

**Workshop Results = Modular
Curriculum Concepts with all
elements and requirements**

Promotion for Sustainability in the Textile and Garment Industry in Asia-FABRIC

Workshop Results = Modular Curriculum Concepts


Modular concept, with all elements and requirements

The modular handbook prescribes a structure which will be followed by all modules (topics) in the same manner.

This concept contains all the required elements.

Modular = clear structure with "exchangeable modules"

Modules can be combined integrated partly or used as complete modules in a study program.

See the example on the right : 

Module-Handbook-Page¶

A-Module-Handbook-Page-on-Resource-Management-(as-an-example)-¶

Application-of-the-module-□	The-Module-will-be-applied-in-the-Master-study-program-"Energy-and-resource-efficiency"-□
Module-numbers	M-xyp
Module-title□	Resource-Management□
ECTS-Credits-□	5-ECTS-Credits□
Workload-and-its-composition□	125-h-(100-h-self-study,-25-h-face-to-face-/contact-time)□
Module-aims,-trained-competencies□	This-module-covers-general-aspects-of-resource-management-but-also-offers-the-opportunity-to-specialize-in-buildings-or-industry.-It-aims-to-explore-management-of-resources-...-Emphasis-is-placed-on-...-www¶ On-completion-of-this-module-learners-will-be-able-to-¶ •→ Classify-according-to-the-use-of-resources,-materials-and-products¶ •→ Carry-out-mass-and-energy-balances¶ •→ Know-and-apply-methods-to-increase-resource-efficiency-□
Prerequisites□	None□
Level-□	Fourth-semester□
Teaching-and-learning-methods□	Face-to-face-presence-lectures-/blended-and-or-online-distance-learning-(online-lectures,-forums,-chat-and-messaging,-self-study,-exercises,-video-podcasts)□
Form-of-module□	Compulsory□
Frequency-of-module-offers□	Every-fall-semester□
Duration-of-the-module□	6-months-/October-to-March□
Method-/duration-of-examination□	Written-assignment-and-exam-(90-min)□
Calculation-of-module-grade□	1/3-written-assignment-and-2/3-exam-□
Content-□	1.-→ Terminology-and-introduction¶ 1.1.-From-resources-to-materials-to-products¶ 1.2.-Raw-material-markets,-range-and-limitations,-criticality-of-resources¶ 2.-→ Management-of-material-and-water¶ 2.1.-Balance-equations-for-technical-systems:-mass-and-energy¶ 2.2.-Material-flow-cost-accounting¶ 3.-→ Resource-efficiency-of-products-and-processes¶ 3.1.-Integrated-pollution-control-(IPC)¶ 3.2.-Substitution,-Eco-design,-process-optimization,-recycling¶ 4.-→ Life-cycle-assessment-(LCA)-¶ 4.1.-Aim-and-history,-Life-Cycle-analysis¶ 4.2.-Product-carbon-footprint¶ 5.-→ Research-and-Future-Development¶ 5.1.-Recent-developments-for-efficient-resource-management¶ 5.2.-Future-field-of-application-in-industry-□
Recommended-literature□	¶ References-and-study-literature-communicated-at-beginning-of-course.¶ European-Commission-(2011)-A-resource-efficient-Europe-–-Flagship-initiative-of-the-Europe-2020-Strategy,-Brussels-COM-(2011)-¶ UNEP-International-Resource-Panel-(2014)-E-Book:-www.unep.org/resourcepane¶ Also-see-¶ www.umberto.de-(Software-for-Material-and-Energy-Accounting),¶ □
Comments□	□

GROUP 1

Sustainable Development in the Textile Industry

Module Handbook Page

Application of the module	Module in Textile engineering programme
Module number	G1
Module title	Sustainable development in textile
ECTS-Credits	18 credits
Workload and its composition	450h (300h lecture, 150h practice, 600h self study)
Module aims, trained competencies	<p>This module covers general aspects of Sustainable development in textile. The learner will have knowledge to apply sustainable development in their work in textile industry.</p> <p>On completion of this module learners will be able to:</p> <ul style="list-style-type: none">Understanding the concepts of Sustainable development in textileApply methods to increase resource efficiencyApplied in textile management

Module Handbook Page

Prerequisites	None
Level	Bachelor
Teaching and learning methods	Face to face presence lectures / blended, self-study, exercises, video.
Form of module	Selective
Frequency of module offer	Every semester
Duration of the module	6 months
Method / duration of examination	Written assignment and exam (90 min/subject), final exam (presentation)
Calculation of module grade	2/3 subject assignment and 1/3 final exam

Module Handbook Page

Content

Recycling in textiles (Classification of wastes; Recycling technologies; product design after recycling)

