

## Liverpool John Moores University

Title: ECONOMICS OF AUTOMOTIVE SYSTEMS AND VALUE ENGINEERING  
Status: Definitive  
Code: **5506ICBTAE** (127068)  
Version Start Date: 01-08-2021  
Owning School/Faculty: Engineering  
Teaching School/Faculty: ICBT, Colombo

Team	Leader
Alison Cotgrave	Y

**Academic Level:** FHEQ5  
**Credit Value:** 15  
**Total Delivered Hours:** 62  
**Total Learning Hours:** 150  
**Private Study:** 88

### Delivery Options

Course typically offered: S2 and Non Std S2 (S2 for Jan)

Component	Contact Hours
Lecture	45
Tutorial	15

**Grading Basis:** 40 %

### Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS2	Exam	70	2
Essay	AS1	Coursework (1500 words)	30	

### Aims

*This unit will provide learners with the value management of automotive design and development process, economics of manufacture, virtual methods of testing and manufacture and economies of scale leading towards make or buy designs of components. In addition, the units also emphasize the running costs of automobiles including the fuel and maintenance which leads towards the concept of optimization. Finally the unit addresses the disposal costs and a total analysis of life cycle costing.*

## Learning Outcomes

After completing the module the student should be able to:

- 1 Identify different costs associated with design, development, manufacture, use, maintenance and disposal of vehicles.
- 2 Discuss historical milestones and innovations in the automotive industry in terms of reduction on cost of manufacture and economics of usage and explain the importance of cost optimisation in automobiles in manufacture.
- 3 Explain the value chain of automobiles and carry out the life cycle cost analysis.
- 4 Illustrate the different approaches in vehicle maintenance and the effect of maintenance on economics of vehicles and carry out a basic survey on vehicle economics and cost studies.

## Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

Exam	3	4
Coursework	1	2

## Outline Syllabus

*Economics of design and development of vehicles*

*Feasibility of design manufacture, design for manufacture, design and manufacture of parts, assembly techniques and costs associated with manufacture and assembly, economies of scale, cost of dies, breakeven, make or buy decision of parts, reciprocal arrangements in automobile manufacture*

*History of economics of manufacture of cars, evolution of technology and cost of technology*

*Materials selection for automotive manufacture, use of cost effective and durable materials, economics of materials processing technologies*

*Virtual manufacture, introduction to FEA and other computational applications to reduce cost of manufacture and testing*

*Energy cost, enhancing fuel economy, cost of maintenance, and drawbacks of breakdown maintenance, preventive maintenance, planned or scheduled maintenance, condition based monitoring, overall economics of usage and optimisation of cost effectiveness.*

*Life cycle analysis of automobiles, disposal costs, costs on environment in usage and disposals of automobiles*

## **Learning Activities**

Students will be supported in their learning, to achieve the above learning outcomes, in the following ways:

Through a series of lectures and tutorials and through participation in discussions and case studies.

Self-managed investigative study to analyse life cycle cost of automobile and cases related to innovations in the automobile industry which focused on economics and value engineering

Interactive sessions in a workshop/laboratory on maintenance of vehicles

A recommended resource list - indicating key reading, internet support and physical learning assistance, is provided to help enable students to undertake self-directed study.

## **Notes**

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