Liverpool John Moores University

Title:	DIGITAL APPLICATIONS & IMPLEMENTATIONS FOR BSE PROJECTS & BSE MATHEMATICS
Status:	Definitive
Code:	**5602BEFDL** (123938)
Version Start Date:	01-08-2017
Owning School/Faculty:	Built Environment
Teaching School/Faculty:	City of Liverpool College

Team	Leader
Stephen Wynn	Y

Academic Level:	FHEQ5	**Credit Value:**	20	**Total Delivered Hours:**	90
Total Learning Hours:	200	**Private Study:**	110		

Delivery Options
Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	57
Tutorial	20
Workshop	10

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Portfolio	AS1	Portfolio completed with individual responsibilities documents the developmental stages of digital design process	50	
Exam	AS2	Formal examination	50	3

Aims

To enable apply and implement the digital design process on the building services engineering project and to provide the students with the fundamental mathematical and analytical techniques to support the mathematical and analytical functions

required in the other modules of the programme. This module is intended to enable students studying the commercial pathway of the Building Services programme to apply analytical techniques associated with statistical analysis, heat transfer and electrical waveforms.

Learning Outcomes

After completing the module the student should be able to:

1	Apply the digital design software for a building services engineering project
2	Implement the digital design software for a building services engineering project.
3	Analyse the digital design process for a building services engineering project.
4	Construct differential equations for the purpose of solving building services problems.
5	Demonstrate a knowledge of the properties of trigonometrical functions and relate these to the characteristics of wave forms
6	Analyse and solve problems using statistics and probability.

Learning Outcomes of Assessments

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

PORTFOLIO	1	2	3
FORMAL EXAMINATION	4	5	6

Outline Syllabus

The BIM process: overview the process which related to all members of project team.

The engineering design software: IES VE, ASTRA Project Planning,

Use of computer software as analytical, design and management tools.

Differential Equations: General and particular solutions. Boundary condition.

Differential equation models in building services engineering.
Trigonometrical Functions: Properties of waves: Amplitude, wavelength, frequency, phase difference, etc

Graphs: Sin θ*, cos* θ*, sin 2*θ*, sin* θ*/2 etc.*
Trigonometrical identities: sin θ*/cos* θ *= tan* θ*, sin2* θ *+ cos2* θ *= 1, compound angle, formula, etc*

*Addition of wave-forms: a sin*θ *+ b cos*θ *= R sin (*θ ± α*)*

Statistics and Probability: Mutually exclusive and independent events. Binomial, Poisson and normal distributions.

Matrices: Multiplication, transposition and inversion, applications.

Learning Activities

Lectures, tutorials, and seminars sessions during which students will work towards a project.

Notes

This module brings together the students' learning throughout their study and develop the skill to operate the engineering design and management software. The module requires the students to demonstrate the competence to use the engineering design software. This module also provides fundamental mathematical and analytical techniques to support and contextualise the mathematical and analytical functions required in the other modules of the programme, such as statistical analysis, heat transfer and electrical waveforms.