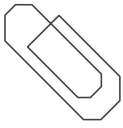


Unfold your talent
VIA University College



Curriculum

Programme section

**Bachelor of Engineering in Material Science and
Product Design**

For students enrolled in August 2018 and after

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1 Introduction

In accordance with the Diploma Engineering Education programme, the purpose of the diploma engineering programme is to qualify students to, nationally and internationally, carry out the following business functions;

- Transpose technical research results as well as scientific and technical knowledge to practical use in development tasks and in solving technical problems within the field of interest
- Critically acquire new knowledge within relevant engineering areas
- Independently solve common engineering task
- Plan, implement and manage technical and technological facilities, including being able to involve social, economic, environmental, sustainability and occupational health consequences in the solution of technical problems
- Participate in collaborative and managerial functions and contexts at a qualified level with people who have different educational, linguistic and cultural backgrounds

In addition, the education must qualify students to participate in further studies.

VIA Engineering, endeavours to work in accordance with a common DNA for all engineering courses. The DNA contains a description of what especially characterizes the engineering programmes at VIA, as well as what to expect from a graduate from our engineering programmes.

At VIA Engineering, we are practice- and project oriented and focused on the surrounding world. These goals are achieved in the form of qualified graduates obtained through targeted education, relevant research and development as well as cooperation and ongoing dialogue and mentor arrangement with the business community. The programmes at VIA Engineering will qualify the graduates to perform practice- and development-oriented business functions.

English-language programmes and international admission is a characteristic of our engineering programmes. This profile creates a unique opportunity to educate students who can act in a Danish context in an increasingly global market. Our lecturers have a broad practical experience, and they understand how to Anchor the theory in practice through laboratory work, company visits and projects for and in collaboration with companies.

To ensure the usefulness of the content of the programme, the principles of the CDIO education concept are applied, ensuring that the individual courses are continuously reviewed, evaluated and developed.

2 Identity of the programme

The purpose of the Material Science and Product Design Programme at VIA is to enable the graduates to work within the areas of Material Science and Product design/development, sustainability and CSR, Innovation and giving them the opportunity to specialize in 1) Textile 2) Plastics or 3) Other area that might be of interest. It is crucial that the graduates, in relation to the above, develop a deep understanding for scientific problems, experimental competences and general business understanding. Furthermore, the graduates will develop competences enabling them to work as project managers both nationally and internationally within the Material Science, Product Design, Product Development or Innovation area,

The purpose of the programme is primarily achieved by:

- Making project work an essential part of the course in which the technical elements of the programme are integrated via problem solving focusing on use-oriented and practical engineering work.

In the project work, it is also important that the students develop technical, methodical, communicative and personal competences.

- The student methodical, communicative and personal competences is a key development area in the Mentor arrangement
- Collaboration with research environments and companies in connection with the courses and through the mentor arrangement.
- Offering an international study environment, in which parts of the programme can take place abroad and where all courses are carried out in English for both Danish and foreign students. Few electives can be in Danish for both Danish and foreign student as additional options.
- Using the student's mentor arrangement and internship actively to exchange knowledge and experience between VIA and the profession.
- Obtaining application and practice-oriented competences by using VIA's Horsens and Via Designs laboratory, workshop and library facilities.

3 Structure and content

The programme is organized as an ordinary full-time higher education. For students who complete the programme without an individually organized course sequence, the programme build-up, structure and progression, including tests, will be as indicated in the table at the end of this section.

The official duration of the degree programme is 3½ years, divided into 7 semesters corresponding to 210 ECTS credits. New students are enrolled once a year in August.

The scope of each course and project is documented in ECTS credits (European Credit Transfer System). 1 ECTS credit corresponds to 27.5 hours of standard study activity for a student and one study year equals 60 ECTS credits.

The reading of the study material requires English on level B in order to complete the programme.

The programme consists of:

- Compulsory courses and projects
- Elective courses
- Mentor arrangement and Internship
- Bachelor Project
- Workshop practice

A semester consists of 3-6 courses as delimited courses. One course can have a volume of 5 – 10 ECTS credits and a project can have a volume of 5-20 ECTS credits.

