# Course Catalogue Engineering and ICT

EXCHANGE PROGRAMME

Applied Mechanics 2025-2026

University of Applied Sciences Windesheim

# Course summary

VOE Code: EDDT.25 ECTS credits: 5 Level: Bachelor's degree (full-time)

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|---|---|---|---|
| **Course Title** | Drive Technology | | |
| **Type** | Compulsory | | |
| **Learning competences** | | | |
| **Learning outcomes** | Learning outcomes related to the theme 'drive technology':<br>• The student understands basic concepts related to drive technology from electrical engineering such as: 3 phase current, active and reactive power.<br>• The student can reproduce the properties of a number of electric motors commonly used in industry, such as direct current, asynchronous 3 phase and stepper motors, and can make a well-founded choice from these motors in a design.<br>• The student can perform simple calculations on these motors.<br>• The student is familiar with the basic properties of electronic controls for these motors.<br><br>Learning outcomes related to the theme 'machine parts':<br>• The student calculates components of a technical installation. The student applies basic principles and methods of Machine Parts.<br>• The student documents the technical substantiation and the results. | | |
| **Course content** | | | |
| **Planned learning activities and teaching methods** | Drive technology:<br>• Introduction to electricity and magnetism<br>• Three-phase and introduction to diodes<br>• Basic mechanics and introduction to stepper motors and oscilloscope<br>• Traditional DC motor, shunt only / permanent magnet<br>• Three-phase induction motors and permanent magnet synchronous (brushless DC)<br>• Electrical drives / frequency converters for DC and AC motors<br>• Stepper motors<br><br>Machine components:<br>• A number of different topics within the field of machine components will be discussed | | |
| **Recommended or required reading and other learning resources / tools** | • *Electric motors and drives*, A. Hughes/B. Drury<br>• *Electrical Machines, Drives and Power Systems*, T. Wildi<br>• *Machineonderdelen*, Roloff/Matek | | |
| **Prerequisites and co-requisites** | You are required to have two years of Bachelor's study experience in a relevant field (e.g. Bachelor's degree in Mechanical Engineering) and English-language skills at B2 level. In order to be able to complete some modules, you will also need mathematics and physics at high school level. | | |
| **Level** | Advanced | | |
| **Grading scale** | 1 up to 10, 1 dec. | | |
| **Assessment methods and criteria** | **Type of assessment** | **Grade weighting** | **Criteria** |
| | T1 Electrical Drive Systems | 1 | Higher or equal to 5.5 |
| | P1 Lab Work | 0 | Higher or equal to 5.5 |
| | P2 Machine components | 1 | Higher or equal to 5.5 |
| **Language of Instruction** | English | | |
| **Name of lecturer** | For information about the lecturers you can contact Laurens Bervoets | | |

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| **Mode of delivery** | Face to face |

## Course summary

VOE Code: EDDV.25 ECTS credits: 5 Level: Bachelor's degree (full-time)

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|---|---|---|---|
| **Course Title** | Dynamics and Vibrations | | |
| **Type** | Compulsory | | |
| **Learning competences** | | | |
| **Learning outcomes** | **Individual Learning Outcome:**<br>1. The student write, analyze and apply correctly the kinetics formula's for the linear and angular momentum of rigid-body plane motion,<br>2. The student analyze and apply the correct model of vibration on a given problem ( free and/ or forced, damped and/or undamped vibration) to solve different basic problems in Engineering vibration.<br><br>**Group Learning Outcome:**<br>The student group (max. 3 students) conducts an analysis of a dynamic case (e.g., an existing or to-be-designed vibrating system).<br>In doing so, the student describes, explains, and predicts the behavior of this dynamic system by applying principles and methods of Dynamics (e.g., vibrations).<br>The student group reports and presents the technical justification and the findings. | | |
| **Course content** | Module 1: Linear and Angular Momentum- Rigid Body Planar Kinetics(Ghassan Radha)<br>Module 2: Introduction to Engineering vibration (Ruud Groen)<br>Module 3: Design applications of Engineering vibration (Ghassan Radha) | | |
| **Planned learning activities and teaching methods** | Theory lectures, tutorials (practical sessions), supervised assignments | | |
| **Recommended or required reading and other learning resources / tools** | Book: Mechanics for Engineers: Dynamics - Russell Charles Hibbeler | | |
| **Prerequisites and co-requisites** | You are required to have two years of Bachelor's study experience in a relevant field (e.g. Bachelor's degree in Mechanical Engineering) and English-language skills at B2 level. In order to be able to complete some modules, you will also need mathematics and physics at high school level. | | |
| **Level** | Advanced | | |
| **Grading scale** | 1 up to 10, 1 dec. | | |
| **Assessment methods and criteria** | **Type of assessment** | **Grade weighting** | **Criteria** |
| | T1: Test Relative motion, momentum and impulse, basic vibrations | 1 | Higher or equal to 5.5 |
| | P1: Professional product advanced vibrations | 1 | Higher or equal to 5.5 |
| **Language of Instruction** | English | | |
| **Name of lecturer** | For information about the lecturers you can contact Laurens Bervoets | | |
| **Mode of delivery** | Face to face | | |

