#### Programme: MTEMP006 Master of Engineering

# Major Code: T164 UCD Master of Engineering (ME) in Energy Systems Engineering 2012/13 Full List of Modules Available (90 or 120-Credit Versions of Programme)

	UCD Code	Title	Core / Option	Core Credits	Option Credits	Sem- ester	Module Coordinator	Required Prior Learning	Comments 2012
1	EEEN40080	Power System Operation	С	5		1	Dr. Andrew Keane (Electrical Eng.)	Students taking this module must have a basic understanding of electrical power systems and be fully conversant with the underlying mathematics. Prior completion of an introductory course in electrical power systems (e.g. the equivalent of EEEN30070 Power System Engineering), is strongly recommended but is not essential.	
2	MEEN30140	Professional Engineering (Finance) (core for 120 credit programme, if not already taken)	С	5		1	Dr. Vincent Hargaden (Mechanical Eng.)	n/a	
3	EEEN40400	Wind Energy	С	5		1	Mr. Rick Watson (Electrical Eng.)	Prior completion of an introductory course in electrical power systems (e.g. the equivalent of EEEN30070 Power System Engineering), is strongly recommended but is not essential.	Incompatible with EEEN40110 Renewable Energy Systems
4	MEEN 40560	Research Skills and Techniques	С	5		1	Dr. David Browne (Mechanical Eng.)	n/a	· · · · · · · · · · · · · · · · · · ·
5	GEOL40310	Fossil Fuels, Carbon Capture & Storage	С	5		1	Prof. Pat Shannon (Geological Sciences)	3 Years of study in physical or chemical sciences or engineering, at Bachelor's level	
6	MEEN30100	Engineering Thermodynamics II	С	5		1	Dr. William Smith (Mechanical Eng.)	MEEN10010 Engineering Thermodynamics & Fluid Mechanics / MEEN10050 Energy Engineering, or equiv.	
7	MEEN40090	Energy Systems & Climate Change	с	5		1	Dr. William Smith (Mechanical Eng.)	MEEN10010 Engineering Thermodynamics & Fluid Mechanics / MEEN10050 Energy Engineering, or equiv.	
8	CHEN40440	Chemical Processes of Sustainable and Renewable Energy	0	5		2	Prof. Ravi Thampi (Chem & Bioproc. Eng)	3 Years of study in physical or chemical sciences or engineering, at Bachelor's level	
9	MEEN40430	Professional Engineering (Management) (core for 120 credit programme, if not already taken)	С	5		2	Dr. Eamonn Ambrose (Mechanical Eng. / Business)	n/a	
10	BMGT 30090	Entrepreneurial Management	0		5	2	Ms Patricia Kavanagh (Business)	n/a	
11	BSEN30030	Air Pollution	0		5	2	Dr Tom Curran (Biosystems Eng.)	Prior study in any of the physical or chemical sciences or engineering at Bachelor's level	
12	CHEN30140	Process Instrumentation & Control	0		5	2	Dr Niall English (Chem & Bioproc. Eng)	Mathematics for Engineers: ACM30160 or MAPH30160 - (differential equations)	
13	CVEN20030	Environmental Engineering Fundamentals	0		5	1	Dr Bill Magette (Civil Eng.)	Differential calculus Linear algebra Integral calculus and differential equations	
14	ECON41710	Energy Economics	0		5	2	Mr. Colm McCarthy (Economics)	Some knowledge of economics at an introductory level would be helpful.	This module is no longer available but an equivalent (under a "FIN4XXXX" module code) is under development.
15	EEEN 30090	Electrical Machines	0		5	1	Mr. Jeremiah O'Dwyer (Electrical Eng.)	EEEN20080 Electrical Engineering or EEEN20090 Electrical Energy Systems	
16	EEEN20020	Electrical and Electronic Circuits (core if not already taken)	0		5	1	Dr. Damian Flynn (Electrical Eng.)	Underlying mathematics: linear algebra, complex numbers and calculus. (Equiv. to MATH10150 & MATH10160 & MATH10170)	
17	EEEN20090	Electrical Energy Systems II	0		5	2	Dr. Damian Flynn (Electrical Eng.)	EEEN20020 or equivalent (Ability to analyse dc and ac circuits)	
18	EEEN30070	Power System Engineering	0		5	2	Mr. Rick Watson (Electrical Eng.)	Circuit Theory, Electronics & Electrical Engineering to the level of EEEN20020.	