Some compulsory courses can be taught in collaboration with AU Herning or VIA Engineering Horsens. The course at AU Herning or VIA Engineering Horsens must be approved by a Material Science coordinator in order to secure the relevance and an increase of the technical level. Physically the course in collaboration with AU Herning can take place at AU Herning. Physically the course in collaboration with Via Engineering can either take place in Horsens like joint Innovation week, or in a combination with on line learning and being present in Horsens once in a while.

The topics, volume, learning objectives and tests of the courses are described in this curriculum. For a more detailed description of the individual courses, the valid Syllabus are available on VIA's web site or on Study net.

There is 3 week of workshop courses during the two first semesters aligned to the study programme.

The programme is structured as illustrated below:

| Semester Theme | Course | Course | Course | Course/ Project | Project | |
|---|--|---|--|---|---|---|
| 7. semester Elective course/ Specialisation | Elective course | Elective course | BPR 1 Bachelor Project (speciality) | | | |
| 6. semester Elective course/ Specialisation | MET5 Specialty Technology module 5 | MET6 Specialty Future material Module 6 | Elective course | TOC1 Theory of Science | SEP 6 Semester Project (Open project within speciality) | |
| 5. semester Internship | INP1 Engineering Internship (speciality) | | | | | |
| 4. semester Business-oriented Innovation | MET4 Material Science Module 4 | STR1 Business development and Strategic Management | LOG1 Logistics, purchasing and out/insourcing. | PRO1 Project Management | INN1 Innovation (innovation week and Innovation) | SEP4 Semester project Innovation and Business development |
| 3. semester Future materials | ECO1 Economy | CHE2 Applied chemistry Dying, Printing Chromotology | MET3 Material technology processes and Production management | PHY2 Physics, Electronics and thermodynamics (module 2) | SEP 3 Semester project Future material | |
| 2. semester Quality/CSR and Sustainability | GRA1 Graphics communication | MET2 Material technology module 2 | PHY1 Statistics and Mechanics of materials (module 1) | QSE 1 QHSE Management, CSR and sustainability | SEP2 Semester project Quality/CSR and sustainability | |
| 1. semester Innovation and development | MAT1 Mathematics | STA1 Statistics | MET1 Material technology module 1 | CHE1 Basic Chemistry module 1 | SSE1 Study Skills for Engineering Students | SEP1 Semester project Innovation and Development |

4 Compulsory courses of the programme, 1st – 4th semester

All courses and projects on the first four semesters are compulsory.

Each of the four first semesters contains a semester project that represents 5-10 ECTS credits. The overall purpose of the semester project is to tie the subjects of the semester together to a unified whole. Project methodology, science theory, research methodology and teamwork will be introduced throughout the programme in connection with the semester projects.

Each semester has a theme in such a way that knowledge and skills are acquired through the courses and the competences are acquired and tested in the projects.

- 1st semester: Innovation and Development
- 2nd semester: Quality/CSR and sustainability
- 3rd semester: Future materials
- 4th semester: Business-oriented Innovation

4.1 1st semester: Innovation and Development

Topics

- Mathematics (MAT1)
- Statistics (STA11)
- Material Technology Module 1 (MET1)
- Basic Chemistry Module 1 (CHE1)
- Study Skills for Engineering Students (SSE1)
- Innovation and Development, Semester project (SEP1)

Overall learning objectives

Knowledge

- Acquire knowledge about research and central theories within the subject area: "Integrals, vectors and financials"
- Acquire basic understanding of statistics like probability theory and random sample theory
- The basic characteristics of metals and polymers
- Acquire knowledge and understanding of chemistry and calculation on chemical reactions.
- The phases and documentation of the project

Skills

- Solve tasks within mathematical disciplines listed within the subject area: "Integrals, vectors and financials"
- Selection and application of the most suitable statistical method for a given problem and critically reflect upon the assumptions underlying the chosen method.
- Selection of suitable materials based on basic economy and properties
- Account for and deal with simple chemical problems using a qualitative and quantitative approach
- Account for simple polymerisation of plastics and textile
- Carrying out basic study and project related activities

Competences

- Working independently and communicate the results of the analyses to specialists as well as non-specialists and suggest possible improvements to data sampling and analyses
- Being familiar with the commonly used materials within each materials class, especially within metals, polymers, composites, wood and textiles
- Analyze, make chemical calculations and communicate results orally and in writing
- Working in a project group, including carrying out problem analysis and making project descriptions.
- Formulating a project report and presenting it orally, arguing for selected solutions and used methods

Overall learning objective for Mathematics and Statistics (AU courses) is in the syllabus on AU web.