## Course summary

VOE Code: EDMV.25 ECTS credits: 5 Level: Bachelor's degree (full-time)

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|---|---|
| **Course Title** | Modelling and Validation |
| **Type** | Compulsory |

<table>
<tr><td>Learning competences</td><td></td></tr>
<tr><td>Learning outcomes</td><td>
<ul>
<li>The student models a mechanical engineering case of his/her own choice (e.g. bicycle frame, TV mounting bracket, gantry crane, etc.) in an iterative process of models with increasing complexity and describes, explains and predicts (by means of manual calculations, FEM simulations and performing measurements) the behaviour with regard to e.g. strength, stiffness and plastic deformation.</li>
<li>The student goes through the following iterative steps:</li>
</ul>
1. The student makes a highly simplified theoretical model of a real case, gradually adds more complexity (by adjustment, expansion, refinement), so that the model is an increasingly better representation of the real case.<br>
2. The student describes, explains and predicts the behaviour of the case for the various iterative model steps of increasing complexity by means of manual calculations, in order to arrive at increasingly accurate results.<br>
3. The student validates the manual calculations for the various iterative model steps of increasing complexity with simulations (e.g. FEM). The student creates a suitable test setup of the case to validate the manual and FEM calculations, performs measurements in a reproducible manner and records the results.
<ul>
<li>The student compares, evaluates and interprets the results of the manual calculations, simulations and tests, and formulates clear conclusions and recommendations with regard to the actual case.</li>
<li>The student documents (e.g. in a report) and presents (e.g. in a final presentation) the findings and conclusions.</li>
</ul>
</td></tr>
<tr><td>Course content</td><td>See Learning Outcomes</td></tr>
<tr><td>Planned learning activities and teaching methods</td><td>Project lectures<br>In the project lectures, students work independently in groups on their project. Supervision by lecturers in the field of model formation, theoretical calculations, Solid Works/Fem and Testing.<br><br>Presentations<br>Students regularly give a project progress presentation.<br><br>Tutoring in the areas of:<br><br>• Theoretical calculations and modeling<br>• FEM Modeling / Soliw Works<br>• Testing<br><br>The initiative lies with the student, tutors are available for consultation.</td></tr>
<tr><td>Recommended or required reading and other learning resources / tools</td><td>Laptop with Solid Works</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>You are required to have two years of Bachelor’s study experience in a relevant field (e.g. Bachelor’s degree in Mechanical Engineering) and English-language skills at B2 level. In order to be able to complete some modules, you will also need mathematics and physics at high school level.</td></tr>
<tr><td>Level</td><td>Advanced</td></tr>
<tr><td>Grading scale</td><td>1 up to 10, 1 dec.</td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Type of assessment</th><th>Grade weighting</th><th>Criteria</th></tr>
<tr><td>P1 Modelling and Validation</td><td>1</td><td>Higher or equal to 5.5</td></tr>
</table>
</td></tr>
<tr><td>Language of Instruction</td><td>English</td></tr>
<tr><td>Name of lecturer</td><td>For information about the lecturers you can contact Laurens Bervoets</td></tr>
<tr><td>Mode of delivery</td><td>Face to face</td></tr>
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## Course summary

VOE Code: EDDST.25 ECTS credits: 5 Level: Bachelor's degree (full-time)

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|---|---|---|---|
| **Course Title** | Design tools (2+1) | | |
| **Type** | Compulsory | | |
| **Learning competences** | | | |
| **Learning outcomes** | The student chooses from a range of various in-depth themes from Mechanical Engineering (so-called "Design tools", such as Topology, Hand sketches, Solid Works Non-Linear, Solid Works Motion, Mechanics of Materials) a number of design tools for further study and application.<br><br>The student applies the material covered for each chosen design tool in one or more assignments, for example by making an analysis, calculation or elaboration, appropriate for the design tool in question.<br><br>The student documents and/or presents the results in a manner appropriate to the design tool (e.g. report, portfolio, calculations, presentation). | | |
| **Course content** | Within the EvE Design Tools, a number of (possibly changing per year) series of lessons ("design tools") are offered:<br><br>Choice of design tools (DT1 and DT2):<br><br>Choose two design tools from the example list below:<br><br>• Hand sketching<br>• Solid Work Non Linear<br>• Solid Works Motion<br>• Topology<br>(note: the subjects offered may change per year)<br><br>In addition, one compulsory design tool is offered:<br>Compulsory design tool (DT3):<br><br>• Mechanics of Materials Capita Selecta + applications in Solid Works ("Mech or Mat CS")<br><br>In total, the student follows 2 elective design tools and 1 compulsory design tool for the EvE Design Tools (2+1). | | |
| **Planned learning activities and teaching methods** | • Lectures<br>• Practical sections and workshops | | |
| **Recommended or required reading and other learning resources / tools** | Various tools depending on the chosen design tools | | |
| **Prerequisites and co-requisites** | You are required to have two years of Bachelor's study experience in a relevant field (e.g. Bachelor's degree in Mechanical Engineering) and English-language skills at B2 level. In order to be able to complete some modules, you will also need mathematics and physics at high school level. | | |
| **Level** | Advanced | | |
| **Grading scale** | 1 up to 10, 1 dec. | | |
| **Assessment methods and criteria** | **Type of assessment** | **Grade weighting** | **Criteria** |
| | P1 Designtool 1 | 1 | Higher or equal to 5.5 |
| | P2 Designtool 2 | 1 | Higher or equal to 5.5 |

