

# IB320-15 Simulation

**22/23**

**Department**

Warwick Business School

**Level**

Undergraduate Level 3

**Module leader**

Katy Hoad

**Credit value**

15

**Module duration**

10 weeks

**Assessment**

40% coursework, 60% exam

**Study location**

University of Warwick main campus, Coventry

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## Description

### Introductory description

This is an elective module available for WBS and non-WBS students.

Simulation is one of the most commonly used operational research methods for analysing complex operational/ industrial problems. This module will focus on discrete event simulation. Students will learn the theoretical underpinnings of the methods and the range of applications for which they are useful. They will gain practical experience in problem solving using commercial simulation software.

[Module web page](#)

### Module aims

Simulation is one of the most commonly used operational research methods for analysing complex operational/ industrial problems. This module will focus on discrete event simulation. Students will learn the theoretical underpinnings of the methods and the range of applications for which they are useful. They will gain practical experience in problem solving using commercial simulation software.

### Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

Topics covered will be:

- The discrete-event simulation method
  - Software for discrete-event simulation (with use of a specific package e.g. Simul8 or Witness)
  - Performing a simulation study (conceptual modelling, data collection and analysis, experimentation, verification and validation)
- The tutorials provide the opportunity for supervised exercises and help students develop their own computer based simulation programmes.

## **Learning outcomes**

By the end of the module, students should be able to:

- Understand the nature and application of discrete-event simulation and know how to experiment with it.
- Work out how to analyse data and present it in an intelligible form.

## **Indicative reading list**

- Simulation, The Practice of Model Development and Use, Stewart Robinson, Palgrave Macmillan, 2014.
- Simulation Modeling and Analysis, Avril M Law, McGraw-Hill, 2007.
- Conceptual Modeling for Discrete-Event Simulation, Edited by Stewart Robinson, Roger Brooks, Kathy Kotiadis, Durk-Jouke Van Der Zee, Boca Raton: CRC Press, 2010.
- Simul8 Websites:  
<http://www.simul8.com/>  
These are the preferred texts as the most suitable for this topic (the subject matters changes little over time)

## **Subject specific skills**

Develop and use a simulation for investigating a problem situation.

## **Transferable skills**

Develop a working knowledge of a discrete event simulation software package.

Work in groups to solve problems cooperatively.

Communicate effectively.

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## **Study**

## **Study time**

Type	Required
Lectures	10 sessions of 1 hour (7%)
Supervised practical classes	9 sessions of 1 hour (6%)
Online learning (independent)	10 sessions of 1 hour (7%)
Private study	48 hours (32%)
Assessment	73 hours (49%)
Total	150 hours

## Private study description

Private study.

## Costs

No further costs have been identified for this module.

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## Assessment

You do not need to pass all assessment components to pass the module.

### Assessment group D3

	Weighting	Study time
Group Assignment	40%	29 hours
Online Examination	60%	44 hours
Exam		
~Platforms - AEP		

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- Online examination: No Answerbook required

## Feedback on assessment

Feedback via my.wbs.

[Past exam papers for IB320](#)

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## Availability

## Pre-requisites

Or Equivalent statistics modules.

To take this module, you must have passed:

- Any of
  - [IB121-15 Business Statistics](#)
  - [IB122-15 Business Analytics](#)

## Courses

This module is Core for:

- USTA-G301 Undergraduate Master of Mathematics, Operational Research, Statistics and Economics (with Intercalated
  - Year 3 of G30G Master of Maths, Op.Res, Stats & Economics (Operational Research and Statistics Stream) Int
  - Year 4 of G30G Master of Maths, Op.Res, Stats & Economics (Operational Research and Statistics Stream) Int

This module is Core optional for:

- Year 2 of UMAA-G1NC Undergraduate Mathematics and Business Studies
- Year 2 of UMAA-G1N2 Undergraduate Mathematics and Business Studies (with Intercalated Year)

This module is Optional for:

- Year 4 of UIBA-MN32 Undergraduate Law and Business Studies
- Year 5 of UIBA-MN37 Undergraduate Law and Business Studies (Qualifying Degree) with Intercalated Year
- Year 5 of UIBA-MN36 Undergraduate Law and Business Studies with Intercalated Year (4+1)
- USTA-G300 Undergraduate Master of Mathematics, Operational Research, Statistics and Economics
  - Year 3 of G300 Mathematics, Operational Research, Statistics and Economics
  - Year 4 of G300 Mathematics, Operational Research, Statistics and Economics
- USTA-G1G3 Undergraduate Mathematics and Statistics (BSc MMathStat)
  - Year 2 of G1G3 Mathematics and Statistics (BSc MMathStat)
  - Year 3 of G1G3 Mathematics and Statistics (BSc MMathStat)
  - Year 4 of G1G3 Mathematics and Statistics (BSc MMathStat)
- USTA-G1G4 Undergraduate Mathematics and Statistics (BSc MMathStat) (with Intercalated Year)
  - Year 4 of G1G4 Mathematics and Statistics (BSc MMathStat) (with Intercalated Year)
  - Year 5 of G1G4 Mathematics and Statistics (BSc MMathStat) (with Intercalated Year)
- USTA-GG14 Undergraduate Mathematics and Statistics (BSc)