Environment management in Textile industry (Solid wastes, gas, waste water, chemical, energy management)

Green Chemicals in textiles (New dyestuff, Auxiliaries, finishing agent)

Advanced technologies in textiles (Clean energy, Clean dye, Green Technology in finishing)

Eco-textiles (Eco-environment, effect of wastes to eco-environment, eco-standards for products, eco-label)

Curicular economy (Life cycle, recycle process (4Rs), Introduction some model in industry)

Module Handbook Page

Recommended literature	References and study literature communicated at beginning of course. <ol style="list-style-type: none">1. European Commission (2011) A resource-efficient Europe – Flagship initiative of the Europe 2020 Strategy. Brussels COM (2011)2. UNEP International Resource Panel (2014) E-Book: www.unep.org/resourcepanel3. Ökotex 100 standard4. Muthu, S. S. (Ed.). (2018). Sustainable innovations in recycled textiles (pp. 3-5). Springer.5. Perosa, Alvise, and Fulvio Zecchini. Methods and reagents for green chemistry: an introduction. John Wiley & Sons, 2007.
Comments	This is draft / trial version

GROUP 2

Sustainable development in Garment technology and Fashion design

Module Handbook Page

Application of the module	The Module will be applied in the Bachelor, Engineer, Master study programs "Garment technology" and "Fashion design"
Module number	GF01
Module title	<u>Sustainable development in Garment technology and Fashion design</u>
ECTS-Credits	2 Credits
Workload and its composition	90 h (60 h self-study, 30 h face to face / contact time)
Module aims, trained competencies	<p>Học phần trang bị cho sinh viên kiến thức về khả năng tái chế và sử dụng chất thải làm nguyên liệu trong ngành may và thời trang; Kết thúc học phần học viên có thể phân tích được tính bền vững và sự cần thiết cũng như lợi ích của ecodesign, năng lượng tái tạo, quản lý chất thải trong ngành may, thời trang và một số công nghệ mới có khả năng đáp ứng yêu cầu của phát triển bền vững.</p> <p>This course equips knowledge for students related to recycling ability and using wastes in order to be used as raw materials in garment technology and fashion design</p> <p>After this course, students are able to analyze sustainability and essentials as well as benefits of ecodesign, renewable energy and waste management in garment technology and fashion design, new technologies to meet demand in sustainable development.</p>

Module Handbook Page

Prerequisites	None
Level	Fifth semester
Teaching and learning methods	Face to face presence lectures / blended and or online distance-learning (online lectures, forums, chat and messaging, self-study, exercises, video podcasts)
Form of module	Elective
Frequency of module offer	Every fall semester
Duration of the module	4 months / September to December
Method / duration of examination	Written assignment and exam (60 min)
Calculation of module grade	1/2 written assignment and 1/2 exam

Content

- 1. Using waste as raw materials in recycling garment and fashion products** (Sử dụng chất thải làm nguyên liệu trong tái chế sản phẩm may và thời trang)
 1. General issues of recycling technology (Những vấn đề chung về tái chế và công nghệ tái chế)
 2. Recycled clothes and environmental awareness (quần áo tái chế và cảnh báo về môi trường)
 3. Using waste as raw materials (Sử dụng chất thải làm nguyên liệu thô)
- 2. Sustainability and Ecodesign** (Tính bền vững và ecodesign)
 1. Ecodesign in supply chain of garment and fashion industry (Ecodesign trong chuỗi cung ứng sản phẩm may và thời trang)
 2. Cleaner production in garment and fashion industry (Sản xuất sạch hơn trong ngành may và thời trang)
 3. Ecological ideas in garment and fashion industry (Sáng kiến sinh thái trong ngành may và thời trang)

Content

- A) Using renewable energies for applications in garment industry (Sử dụng năng lượng tái tạo cho các ứng dụng công nghệ may)
- B) Waste management in garment and fashion industry (Quản lý chất thải trong ngành may và thời trang)
- C) Waste management in garment and fashion manufacturing (Quản lý chất thải trong sản xuất sản phẩm may và thời trang)
- D) Waste management during and after using garment and fashion products (Quản lý chất thải trong và sau sử dụng sản phẩm may và thời trang)
- E) New technologies (Các công nghệ mới) New technologies in researching and developing garment and fashion products (Công nghệ mới trong nghiên cứu và phát triển sản phẩm may và thời trang)
- F) New technologies in manufacturing garment and fashion products (Công nghệ mới trong sản xuất sản phẩm may và thời trang)

