

# ES2D0-15 Industrial Engineering for Business Improvement

**25/26**

**Department**

School of Engineering

**Level**

Undergraduate Level 2

**Module leader**

Bill Taylor

**Credit value**

15

**Module duration**

10 weeks

**Assessment**

100% coursework

**Study location**

University of Warwick main campus, Coventry

---

## Description

### Introductory description

ES2D0-15 Industrial Engineering

[Module web page](#)

### Module aims

This module aims to equip students with the skills to design, develop and install integrated systems of people, materials, equipment and energy.

### 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.

Industrial Engineering "...draws upon specialised knowledge and skill in mathematical, physical and social sciences, together with the principles and methods of engineering analysis and design to specify, predict and evaluate results to be obtained from such systems" (adapted from a

definition US Institute of Industrial Engineers)

Indicative Contents is as follows:

Method Study - The Attack on Non Value Added Work

Facilities Planning - Organising People, Facilities, Space and Materials

Work Measurement - The Analysis of Work Performance

Ergonomics - Human Physical Performance, Cognitive Ergonomics, Health & Safety

Work Design - The Essentials

Productivity - Efficiency versus Effectiveness

Approaches to Change / Negotiation of Change- Tactics

Sequence and Time Delay - Constraints & Issues

Linear Programming - Maximising profit when there is choice.

Queuing Theory and Simulation – Attempting to understand a System behaviour, performance and costs

Importance of Balance & Sequence - Resource Smoothing

Lean & Industrial Engineering - Equal Impact

## **Learning outcomes**

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

- Evaluate the consequences of Sequence and Time consumption ( PERT, Resource Smoothing and Line Balancing ) ( C1, C3 , C5, C15, M1, M3, M5, M15 ) )
- Understand the applicability of Industrial Engineering in Operations Management. ( C2, C4, C5, C8, C13, M2, M4, M5, M8, M13 )
- Assess user process Ergonomics and the associated Health and Safety Regulations at work including the guiding principles of application and assessment. ( C4, C5, C8, C15, C16(D) , M4, M5, M8, M15, M16(D))
- Provide a perspective on Approaches to Change, and how best to Negotiate Change. ( C5, C6, C8, C16(D), M5, M6, M8 M16 (D))
- Scope factory layout design to facilitate efficient, effective and productive use of people, space and facilities. ( C4, C5, C6, C8, C15, M4, M5, M6, M8, M15)
- Consider the ethical, social and legal requirements within the context of Industrial Engineering applications. ( C8, C15, M8, M15)

## **Indicative reading list**

Slack, Brandon-Jones, Johnston, Operations Management; Pearson 2013 7th edition, ISBN-10 0273776207 ISBN-13 9780273776208

Hopp, Wallace and Spearman, ML; Factory Physics: Foundations of manufacturing management; McGraw-Hill 2011 ISBN 10 - 0256247951, ISBN 13 9780256247954

Hill, Terry; Operations Management; MacMillan Business 2012 3RD edition ISBN-10 0230362907 ISBN-13 978023062901

Levin, RI and Rubin, DS; Statistics for Management[ Prentice Hall 2013 7th edition ISBN-10 1292039930 ISBN-13 9781292039930

Chopra, S and Meindl, P; Supply Chain Management; Strategy, Planning and Operation; Pearson 2016 ISBN-10 1292093560 ISBN-13 9781292093567

## Subject specific skills

Plan and manage the design process, including cost drivers, evaluating outcomes, and working with technical uncertainty

Knowledge and understanding of the need for a high level of professional and ethical conduct in engineering and the use of technical literature, other information sources including appropriate codes of practice and industry standards

Knowledge and understanding of risk issues, including health & safety, environmental and commercial risk, risk assessment and risk management techniques and an ability to evaluate commercial risk

Knowledge of professional codes of conduct, how ethical dilemmas can arise, relevant legal and contractual issues.

## Transferable skills

Communicate (written and oral; to technical and non-technical audiences) and work with others

Awareness of the nature of business and enterprise in the creation of economic and social value

Ability to formulate and operate within appropriate codes of conduct, when faced with an ethical issue

Appreciation of the global dimensions of engineering, commerce and communication

---

## Study

### Study time

Type	Required
Lectures	27 sessions of 1 hour (18%)
Seminars	1 session of 3 hours (2%)
Other activity	2 hours (1%)
Private study	118 hours (79%)
Total	150 hours

### Private study description

118 hrs Guided independent learning

### Other activity description

2 x 1hr revision class

## Costs

No further costs have been identified for this module.

---

## Assessment

You must pass all assessment components to pass the module.

### Assessment group A2

	Weighting	Study time	Eligible for self-certification
Individual assignment	100%		Yes (extension)
Individual Assignment			

### Feedback on assessment

Feedback on Assignment is by mark sheet and cohort overview  
Cohort level feedback on examination

---

## Availability

### Courses

This module is Core for:

- Year 2 of UESA-H335 BEng Automotive Engineering
- Year 2 of UESA-HN15 BEng Engineering Business Management
- Year 2 of UESA-HH75 BEng Manufacturing and Mechanical Engineering
- Year 2 of UESA-H336 MEng Automotive Engineering
- Year 2 of UESA-HH76 MEng Manufacturing and Mechanical Engineering