19	EEEN40010	Control Theory	0		5	1	Dr. Paul Curran (Electronic Eng.)	Transform theory to level of Signals and Systems (EEEN30110). or equivalent	
		Power System Design	0		5	2		Power system Engineering (EEEN30070),	
20	ELENHOUSU	r olior oyalam boolgin	Ŭ		0	-	Mr. Rick Watson (Electrical Eng.)	or equiv.	
21	EEEN40100	Power Electronics and Drives	0		5	1	Mr. Jeremiah O'Dwyer (Electrical Eng.)		
22	EEEN40120	Applications of Power Electronics	0		5	2	Dr. Andrew Keane (Electrical Eng.)	EEEN20020 & (EEEN20080 or EEEN20090) & EEEN30070 & EEEN30090 & EEEN40010 Power Electronics & Drives, {Power Electronics & Drives, Solid State Electronics, Control Theory, Solid State Electronics}	
23	MEEN20050	Heat Transfer	0		5	1	Dr. Donal Finn (Mechanical Eng.)	MEEN10010 Engineering Thermodynamics & Fluid Mechanics / MEEN10050 Energy Engineering, or equiv.	
24	MEEN30040	Measurement & Instrumentation	0		5	2	Dr. Donal Finn (Mechanical Eng.)	A basic knowledge of (i) statistical methods and (ii) electrical concepts	
25	MEEN40010	Engineering Thermodynamics III	0		5	1	Dr. David Timoney (Mechanical Eng.)	MEEN10010 Engineering Thermodynamics and MEEN30100 Engineering Thermodynamics II	Module to be moved to Semester One from Sept. 2012
26	MEEN40020	Mechanics of Fluids II	0		5	1	Dr. Malachy O'Rourke (Mechanical Eng.)	MEEN20010 Mechanics of Fluids I	
27	MEEN40110	Advanced Composites and Polymer Engineering	0		5	2	Prof. Michael Gilchrist (Mechanical Eng.)	Engineering Mathematics	
28	MEEN40050	Computational Continuum Mechanics I	0		5	1	Prof. Alojz Ivankovic (Mechanical Eng.)		
29	MEEN40150	Computational Contuum Mechanics II	0		5	2	Prof. Alojz Ivankovic (Mechanical Eng.)	Co-Requisite : Computational Continuum Mech I (MEEN40050)	
30	MEEN40160	Kinetics & Thermodynamics of Materials	0		5	1	Dr. David Browne (Mechanical Eng.)	MEEN10020 Materials Science and Engineering I	
31	MEEN40180	Nanomaterials	0		5	2	Dr. Denis Dowling (Mechanical / Chemical Eng.)	University level mathematics, physics, and chemistry, and engineering subjects such as fundamental materials science, electronics, thermal-fluid, and systems design.	
32	MEEN40190	Mechanics of Fluids III	0		5	2	Dr. Malachy O'Rourke (Mechanical Eng.)	MEEN30010 Eng. Thermodynamics II / Engineering Mathematics (ACM30160 or MAPH30160 - (differential equations))	
33	MEEN40200	Energy Systems in Buildings	ο		5	2	Dr. Simos Oxizidis (Mechanical Eng.)	Introductory undergraduate modules in fluid mechanics, heat transfer and thermodynamics.	
34	MEEN40210	Energy in Transport	0		5	1	Dr. David Timoney (Mechanical Eng.)	Introductory undergraduate modules in physics / mechanics and thermodynamics.	
35	MEEN40670	Technical Communication	0		5	1&2	Prof. Michael Gilchrist / Mr. Barry Brophy (Mechanical Eng.)		This module will be offered in Semesters One and Two from 2012-13
36	PHYC30090	Nuclear Physics	0		5	2	Dr. Luis Leon Vintro (Physics)	Physics modules PHYC10080 and PHYC20020 or equivalent.	
	Option Rule:	Students must register for a maximum of one of the following Professional Work Experience Modules							
37	MEEN40530	Professional Work Experience - Long (Jan to July/August)	0		30	Y (2)	Dr. David Timoney (Mechanical Eng.)		
38	MEEN40540	Professional Work Experience - Short (e.g. Summer Work, Work with UCD Research Group on a part-time basis or group design project)	0		10	2	Dr. David Timoney (Mechanical Eng.)		
39	EEEN40190	Professional Work Experience (Electrical Energy) - Long (Jan to July/August)	0		30	2	Dr Damian Flynn		This module also used in ME (Electrical Energy Engineering)
40	EEEN40180	Professional Work Experience (Electrical Energy) - Short (e.g. Summer Work, Work with UCD Research Group on a part-time basis or group design project)	0		10	2	Dr Damian Flynn		This module also used in ME (Electrical Energy Engineering)
	Option Rule:	Students must register for one of the following Research Project Modules							
41	MEEN40570	ME (Energy) Research Project - 120 Credit Programme	С	20		Y	Dr. Simos Oxizidis / Dr. David Timoney (Mechanical Eng.)		
42	MEEN40550	ME (Energy) Research Project - 90 Credit Programme (Summer)	С	30		3	Dr. Simos Oxizidis / Dr. David Timoney		

T164 UCD Master of Engineering (ME) in Energy Systems Engineering Programme Structure 2012/13 Sample Modular Structure for 12-Month 90-Credit Programme (Guidance for UCD BE (Mechanical) Graduates)

	Semester 1	Comment	Core Credits	Option Credits	Sem- ester		Semester 2	Comment	Core Credits	Option Credits	Sem- ester
MEEN40090	Energy Systems & Climate Change (unless already taken)		5		1	CHEN40440	Chemical Processes of Sustainable and Renewable Energy		5		2
EEEN40080	Power System Operation		5		1	MEEN40200	Energy Systems in Buildings			5	2
GEOL40310	Fossil Fuels, Carbon Capture & Storage		5		1	BMGT30090	Entrepreneurial Management			5	2
EEEN40400	Wind Energy		5		1	MEEN40190	Mechanics of Fluids III			5	2
MEEN40560	Research Skills and Techniques		5		1	MEEN40110	Advanced Composites and Polymer Engineering			5	2
MEEN40210	Energy in Transport			5	1	MEEN40150	Computational Contuum Mechanics II			5	2
MEEN40010	Eng. Thermodynamics III			5	1	MEEN40180	Nanomaterials			5	2
MEEN40160	Kinetics & Thermodynamics of Materials			5	1	ECON41710	Energy Economics			5	2
EEEN40010	Control Theory			5	1	MEEN40670	Technical Communication			5	2
CVEN 20030	Environmental Engineering Fundamentals			5	1	PHYC30090	Nuclear Physics			5	2
MEEN40670	Technical Communication			5	1	BSEN30030	Air Pollution			5	2
						EEEN40090	Power System Design			5	2
EEEN 30090	Electrical Machines			5	1	EEEN40120	Applications of Power Electronics			5	2
EEEN40100	Power Electronics and Drives			5	1	EEEN30070	Power System Engineering			5	2
	SEMESTER CREDIT TOTALS		25	5			SEMESTER CREDIT TOTALS		5	25	
	Semester 3 (SUMMER)	Pre-Requisite: UCD Module Code No.	Core Credits	Option Credits	Sem- ester						
MEEN40550	Research Project / Thesis (Summer)		30		3						
	SEMESTER CREDIT TOTALS		30								