Volume

30 ECTS credits

Number of tests 1st semester

| | | |
|---|--------|---|
| Mathematics (MAT1) | 5 ECTS | AU exam Reexam same way 7 grade scale Mandatory assignments required to be admitted to the exam |
| Statistics (STA1) | 5 ECTS | AU exam Reexam based on oral exam on written project assignments Pass/non pass Mandatory assignments required to be admitted to the exam |
| Material Technology Module 1 (MET1) | 5 ECTS | Individual 20 min oral exam with 40 min preparation upon subject by draw. Rexam same way. 7 grade scale Internal censor |
| Basic Chemistry Module 1 (CHE1) | 5 ECTS | 4 hours written test. Rexam same way or and 20 min oral test with 40 min preparation upon subject by draw. 7 grade scale Mandatory assignments required to be admitted to the exam Internal censor (masked) |
| Study Skills for Engineering Students (SSE1) | 5 ECTS | Passed/not passed |
| Innovation and Development, Semester project (SEP1) | 5 ECTS | 1 oral group exam, where students must deliver an oral group presentation of their project work followed by an individual assessment and joint assessment part. Students are given only one overall mark for the Project report, the Process report and their oral presentation. The reports carry a weight of 60% and the presentation carries a weight of 40%. 7 grade scale Re exam same way as ordinary exam. External censor |

4.2 2nd semester: Quality CSR and sustainability

Topics

- Graphics communication (GRA1)
- Material Technology Module 2 (MET2)
- Statistics and Mechanics of Materials Module 1 (PHY1)
- QHSE management, CSR and sustainability (QSE1)
- Quality/CSR and sustainability, Semester project (SEP2)

Learning objectives

Knowledge

- Free hand sketching and presentation of models or projects.
- Force, strength and friction
- The students is expected to reach a stage where he/she can analyze different QHSE management set up and apply the different quality tools on relevant issues within the industry.
- The students will acquire knowledge of development methods and concepts within
- Sustainable production and CSR.
- Increase and refine the phases and documentation of the project

Skills

- Use different presentations tools as well as free hand sketches
- Calculate reactions and determine internal forces in simple structures.
- Solve problems within area of statics and mechanics of materials
- Students who complete the project acquire broad skills in ISO 9001, ISO 14001, EMAS and CSR
- Carrying out basic study and project related activities

Competences

- Present a project in a professional manner using right tools
- Calculate and analyse problem within statics and mechanics of materials
- The student is expected to have gained enough knowledge to be able to work with QHSE Management, CSR or sustainability within the field of preference.
- The student is expected to gained more specific knowledge within the field of materiale
- Organising and making a project by using the skills within the areas of structuring, planning, collaboration and self-reflection.

Volume

30 ECTS credits

Number of tests 2nd semester:

| | | |
|---|--------|--|
| Graphics communication (GRA1) | 5 ECTS | Grade based on written project Re exam same as ordinary exam 7 grade scale Internal censor (masked) |
| Material Technology Module 2 (MET2) | 5 ECTS | 4 hours written test Re exam same as ordinary exam or replaced by oral exam if few students. 7 grade scale Mandatory assignments required to be admitted to the exam Internal censor (masked) |
| Statistics and Mechanics of materials Module 1 (PHY1) | 5 ECTS | 1 oral test based upon subject found upon draw. No preparation. Re exam same as ordinary exam. 7 grade scale Mandatory assignments required to be admitted to the exam Internal censor |
| QHSE management, CSR and sustainability (QSE1) | 5 ECTS | 1 oral exam with preparation Re same as ordinary exam 7 grade scale Internal censor |
| Quality/CSR and sustainability, Semester project (SEP2) | 5 ECTS | 1 oral group exam, where students must deliver an oral group presentation of their project work followed by an individual assessment and joint assessment part. Students are given only one overall mark for the Project report, the Process report and their oral presentation. The reports carry a weight of 60% and the presentation carries a weight of 40%. 7 grade scale Re exam same way as ordinary exam. External censor |

