Energy Management

Module Information

2022.01, Approved

Summary Information

Module Code	5502ICBTBS
Formal Module Title	Energy Management
Owning School	Civil Engineering and Built Environment
Career	Undergraduate
Credits	15
Academic level	FHEQ Level 5
Grading Schema	40

Teaching Responsibility

LJMU Schools involved in Delivery
LJMU Partner Taught

Partner Teaching Institution

Institution Name
International College of Business and Technology

Learning Methods

Learning Method Type	Hours
Lecture	45
Tutorial	15

Module Offering(s)

Display Name	Location	Start Month	Duration Number Duration Unit
SEP-PAR	PAR	September	12 Weeks

Aims and Outcomes

Aims	Aim of this module is to develop skills and capacity for effective energy management through the usage of energy conservation techniques and tools in order to minimize the operational cost of a particular building

After completing the module the student should be able to:

Learning Outcomes

Code	Number	Description
MLO1	1	Demonstrate an understanding of the importance of Energy Efficiency and its current trends
MLO2	2	Apply knowledge on the key areas of applications of energy efficiency in buildings, principal strategies and technologies
MLO3	3	Evaluate the financial benefits of Energy Efficiency Applications
MLO4	4	Demonstrate an understanding of Energy inspection surveys and Renewable Energy Sources

Module Content

Outline Syllabus	Introduction to building energy efficiency, facts & figures related to building stock energy use, impact of building energy use, local & international trends in building energy efficiency – Conventional, Energy Efficient and Green buildings, codes & standardsEnergy Efficiency aspects related to Building EnvelopElements of the building envelop, Energy efficient aspects of building envelop elements – Roof, Walls, Windows/Glazing, Floors/Slabs from design, material & operational perspectives, Envelop shading, prescriptive compliances from codes & standards Energy Efficiency in Building HVAC SystemAspects of design, equipment selection, operational & maintenance selection of HVAC equipment – minimizing cooling/heating loads, selection of equipment with minimum acceptable efficiencies (chillers, pumps, fans & blowers, cooling towers, boilers), energy efficient operational & maintenance strategies, prescriptive compliances of minimum efficiencies of equipment, emerging technologies Energy Efficiency in Building Electrical & Lighting System Aspects of design, equipment selection, operational & maintenance selection of electrical equipment - load reduction, equipment selection, load shifting & demand management (motors, transformers, connecting gear), prescriptive compliances of minimum efficiencies of equipment Selection of appropriate & efficient light sources, lighting controls, use of daylight Selection of efficient motors, lifts Energy Efficiency in Building Steam/Hot Water GenerationAspects of equipment selection, operational & maintenance selection of steam/hot water generation equipment – air/fuel ratio, burners, flue gas heat recovery, economizers, combustion preheating, condensate recovery, control gearBasic Economic aspects of Energy Efficiency in BuildingsUse of simple payback, IRR, NPV in the financial evaluation of an energy efficiency applicationIntroduction to Building Energy Auditing Basics of energy auditing, description and steps of a walk-through audit, benefits of walk-through audits Introduction to Renewable Energy Sources Overview to renewable energy technologies, common principles and trends Wind energy, solar energy, bio energy, and other renewable energy technologies (hydropower, geo thermal, fuel cells)
Module Overview	
Additional Information	

Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Report	Project based report	30	0	MLO2, MLO3, MLO1, MLO4

Exam	Written Examination	70	2	MLO2, MLO3, MLO1, MLO4

Module Contacts

Module Leader

Contact Name	Applies to all offerings	Offerings
Alison Cotgrave	Yes	N/A

Partner Module Team

Contact Name	Applies to all offerings	Offerings