## T164 UCD Master of Engineering (ME) in Energy Systems Engineering Programme Structure 2012/13

Sample Modular Structure for 12-Month 90-Credit Programme (Guidance for UCD BE (Electrical / Electronic) Graduates)

	Semester 1	Comment	Core Credits	Option Credits	Sem- ester		Semester 2	Comment	Core Credits	Option Credits	Sem- ester
MEEN40090	Energy Systems & Climate Change (unless already taken)		5		1	CHEN40440	Chemical Processes of Sustainable and Renewable Energy		5		2
EEEN40080	Power System Operation		5		1	MEEN40200	Energy Systems in Buildings			5	2
GEOL40310	Fossil Fuels, Carbon Capture & Storage		5		1	BMGT30090	Entrepreneurial Management			5	2
EEEN40400	Wind Energy	Incompatible with EEEN40110 Renewable Energy Systems	5		1	ECON41710	Energy Economics			5	2
MEEN40560	Research Skills and Techniques		5		1	MEEN40670	Technical Communication			5	2
MEEN30100	Engineering Thermodynamics II			5	1						
MEEN40010	Engineering Thermodynamics III			5	1	PHYC30090	Nuclear Physics			5	2
MEEN40210	Energy in Transport			5	1	BSEN30030	Air Pollution			5	2
MEEN40020	Mechanics of Fluids II			5	1						
CVEN 20030	Environmental Engineering Fundamentals			5	1	EEEN40090	Power System Design			5	2
MEEN 20050	Heat Transfer			5	1	EEEN40120	Applications of Power Electronics			5	2
EEEN 30090	Electrical Machines			5	1	EEEN30070	Power System Engineering			5	2
EEEN40100	Power Electronics and Drives			5	1						
MEEN40670	Technical Communication			5	1						
	SEMESTER CREDIT TOTALS		25	5			SEMESTER CREDIT TOTALS		5	25	
	Semester 3 (SUMMER)	Pre-Requisite: UCD Module Code No.	Core Credits	Option Credits	Sem- ester						
EEEN4XXXX	ME (Energy) Research Project (Electrical) - 90 Credit Programme (Summer)		30		3						
	SEMESTER CREDIT TOTALS		30								

T164 UCD Master of Engineering (ME) in Energy Systems Engineering Programme Structure 2012/13 Sample Modular Structure for 12-Month 90-Credit Programme - Guidance for UCD BE (CHEMICAL) Graduates

	Semester 1	Comment	Core Credits	Option Credits	Sem- ester		Semester 2	Comment	Core Credits	Option Credits	Sem- ester
MEEN40090	Energy Systems & Climate Change (unless already taken)		5		1	CHEN40440	Chemical Processes of Sustainable and Renewable Energy		5		2
EEEN20020	Electrical and Electronic Circuits (unless- already taken)	Prior completion of this module is required if programme is to be completed in 12 months			4	EEEN20090	Electrical Energy Systems II	Prior completion of this module is required if programme is to be completed in 12 months			2
EEEN40080	Power System Operation		5		1	MEEN40200	Energy Systems in Buildings			5	2
GEOL40310	Fossil Fuels, Carbon Capture & Storage		5		1	BMGT30090	Entrepreneurial Management			5	2
EEEN40400	Wind Energy		5		1	ECON41710	Energy Economics			5	2
MEEN40560	Research Skills and Techniques		5		1	PHYC30090	Nuclear Physics			5	2
MEEN40210	Energy in Transport			5	1	MEEN40670	Technical Communication			5	2
MEEN30100	Engineering Thermodynamics II			5	1	EEEN30070	Power System Engineering	Pre-requisites: EEEN20020 & EEEN20090		5	2
MEEN40010	Engineering Thermodynamics III			5	1	EEEN40090	Power System Design	Pre-requisites: EEEN20020 & EEEN20090		5	2
EEEN40100	Power Electronics and Drives	Pre-requisites: EEEN20020 & EEEN20090		5	1	EEEN40120	Applications of Power Electronics	Pre-requisites: EEEN20020 & EEEN20090		5	2
EEEN 30090	Electrical Machines	Pre-requisites: EEEN20020 & EEEN20090		5	1						
MEEN40670	Technical Communication			5	1						
	SEMESTER CREDIT TOTALS		25	0			SEMESTER CREDIT TOTALS		5	20	
	Semester 3 (SUMMER)	Pre-Requisite: UCD Module Code No.	Core Credits	Option Credits	Sem- ester						
MEEN40550	Research Project / Thesis (Summer)		30		3						
	SEMESTER CREDIT TOTALS		30								

T164 UCD Master of Engineering (ME) in Energy Systems Engineering Programme Structure 2012/13

Sample Modular Structure for 2-year 120 Credit Programme - Guidance for BSc (Engineering Science) Graduates (1-Semester "Long" PWE)

