# Module Proforma

**Approved, 2022.02**

## Summary Information

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|---|---|
| **Module Code** | 7302CIV |
| **Formal Module Title** | Energy and Carbon Management |
| **Owning School** | Civil Engineering and Built Environment |
| **Career** | Postgraduate Taught |
| **Credits** | 20 |
| **Academic level** | FHEQ Level 7 |
| **Grading Schema** | 50 |

## Module Contacts

### Module Leader

| Contact Name | Applies to all offerings | Offerings |
|---|---|---|
| Mawada Abdellatif | Yes | N/A |

### Module Team Member

| Contact Name | Applies to all offerings | Offerings |
|---|---|---|
| Joseph Amoako-Attah | Yes | N/A |

### Partner Module Team

| Contact Name | Applies to all offerings | Offerings |
|---|---|---|

## Teaching Responsibility

| LJMU Schools involved in Delivery |
|---|
| Civil Engineering and Built Environment |

## Learning Methods

| Learning Method Type | Hours |
|---|---|
| Lecture | 22 |
| Practical | 2 |
| Tutorial | 22 |

## Module Offering(s)

| Offering Code | Location | Start Month | Duration |
|---|---|---|---|
| JAN-CTY | CTY | January | 12 Weeks |
| SEP-CTY | CTY | September | 12 Weeks |

## Aims and Outcomes

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| **Aims** | To provide the necessary skills for the selection and the effective management of energy in the construction industry, business environment and the energy supply sector. |

## Learning Outcomes

**After completing the module the student should be able to:**

| Code | Description |
|---|---|
| MLO1 | Critically appraise the existing procedures for energy management and energy source selection, and suggest improvements in accordance with the UNSDGS. |
| MLO2 | Design and critically evaluate carbon neutral and low carbon construction and energy supply. |
| MLO3 | Critically evaluate the existing financial framework for energy systems. |
| MLO4 | Design and critically evaluate a sustainable energy system. |

## Module Content

| Outline Syllabus |
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| Energy use, range of electricity sources used, applications of energy Design and critical evaluation of conventional energy sources: Primary andsecondary fuel sources. Fossil fuels. Design and critical evaluation of methods of control of pollution from energy supply sources.Electricity generation. Process efficiency, transmission losses, economic and environmental considerations.Renewable energy sources: Solar radiation - photovoltaics, solar collectors and passive solar heating. Biomass. Refuse use. Gasification, anaerobic digestion, landfill gas. Energy crops. Hydroelectricity and tidal power. Wave energy. Wind energy. Geothermal energy and ground source energy. OTEC. Sizing of schemes and choice of options. Design and critical assessment of the Civil Engineering works needed for each.Energy management; Objectives and strategies. Energy audits. Efficiency. Insulation.Energy tariff selection. Plant control optimisation, energy management systems. Transport.Carbon neutral and sustainable construction.Calculations of embodied energy and energy pay back period. Economic assessment of energy supply and financial risk.Legal and institutional framework governing energy and its use. International, EU and UK policy, law and regulation governing energy and its uses, and its impact on the environment. Targets, incentives and competition.Energy sustainability. |

**Module Overview**

| Additional Information |
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| The module develops the students' ability to undertake a comprehensive review of energy supply, use and efficiency measures, to enable the student to make informed decisions on energy use in the construction industry and business. |

## Assessments

| Assignment Category | Assessment Name | Weight | Exam/Test Length (hours) | Learning Outcome Mapping |
| --- | --- | --- | --- | --- |
| Centralised Exam | Examination | 60 | 3 | MLO2, MLO4, MLO3, MLO1 |
| Portfolio | Portfolio | 40 | 0 | MLO2, MLO4 |