



MODULE SPECIFICATION

| Part 1: Information | | | |
|---------------------------|---|--------------------|-------------------------------------|
| Module Title | Mathematics for Civil and Environmental Engineering | | |
| Module Code | UFMFYG-15-1 | Level | Level 4 |
| For implementation from | 2019-20 | | |
| UWE Credit Rating | 15 | ECTS Credit Rating | 7.5 |
| Faculty | Faculty of Environment & Technology | Field | Engineering, Design and Mathematics |
| Department | FET Dept of Engin Design & Mathematics | | |
| Module type: | Standard | | |
| Pre-requisites | None | | |
| Excluded Combinations | None | | |
| Co- requisites | None | | |
| Module Entry requirements | None | | |

| Part 2: Description |
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| <p>Overview: In this module students will study standard mathematical techniques used in the solution of engineering problems.</p> <p>Educational Aims: See Learning Outcomes</p> <p>Outline Syllabus: Algebraic Manipulation and Standard engineering functions: Dimensions, polynomials, rational functions, exponential and logarithmic functions, trigonometric and hyperbolic functions, the inverse function, solving non-linear equations.</p> <p>Matrix and Vector Algebra: Properties of matrices and determinants, the inverse matrix, Gaussian elimination. Vector and scalar quantities, resolution of forces, properties of vector quantities, vector addition, unit vectors, position vectors, scalar product, vector product.</p> <p>Differential and Integral Calculus: Limits, average rate and instantaneous rate of change, differentiation, linearity, product rule, quotient rule and chain rule. Higher order derivatives, classification of turning points. Integration, indefinite and definite integration, integration by parts, numerical integration. First order differential equations, separation of variables.</p> <p>Teaching and Learning Methods: Scheduled learning includes lectures and workshops with tutorial sessions.</p> |

STUDENT AND ACADEMIC SERVICES

Independent learning includes hours engaged in problem solving and preparation of tutorial questions.

Contact time: 36 hours

Assimilation and skill development: 54 hours

Coursework: 15 hours

Exam preparation: 45 hours

Total: 150 hours

Part 3: Assessment

Component A, a two hour end of module examination has been chosen to test the understanding and knowledge of functions, calculus and linear algebra techniques under controlled conditions.

Component B, uses an e-assessment strategy to provide regular and rapid feedback to help students consolidate their knowledge as the module progresses.

| First Sit Components | Final Assessment | Element weighting | Description |
|---------------------------------|------------------|-------------------|-----------------------|
| Online Assignment - Component B | | 25 % | E-assessment |
| Examination - Component A | ✓ | 75 % | Examination (2 hours) |
| Resit Components | Final Assessment | Element weighting | Description |
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STUDENT AND ACADEMIC SERVICES

| Part 4: Teaching and Learning Methods | | | | | | | | | | | | | | | | | |
|--|---|---------------------------------|------------------|--|-----|--|-----|--|-----|---|-----|---|----|------------------------------|-----|------------------------|-----|
| Learning Outcomes | <p>On successful completion of this module students will achieve the following learning outcomes:</p> <table border="1"> <thead> <tr> <th style="text-align: left;">Module Learning Outcomes</th> <th style="text-align: left;">Reference</th> </tr> </thead> <tbody> <tr> <td>Select and apply appropriate techniques from calculus to the solution of a given problem</td> <td>MO1</td> </tr> <tr> <td>Select and apply appropriate techniques from linear algebra to the solution of a given problem</td> <td>MO2</td> </tr> <tr> <td>Interpret a mathematical model in terms of the physical problem being described with reference to the underlying assumptions and limitations of the mode</td> <td>MO3</td> </tr> <tr> <td>Use appropriate notation and terminology to communicate mathematical concepts</td> <td>MO4</td> </tr> </tbody> </table> | Module Learning Outcomes | Reference | Select and apply appropriate techniques from calculus to the solution of a given problem | MO1 | Select and apply appropriate techniques from linear algebra to the solution of a given problem | MO2 | Interpret a mathematical model in terms of the physical problem being described with reference to the underlying assumptions and limitations of the mode | MO3 | Use appropriate notation and terminology to communicate mathematical concepts | MO4 | | | | | | |
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| Select and apply appropriate techniques from calculus to the solution of a given problem | MO1 | | | | | | | | | | | | | | | | |
| Select and apply appropriate techniques from linear algebra to the solution of a given problem | MO2 | | | | | | | | | | | | | | | | |
| Interpret a mathematical model in terms of the physical problem being described with reference to the underlying assumptions and limitations of the mode | MO3 | | | | | | | | | | | | | | | | |
| Use appropriate notation and terminology to communicate mathematical concepts | MO4 | | | | | | | | | | | | | | | | |
| Contact Hours | <table border="1"> <thead> <tr> <th colspan="2">Independent Study Hours:</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Independent study/self-guided study</td> <td style="text-align: center;">114</td> </tr> <tr> <td style="text-align: center;">Total Independent Study Hours:</td> <td style="text-align: center;">114</td> </tr> <tr> <th colspan="2">Scheduled Learning and Teaching Hours:</th> </tr> <tr> <td style="text-align: center;">Face-to-face learning</td> <td style="text-align: center;">36</td> </tr> <tr> <td style="text-align: center;">Total Scheduled Learning and Teaching Hours:</td> <td style="text-align: center;">36</td> </tr> <tr> <td>Hours to be allocated</td> <td style="text-align: center;">150</td> </tr> <tr> <td>Allocated Hours</td> <td style="text-align: center;">150</td> </tr> </tbody> </table> | Independent Study Hours: | | Independent study/self-guided study | 114 | Total Independent Study Hours: | 114 | Scheduled Learning and Teaching Hours: | | Face-to-face learning | 36 | Total Scheduled Learning and Teaching Hours: | 36 | Hours to be allocated | 150 | Allocated Hours | 150 |
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| Reading List | <p><i>The reading list for this module can be accessed via the following link:</i></p> <p>https://uwe.rl.talis.com/modules/ufmfyg-15-1.html</p> | | | | | | | | | | | | | | | | |

| Part 5: Contributes Towards |
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| <p>This module contributes towards the following programmes of study:</p> <p>Civil and Environmental Engineering {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2018-19</p> <p>Architecture and Environmental Engineering {Foundation} [Sep][SW][Frenchay][6yrs] BEng (Hons) 2018-19</p> <p>Architecture and Environmental Engineering {Foundation} [Sep][FT][Frenchay][5yrs] BEng (Hons) 2018-19</p> <p>Civil and Environmental Engineering [Sep][PT][Frenchay][7yrs] MEng 2018-19</p> <p>Civil and Environmental Engineering {Apprenticeship} [Sep][PT][Frenchay][5yrs] BEng (Hons) 2018-19</p> <p>Civil and Environmental Engineering [Sep][PT][Frenchay][5yrs] BEng (Hons) 2018-19</p> <p>Civil and Environmental Engineering {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2018-19</p> |