Bit induities from the list of Core and Option Modules below, 30 Credits per Sementer, incer, Al Core modules most to taken below         June Sementer, Core Modules Service, Can to July/August)         June Sementer, Can to July/August)         July/August)         July/August         July/August)         July/August         July/August)         July/August)         July/August         July/August)         July/August         July/August         July/August         July/August         July/August         July/August         July/August         July/August         July/August <thjuly august<="" th="">         July/August         <th< th=""><th></th><th>Semester 1, Year 1</th><th>Comment</th><th>Core Credits</th><th>Option Credits</th><th>Sem- ester</th><th></th><th>Semester 2, Year 1 (30-Credit "Long" PWE)</th><th>Comment</th><th>Core Credits</th><th>Option Credits</th><th>Sem- ester</th></th<></thjuly>		Semester 1, Year 1	Comment	Core Credits	Option Credits	Sem- ester		Semester 2, Year 1 (30-Credit "Long" PWE)	Comment	Core Credits	Option Credits	Sem- ester
Semester 1, Year 2         Comment         Construct         Option Construct         Semester 2, Year 2         Comment         Construct         Option Construct         Option Construct         Option           MEE/M0570         ME (Energr) Research Project - 120 Credit programme - Part 1         5 or 10         Y         MEEM0570         ME(Energr) Research Project - 120 Credit programme - Part 2         Construct         MEEN0100         Construct		<ul> <li>6 modules from the list of Core and Option Modules below (30 Credits per Semester).</li> <li>Note: All core modules must be taken before completion of ME programme.</li> </ul>					MEEN40530	Professional Work Experience (Jan to July/August)		30		2
Semester 1, Year 2         Comment         Creatis Decisits         Creatis Programme - Part 1         Semester 1, Year 2         Comment         Creatis Decisits         Programme - Part 2         Comment         Creatis Decisits         Programme - Part 2         Comment         Creatis Decisits         Programme - Part 2         Comment         Continue         Decisits         Decisits         Programme - Part 2         Comment         Continue         Decisits         Decisits         Programme - Part 2         Comment         Continue         Decisits         Decisits         Programme - Part 2         Continue         Ioo 15         Continue         Decisits         Decisits <thdecisits< th="">         Decisits         Decis</thdecisits<>				Coro	Ontion	Som				Coro	Ontion	Som
ME Elenago         ME (Energy) Research Project - 120 Credit Programme - Part 1         10 or 15           MEEN40560         Research Skills and Techniques (to be taken in the last of Core and Option Modules toom, with a total of 25-35 Credits por Somester. Note: All core modules must be taken before completion of ME programme.         Image: Core Modules         Image: Core Modues         Image: Core Modules		Semester 1, Year 2	Comment	Credits	Credits	ester		Semester 2, Year 2	Comment	Credits	Credits	ester
MEEN40600       Research Skills and Techniques (b be taken in frail ayard ME)       5       1       Typically 3 or 4 additional modules from the list of Core and Option Modules below. Whether All Core is and Option Modules below. Note: All Core is and Diverses of Sustainable and NetRetAlG000       NetRetAlG00	MEEN40570	ME (Energy) Research Project - 120 Credit Programme - Part 1		5 or 10		Y	MEEN40570	ME (Energy) Research Project - 120 Credit Programme - Part 2		10 or 15		Y
Typically 3 of 4 additional modules from the list of Core and Option Modules below, with a total of 25-55 Credits presenseter. Note: All core modules must be taken before completion of ME programme.     Typically 3 of 4 additional modules from the list of Core and Option Modules below, with a total of 25-55 Credits presenseter. Note: All core modules must be taken before completion of ME programme.     Image: Core Modules     Image: Core Modules </td <td>MEEN40560</td> <td>Research Skills and Techniques (to be taken in final year of ME)</td> <td></td> <td>5</td> <td></td> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	MEEN40560	Research Skills and Techniques (to be taken in final year of ME)		5		1						
Core Modules         Core Modules         Core Modules         Core Modules           EEEN20200         Electrical and Electronic Circuits (I not already Isken)         5         1         EEEN20209         Electrical Energy Systems II (In to already Isken)         5         1           MEEN30140         Professional Engineering (Finance) (If not already taken)         5         1         CHEN40440         Chemical Processes of Sustainable and Renewable Energy         5         1           MEEN30100         Engineering Themodynamics II (If not already taken)         5         1         CHEN40440         Renewable Energy Professional Engineering (Management)         5         1           MEEN40030         Energy System Operation         5         1         Chemical Processes of Sustainable and Renewable Energy         5         1           GE0L40310         Wind Energy System Operation         5         1         Chemical Processes of Sustainable and Renewable Energy         5         1           GE0L40310         Fossi Fuels, Carbon Capture & Storage         5         1         Chemical Processes of Sustainable and Renewable Energy         5         1           MEEN40202         Mechanics of Fluids II         5         1         MEEN40200         Energy Systems in Buildings         5         5           MEEN40202         Mechanics of Fluids II		<b>Typically 3 or 4 additional modules</b> from the list of Core and Option Modules below, with a total of 25-35 Credits per Semester. Note: All core modules must be taken before completion of ME programme.						Typically 3 or 4 additional modules from the list of Core and Option Modules below, with a total of 25-35 Credits per Semester. Note: All core modules must be taken before completion of ME programme.				
EEEEN20202         Electrical and Electronic Circuits (if not already taken)         5         1         EEEN20200         Electrical Energy Systems II (f not already taken)         5         1           MEEN30140         Professional Engineering (Finance) (if not already taken)         5         1         CHEN40440         Chemical Processes of Sustainable and Renewable Energy.         5         1           MEEN30100         Engineering Thermodynamics II (if not already taken)         5         1         CHEN40440         Chemical Processes of Sustainable and Renewable Energy.         5         1           MEEN30100         Energy System Operation         5         1         MEEN40390         Professional Engineering (Management)         5         1           Deption Modules         Energy Systems & Climate Change         5         1         MEEN40300         Energy Systems in Buildings         1         1           MEEN40020         Mechanics of Fluids II         5         1         MeEN40200         Energy Systems in Buildings         1         1           MEEN40200         Mechanics of Fluids II         5         1         MeEN40200         Energy Systems in Buildings         5         1           MEEN40200         Mechanics of Fluids II         5         1         MeEN40200         Energy Systems in Buildings         5<	Core Modul	les					Core Modul	les				