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| | P3 Designtool 3 | 1 | Higher or equal to 5.5 |
| **Language of Instruction** | English | | |
| **Name of lecturer** | For information about the lecturers you can contact Laurens Bervoets | | |
| **Mode of delivery** | Face to face | | |

## Course summary

VOE Code: EDPAM.25 ECTS credits: 5 Level: Bachelor's degree (full-time)

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|---|---|---|---|
| **Course Title** | Project Applied Mechanics | | |
| **Type** | Compulsory | | |
| **Learning competences** | | | |
| **Learning outcomes** | The student (re)designs or researches a (part of) a product or installation in a group on the basis of a plan of approach.<br><br>The student takes responsibility for the entire process. The student takes initiative by taking the necessary steps in a timely manner and anticipates changing circumstances.<br><br>The student(s) delivers the project results agreed in advance in the PVA and presents the project orally to colleagues. | | |
| **Course content** | See 'Learning outcomes' | | |
| **Planned learning activities and teaching methods** | **Activities at company**<br>Project is carried out at the company that submitted the assignment. Activities to be carried out depend on the project objectives.<br><br>**Presentations**<br>Students regularly give a project progress presentation and end the project with a final presentation.<br><br>**Guidance from the Windesheim lecturer**<br>• Periodical consultations on how the project is progressing<br>• Organizational questions are answered<br>• Organization of a mid-term review for all project groups together with the company managers at the end of quarter 1<br>• Determining the deadlines for all project activities<br><br>**Guidance from the company**<br>• One day per week physical contact in the company<br>• Checking the substantive quality and promoting the project implementation activities<br>• Directly contacting the supervisor of the applied university if he expects unwanted challenges | | |
| **Recommended or required reading and other learning resources / tools** | • Laptop<br>• Possibly Solidworks | | |
| **Prerequisites and co-requisites** | You are required to have two years of Bachelor's study experience in a relevant field (e.g. Bachelor's degree in Mechanical Engineering) and English-language skills at B2 level. In order to be able to complete some modules, you will also need mathematics and physics at high school level. | | |
| **Level** | Advanced | | |
| **Grading scale** | 1 up to 10, 1 dec. | | |
| **Assessment methods and criteria** | **Type of assessment** | **Grade weighting** | **Criteria** |
| | P1: Project Applied Mechanics | 1 | Higher or equal to 5.5 |

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| **Language of Instruction** | English |
| **Name of lecturer** | For information about the lecturers you can contact Laurens Bervoets |
| **Mode of delivery** | Face to face |

## Course summary

VOE Code: EDPRC.25 ECTS credits: 5 Level: Bachelor's degree (full-time)

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|---|---|
| **Course Title** | Projectresults + Communication Applied Mechanics |
| **Type** | Compulsory |
| **Learning competences** | |
| **Learning outcomes** | **Project results**<br>The student writes a plan of approach in a group for the (re)design or research that he carries out as mentioned under the EVE: **Project Applied Mechanics (EDPAM.25).** In addition, the student delivers project results in a group, the so-called professional products. The professional products are agreed with both the company supervisor and the Windesheim supervisor, such as: TCD, 3d models, technical calculations, reports, manuals.<br><br>**Learning outcomes Technical English speaking skills**<br>In English, the student holds informal and formal discussions in a group about the content, progress, and results of the project.<br><br>**Learning outcomes Professional communication**<br>The student can:<br>• Analyse his or her identity and translate it into a Personal Brand<br>• Present his or her personal Brand visually and orally |
| **Course content** | See 'Learning outcomes' |
| **Planned learning activities and teaching methods** | See 'Learning outcomes' |
| **Recommended or required reading and other learning resources / tools** | Laptop |
| **Prerequisites and co-requisites** | You are required to have two years of Bachelor's study experience in a relevant field (e.g. Bachelor's degree in Mechanical Engineering) and English-language skills at B2 level. In order to be able to complete some modules, you will also need mathematics and physics at high school level. |
| **Level** | Advanced |
| **Grading scale** | 1 up to 10, 1 dec. |

| **Assessment methods and criteria** | **Type of assessment** | **Grade weighting** | **Criteria** |
|---|---|---|---|
| | P1: Project results | 2 | Higher or equal to 5.5 |
| | P2: Technical English speaking skills | 1 | Higher or equal to 5.5 |
| | P3: Professional communication | 1 | Higher or equal to 5.5 |

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| **Language of Instruction** | English |
| **Name of lecturer** | For information about the lecturers you can contact Laurens Bervoets |
| **Mode of delivery** | Face to face |