Course: CAD — credits: 5

Course code	WBVP26CAD
Name	CAD
Study year	2026-2027
ECTS credits	5
Language	English
Coordinator	H.J. Grijpstra
Modes of delivery	Education
Assessments	CAD - Assignment

Learning outcomes

1. CAD Modelling (Assignments 1 & 2) Students can create fully defined 3D part models using sketches, features, relations, and dimensions; build multi-part assemblies with correct mates and a clean part structure; resolve incomplete or contradictory drawings by interpreting engineering intent; and produce simple 2D workshop drawings including BOM and position numbers.

2. Motion Simulation (Assignment 3) Students can set up a correct Motion Study to drive a mechanism using a motor or force input; generate realistic time-dependent reaction forces and displacement plots; and export the reaction forces required for structural FEA.

3. Structural Simulation (Assignment 4) Students can apply realistic boundary conditions using degrees of freedom (DOF), particularly cylindrical fixtures (radial, axial, rotational); apply force data from the Motion Study to a structural model; run an FEA on an assembly and create a sub-model with a refined mesh; and interpret stress plots, displacement, and potential weak regions in the design.

4. ISO Technical Drawings (Assignment 5) Students can produce fully annotated 2D technical drawings to ISO standards, including correct dimensioning, tolerances, views, and title block; and present their design clearly and professionally.

Content

3D CAD is essential for producing technical drawings, running simulations, supporting sustainability analysis, and presenting designs professionally. Drafting skills, ISO standards in particular, remain the professional language of engineering communication.

The five subjects:

1. **Basics of 3D CAD** – Sketch → feature → part → assembly.
2. **First Model** – Create your first usable model (tutorial + can crusher).
3. **Simulation: Motion** – Test how it moves; kinematics, forces, torque.
4. **Simulation: FEM** – Check whether the design is structurally sound.
5. **ISO Drafting** – Dimensioning, tolerances, advanced CAD, and technical presentations.

Included in programme(s)

Mechanical Engineering VWO a 3-year variant

School(s)

Engineering, Life Sciences & ICT

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