

Module Title:	Applied Civil Engineering
Language of Instruction:	English
Credits:	5
NFQ Level:	6
Module Delivered In	No Programmes
Teaching & Learning Strategies:	Lectures Project work Private study
Module Aim:	The aims of this module are: (1) to develop the mathematical knowledge of students in order to enable them to successfully pursue their studies in civil engineering; (2) to teach elementary management skills in the areas of scheduling, material control, plant and labour costs. (3) to apply basic mathematical principles to practical civil engineering examples.

Learning Outcomes	
On successful completion of this module the learner should be able to:	
LO1	use a scientific calculator effectively.
LO2	to calculate: - (a) fractions & manipulate same; (b) ratios and percentages; (c) the area of standard shapes including triangle, rectangle, trapezoid, circle and semi-circle; (d) the surface area and volume of shapes including cylinder, cone, cube, cuboids, sphere and pyramids; (e) shear force & bending moment & draw appropriate diagrams for a simply supported beam.
LO3	plot graphs given a set of data points or an equation for straight line, quadratic and cubic equations.
LO4	solve simultaneous equations.
LO5	to apply trigonometric relationships to the solution of right angled triangles.
LO6	to prepare: - (a) materials schedules for construction projects and to calculate centre lines, floor areas, wall areas, etc.; (b) basic programmes (Gantt charts etc.).

Pre-requisite learning
Module Recommendations <i>This is prior learning (or a practical skill) that is recommended before enrolment in this module.</i>
No recommendations listed
Incompatible Modules <i>These are modules which have learning outcomes that are too similar to the learning outcomes of this module.</i>
No incompatible modules listed
Co-requisite Modules
No Co-requisite modules listed
Requirements <i>This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.</i>
No requirements listed

Module Content & Assessment

Indicative Content

(1) Numeracy (8 hours)

(a) Adding, subtracting, multiplication and division; (b) Using the calculator for standard engineering calculations: - (i) Square root; (ii) Multiplication, addition etc.; (iii) Bracketing etc for longer calculations; (iv) Manipulation of fractions. (c) Precision (decimal places and significant figures) (d) Numbers in standard notation ($1 \times 10^4 = 10000$ etc) (e) Fractions (f) Ratios (g) Percentages (h) Simultaneous Equations (2 variables) (i) Basic Algebra

(2) Engineering Science (8 hours lectures)

(a) SI Units (b) Mass, Forces (c) Resolving Forces (d) Principle of Levers

(3) Areas & Volumes (8 hours lectures)

(a) Area and perimeters of triangle, square, rectangle, circle, semi-circle, trapezoids. (b) Trapezoidal, Simpson & mid-ordinate Rule's (c) Surface area and volumes of cylinder, cone, cube, cuboids, sphere and pyramids. (d) Context of Space (e) Survey of existing building &/or drawings & then work out centre lines, floor areas, wall areas etc.

(4) Trigonometry (13 hours lectures)

(a) Right angle triangle (i) Pythagoras Theorem (ii) Trig ratios (cos, sin, tan) (b) Height of Building (c) Slopes on sites, area of sloping surfaces (d) Setting out a plot of ground (e) Triangulation of a plot of ground, calculate the area.

(5) Graphs (8 hours)

(a) Given a set of data points, construct a graph showing these (picking appropriate scale to show data properly) (b) Plotting straight line, quadratic and cubic graphs (given the equation or points)

(6) Scheduling (5 hours lectures)

(a) Preparation of Material Schedule (b) Use and Preparation of Basic Programmes (i.e. Gantt Chart etc) (c) Plant costing

(7) Shear Force and Bending Moment Diagrams (10 hours lectures)

(a) Shear and bending moment diagrams (b) Concentrated loads and uniform distributed force loading

Assessment Breakdown	%
Project	100.00%

No Continuous Assessment

Project

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Project	No Description	1,2,3,4,5,6	100.00	n/a

No Practical

No End of Module Formal Examination

SETU Carlow Campus reserves the right to alter the nature and timings of assessment

Module Workload

Workload: Full Time		
<i>Workload Type</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>
Lecture	30 Weeks per Stage	2.00
Practicals	30 Weeks per Stage	1.00
Estimated Learner Hours	30 Weeks per Stage	3.00
Total Hours		180.00

