Academic Course Description

BHARATH UNIVERSITY
Faculty of Engineering and Technology
Department of Mechanical Engineering

BBA007 - ENGINEERING ECONOMICS AND COST ANALYSIS
Eight Semester 2015 – 2016 – Even Semester

Course (catalog) description

To know about engineering economics and cost analysis.
Compulsory/Elective course   :   Elective course

Credit & contact hours   : 3 & 45

Course Coordinator   : Mr.Karthikeyan R
Instructors   :

Name of the instructor	Class handling	Office location	Office phone	Email (domain:@ bharathuniv.ac.in	Consultation
Mr.Karthikeyan R	Final Year Mech	JR106		Karthikeyanr.mech@bharathuniv.ac.in	9.00 to 9.50 am

Relationship to other courses:

Pre –requisites   **:** Economics

Assumed knowledge : To know the Economics and cost analysis.

Following courses   : Accountancy

Syllabus Contents
UNIT I INTRODUCTION TO ECONOMICS   8
Introduction to Economics- Flow in an economy, Law of supply and demand, Concept of Engineering Economics – Engineering efficiency, Economic efficiency, Scope of engineering economics- Element of costs, Marginal cost, Marginal Revenue, Sunk cost, Opportunity cost, Break-even analysis- V ratio, Elementary economic Analysis – Material selection for product Design selection for a product, Process planning.
UNIT II VALUE ENGINEERING   10
Make or buy decision, Value engineering – Function, aims, and Value engineering procedure. Interest formulae and their applications –Time value of money, Single payment compound amount factor, Single payment present worth factor, Equal payment series sinking fund factor, Equal payment series payment Present worth factor- equal payment series capital recovery factor-Uniform gradient series annual equivalent factor, Effective interest rate, Examples in all the methods.
UNIT III CASH FLOW   9
Methods of comparison of alternatives – present worth method (Revenue dominated cash flow diagram), Future worth method (Revenue dominated cash flow diagram, cost dominated cash flow diagram), Annual

equivalent method (Revenue dominated cash flow diagram, cost dominated cash flow diagram), rate of return method, Examples in all the methods.

UNIT IV REPLACEMENT AND MAINTENANCE ANALYSIS   9

Replacement and Maintenance analysis – Types of maintenance, types of replacement problem, determination of economic life of an asset, Replacement of an asset with a new asset – capital recovery with return and concept of challenger and defender, Simple probabilistic model for items which fail completely.

UNIT V DEPRECIATION   9

Depreciation- Introduction, Straight line method of depreciation, declining balance method of depreciation- Sum of the years digits method of depreciation, sinking fund method of depreciation/ Annuity method of depreciation, service output method of depreciation-Evaluation of public alternatives- introduction, Examples, Inflation adjusted decisions – procedure to adjust inflation, Examples on comparison of alternatives and determination of economic life of asset.

TEXT BOOKS:

1. Panneer Selvam, R, Engineering Economics, Prentice Hall of India Ltd, New Delhi, 2001.

REFERENCES:

1. Chan S.Park, Contemporary Engineering Economics, Prentice Hall of India, 2002.
2.https://books.google.co.in/books?id=IWRI-5g0uHUC
3.www.springer.com/us/book/9780387970486
Course Description

Total: 45

Computer usage: 50%

Professional component

General	-	0%
Basic Sciences	-	0%
Engineering sciences & Technical arts	-	0%
Professional subject	-	100%

Broad area: Economics and Cost analysis

Test Schedule

S. No.	Test	Tentative Date	Portions	Duration
1	Cycle Test-1	February 2nd week	Session 1 to 14	2 Periods
2	Cycle Test-2	March 2nd week	Session 15 to 28	2 Periods
3	Model Test	April 3nd week	Session 1 to 45	3 Hrs
4	University Examination	TBA	All sessions / Units	3 Hrs.

Mapping of Instructional Objectives with Program Outcome

	Correlates to program outcome		
	H	**M**	**L**
1. To learn about introduction to economics	a		
2. To learn about value engineering.	b		
3. To learn about cash flow.		c,e	
4. To learn about economics of sampling and Replacement and Maintenance	d,g.k		i
5. To learn about depreciation and Evaluation of public alternatives.		h	f,j
6. To learn about design analysis			l

H: high correlation, M: medium correlation, L: low correlation

Draft Lecture Schedule

S.NO	Topics	Problem solving (Yes/No)	Text / Chapter
UNIT-I			
1.	Introduction to Economics-	No	T1
2.	Flow in an economy, Law of supply and demand,	NO	
3.	Concept of Engineering Economics	NO	
4.	Engineering efficiency, Economic efficiency,	**Yes**	
5.	Scope of engineering economics- Element of costs, Marginal cost, Marginal Revenue, Sunk cost, Opportunity cost,	**Yes**	
6.	Break-even analysis	**Yes**	
7.	V ratio, Elementary economic Analysis	No	
8.	Material selection for product Design selection for a product, Process planning.	NO	
UNIT-II			
9.	Make or buy decision,		T1
10.	Value engineering – Function, aims, and Value engineering procedure.	NO	
11.	Interest formulae and their applications	NO	
12.	–Time value of money, Single payment compound amount factor, Single payment present worth factor,		