MEEN30140         Professional Engineering (Finance) (if not already taken)         5         1         CHEN4040         Chemical Processos of Sustainable and Renewable Energy         5         5           MEEN30100         Engineering Thermodynamics II (if not already taken)         5         1         MEEN40430         Professional Engineering (Management)         5         5         1           MEEN40080         Energy System Operation         5         1         MEEN40430         Professional Engineering (Management)         5         1           GEDLA03010         Fossil Fuels, Carbon Capture & Storage         5         1          1 <td>EEEN20020</td> <td>Electrical and Electronic Circuits (if not already taken)</td> <td></td> <td>5</td> <td></td> <td>1</td> <td>EEEN20090</td> <td>Electrical Energy Systems II (if not already taken)</td> <td></td> <td>5</td> <td></td> <td>2</td>	EEEN20020	Electrical and Electronic Circuits (if not already taken)		5		1	EEEN20090	Electrical Energy Systems II (if not already taken)		5		2
MEEN30100         Engineering Thermodynamics II (If not already taken)         5         1         MEEN40430         Professional Engineering (Management)         5         1           EEEEN40080         Power System & Climate Change         5         1         Image: Change Change Change         Image: Change Ch	MEEN30140	Professional Engineering (Finance) (if not already taken)		5		1	CHEN40440	Chemical Processes of Sustainable and Renewable Energy		5		2
EEEEN40080         Power System & Climate Change         5         1           MEEN40090         Energy Systems & Climate Change         5         1           Option Modules	MEEN30100	Engineering Thermodynamics II (If not already taken)		5		1	MEEN40430	Professional Engineering (Management)		5		2
MEEN40000         Energy Systems & Climate Change         5         1           GEDL40310         Fossil Fuels, Carbon Capture & Storage         5         1         Option Modules         -	EEEN40080	Power System Operation		5		1						
LEEEN40400       Wind Energy       Construct a Storage       S       1         Option Modules       Option Modules       Option Modules       Option Modules       S       1         MEEN40020       Mechanics of Fluids II       S       1       MEEN40200       Energy Systems in Buildings       S       5         MEEN40020       Control Theory       S       1       MEEN40190       Mechanics of Fluids II       S       5         MEEN40210       Energy in Transport       S       1       MEEN40190       Mechanics of Fluids II       S       5         MEEN20050       Heat Transport       S       1       CHEN30140       Process Instrumentation & Control       S       5         MEEN40050       Computational Continuum Mechanics I       S       1       BSEN 30030       Air Pollution       S         MEEN40050       Computational Continuum Mechanics I       5       1       BEEN40150       Computational Communication       S         MEEN40670       Technical Communication       Pre-requisites:       5       1       EEEN40150       Computational Contuum Mechanics II       S         EEEN 30090       Electrical Machines       EFEN20020 &       5       1       EEEN40150       Computational Contuum Mechanics II	MEEN40090	Energy Systems & Climate Change		5		1						+
GEOL/0310       Fossil Fuels, Carbon Capture & Storage       5       1       Option Modules       Image: Control Theory       Image: Control Theory<	EEEN40400	Wind Energy		5		1						+
Option Modules         Option Modules         Option Modules         Image: Network and the second	GEOL40310	Fossil Fuels, Carbon Capture & Storage		5		1						
MEEN40020         Mechanics of Fluids II         5         1         MEEN40200         Energy Systems in Buildings         5           EEEN40010         Control Theory         5         1         MEEN40200         Mechanics of Fluids III         5         5           MEEN40210         Energy in Transport         5         1         CHEN 30140         Process Instrumentation & Control         5           MEEN40210         Energy in Transport         5         1         ECON41710         Energy Economics         1         5           OVEN 20030         Environmental Engineering Fundamentals         5         1         BSEN 30030         Air Pollution         5           MEEN40010         Engineering Thermodynamics II         5         1         MEEN40670         Technical Communication         5           MEEN40010         Power Electronics and Drives         Pre-requisites:         5         1         MEEN40150         Computational Contuum Mechanics I         5           EEEN 30090         Electrical Machines         Pre-requisites:         5         1         EEEN40150         Computational Contuum Mechanics I         Pre-requisites:         5           EEEN 30090         Electrical Machines         Pre-requisites:         5         1         EEEN40120         Ap	Option Moa	lules					Option Mod	lules				
EEEN40010         Control Theory         5         1         MEEN40190         Mechanics of Fluids III         5         5           MEEN40210         Energy in Transport         5         1         CHEN 30140         Process Instrumentation & Control         5         5           MEEN 20050         Heat Transfer         5         1         ECON41710         Energy Economics         5         5           CVEN 20030         Environmental Engineering Fundamentals         5         1         BSEN 30030         Air Pollution         5         5           MEEN40050         Computational Continuum Mechanics I         5         1         BMGT30090         Entrepreneurial Management         5         5           MEEN40100         Engineering Thermodynamics III         5         1         MEEN40150         Computational Continuum Mechanics II         5         5           MEEN40100         Power Electronics and Drives         Pre-requisites:         5         1         EEEN40090         Power System Design         EEEN20020 & EEEN20020	MEEN40020	Mechanics of Fluids II			5	1	MEEN40200	Energy Systems in Buildings			5	2
MEEN40210       Energy in Transport       5       1       CHEN 30140       Process instrumentation & Control        5         MEEN 20050       Heat Transfer       5       1       CHEN 30140       Process instrumentation & Control       5       5         OVEN 20030       Environmental Engineering Fundamentals       5       1       BMCT 30090       Energy Economics       5       5         MEEN40050       Computational Continuum Mechanics I       5       1       BMCT 30090       Entrepreneurial Management       5       5         MEEN40670       Technical Communication       5       1       BMCEN4070       Technical Communication       5         EEEN40100       Power Electronics and Drives       Pre-requisites: EEEN20020 & EEEN20020 & EEEN20020 & EEEN20020 & EEEN20090       5       1       EEEN40090       Power System Design       Pre-requisites: EEEN20020 & EEEN20020 & EEN20020 & EEEN20020 & EEEN20020 & EEEN20020 & EEEN20020 & EEEN20020 & EEEN20020 & EEEN20020 & EEN20020 & EEN2002	EEEN40010	Control Theory			5	1	MEEN40190	Mechanics of Fluids III			5	2
