# ES2D0-15 Industrial Engineering

## 22/23

**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

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## 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 )
- Understand the applicability of Industrial Engineering in Operations Management.
- Assess user process Ergonomics and the associated Health and Safety Regulations at work including the guiding principles of application and assessment.
- Provide a perspective on Approaches to Change, and how best to Negotiate Change.
- Scope factory layout design to facilitate efficient, effective and productive use of people, space and facilities.
- Appreciate the relevance and use of Method Study and Work Measurement.
- Consider the ethical, social and legal requirements within the context of Industrial Engineering applications

## 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

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## 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.

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## Assessment

You must pass all assessment components to pass the module.

### Assessment group A1

| | Weighting | Study time |
|---|---|---|
| Individual assignment | 100% | |
| Individual Assignment | | |

### Feedback on assessment

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

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## Availability

## Courses

This module is Core for:

- Year 2 of UESA-HN15 BEng Engineering Business Management
- Year 2 of UESA-HH75 BEng Manufacturing and Mechanical Engineering
- Year 2 of UESA-HN11 BSc Engineering and Business Studies
- Year 2 of UESA-HH76 MEng Manufacturing and Mechanical Engineering

This module is Option list A for:

- Year 2 of UESA-H335 BEng Automotive Engineering
- Year 2 of UESA-H113 BEng Engineering
- UESA-H112 BSc Engineering
    - Year 2 of H112 Engineering
    - Year 2 of H112 Engineering
- Year 2 of UESA-HN11 BSc Engineering and Business Studies
- Year 2 of UESA-H336 MEng Automotive Engineering
- Year 2 of UESA-H114 MEng Engineering