assessment pattern of the AAT prior to commencement of the class work.

VI. HOW PROGRAM OUTCOMES ARE ASSESSED:

Program Outcomes (POs)		Strength	Proficiency assessed by
PO1	Managerial Skills: Apply knowledge of management theories and practices to solve business problems.	2	Assignments

Program Outcomes (POs)		Strength	Proficiency assessed by
PO4	Communication Skills: Ability to understand, analyze and communicate global, economic, legal and ethical aspects of business	2	Assignments
PO7	Strategic analysis: Ability to conduct strategic analysis using theoretical and practical applications	3	Seminars
PO8	Technology Skills: Inculcate and develop technical skills to face the competitive world successfully.	3	Seminars

3 = High; 2 = Medium; 1 = Low

VII. COURSE OBJECTIVES :

The course should enable the students to:	
I	Develop the ability to design innovation strategies that can successfully take advantage of innovation opportunities
II	Able to examine the patterns and sources of technological change and the mechanisms for capturing the economic benefits from innovation
III	Identify the strategic and organizational challenges involved in managing technological innovation.
IV	Explores the challenges, tools and principles involved in managing innovation and technology.

VIII. COURSE OUTCOMES (COs):

CO Code	CO's	At the end of the course, the student will have the ability to:	PO's Mapped	Strength of Mapping
CMBB06.01	CO1	Able to design and implement innovation strategies in organizations, corporate foresight and technology with the aim of detecting sources of competitive advantage for evaluating and selecting R&D proposals.	1,8	3
CMBB06.02	CO2	Examine product failures and try to understand the causes of product failures.	7	3
CMBB06.03	CO3	Understand the cost effectiveness in financial aspects of Research and Development in new product development	4	2
CMBB06.04	CO4	Identify the discounted cash flow techniques and other techniques for evaluating research and development projects.	1	2
CMBB06.05	CO5	Explain the need and importance of research and development in new product development.	1,4	2
CMBB06.06	CO6	Able to manage innovation activities (new product and process development) for decision making, management and early cancellation.	8	3
CMBB06.07	CO7	Understand the major forecasting tools and techniques tools that are used in technological forecasting to know the current status.	1,8	3
CMBB06.08	CO8	Explain the role of technological forecasting and examine technology role in decision making with regard to technological issues.	8,7	3
CMBB06.09	CO9	Why should company go in for technology transfer to manufacture a new product or implementing a new product?	8,1	3

CMBB06.10	CO10	Utilise high level interpersonal skills to negotiate and communicate effectively with both technical and non-technical stakeholders verbally and in writing skills.	4,1	2
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3 = High; 2 = Medium; 1 = Low

IX. MAPPING COURSE OUTCOMES LEADING TO THE ACHIEVEMENT OF PROGRAM OUTCOMES:

Cos	Program Outcomes (POs)			
	PO1	PO4	PO7	PO8
CO 1	2			3
CO 2			3	
CO 3		2		
CO 4	2			
CO 5	2	2		
CO 6				3
CO 7	2			3
CO 8			3	3
CO 9	2			3
CO 10	2	2		

3 = High; 2 = Medium; 1 = Low

X. ASSESSMENT METHODOLOGIES–DIRECT

CIE Exams	PO1,PO4, PO7, PO8.	SEE Exams	PO1,PO4, PO7, PO8.	Assignments	PO1, PO4	Seminars	PO7,PO8.
Laboratory Practices	-	Guest Lecture	-	Mini Project	-	Certification	-
Term Paper							

XI. ASSESSMENT METHODOLOGIES-INDIRECT

√	Early Semester Feedback	√	End Semester OBE Feedback
X	Assessment of mini projects by experts		

XII. SYLLABUS

UNIT– I	TECHNOLOGICAL INNOVATION
The need for a conceptual approach, technological innovation as a conversion process factors contributing to successful technological innovation. Strategies for research and development : research and development as a business, resource allocation to research and development, research and development strategy in the decision making process, selection and	

implementation of research and development strategy, research and development and competitive advantage, new product development techniques for Creative problem solving.	
UNIT-II	FINANCIAL EVALUATION OF RESEARCH AND DEVELOPMENT
Financial evaluation of research and development projects: the need for cost effectiveness, financial forecasts, risk as a factor in financial analysis, project selection formulae and allocation of resources, DCF and other techniques of evaluating research and development.	
UNIT-III	RESEARCH AND DEVELOPMENT
Program planning and control, portfolio planning, project planning and control, project termination, resource allocation and management. New product development: new product development as a competitive strategy, market research for developing new Products. Commercialization of research outcomes, industrial design, product architecture and design for manufacture, developing indigenous substitute for raw materials.	
UNIT-IV	TECHNOLOGICAL FORECASTING FOR DECISION MAKING
The definition of technological forecasting, forecasting, system inputs and outputs, classification of forecasting techniques, organization for technological, forecasting, current status.	
UNIT-V	TRANSFER OF TECHNOLOGY
Transfer of technology: modes of technology transfer, price of technology transfer, negotiation for price Of management of technology.	
Text books	
<ol style="list-style-type: none"> 1. Neelakantam Tatikonda, “ Management of Technology”, Excel Publications , New Delhi, 1st Edition, 2010. 2. Tarek Khalil, “Management of Technology, “The Key to Competitiveness and Wealth”, Tata McGraw Hill, Boston, 4th Edition, 2011. 3. V.K.Narayanan, “Managing Technology and Innovation for Competitive Advantage”, Pearson Education, 3rd Edition, 2007. 4. Norma Harison and Samson, “Technology Management Text and Cases”, Tata McGraw Hill, 4th Edition, 2011. 	
References	
<ol style="list-style-type: none"> 1. C.S.G.Krishnamacharyulu, “ Management of technology “ Himalaya Publications , 2nd Edition, 2010 2. Shane, “Technology Strategy for Managers and Entrepreneurs”, Pearson, 5th Edition, 2015. 3. Khandwala, “Corporate Creativity”, Tata McGraw Hill, 4th Edition, 2013. 4. Lucy C. Morse, Daniel L. Babcock, “Managing Engineering and Technology “, Pearson, 6th Edition, 2014. 	
Web References	
<ol style="list-style-type: none"> 1. http://www.change-management.com/Prosci-Defining-Change-Management.pdf 2. http://www.tcs.com/SiteCollectionDocuments/White%20Papers/EntSol-Whitepaper-Change- Management-Theories-Methodologies-0213-1.pdf. 	
E-Text Books	
<ol style="list-style-type: none"> 1. http://www.bookboon.com 2. http://www.freemagagement.com 3. http://www.emeraldinsight.com 4. http://www.nickols.us/four_strategies.pdf 5. http://ifcext.ifc.org/ifcext/spiwebsite1.nsf/0/00DB06A86B84D253852576BA000E2AF0/\$File/MoC%20Procedure.pdf 	