MEEN 20050       Heat Transfer       5       1       ECON41710       Energy Economics       5       5         CVEN 20030       Environmental Engineering Fundamentals       5       1       BSEN 30030       Air Pollution       5       5         MEEN40050       Computational Continuum Mechanics I       5       1       BMGT 30030       Entrepreneurial Management       5       5         MEEN40050       Technical Communication       Fre-requisites:       5       1       BMGT 30030       Entrepreneurial Management       5       5         MEEN40670       Technical Communication       Fre-requisites:       5       1       MEEN40150       Computational Contunu Mechanics II       5         EEEN40100       Power Electronics and Drives       EEEN20020 & 5       1       EEEN40090       Power System Design       EEEN20020 & 5       5         EEEN 30090       Electrical Machines       Pre-requisites:       5       1       EEEN40090       Power System Design       EEEN20020 & 5       5       5       1       EEEN20020 & 5       EEEN20020 & 5       EEEN20020 & 5       5       5       1       EEEN40120       Applications of Power Electronics       EEEN20020 & 5       5       5       5       1       EEEN20020 & 5       EEEN20020 & 5	MEEN40210	Energy in Transport			5	1	CHEN 30140	Process Instrumentation & Control			5	2
CVEN 20030       Environmental Engineering Fundamentals       5       1       BSEN 30030       Air Pollution       5       5         MEEN40050       Computational Continuum Mechanics I       5       1       BMGT30090       Entrepreneurial Management       5       5         MEEN40070       Technical Communication       5       1       BMGT30090       Entrepreneurial Management       5         MEEN40670       Technical Communication       5       1       MEEN40670       Technical Communication       5         EEEN40020       Pre-requisites:       5       1       MEEN40090       Power System Design       Pre-requisites:       5         EEEN 30090       Electrical Machines       Pre-requisites:       5       1       EEEN40090       Power System Design       Pre-requisites:       5         EEEN 30090       Electrical Machines       Pre-requisites:       5       1       EEEN40120       Applications of Power Electronics       Pre-requisites:       5       5         EEEN 30090       Electrical Machines       EEEN20020 & EEN20090 & EEEN20020 & EEN20090 & EEEN20090 & EEN20090 & EEEN	MEEN 20050	Heat Transfer			5	1	ECON41710	Energy Economics			5	2
MEEN40050       Computational Continuum Mechanics I       5       1       BMGT30090       Entrepreneurial Management       5       5         MEEN40010       Engineering Thermodynamics III       5       1       BMGT30090       Entrepreneurial Management       5       5         MEEN40670       Technical Communication       5       1       MEEN40670       Technical Communication       5         EEEN40070       Precrequisites:       5       1       MEEN40150       Computational Contuum Mechanics II       5         EEEN40070       Power Electronics and Drives       Pre-requisites:       5       1       BEEN40090       Power System Design       Pre-requisites:       5         EEEN 30090       Electrical Machines       Pre-requisites:       7       1       EEEN40120       Applications of Power Electronics       Pre-requisites:       7       5         EEEN 30090       Electrical Machines       Pre-requisites:       7       1       EEEN40120       Applications of Power Electronics       EEEN20020 & 5       5         EEEN 30090       Electrical Machines       Pre-requisites:       7       7       8       7       8       8       8         EEEN 30090       Electrical Machines       Pre-requisites:       8       8	CVEN 20030	Environmental Engineering Fundamentals		_	5	1	BSEN 30030	Air Pollution			5	2
MEEN40010       Engineering Thermodynamics III       5       1       MEEN40670       Technical Communication       5         MEEN40670       Technical Communication       5       1       MEEN40150       Computational Contuum Mechanics II       5         EEEN40100       Power Electronics and Drives       Pre-requisites: EEEN20090       5       1       EEEN40090       Power System Design       Pre-requisites: EEEN20090       5       5         EEEN 30090       Electrical Machines       Pre-requisites: EEEN20090       5       1       EEEN40120       Applications of Power Electronics       Pre-requisites: EEEN20090       5         EEEN 30090       Electrical Machines       EEEN20020 & EEEN20090       5       1       EEEN40120       Applications of Power Electronics       EEEN20020 & EEEN20090       5         EEEN 30090       Electrical Machines       EEEN20020 & EEEN20090       5       1       EEEN40120       Applications of Power Electronics       EEEN20020 & EEEN20090       5         EEEN 30090       Electrical Machines       EEN20020 & EEEN20090       5       1       EEEN30070       Power System Engineering       Pre-requisites: EEEN20020 & EEEN20020 & EEEN20090       5         EI       EI       EI       EI       F       1       F       F       F       F <td>MEEN40050</td> <td>Computational Continuum Mechanics I</td> <td></td> <td></td> <td>5</td> <td>1</td> <td>BMGT30090</td> <td>Entrepreneurial Management</td> <td></td> <td></td> <td>5</td> <td>2</td>	MEEN40050	Computational Continuum Mechanics I			5	1	BMGT30090	Entrepreneurial Management			5	2
MEEN40670       Technical Communication       5       1       MEEN40150       Computational Contuum Mechanics II       5       5         EEEN40100       Power Electronics and Drives       Pre-requisites: EEEN20090       5       1       EEEN40090       Power System Design       Pre-requisites: EEEN20090       EEEN20090       5       5       5       1       EEEN40090       Power System Design       Pre-requisites: EEEN20090       5       5       5       1       EEEN40090       Pre-requisites: EEEN20090       5       5       1       EEEN40120       Applications of Power Electronics       Pre-requisites: EEEN20090       5       5       5       5       1       EEEN40120       Applications of Power Electronics       Pre-requisites: EEEN20090       5       5       5       5       1       EEEN40120       Applications of Power Electronics       EEEN20090       5       5       5       5       5       1       EEEN40120       Applications of Power System Engineering       Pre-requisites: EEEN20090       5       5       5       5       1       EEEN30070       Power System Engineering       Pre-requisites: EEEN20090       5       5       5       5       5       5       5       5       5       5       5       5       5       5       5	MEEN40010	Engineering Thermodynamics III		_	5	1	MEEN40670	Technical Communication			5	2
EEEN 30090       Electrical Machines       Pre-requisites: EEEN20020 & EEEN20090       5       1       EEEN40120       Applications of Power Electronics       Pre-requisites: EEEN20090       5         Image: Second and the	EEEN40670	Power Electronics and Drives	Pre-requisites: EEEN20020 & EEEN20090		5	1	EEEN40090	Power System Design	Pre-requisites: EEEN20020 & EEEN20090		5	2
Image: state in the state	EEEN 30090	Electrical Machines	Pre-requisites: EEEN20020 & EEEN20090		5	1	EEEN40120	Applications of Power Electronics	Pre-requisites: EEEN20020 & EEEN20090		5	2
Physics modules       Physics modules       Physics modules       Phychologo and       Ph							EEEN30070	Power System Engineering	Pre-requisites: EEEN20020 & EEEN20090		5	2
REQUIRED CREDIT TOTALS 45 or 50 10 REQUIRED CREDIT TOTALS 50 or 55 10							PHYC30090	Nuclear Physics	Physics modules PHYC10080 and PHYC20020 or equivalent.		5	2
		REQUIRED CREDIT TOTALS		45 or 50	10		<u></u>	REQUIRED CREDIT TOTALS		50 or 55	10	

