

WM9G4-15 Research and Development in Digital Lifecycle

22/23

Department

WMG

Level

Taught Postgraduate Level

Module leader

Pasquale Franciosa

Credit value

15

Module duration

3 weeks

Assessment

100% coursework

Study location

University of Warwick main campus, Coventry

Description

Introductory description

This is a specialist module that provides a focus on an area of research relevant to the subject of Intelligent Manufacturing Systems. Students will have an opportunity to engage more deeply than elsewhere and share their observations and ideas with leading researchers.

Module aims

This module will engage the student with the latest research in intelligent manufacturing systems from the perspective of one of WMG's research teams in the area, in this case Digital Lifecycle Management. This will enhance their understanding of the relationships that form between research institutions and industry and how these serve both sides' needs in introducing advanced technologies. For those interested in pursuing an academic career it will provide a closer look at the nature of the work in this field.

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.

Digital Design and Manufacturing: multi-physics modelling, variation simulation analysis;
Industrial Systems: discrete-event simulation, systems dynamics and design;
Process Monitoring: real-time monitoring, data analytics;
Process Control: machine learning, engineering and statistical process control.

Learning outcomes

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

- Appraise the methods and practices of current research in this area.
- Evaluate the process of creating a proposal for industrially funded or supported research in this area
- Critically evaluate the strengths and weaknesses of the latest cyber-manufacturing and related concepts and the progress of research in this area.

Indicative reading list

Modelling and control for intelligent industrial systems : adaptive algorithms in robotics and industrial engineering, Gerasimos G. Rigatos, Springer, 2011;
Cybersecurity of industrial systems , Flaus, Jean-Marie, ISTE, 2019;

Research element

The module will be owned by the WMG Digital Lifecycle Management research team. They will decide the most appropriate means of delivering the module learning outcomes setting this within the context of their research. This may involve practical work alongside researchers or research technicians, evaluating new technologies, or reviewing and reporting on pre-publication research papers.

Subject specific skills

At least one subject specific skill will be developed. The nature of this will depend on the focus of the research team at the time of delivery, but may include:

designing a test regime;
setting up equipment;
logging and analysing trials data;
drafting a research/grant proposal.

Transferable skills

Knowledge elicitation; communicating with new people; grant/proposal writing and presentation skills.

dealing with complex issues both systematically and creatively, make sound judgements in the absence of complete data, and communicate their conclusions clearly to specialist and non-specialist audiences;

advancing their knowledge and understanding, and to develop new skills to a high level; and making decisions in complex and unpredictable situations.

Study

Study time

Type	Required
Lectures	7 sessions of 1 hour (5%)
Seminars	2 sessions of 1 hour (1%)
Tutorials	6 sessions of 1 hour (4%)
Demonstrations	4 sessions of 1 hour (3%)
Practical classes	5 sessions of 1 hour (3%)
Supervised practical classes	1 session of 3 hours (2%)
Online learning (independent)	14 sessions of 30 minutes (5%)
Other activity	8 hours (5%)
Private study	18 hours (12%)
Assessment	90 hours (60%)
Total	150 hours

Private study description

Students will need to familiarise themselves with the subject area, the scope of publications made by the research team, communications made on their website, and the sources commonly used in the area.

Other activity description

Visits from project collaborators and/or visits to a research partner's site where practical; working alongside researchers: technicians and academics; analysing data; attending project meetings.

Costs

No further costs have been identified for this module.

Assessment

You must pass all assessment components to pass the module.

Assessment group A

	Weighting	Study time
An evaluation on current research in the area.	20%	10 hours

Weighting**Study time**

A 20 minute presentation on one of the following related to an aspect of the research team's current activities: SWOT analysis, requirements analysis; Technology Road Map; stakeholder analysis, taking a cyber-manufacturing perspective.

Opportunities and applications of cyber-manufacturing in 'X' (where 'x' is a current area of research.)

80%

80 hours

Develop a work-plan proposal for applying cyber-manufacturing principles to an aspect of the research team's ongoing or future research. In principle this could form support for a grant proposal.

Feedback on assessment

Oral feedback for in-module presentation by members of the research team audience.

Written feedback for the essay component

Availability

There is currently no information about the courses for which this module is core or optional.