BN3324 - SIMULATION

Module Number: BN3324

Module Title: Simulation

Number of Aston Credits: 10

Total Number of ECTS Credits: 5
(European Credit Transfer)

Staff Member Responsible for the Module:

Dr Pavel Albores
Operations and Information Management Group

ABS Building, Room 261, Extension 3262
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Availability: Please see office hours http://tinyurl.com/Pavel-OH or group administrator, John Morley, ABS266, Extension 3236

Other Staff Contributing to the Module: None

Pre-Requisite(s) for the Module: BN1105 Quantitative Techniques (or equivalent)

Module Learning Outcomes:

Upon successful completion of the module students will be able to:

1. Apply computer simulation methods and software to a diversity of problems, including manufacturing, services and healthcare.

2. Demonstrate the ability to make an immediate contribution to a simulation consultancy unit

Module Content:

Understanding simulation: What is simulation, why use it and where to apply it.

Basic Simulation Principles: entities, events, activities, queues, states and attributes; timing mechanism of a discrete event simulation model, including the "three phase rule"; discrete and continuous simulation; flow charts and activity cycle diagrams for a simple simulation model.

Sampling and Experimentation: deterministic and stochastic models; principles and methods of sampling; use of random numbers in sampling; implications of sampling on the validity of simulation models; tactics to ensure validity of simulation models.

Software Principles: principal types of simulation packages, functions of a simulation software package.

Simul8: how Simul8 provides these function, model building process in Simul8, experimentation and analysis.

Other Software Packages: Characteristics of typical simulation packages, procedure for evaluating and selecting software packages.

Simulation Project Management: Main stages in a simulation project, procedures for ensuring model credibility, verification and validation

International Dimensions:

By its very nature, the visual aspect of visual interactive simulation makes it a worldwide language. Simulation is thus a very attractive technique for multi-national organisations and is used within a range of international consultancy units. Application of simulation in cases across the globe will be presented.

Corporate Connections:

The lecturer has conducted a number of consultancy assignments for public and private sector organisations. He draws extensively on this experience during the teaching of this module. A visiting lecture will be arranged from users or developers of simulation solutions

Links to Research:

The Lecturer is very active in the simulation area. Examples from his research in applying simulation to a number of contexts (manufacturing, services, and emergency response) will be brought into the class. Students are expected to do research for both their assignments.

Learning and Teaching Rationale and Methods:

Method of Teaching - Lectures and hands-on computer practicals lasting 2 hours per week for 12 weeks (approximately 50% lecture, 50% practical).

The lectures will provide the knowledge to develop and use simulations for an organisation. Practical sessions will enable students to apply and enhance what they have learnt using the SIMUL8 simulation software package. Both lectures and tutorials address outcomes 1 and 2 together.

Self-paced study is used through this class. Students are expected to use study materials provided. Timetabled tutorials are there for students to seek assistance and guarantee PC access.

There will be mini-quizzes at the beginning of some lectures, in order to provide (self) feedback regarding the learning of simulation concepts.

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Class materials are available on Blackboard. They include Computer Aided Learning (CAL) materials, information on lectures, labs, PowerPoint slides, tutorial questions / solutions, outside material, etc.

Contact and directed learning

Lectures and tutorial	22 hours
Examination	2 hours
Indirect learning	
Preparation of podcast	8 hours
Preparation of coursework	30 hours
Exam revision	22 hours
Reading (including CAL)	16 hours
Total	**100 hours**

Ethical Approval:

This module does not require any primary research and no ethical approval will be necessary.

Assessment and Feedback Rationale and Methods:

The assessment is coursework (group work with individual component) (40%), Podcast (20%). and closed book exam (40%).

There is one piece of coursework, requiring the development of a simulation model using the Simul8® simulation modelling software package and the production of a report. This tests outcomes 1 and 2. The coursework is carried out on groups of MAXIMUM FOUR members. By doing this coursework, students will apply all the steps of a simulation project to an organisational setting.

The podcasts created will be useful as revision tool for the final exam and as support for the coursework.

Students are encouraged to utilise lecturer office hours to obtain more detailed feedback and advice.

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GROUP CONTRIBUTION SHEET – BN3324

PLEASE COMPLETE AND **ATTACH TO THE GROUP REPORT.**

MODULE: BN3324 - SIMULATION **GROUP:**

(E,g. 100 means that the student will receive 100% of the Final Grade, 50 means the student will receive 50% of the Final Grade.)

Student Candidate No.	Contribution (%)

All group members contributed equally (Please Tick)

DATE: _____

MODULE: **GROUP:**

Group Members Signatures (Should correspond to candidate numbers given above):
