

## Liverpool John Moores University

Title: MOTORSPORT TECHNOLOGY  
Status: Definitive  
Code: **5097ENG** (117170)  
Version Start Date: 01-08-2011

Owning School/Faculty: Engineering  
Teaching School/Faculty: Engineering

Team	Leader
Stephen Ebbrell	Y
Keith Metcalfe	

**Academic Level:** FHEQ5      **Credit Value:** 24.00      **Total Delivered Hours:** 48.00  
**Total Learning Hours:** 240      **Private Study:** 192

### Delivery Options

Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	12.000
Practical	24.000
Tutorial	12.000

**Grading Basis:** 40 %

### Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Report	set-up ex		25.0	
Report	laboratory		50.0	
Report	materials		25.0	

### Aims

*The aim of this module is to develop the students understanding of automotive technology with an emphasis on applications in motor sport.*

### Learning Outcomes

After completing the module the student should be able to:

- LO1 Identify and understand the principles of vehicle components that affect handling.
- LO2 Understand the application of aerodynamic features added to a sports car
- LO3 Test, analyse and tune an engine for race conditions
- LO4 Identify a range of modern materials found in motor sport components and understand how they improve performance.

### Learning Outcomes of Assessments

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

Vehicle set-up exercise	LO	
	1	
Car performance laboratory	LO	LO
	2	3
Motorsport materials assignmen	LO	
	4	

### Outline Syllabus

*Handling components: Springs; dampers; camber; braking systems; gearboxes; fuel systems. Performance suspension, design performance, modelling and testing; performance wheels, tyres and hubs, minimising rolling resistance.*

*Aerodynamics: Basic aerodynamic components such as airfoils, wings, slots, dams, spoilers and fairings are studied with basic fluid flow analysis and wind tunnels experiments to optimise racecar aerodynamics.*

*Engines: Adv engine design; performance, analysis and tuning; engine test rigs, advanced power train technology.*

*Data logging and Analysis:*

*Acquiring and recording qualitative and quantitative track data weights, fuel. Fuel consumption; tyres; tyre pressure; tyre temperature, track temperature and set up data; analysis of data to determine actions to improve vehicle performance.*

*Structures: Advance materials and design to resist high temperatures; minimise vehicle mass and improve stiffness, geometry, joints and joining, safety factors; collision and rolling.*

### Learning Activities

Students will attend lectures and practicals. They will also experience the vehicle set-up factors that affect vehicle performance during practical workshops.

### References

<b>Course Material</b>	Book
<b>Author</b>	Paul Haney, Jeff Braun
<b>Publishing Year</b>	1995
<b>Title</b>	Inside Racing Technology
<b>Subtitle</b>	Discussions of Racing Technical Topics
<b>Edition</b>	
<b>Publisher</b>	Motorbooks Intl
<b>ISBN</b>	0964641402

<b>Course Material</b>	Book
<b>Author</b>	John H. Glimmerveen
<b>Publishing Year</b>	2004
<b>Title</b>	Hands-on Race Car Engineer
<b>Subtitle</b>	
<b>Edition</b>	
<b>Publisher</b>	American Society for Testing & Materials
<b>ISBN</b>	0768008980

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### Notes

The lectures will be supported by practical, workshop based activities and laboratory experiments