13.	Equal payment series sinking fund factor,	NO		
14.	Equal payment series payment Present worth factor-	NO		
15.	Equal payment series capital recovery factor-	NO		
16.	Uniform gradient series annual equivalent factor,	NO		
17.	Effective interest rate,	**Yes**		
18.	Examples in all the methods.	**Yes**		

UNIT-III

19.	Methods of comparison of alternatives – present worth method (Revenue dominated cash flow diagram),	NO	T1
20.	Future worth method (Revenue dominated cash flow diagram, cost dominated cash flow diagram),	NO	
21.	Annual equivalent method (Revenue dominated	NO	
22.	cash flow diagram,	NO	
23.	cost dominated cash flow diagram),		
24.	rate of return method,	NO	
25.	Examples in Annual equivalent method.	**Yes**	
26.	Examples in all the cash flow diagram,	**Yes**	
27.	Examples in rate of return method,	**Yes**	

UNIT-IV

28	Replacement and Maintenance analysis	NO	
29	Types of maintenance,	NO	
30	Types of replacement problem,	NO	
31	Determination of economic life of an asset,	NO	T1
32	Replacement of an asset with a new asset	NO	
33	capital recovery with return	NO	
34	Concept of challenger	NO	
35	Defender,	NO	
36	Simple probabilistic model for items which fail completely.	yes	

UNIT-V

37	Depreciation- Introduction,		
38	Straight line method of depreciation, and determination of economic life of asset.		T1
39	declining balance method of depreciation		
40	-Sum of the years digits method of depreciation,		
41	sinking fund method of depreciation/ Annuity method of depreciation,		
42	service output method of depreciation-		
43	Evaluation of public alternatives- introduction, Examples, Inflation adjusted decisions –		
44	procedure to adjust inflation,		
45	Examples on comparison of alternatives		

Teaching Strategies

The teaching in this course aims at establishing a good fundamental understanding of the areas covered using:

- Formal face-to-face lectures

- Tutorials, which allow for exercises in problem solving and allow time for students to resolve problems in understanding of lecture material.

- Laboratory sessions, which support the formal lecture material and also provide the student with practical construction, measurement and debugging skills.

- Small periodic quizzes, to enable you to assess your understanding of the concepts.

Evaluation Strategies

Cycle Test – I	-	5%
Cycle Test – II	-	5%
Model Test	-	10%
Assignment / Seminar / Online Test / Quiz	-	5%
Attendance	-	5%
Final exam	-	70%

Prepared by : Ramalingam

Addendum

ABET Outcomes expected of graduates of B.Tech / MECH / program by the time that they graduate:

a) The ability to apply knowledge of mathematics, science, and engineering fundamentals.

b) The ability to identify, formulate and solve engineering problems.

c) The ability to design a system, component, or process to meet the desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.

d) The ability to design and conduct experiments, as well as to analyze and interpret data

e) The ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

f) The ability to apply reasoning informed by the knowledge of contemporary issues.

g) The ability to broaden the education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.

h) The ability to understand professional and ethical responsibility and apply them in engineering practices.

i) The ability to function on multidisciplinary teams.

j) The ability to communicate effectively with the engineering community and with society at large.

k) The ability in understanding of the engineering and management principles and apply them in project and finance management as a leader and a member in a team.

l) The ability to recognize the need for, and an ability to engage in life-long learning.

Program Educational Objectives

PEO1: PREPARATION:
Mechanical Engineering graduates are enthusiastic to provide strong foundation in mathematical, scientific and engineering fundamentals necessary to analyze, formulate and solve engineering problems in the field of Mechanical Engineering.

PEO2: CORE COMPETENCE:
Mechanical Engineering graduates have competence to enhance the skills and experience in defining problems in the field of Mechanical Engineering and Technology design and implement, analyzing the experimental evaluations, and finally making appropriate decisions.

PEO3: PROFESSIONALISM:
Mechanical Engineering graduates made competence to enhance their skills and embrace new thrust areas through self-directed professional development and post-graduate training or education.

PEO4: PROFICIENCY:
Mechanical Engineering graduates became skilled to afford training for developing soft skills such as proficiency in many languages, technical communication, verbal, logical, analytical, comprehension, team building, inter personal relationship, group discussion and leadership skill to become a better professional.

PEO5: ETHICS:
Mechanical Engineering graduates are morally merged to apply the ethical and social aspects of modern Engineering and Technology innovations to the design, development, and usage of new products, machines, gadgets, devices, etc.

BBA007 - ENGINEERING ECONOMICS AND COST ANALYSIS

Course Teacher	Signature
Mr.Karthikeyan R	

Course Coordinator   **HOD/MECH**
Mr.Karthikeyan R