Module Handbook Page

Recommended literature	<p>[1] M. MirafTAB and A. R. Horrocks, Ecotextiles The way forward for sustainable development in textiles, Woodhead Publishing Limited and CRC Press, 2007.</p> <p>[2] A Richard Horrocks, ECOTEXTILE '98 - SUSTAINABLE DEVELOPMENT, Proceedings of the Conference, Ecotextile '98, The Bolton Moat House, 7 &8th April 1998, Woodhead Publishing Limited, 1999.</p> <p>[3] UNEP DTIE, Sổ tay hướng dẫn thiết kế hướng tới phát triển bền vững, 2012.</p> <p>[4] Harold Carr, John Pomeroy, Fashion Design and Product Development, John Wiley & Sons, 1992.</p> <p>[5] Karl T. Ulrich, Steven D. Eppinger, Product Design and Development, McGraw Hill International Edition, 2008.</p>
Comments	<p>To implement this course successfully, we need to</p> <ul style="list-style-type: none">- Provide more materials about sustainable development- Connect several universities having available courses to learn mutually,- Connect organizations in sustainable development in garment and fashion to achieve more supports- Organize several workshop/seminars about this field

Modular Concepts

The **module handbook** gives an overview of all the different topics covered in a study program.

Within the discussions of working groups the curriculum in form of a module handbook page was **developed in an cooperative, joint, iterative, participatory process among the univesities.**

Last but not least, this modular curriculum outlines will the most important components for the **change process** in the universities **towards sustainable topics.**

Module Handbook Page ¶

A Module Handbook Page on Resource Management (as an example) ¶

Application of the module □	The Module will be applied in the Master study program "Energy and resource efficiency". □
Module number □	M.xyp □
Module title □	Resource Management □
ECTS Credits □	5 ECTS Credits □
Workload and its composition □	125 h (100 h self-study, 25 h face-to-face / contact time) □
Module aims, trained competencies □	This module covers general aspects of resource management but also offers the opportunity to specialize in buildings or industry. It aims to explore management of resources. ... Emphasis is placed on ... ¶ On completion of this module learners will be able to: ¶ <ul style="list-style-type: none"> •→ Classify according to the use of resources, materials and products ¶ •→ Carry out mass and energy balances ¶ •→ Know and apply methods to increase resource efficiency □
Prerequisites □	None □
Level □	Fourth semester □
Teaching and learning methods □	Face to face presence lectures / blended and or online distance learning (online lectures, forums, chat and messaging, self-study, exercises, video podcasts) □
Form of module □	Compulsory □
Frequency of module offers □	Every fall semester □
Duration of the module □	6 months / October to March □
Method / duration of examination □	Written assignment and exam (90 min) □
Calculation of module grades □	1/3 written assignment and 2/3 exam □
Content □	<ol style="list-style-type: none"> 1.→ Terminology and introduction ¶ <ol style="list-style-type: none"> 1.1.→ From resources to materials to products ¶ 1.2.→ Raw material markets, range and limitations, criticality of resources ¶ 2.→ Management of material and water ¶ <ol style="list-style-type: none"> 2.1.→ Balance equations for technical systems: mass and energy ¶ 2.2.→ Material flow cost accounting ¶ 3.→ Resource efficiency of products and processes ¶ <ol style="list-style-type: none"> 3.1.→ Integrated pollution control (IPC) ¶ 3.2.→ Substitution, Eco design, process optimization, recycling ¶ 4.→ Life cycle assessment (LCA) ¶ <ol style="list-style-type: none"> 4.1.→ Aim and history, Life Cycle analysis ¶ 4.2.→ Product carbon footprint ¶ 5.→ Research and Future Development ¶ <ol style="list-style-type: none"> 5.1.→ Recent developments for efficient resource management ¶ 5.2.→ Future field of application in industry □
Recommended literature □	¶ References and study literature communicated at beginning of ¶ course. ¶ European Commission (2011): A resource-efficient Europe – Flagship initiative of the Europe 2020 Strategy. Brussels COM (2011) ¶ UNEP International Resource Panel (2014) E-Book: ¶ www.unep.org/resourcepanel ¶ Also see: ¶ www.umberto.de (Software for Material and Energy Accounting); ¶ □
Comments □	□

Action Plan for the University _____

Action Plan for the University

	What (Action Subject, Task)	Who (Person, Group, Commission)	When (Time frame)	Resources (Budget)
1				
2				
3				

**Deutsche Gesellschaft für
Internationale Zusammenarbeit (GIZ) GmbH**

Registered offices
Bonn and Eschborn

Friedrich-Ebert-Allee 32 + 36
53113 Bonn, Germany
T +49 228 44 60 - 0
F +49 228 44 60 - 17 66

Dag-Hammarskjöld-Weg 1 - 5
65760 Eschborn, Germany
T +49 61 96 79 - 0
F +49 61 96 79 - 11 15

E info@giz.de
I www.giz.de