4.3 3rd semester: Future materials**Topics**

Economy (ECO1)

Applied chemistry, Dying, Printing Chromotology (CHE2)

Material Technology Processes and Production Management (MET3)

Physics, Electronics and Thermodynamics (PHY2)

Future material, Semester project (SEP3)

Learning objectives

Knowledge

- Heat transfer, electrical resistors and capacitors
- Students should acquire basic practical knowledge of significant manufacturing processes within the textile and plastics area.
- Is able to understand the financial statement for a small company and make an interpretation what the figures shows
- Is able to make cost price calculation as well as an investment calculations and budgets
- The student will acquire knowledge of chemical processes and its application, Dying of fibers, synthetics and natural fibers, dyestuff principle
- Through the project, students will acquire knowledge of research, innovation, idea development methods as well as concepts and tools for the scouting and exploitation of new materials and technologies required for a specific assignment

Skills

- Solve problems within area of thermodynamics and electronics.
- Upon completing the course the student is expected to acquire broad skills in order to choose and recommend appropriate manufacturing processes within plastics and textile production at basic level and to select a suitable material for a specific process. Select and dimension machine elements from product data for simple machine systems
- Budgeting, cost calculations, Investment and Financing
- Independently select relevant dyes for natural and synthetics fibers
- Students who complete the project will acquire skills in demonstrating broad knowledge in future materials and their application possibilities and demonstrating enhance skills in the evaluation of advanced material properties

Competences

- Calculate and analyse problems about physical situations involving energy, heat transfer or electrical circuits
- Acquire basic competences within commonly used production process for textile and plastics
- It is expected that the student has established a fundamental understanding of economy and that the student can relate theory to practical conditions and that the student understands the basic concepts of financial management, and can make simple price quotes, investment analysis and budgets.
- Independently select relevant dyes for natural and synthetics fibers select and use an appropriate color system
- Analyze future material including technical description og the functional properties, definition of the product specifications, analysis and selection og bio-based or sustainable materials, selection of sustainable processes etc.

Volume

30 ECTS credits

Number of tests 3rd semester

| | | |
|--|---------|--|
| Economy (ECO1) | 5 ECTS | 1 written test 7 grade scale Re exam same as ordinary exam or as oral exam due to few students for re exam Mandatory assignments required to be admitted to the exam Internal censor (masked) |
| Applied Chemistry, Dying, Printing Chromotology (CHE2) | 5 ECTS | Oral exam Re exam same as ordinary exam. Mandatory assignments required to be admitted to the exam 7 grade scale Internal Censor |
| Material Technology processes and Production Management (MET3) | 5 ECTS | Grade based on 2 written project assignments with the purpose of researching the production processes of materials and/or products based on: - Textile fabrics - Plastics product The overall mark for the course will be the average of the marks of the two reports. Re-examination: Same as the ordinary examination on two new project case(s). Evaluation using the 7 point scale. Internal censor (mask assignments) |
| Physics, Electronics and Thermodynamics Module 2 (PHY2) | 5 ECTS | 1 oral test based upon subject found upon draw. No preparation. Re exam same as ordinary exam. 7 grade scale Mandatory assignments required to be admitted to the exam Internal Censor |
| Future material, Semester project (SEP3) | 10 ECTS | 1 oral group exam, where students must deliver an oral group presentation of their project work followed by an individual assessment and joint assessment part. Students are given only one overall mark for the Project report, the Process report and their oral presentation. The reports carry a weight of 60% and the presentation carries a weight of 40%. 7 grade scale Re exam same way as ordinary exam. External censor |

