

## Liverpool John Moores University

Title: Navigational Maths  
Status: Definitive  
Code: **4555BFC** (121554)  
Version Start Date: 01-08-2020

Owning School/Faculty: Engineering  
Teaching School/Faculty: Blackpool & Fylde College

Team	Leader
Barbara Kelly	Y

**Academic Level:** FHEQ4      **Credit Value:** 20      **Total Delivered Hours:** 84  
**Total Learning Hours:** 200      **Private Study:** 116

### Delivery Options

Course typically offered: Summer

Component	Contact Hours
Lecture	74
Tutorial	6

**Grading Basis:** 40 %

### Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	Exam 1	Introductory Maths	50	2
Exam	Exam 2	Sailings	50	2

### Aims

*To apply theoretical mathematics to a range of nautical operations, including navigation and passage planning.*

### Learning Outcomes

After completing the module the student should be able to:

- 1 Calculate lengths and angles using trigonometry.
- 2 Derive areas, lengths, volumes and densities from identified dimensions
- 3 Calculate moments, magnitudes, distances and directions using vector principles.
- 4 Estimate distances, courses and positions using sailings.

### **Learning Outcomes of Assessments**

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

Introductory Maths	1	3	2
Sailings	4		

### **Outline Syllabus**

*Plane trigonometry*

*Lengths, areas, volumes and densities*

*Spherical Cosine and Napier's Rules*

*Moments about a single pivot point*

*Vector problems (to find resultant vector or components)*

*Plane Sailing (to find course and distance or position)*

*Mercator Sailing (to find course and distance or position)*

*Great Circle Sailing (including position of vertex and waypoints)*

*Composite Great Circle Sailing*

### **Learning Activities**

Calculate theoretical values based on given information.

Introduce and use various nautical calculations.

Estimate values based on given information.

Discuss theories and origins of calculations to support their use.

### **Notes**

This module will contribute to the underpinning knowledge required for progression to an Officer of the Watch professional qualification.