XIII. COURSE PLAN:

The course plan is meant as a guideline. Probably there may be changes.

Lecture No	Topics to be covered	Course Outcomes (COs)	Reference
1	Introduction to technological innovation	CO 1	T-1 p.g. 41-45, R-2 p.g 2-10
2-4	Factors contributing to successful technological innovation	CO 1	T-2p.g. 46-49, R-2p.g. 25-26
4-6	Strategies for research and development: Research and development as business	CO 1	T-1p.g.50 - 52, R-2p.g. 27-32
6-8	Resource allocation to research and development, and strategy in the decision making process	CO2	T-2 p.g. 173-175, R-2p.g. 33-35
8-10	Selecting and implementing of research and development strategy	CO2	T-2p.g. 180-184, R-2p.g. 48-58
11	Introduction to financial forecast	CO3	T-1p.g. 221-223, R-1p.g. 85-95
12	Research and Development Financial Forecasts	CO3	T-1p.g. 225-228, R-2p.g. 99-105
13	Working Capital requirement and financing	CO3	T-1p.g. 230-238, R-2p.g. 154-158
14-15	Financial models for project selection	CO4	T-1p.g. 245-249, R-2p.g. 155-198
16-20	Allocation of resources and Discounted cash flow techniques	CO4	T-1p.g. 250-259, R-2p.g. 116-125
21	Some other techniques of evaluating Research and Development Projects	CO4	T-1p.g. 260-273, R-2p.g. 105-145
22	Introduction to Research and Development	CO5	T-1p.g. 276-278, R-2p.g. 142-153
23	Types of research and development project portfolio	CO5	T-1p.g. 280-284, R-2p.g. 65-68
24	Research and development project planning	CO5	T-1p.g. 285-287, R-2p.g. 112-116
25	Tools of R&D project planning	CO5	T-1p.g. 289-292 R-1p.g. 117-125
26	Project termination and close out	CO5	T-1p.g. 296-298, R-2p.g. 214-225
27	Commercialization of research outcomes	CO6	T-1p.g. 299-302, R-2p.g. 198-215
28	Industrial designs	CO6	T-1p.g. 302-306, R-2p.g. 214-225
29	Product architecture and design for manufacturing	CO6	T-1p.g. 306-308, R-1p.g. 214-225
30	Developing indigenous substitute for raw materials	CO6	T-1p.g. 308-312, R-2p.g. 190-215,
31-32	Introduction to Technological forecasting	CO7	T-1p.g. 396-397, R-1p.g. 98-116
33	Technology forecasting process	CO7	T-1p.g. 404-407, R-2p.g. 216-235

Lecture No	Topics to be covered	Course Outcomes (COs)	Reference
34-35	Forecasting models	CO7	T-1p.g. 407-409, R-2p.g. 236-245
35-39	Classification of forecasting technology	CO8	T-1p.g. 409-410, R-1p.g. 235-245
40	Numeric data based technological forecasting	CO8	T-1p.g. 411-413, R-1p.g. 240-256
41-42	Trend exploration methods	CO8	T-2p.g. 414-416, R-1p.g. 235-256
43	Introduction technology forecasting	CO9	T-1p.g. 417-432, R-1p.g. 302-325
44	Classification of technology	CO9	T-1p.g. 436-437, R-2p.g. 215-223
45	Levels of technology transfer	CO9	T-1p.g. 437-439, R-1p.g. 216-225
46	Models of technology transfer	CO9	T-1p.g. 440-446, R-1p.g. 230-255
47	Price technology transfer	CO9	T-1p.g. 458-460, R-1p.g. 237-248
48-51	Negotiation for price of management technology	CO10	T-1 p.g.461-465, R-1p.g. 253-262
52	Organisations aspects of negotiations	CO10	T-1p.g. 467-469, R-1p.g. 295-305
53	General provisions of technology transfer	CO10	T-1p.g. 472-477, R-1p.g. 308-315

XIII. GAPS IN THE SYLLABUS - TO MEET INDUSTRY / PROFESSION REQUIREMENTS:

S NO	Description	Proposed actions	Relevance with POs
1	Study of technological innovation.	Seminars / Guest Lectures.	PO1, PO4, PO7
2	Historical reasons of R&D and new product development.	Seminars / Guest Lectures.	PO4, PO7, PO8

Prepared by:

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