

ES4B9-15 Innovative Process Development

20/21

Department

School of Engineering

Level

Undergraduate Level 4

Module leader

Ian Tuersley

Credit value

15

Module duration

10 weeks

Assessment

100% coursework

Study location

University of Warwick main campus, Coventry

Description

Introductory description

ES4B9-5 Innovative Process Development

[Module web page](#)

Module aims

The main role of many manufacturing engineers is to select and or develop manufacturing processes in order to get the best out of them and to provide a competitive edge. This module aims to show how this has been done in the past and is being done at this time. Participants will learn the skills and techniques involved and will gain experience of the thought processes used.

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.

Using examples from the main classes of manufacturing process, the module will look at the basic process and then at current advanced variants. Examples might include;

Conventional powder processing leading to MIM, HIP and Conform.

Sand Casting leading to Squeeze Casting and Investment Casting.

Surface Improvement processes such as spray deposition, CVD, and PVD.

Forging leading to Superplastic Deformation.

Rapid Prototyping, Rapid Tooling and Rapid Manufacture

Examples of newly developed processes will be analysed according to their business and technical issues and potential.

Business and Social factors to be taken into account when selecting or developing a new process.

Learning outcomes

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

- Evaluate the advantages and disadvantages of current and new processes from limited and often unpredictable information.
- Critique the importance of business and social issues as well as technical issues when developing advanced processes.
- Conceptualise those limitations of existing processes that might be capable of improvement and hypothesise how they might practically be overcome.
- Evaluate other (novel, where appropriate) market/application opportunities of current processes and products.

Indicative reading list

Any general text on Manufacturing Processes and Technology will be a good starting point. These will be supplemented by;

Current journals that cover Manufacturing Processes and their development. For example;

International Journal of Advanced Manufacturing Technology, Springer, ISSN 0268 – 3768

Journal of Manufacturing processes, Elsevier

Links to a small number of selected articles concerning specific processes covered in the lectures will be posted on the website.

[View reading list on Talis Aspire](#)

Subject specific skills

Ability to conceive, make and realise a component or process

Ability to develop economically viable and ethically sound sustainable solutions

Ability to be pragmatic, taking a systematic approach and the logical and practical steps necessary for, often complex, concepts to become reality

Ability to seek to achieve sustainable solutions to problems and have strategies for being creative and innovative Ability to be risk, cost and value-conscious, and aware of their ethical, social, cultural, environmental, health and safety, and wider professional engineering responsibilities

Transferable skills

Apply problem solving skills, information retrieval, and the effective use of general IT facilities

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

Plan self-learning and improve performance, as the foundation for lifelong learning/CPD
Exercise initiative and personal responsibility, including time management, which may be as a team member or leader
Awareness of the nature of business and enterprise in the creation of economic and social value
Overcome difficulties by employing skills, knowledge and understanding in a flexible manner
Ability to formulate and operate within appropriate codes of conduct, when faced with an ethical issue
Appreciation of the global dimensions of engineering especially with regard to the development of innovative manufacturing processes.
Be professional in their outlook, be capable of team working, be effective communicators, and be able to exercise responsibility and sound management approaches.

Study

Study time

| Type | Required |
|----------------|----------------------------|
| Lectures | 10 sessions of 1 hour (7%) |
| Seminars | 10 sessions of 1 hour (7%) |
| Other activity | 2 hours (1%) |
| Private study | 128 hours (85%) |
| Total | 150 hours |

Private study description

Guided independent learning 128 Hours

Other activity description

Revision Examples Class

Costs

No further costs have been identified for this module.

Assessment

You must pass all assessment components to pass the module.

Students can register for this module without taking any assessment.

Assessment group A

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

Feedback on assessment

Written comments and feedback on submitted individual assignment.

Cohort level feedback on examination.

Support through advice and feedback hours.

Availability

Courses

This module is Core for:

- Year 4 of UESA-HH76 MEng Manufacturing and Mechanical Engineering
- Year 5 of UESA-HH38 MEng Manufacturing and Mechanical Engineering with Intercalated Year

This module is Option list A for:

- Year 4 of UESA-H114 MEng Engineering
- Year 4 of UESA-H311 MEng Mechanical Engineering

This module is Option list C for:

- Year 4 of UESA-H311 MEng Mechanical Engineering
- Year 4 of UESA-H316 MEng Mechanical Engineering
- Year 4 of UESA-H318 MEng Mechanical Engineering with Exchange Year
- Year 5 of UESA-H317 MEng Mechanical Engineering with Intercalated Year