T164 UCD Master of Engineering (ME) in Energy Systems Engineering Programme Structure 2012/13

Sample Modular Structure for 2-year 120 Credit Programme - Guidance for BSc (Engineering Science) Graduates ("Short" PWE)

	Semester 1, Year 1	Comment	Core Credits	Option Credits	Sem- ester		Semester 2, Year 1 or Summer Period after Year 1 (10-Credit "Short" PWE)	Comment	Core Credits	Option Credits	Sem- ester
	6 modules from the list of Core and Option Modules below (30 Credits per Semester). Note: All core modules must be taken before completion of ME programme.					MEEN40540	Professional Work Experience (e.g. Summer Work, Work with UCD Research Group on a part- time basis or group design project) during Semester			10	2
							Four modules from the list of Core or Option Modules below. Note: All core modules denoted (C) must be taken before completion of ME programme				
	Semester 1, Year 2	Comment	Core Credits	Option Credits	Sem- ester		Semester 2, Year 2	Comment	Core Credits	Option Credits	Sem- ester
MEEN40570	ME (Energy) Research Project - 120 Credit Programme - Part 1		5 or 10		Y	MEEN40570	ME (Energy) Research Project - 120 Credit Programme - Part 2		10 or 15		Y
MEEN40560	Research Skills and Techniques (to be taken in final year of ME)		5		1						
	Typically 3 or 4 additional modules from the list of Core and Option Modules below, with a total of 25-35 Credits per Semester. Note: All core modules must be taken before completion of ME programme.						Typically 3 or 4 additional modules from the list of Core and Option Modules below, with a total of 25-35 Credits per Semester. Note: All core modules must be taken before completion of ME programme.				
Core Modul	es					Core Module	25				
EEEN20020	Electrical and Electronic Circuits (if not already taken)		5		1	EEEN20090	Electrical Energy Systems II (if not already taken)		5		2
MEEN30140	Professional Engineering (Finance) (if not already taken)		5		1	CHEN40440	Chemical Processes of Sustainable and Renewable Energy		5		2
MEEN30100	Engineering Thermodynamics II (If not already taken)		5		1	MEEN40430	Professional Engineering (Management)		5		2
EEEN40080	Power System Operation		5		1						
MEEN40090	Energy Systems & Climate Change		5		1						
GEOL 40310	Vind Energy Eossil Euels, Carbon Capture & Storage		5		1						
Option Mod			5		<u> </u>	Ontion Modu	llos				
				-							
	Control Theory			5	1		Energy Systems in Buildings			5	2
MEEN40010	Energy in Transport			5	1	CHEN 30140	Process Instrumentation & Control			5	2
MEEN 20050	Heat Transfer			5	1	ECON41710	Energy Economics			5	2
CVEN 20030	Environmental Engineering Fundamentals		1	5	1	BSEN 30030	Air Pollution			5	2
MEEN40050	Computational Continuum Mechanics I			5	1	BMGT30090	Entrepreneurial Management			5	2
MEEN40010	Engineering Thermodynamics III			5	1	MEEN40670	Technical Communication			5	2
MEEN40670	Technical Communication			5	1	MEEN40150	Computational Contuum Mechanics II			5	2
EEEN40100	Power Electronics and Drives	Pre-requisites: EEEN20020 & EEEN20090		5	1	EEEN40090	Power System Design	Pre-requisites: EEEN20020 & EEEN20090		5	2
EEEN 30090	Electrical Machines	Pre-requisites: EEEN20020 & EEEN20090		5	1	EEEN40120	Applications of Power Electronics	Pre-requisites: EEEN20020 & EEEN20090		5	2
						EEEN30070	Power System Engineering	Pre-requisites: EEEN20020 & EEEN20090		5	2
						PHYC30090	Nuclear Physics	Physics modules PHYC10080 and PHYC20020 or equivalent.		5	2
	REQUIRED CREDIT TOTALS		45 or 50	10			REQUIRED CREDIT TOTALS		20 or 25	30	