4.4 4th semester: Business-oriented Innovation

Topics

Materials Science Module 4 (MET4)
Business Development and Strategy deployment (STR1)
Logistics, Purchasing and out/insourcing (LOG1)
Project management (PRO1)
Innovation (Innovation week and innovation) (INN1)
Innovation and Business development, Semester project (SEP4)

Learning objectives

Knowledge

- Students should gain a broad knowledge of Logistics in relation to Supply chain management, Purchasing and inventory management, In/outsourcing and Make / Buy analysis
- Have knowledge of the basic paradigms, perspectives, theories, models and concepts of the subject area
- Students should gain knowledge of the basic paradigm, perspectives, theories, models and concepts in relations to project management.
- Students should gain advanced knowledge within synthetics and natural fibers, leather etc.
- General knowledge in relation to overall business strategy and strategy deployment.
- Business model evaluation and business plan
- Project knowledge in a real life situation

Skills

- Broad skills within logistics, supply chain management, purchasing, and inventory considerations
- Obtain skills in mastering a project through the different phase in relation to stakeholder, timeschedule and risk analysis.
- Identify and measure relevant material parameters for a specific purpose as well as select and specify the most appropriate material for a specific purpose.
- Basic skill in strategy development and strategy deployment
- Analyse new business opportunities through Business Model Canvas
- Work independently on a project in the mentor company

Competences

- It is expected that the student has established a fundamental understanding of logistics, purchasing and In/Outsourcing and that the student can relate theory to practical conditions and that the student understands the basic concepts of logistics, inventory management, purchasing.
- Project leadership competence
- Materials selection framework
- General understanding of strategy deployment tools and strategy processes.
- Gain experience in working cross functional on a new business case.
- Conduct a product development process through the analyzing phase and description of a product, including design of the project and the selection of material.

Volume

30 ECTS credits

Number of tests

| | | |
|--|--------|---|
| Materials Science Module 4 (MET4) | 5 ECTS | Project exam based on hand in materials. Evaluation using the 7 point scale. Any re-exam will take place in the same way as the ordinary exam. New assignments. Internal censor (masked) |
| Business Development and Strategy Deployment (STR1) | 5 ECTS | Individual oral exam based on a synopsis. Evaluation using the 7 point scale. Any re-exam will take place in the same way as the ordinary exam. External censor |
| Logistics, Purchasing and Out/insourcing (LOG1) | 5 ECTS | Oral exam based on handed in mini project. Re-examination: Same as the ordinary examination on a new project case. Evaluation using the 7 point scale. Internal censor |
| Project management (PRO1) | 5 ECTS | Individual oral exam based on a synopsis. Evaluation using the 7 point scale. Any re-exam will take place in the same way as the ordinary exam. Internal censor |
| Innovation (Innovation week and Innovation) (INN1) | 5 ECTS | Passed/not passed on active participation though Innovation week. |
| Innovation and Business development, Semester project (SEP4) | 5 ECTS | An oral project exam, where students must deliver an oral presentation of their project work followed by an individual assessment and assessment. 7 grade scale Re exam same way as ordinary exam. External censor |

5 Mentor arrangement from 4th semester

The mentor arrangement is an arrangement where the students are entering in an arrangement with a private or public company from the 4th semester and onwards. The goal is the place the student in the mentor company in periods during the 4th to 7th semester.

On the 4th and 6th semester the student will make his/hers semester project in and for the mentor company. On the 5th semester the student will have their internship in the mentor company – see section 5 for further details. On the 7th semester the student will make his/hers final dissertation project in and for the mentor company

The overall purpose with the mentor arrangement is to give the student maximum real company experience and insight into practical engineering work while being a student. The goal is to increase the students personal competence in a real company employment situation as well as balancing the students theoretical competences with experience for applying the theories in practice.

The mentor company will select a mentor for the student that will act as a normal employer, with normal following up on work related competence as well as on the development of the more personal competence. The student will act as mentee and will be located in the mentor company during the different periods as a normal employee. The student will work on their project but also participate in the daily routines in the mentor company like department meetings etc.