- Year 2 of GG14 Mathematics and Statistics
- Year 2 of GG14 Mathematics and Statistics

This module is Core option list C for:

- USTA-G300 Undergraduate Master of Mathematics, Operational Research, Statistics and Economics
  - Year 3 of G30C Master of Maths, Op.Res, Stats & Economics (Operational Research and Statistics Stream)
  - Year 3 of G30C Master of Maths, Op.Res, Stats & Economics (Operational Research and Statistics Stream)

This module is Option list A for:

- Year 2 of USTA-G300 Undergraduate Master of Mathematics, Operational Research, Statistics and Economics
- USTA-Y602 Undergraduate Mathematics, Operational Research, Statistics and Economics
  - Year 2 of Y602 Mathematics, Operational Research, Stats, Economics
  - Year 2 of Y602 Mathematics, Operational Research, Stats, Economics
  - Year 3 of Y602 Mathematics, Operational Research, Stats, Economics
  - Year 3 of Y602 Mathematics, Operational Research, Stats, Economics
- Year 4 of USTA-Y603 Undergraduate Mathematics, Operational Research, Statistics, Economics (with Intercalated Year)

This module is Option list B for:

- UMAA-G105 Undergraduate Master of Mathematics (with Intercalated Year)
  - Year 2 of G105 Mathematics (MMath) with Intercalated Year
  - Year 4 of G105 Mathematics (MMath) with Intercalated Year
  - Year 5 of G105 Mathematics (MMath) with Intercalated Year
- UMAA-G100 Undergraduate Mathematics (BSc)
  - Year 2 of G100 Mathematics
  - Year 2 of G100 Mathematics
  - Year 2 of G100 Mathematics
  - Year 3 of G100 Mathematics
  - Year 3 of G100 Mathematics
  - Year 3 of G100 Mathematics
- UMAA-G103 Undergraduate Mathematics (MMath)
  - Year 2 of G100 Mathematics
  - Year 2 of G103 Mathematics (MMath)
  - Year 2 of G103 Mathematics (MMath)
  - Year 3 of G100 Mathematics
  - Year 3 of G103 Mathematics (MMath)
  - Year 3 of G103 Mathematics (MMath)
  - Year 4 of G103 Mathematics (MMath)
  - Year 4 of G103 Mathematics (MMath)
- UMAA-G106 Undergraduate Mathematics (MMath) with Study in Europe
  - Year 2 of G106 Mathematics (MMath) with Study in Europe

- Year 3 of G106 Mathematics (MMath) with Study in Europe
- Year 4 of G106 Mathematics (MMath) with Study in Europe
- Year 2 of UMAA-GL11 Undergraduate Mathematics and Economics
- Year 2 of UECA-GL12 Undergraduate Mathematics and Economics (with Intercalated Year)
- USTA-GG14 Undergraduate Mathematics and Statistics (BSc)
  - Year 3 of GG14 Mathematics and Statistics
  - Year 3 of GG14 Mathematics and Statistics
- Year 4 of USTA-GG17 Undergraduate Mathematics and Statistics (with Intercalated Year)
- UMAA-G101 Undergraduate Mathematics with Intercalated Year
  - Year 2 of G101 Mathematics with Intercalated Year
  - Year 4 of G101 Mathematics with Intercalated Year

This module is Option list C for:

- Year 4 of UCSA-G504 MEng Computer Science (with intercalated year)
- UCSA-G500 Undergraduate Computer Science
  - Year 3 of G500 Computer Science
  - Year 3 of G500 Computer Science
- UCSA-G502 Undergraduate Computer Science (with Intercalated Year)
  - Year 4 of G502 Computer Science with Intercalated Year
  - Year 4 of G502 Computer Science with Intercalated Year
- UCSA-G503 Undergraduate Computer Science MEng
  - Year 3 of G500 Computer Science
  - Year 3 of G503 Computer Science MEng
  - Year 3 of G503 Computer Science MEng