WM9QJ-15 Sustainable Supply Chain Management and the Circular Economy

24/25

Department
WMG
Level
Taught Postgraduate Level
Module leader
Maria Triantafyllou
Credit value
15
Module duration
4 weeks
Assessment
100% coursework
Study location
University of Warwick main campus, Coventry

Description

Introductory description

In this module, students will delve into the core intricacies of sustainability and will acquire the skills to apply its fundamental principles into the design of environmentally friendly, economically viable, and socially responsible supply chains.
Emphasis will be placed on providing students with the knowledge to develop efficient, cost-effective and ethical procurement strategies; apply lean management principles to eliminate non-value added manufacturing activities and leverage emerging technologies to empower sustainable production; design sustainable warehouse facilities to optimise operational efficiency and reduce energy consumption and waste generation; plan efficient freight transport systems using alternative fuels, modes and technologies and utilise appropriate greenhouse gases assessment methodologies to quantify, assess and report their environmental performance; acquire a profound understanding of the challenges associated with last-mile logistics and develop innovative strategies to overcome them; and adopt circular economy principles to optimise resource utilisation and minimise waste generation across supply chains.
Lastly, students will learn how to conduct comprehensive life cycle assessments and will enhance

their problem-solving and decision-making abilities through the examination of real-world case studies and best practice examples.

Module aims

The main aim of this module is to provide students with a fundamental understanding of crucial sustainability issues and drivers and equip them with the necessary knowledge and skills to apply core sustainability principles into the design and management of modern supply chains.
Upon the completion of this module, students will be equipped with the knowledge and the skills, enabling them to confidently address an array of sustainability challenges within supply chains and become responsible leaders capable of adapting to evolving market, economic and technological conditions and identifying new opportunities in the rapidly changing business landscape.

Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

Sustainability: introduction to the fundamental concepts of sustainable development, triple bottom line and ESG; , understanding of global warming impacts and importance of achieving net-zero emissions to combat climate change; and examination of the prerequisites of major international agreements, regulatory frameworks and the UN Sustainable Development Goals.
Sustainable procurement: introduction to the concepts of social responsibility, ethical procurement, and supplier codes of conduct; and application of tools and standards like the GreenScor model and ISOs to ensure sustainable material sourcing.
Lean Manufacturing: introduction to the principles of Lean Manufacturing and Toyota’s Production Management concept and application of Value Stream Mapping, Six Sigma, Total Quality Management and other tools to optimise and assess the performance of production activities.
Green Warehousing: introduction to the principles of green buildings design using eco-friendly materials, renewable energy sources, and reusable packaging; examination of warehouse management systems and automation technologies; and application of energy design and environmental management standards to improve and assess warehouse performance.
Sustainable Freight Transportation: introduction to different transport modes, vehicles types, and alternative fuels; identification of major freight transport issues (e.g. drivers shortage and empty-running); and examination of technological and operational measures (e.g. use of transport management and navigation systems) to reduce impacts on the environment, the economy and the society.
Carbon Auditing: introduction to the concepts of decarbonisation, greenhouse gases and Scope 3 emissions; and application of carbon auditing and life cycle assessment tools.
Sustainable City Logistics: introduction to the concept of last-mile logistics, identification of transport externalities (e.g. congestion, noise, vibration), and identification of best practices (e.g. reduced emission zones, consolidation centres, parcel lockers, drone deliveries, etc).
Sustainable Waste Management and Circular economy: introduction to the concepts of waste hierarchy and resource productivity; examination of linear economy versus circular economy principles; examination of relevant strategies and examples; and evaluation of their performance using relevant KPIs.

Learning outcomes

By the end of the module, students should be able to:

- Demonstrate an in-depth understanding of the fundamental principles of sustainable development and the prerequisites of major international agreements and policy initiatives for the development of sustainable supply chains.
- Identify and apply sustainable principles on the procurement, manufacturing and storage practices for products and materials.
- Strategically select and apply appropriate carbon auditing tools for life-cycle and scenario analyses considering the use of different fuels, modes and vehicle technologies, and critically assess the resulting environmental and social implications.
- Critically evaluate the practical application of the most appropriate technological and engineering methods to recover energy and value from waste in line with the circular economy principles.
- Formulate and critically assess the performance of practical city logistics solutions for the industry and the society.

Indicative reading list

McKinnon, A., Browne, M., Piecyk, M., & Whiteing, A. (2015). Green Logistics: Improving the Environmental Sustainability of Logistics (3rd ed.). London: Kogan Page.
Weetman, C. (2016). A Circular Economy Handbook for Business and Supply Chains: Repair, Remake, Redesign, Rethink (3rd ed.). London: Kogan Page.
Grant, D. B., Trautrims, A., & Wong, C. Y. (2023). Sustainable Logistics and Supply Chain Management: Principles and Practices for Sustainable Operations and Management (3rd ed.). London: Kogan Page.

Subject specific skills

Understanding key sustainability concepts, critical thinking, problem-solving, data analysis and interpretation, decision-making, analytical, research skills .

Transferable skills

Communication of sustainability concepts to an audience both in written and verbally. Problem solving capabilities. Reflective practice. Strategy planning skills. Technical and numeracy skills. Work independently. Teamwork. Leadership skills. Resilience and reflection.

Study

Study time

Type	Required
Lectures	15 sessions of 1 hour (10%)
Seminars	15 sessions of 1 hour (10%)
Online learning (independent)	3 sessions of 1 hour (2%)
Private study	57 hours (38%)
Assessment	60 hours (40%)
Total	150 hours

Private study description

Students will be encouraged to explore the reading list which includes essential and recommended reading materials. Students will be encouraged to utilise the CPD tools and range of resources from the CILT and CIPS websites as part of their student and affiliate memberships. Students will be encouraged to search on recruitment and job advertisement websites to compare their skills sets and their learning to job role and position requirement in the supply chain field.

Costs

No further costs have been identified for this module.

Assessment

You must pass all assessment components to pass the module.

Assessment group A

	Weighting	Study time	Eligible for self-certification
Industry analysis based on manager interviews	50%	30 hours	Yes (extension)
Students will have to select one out of four pre-recorded interviews with industry managers, critically analyse the sustainability issues raised by the interviewees and propose a set of solutions			
Sustainable supply chains in-class closed-book quiz	20%	12 hours	No
An in-class closed-book quiz testing student understanding on key sustainable supply chains concepts and practices			
Life Cycle Assessment Reflection	30%	18 hours	Yes (extension)
Reflective piece on life cycle assessment exercise run in-class			

Feedback on assessment

1. Written report - written feedback report
2. In-class test - automatic Moodle feedback for close-ended questions and manually inserted descriptive feedback in Moodle for open-ended questions
3. Reflection report - written feedback report
4. Re-assessments - same feedback format as in original assessments

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Availability

There is currently no information about the courses for which this module is core or optional.