The student will not receive any payment for the mentor arrangement only during the internship – see section 5 for the Internship. The company can choose to support the student with transport cost in excess of normal transport.

The student is responsible for finding a mentor company, which must be approved by VIA, who will attach a supervisor to the mentee

If it is not possible for a student to find a mentor company then VIA will help with relevant project on the respective semesters.

If the student wishes to go aboard then the mentor company can either support this if they have relations in the given country or end the mentor arrangement. The mentor arrangement can always be ended from both sides if special circumstances is present.

6 Internship, 5th semester

DM-INP1

The internship comprises a semester of 30 ECTS credits and is placed time wise on the 5th semester of the programme. The internship period is either paid or unpaid and takes place either in a private or in a public company in Denmark or abroad.

The purpose of the internship is for the student to acquire insight into practical engineering equivalent to the work of an engineering assistant, combined with the integrated application of the concepts, methods and techniques of the applied disciplines acquired in the first four semesters.

The following prerequisites must be met before an internship can commence:

- All courses on 1st – 4th semester must be passed/approved
- Workshop courses must be passed/approved or credited

The student is responsible for finding an internship, which must be approved by VIA, who will attach a supervisor to the intern. If the student is in a mentor arrangement then the internship will take place in the mentor company.

The student prepares a plan for the internship programme with a corresponding assignment formulation, in cooperation with the company.

The basis for the assessment of internship is a continuous report from the student to VIA, a feedback from the internship company, as well as a presentation where the supervisor can ask detailed questions about the internship content.

If the internship is interrupted before the end of the internship period, the supervisor must, in consultation with the head of programme, assess whether the internship has had a duration and content sufficient for passing the internship.

The internship is assessed passed/not passed.

7 Elective courses and semester project, 6th – 7th semester

On 6th and 7th semester, it is possible to select elective courses. Apart from elective courses targeted selected specialisations, a number of relevant elective courses are offered on the Material Science and Product Design Programme. The potential elective course might be a combination of course at VIA Herning, AU Herning, Via Horsens and Via Holstebro. Descriptions of the individual elective courses will change from year to year. There will always be a syllabus for at different elective courses. The students will be offered the possible elective mid semester and select the electives that they want.

Via Engineering can cancel an elective course if too few students have selected a specific course. The affected students will have to reselect among the selected electives.

It is also possible to choose relevant elective courses offered by VIA's other programmes and from AU Herning, except courses, which consists of study material which the student has had earlier on in the programme. Selecting courses from other programmes must be approved by a Material Science coordinator in order to secure the relevance and an increase of the technical level.

Physically the elective course in collaboration with AU Herning can take place at AU Herning or at VIA Design in Herning. Physically the course in collaboration with Via Engineering can either take place in Herning, Horsens or Holstebro or in a combination with on line learning and being present in Horsens or Holstebro once in a while.

On the Material Science and Product Design, some of the elective courses are included in the following specialisations:

Textile

Plastics

Others relevant from time to time.

Via Engineering can cancel a specialization if less than 3 student have selected the specialisation due to lack of expected value due to few students. The affected students will have to reselect the specialization.

A specialisation consists of 2 elective courses (10 ECTS credits), 4th and 6th semester project (15 ECTS credits) and bachelor project (20 ECTS credits), in total 45 ECTS credits.

The elective courses in the 6th semester is supported with a compulsory course in Theory of Science to prepare the student for the bachelor project.

The Open project on the 6th semester can be a pre-project for the bachelor project. The open project is a compulsory course on the 6th semester. The intent with the 6th semester project is to support the learned theory from the elective courses by means of a practice based project, consisting of the development and manufacturing of a product, laboratory assignments etc. preferable in the mentor company. Furthermore, the use of elements of advanced project methods is also included in the semester project.