T164 UCD Master of Engineering (ME) in Energy Systems Engineering Programme Structure 2012/13

Trial Modular Structure for 1.5 year (Start: September Year 1, End: December Year 2) 100 Credit Programme - Guidance for BE (Civil) Graduates

	Semester 1, Year 1	Comment	Core Credits	Option Credits	Total Credits	Sem- ester		Semester 2, Year 1 or Summer Period after Year 1 (Assuming Candidate is Eligible for Award of 10-Credits for Prior Learning / "Short" Professional Work Experience)	Comment	Core Credits	Option Credits	Total Credits	Sem- ester
Core Module	es	Suggested Modules in Blue-Shaded Cells					Core Module	S	Suggested Modules in Blue-Shaded Cells				
EEEN20020	Electrical and Electronic Circuits	Dide-Offaded Cella	5			1	EEEN20090	Electrical Energy Systems II	Dide-Onaded Cells	5			
GEOL40310	Fossil Fuels, Carbon Capture & Storage		5			1	CHEN40440	Chemical Processes of Sustainable and Renewable		5			2
	Energy Systems & Climate Change		5			1	MEEN/0550	Energy Research Project / Thesis - Part One		10			3
MEEN30100	Engineering Thermodynamics II		5			1	MEEN40540	Professional Work Experience (ASSUMED PRIOR LEARNING IN THIS STRUCTURE)		10			2
MEEN40560	Research Skills and Techniques		5		1		MEEN40430	Professional Engineering (Management) - If Not Already Taken	Core if not already taken	5			2
MEEN30140	Professional Engineering (Finance) (if not already taken)	Core if not already taken	5		1				-	-	_		
Option Mod	ules						Option Modu	<u>iles</u>					
MEEN 20050	Heat Transfer			5		1	MEEN40200	Energy Systems in Buildings			5		2
WEEN40210	Energy in Transport			5	<u> </u>	1	ECON41710 BSEN 30030	Energy Economics	1		5		2
				<u> </u>	1		BMGT30090	Entrepreneurial Management	1		5	<u> </u>	2
							CHEN 30140	Process Instrumentation & Control			5		2
							MEEN40190	Mechanics of Fluids III			5		2
							MEEN40670 MEEN40150	Computational Contuum Mechanics II			5		2
							PHYC30090	Nuclear Physics			5		2
		Total Semester Credits (Core + Suggested Option Modules)	30						Total Semester Credits (Core + Suggested Option Modules)	30			
	"Semester 3" Summer Period (June / July /	Commont	Core	Option	Total	Sem-							
	August) After Year 1	Comment	Credits	Credits	Credits	ester							
MEEN40550	Research Project / Thesis - Part Two	Tatal One d'ite (Oans	20			3							
		Suggested Option Modules)	20	0	20								
	Semester "Four" (September to December, Year 2)	Comment	Core Credits	Option Credits	Total Credits	Sem- ester		Semester 2, Year 2 - PROGRAMME COMPLETE	Comment	Core Credits	Option Credits	Total Credits	Sem- ester
Core Module	es	Suggested Modules in Blue-Shaded Cells											
EEEN40080	Power System Operation	Pre-requisites: EEEN20020 & 20090	5			1							
EEEN40400	Wind Energy	EEEN20020 & 20090	5			1							
Option Mod	ules												
MEEN40210	Energy In Transport			5		1		1	ł		ł		+
MEEN40020	Mechanics of Fluids II			5		1			1				+
MEEN 20050	Heat Transfer			5		1							
EEEN40010	Control Theory		ļ	5		1						L	+
CVEN 20030 MEEN/0050	Environmental Engineering Fundamentals			5		1							
MEEN40670	Technical Communication			5		1							1
		Total Semester Credits (Core + Suggested Option Modules)	30										
	TOTAL CREDITS FOR SUGGESTED PROGRAMME STRUCTURE (Including Credit for Prior PWE)	120											
Modules Not Acc	cessible (Prior Learning not complete)						Modules Not Acc	essible (Prior Learning not complete)					
EEEN40100	Power Electronics and Drives	Pre-requisites: EEEN20020 & 20090		5		1	EEEN40090	Power System Design	Pre-requisites: EEEN20020 & 20090		5	2	
EEEN 30090	Electrical Machines	Pre-requisites: EEEN20020 & 20090		5		1	EEEN40120	Applications of Power Electronics	Pre-requisites: EEEN20020 & 20090		5	2	
							EEEN30070	Power System Engineering	Pre-requisites: EEEN20020 & 20090		5	2	