

SE4021 Scientific Foundations

Module status in MSc Professional Engineering: Option **Module credits:** 15

Aims

To develop a deep and structured understanding (beyond the remit of the prerequisite module SE4011) of the science underpinning the selected engineering domain, having regard both to typical current applications and potential for new technologies and innovative applications.

Content

This is a generic module specification – whilst adhering to the broad principles set out here, the content of any particular delivery of the module will necessarily depend on the selected engineering domain and the learning contract agreed between the programme participant, Aston University and the participant’s professional engineering institution.

Illustrative content: Mathematical and scientific foundations. Application to analysis and justification of current technologies. New scientific developments, likely technological benefits, application areas.

Teaching

The module may be taught to an appropriate extent through work-based projects supplemented by individual learning (eg through directed reading or guided research) and supported by individual supervision and mentoring. Subject to learning contract specification, it is likely that some of the module will be supported by formally taught material from one or more level 4 modules forming part of another EAS MSc programme, accessed by distance learning.

Assessment

Written reports and/or other formal work products arising from any work-based project(s) will be assessed. Where content has been accessed by distance learning, and if specified by the learning contract, a proportion of the module mark may be derived from formal assessments associated with the modules accessed.

If assessment is based entirely on work-based activities, the participant’s reports should total around 4000 words, or 10-15 pages including appropriate diagrams, tables, etc. Where formal assessment of distance learning provides part of the overall module assessment, reports on work-based activities should be limited to around 2500 words (about 6-9 pages) in total.

Module outcomes

<i>What the participant should gain from successful completion of the module</i>	<i>Teaching/Learning Methods</i>	<i>Assessment Methods</i>
<i>Knowledge and Understanding</i> Enhanced grasp of the scientific basis for current and emerging technologies and design processes and methodologies	A suitable combination of work-based projects, individual learning and distance learning	Written reports or other appropriate formal work products, probably supplemented by exam assessment of distance learning material
<i>Intellectual Skills</i> Ability to develop scientifically well-founded evaluations or applications of technologies, eg in a mathematical or computer-based context		
<i>Professional/Subject-Specific Skills</i>		
<i>Transferable Skills</i>		

Learning resources

As appropriate to the selected engineering domain and any modules accessed by distance learning

Other modules required in order to take this module

SE4001 Professional Development Audit
SE4011 Current Technologies and Applications