Courses on the 6th semester

| | | |
|--|---------|--|
| Speciality Technology (MET5) | 5 ECTS | Written exam Evaluation using the 7 point scale. Any re-exam will take place in the same way as the ordinary exam. Internal censor (masked) . |
| Speciality Future materials MET6 | 5 ECTS | Project exam based on mini project. Evaluation using the 7 point scale. Any re-exam will take place in the same way as the ordinary exam. New assignments. Internal censor |
| Elective (XXX1) | 5 ECTS | According to course description |
| Theory of Science (TOC1) | 5 ECTS | Oral exam based on a written report which include both academic writing elements as well as theory of science. 7 grade scale. Re-exam will take place in the same way as the ordinary exam Internal censor |
| Open project within Speciality area, Semester project (SEP6) | 10 ECTS | An oral project exam, where students must deliver an oral presentation of their project work followed by and individual assessment and assessment. 7 grade scale Re exam same way as ordinary exam. External censor |

Courses on the 7th semester

| | | |
|----------------------------------|---------|--|
| Elective (XXX1) | 5 ECTS | According to course description |
| Elective (XXX1) | 5 ECTS | According to course description |
| Bachelor project – see section 7 | 20 ECTS | An oral project exam, where students must deliver an oral presentation of their project work followed by and individual assessment and assessment. |

| | | |
|--|--|--|
| | | 7 grade scale Re exam same way as ordinary exam. External censor |
|--|--|--|

7.1 Elective courses

On the Material Science and Product Design, 2 of the elective courses have to be within the specialization. These two elective must be on the 6th semester.

7.2 Specialisation: Textile

This specialty aims to give students knowledge of the materials and processes used in both traditional and modern fashion and textile production. Students will equally acquire theoretical knowledge of materials used within the specialty such as yarns and fibers as well as synthetic fibers and natural fibers. Workshops and projects in the lab will teach students how to analyze and assess the properties and quality level of materials as well as what materials may be used for.

In addition to basic knowledge of processes and materials, students will also be introduced to new materials, new types of fibers like sustainable fibers, surface treatments and e-textiles so as to be able to consider the options available in future textile production.

Knowledge and understanding of materials and processes will make it possible for students to take part in product development work.

Topics

Technology module 5 (MET5)

Future materials Module 6 (MET6)

6th semester project (SEP6): Open project in the area of Textile in the mentor company.

Bachelor project (BPR1): Project in the area of Textile in the mentor company

7.3 Specialisation: Plastics (Polymers and Composites)

Throughout the last century, materials such as metal, wood, glass, clay, cotton and wool have been replaced by polymers due to the tailor-made characteristics and the low price. Nowadays, polymers are included in so many products that it would practically be impossible to avoid getting into contact with them in some form or other. But how are products containing polymers produced? How to produce a Cola bottle? How can and should a 100 m long windmill wing be manufactured in order to resist winds and changing weathers?

The keywords for this specialisation are:

Thermoplastics

Thermoset

Biodegradable and Sustainable Plastics

Design and development of future polymers

Semester project about plastics

Collaboration with companies within the plastics industry

Topics

Plastics processing (THP1)

Biodegradable and sustainable Plastics (BSP1)

6th semester project (SEP6): Open project in the area of Plastics in the mentor company.

Bachelor project (BPR1): Project in the area of Plastics (Polymers and Composites) in the mentor company

Students, having completed one of these specialisations, are entitled to add the specialisation on the diploma.

8 Bachelor Project

DM-BPR1

The programme is concluded with a bachelor project (BPR1) which constitutes 20 ECTS credits of the total 210 ECTS credits of the programme and is finalized with a test. The bachelor project can be commenced on 6th semester project (SEP6) being a preproject for the bachelor project.

The Bachelor project must demonstrate individual self-critical reflection within the chosen subject, and must document the student's ability to apply engineering theories and methods. In addition, the bachelor project must reflect the student's ability to express himself/herself professionally and structured within his/her subject.

The conditions for starting the bachelor project, BPR1, are that the student has passed all courses on the 1st - 6th semester (or courses totalling 180 ECTS credits, including the 30 ECTS credits internship). The student cannot hand in the bachelor project if the student fail some of the elective courses on the 7th semester. The student must have passed all courses before handing in the bachelor project.

The Bachelor project is prepared in collaboration with the mentor company meaning individual projects. If two mentee are in the same company then the student can have a group project. However the head of programme may exceptionally dispense with this rule in case of extraordinary circumstances.

The Bachelor project comprises an independent experimental, empirical and/or theoretical examination of a practical problem formulation related to the core subjects of the programme.

The project must be documented in the form of a project report and process report comprising outline of solution, calculations, drawings, etc. If the report is a group assignment, it must be clear who wrote which sections in the report.

The students are examined in the project by an oral test/group test with individual assessment according to the learning objectives described under section 1. The basis for the exam is the bachelor project. It is a prerequisite for participation in the exam that the bachelor project is handed in within the stipulated deadline, and meets the project requirements described.

The examination may take place at the earliest when all the other tests of the programme, including internship test, have been passed. The examination is assessed on the 7-point scale and with the participation of external examiner.

| | | |
|--|---------|--|
| Bachelor project within Speciality area (BPR1) | 20 ECTS | 1 oral test based on the bachelor project report and process report. |
|--|---------|--|

9 Exam rules specially for Bachelor of Engineering in Material Science and Product Design

According to the Curriculum for VIA Engineering Joint regulations the following rules further apply on top of the rules given in section 8.1 Test forms and assessment.

As some exam are taken on AU Herning specify emphasis is on the following rules.

The student are automatically enrolled for the ordinary exam and re exam if they have failed the ordinary exam even if AU have other procedure. VIA study administration will send a mail to AU stating at all relevant student are to be enrolled in the ordinary exam. VIA study administration will send a mail to AU stating that all relevant student are to be enrolled in the reexam for the specific courses.

The student are informed that VIA considered them as automatically enrolled for the ordinary exam and relevant potential reexam even if AU states otherwise to their students.

The student are informed that VIA will send a mail to AU enrolling them in the ordinary exam and relevant re exams.

10 Title and issue of diploma

Graduates who have completed the studies under this curriculum + the joint regulations for VIA Engineering are entitled to use the title Bachelor of Engineering in Material Science and Product Design.

Furthermore, it is possible to obtain the following specialisations:

- Textile
- Plastics
- Others from time to time

Upon completion of the programme, VIA University College issues a diploma indicating title, programme, and specialisation if relevant. Furthermore, the diploma contains information about the number of ECTS credits of the individual elements, the result of the grades obtained, as well as the subjects of the interdisciplinary projects and the bachelor project. In addition, the admittance level on which the graduate was admitted to the programme is noted.

Should the education be discontinued, proof of passing study units is issued.

Updated 23 August 2019

11 Appendix 1: Transition for students enrolled in August 2017

Transition for class DM17 (enrolled August 2017) to new study structure from 3rd Semester

| Semester Theme | Course | Course | Course | Course/ Project | Project | |
|--|--|---|--|---|---|---|
| 7. Elective course/ Specialisation | Elective course | Elective course | BPR 1 Bachelor Project (speciality) | | | |
| 6. Elective course/ Specialisation | MET5 Specialty Technology Module 5 | MET6 Specialty Future material Module 6 | Elective course | Quality Management & Statistics | SEP 6 Semester Project (Open project within speciality) | |
| 5. Internship | INP1 Engineering Internship (speciality) | | | | | |
| 4. Business-oriented Innovation | MET4 Material Science Module 4 | STR1 Business development and Strategic Management | LOG1 Logistics, purchasing and out/insourcing. | PRO1 Project Management | INN1 Innovation (innovation week and Innovation) | SEP4 Semester project Innovation and Business development |
| 3. Future materials | ECO1 Economy | CHE2 Applied chemistry Dying, Printing Chromotology | MET3 Material technology processes and Production management | TOC1 Theory of Science & Academic Writing | SEP 3 Semester project Future material | |
| 2. Quality/CSR and Development | Physics | | Material technology Module 2 | Chemistry Module 2 | SEP2 Semester project CSR & Sustainable Production | |
| 1. semester Innovation and development | Mathematics Statistics | | Material Science Module 1 | Chemistry Module 1 | Drawing & Graphics Comm. Module 1 | SEP1 Semester project Innovation and Development |