

Teaching Statement

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Teaching profile. I am a Senior Lecturer (Associate Professor Equivalent) and researcher in Mechanical Engineering with more than 15 years of combined academic, research, and industry-oriented experience across Sweden, the United Kingdom, India, and Mexico. My teaching is grounded in control systems, dynamics, mechatronics, mechanical engineering, production automation, simulation, sustainability, fault detection, predictive maintenance, and intelligent engineering systems. I have taught undergraduate and postgraduate students, led modules and programmes, supervised bachelor and master projects, and contributed to curriculum development, assessment, academic administration, and research-informed learning environments.

Teaching Philosophy

My teaching philosophy is based on a simple principle: engineering students learn best when theory is connected to real systems, real data, and real decisions. I therefore design my teaching around four connected pillars.

1. Research-informed and application-rich teaching. I use my research in control systems, vibration control, automatic fault detection, predictive maintenance, fuzzy control, sliding mode control, and simulation to make engineering concepts more concrete. In subjects such as Dynamics, Control Engineering, Mechanical Vibration, Production Simulation, and Production Development with Sustainability, I connect mathematical models, algorithms, and design principles to industrial examples such as drilling systems, manufacturing processes, gas turbines, robotic manipulators, and sustainable production systems.

2. Active learning before passive listening. I use flipped delivery, short pre-session materials, numerical problem-solving, laboratory demonstrations, software-based exercises, and project-based tasks. Instead of presenting formulas only as final results, I guide students through why the model is needed, what assumptions are made, how the solution is obtained, and how the result can be interpreted in practice.

3. Inclusive and international learning. My teaching experience spans the UK, Sweden and India, and I have worked with students from different educational systems, professional backgrounds, and levels of confidence. I create a supportive classroom by beginning with clear prerequisites, explaining expectations, using step-by-step worked examples, and giving students multiple ways to participate: discussion, group work, short presentations, written tasks, simulation tasks, and practical demonstrations.

4. Transparent assessment and continuous feedback. I believe that assessment should support learning, not only measure it. I use constructive alignment between learning outcomes, teaching activities, and assessment tasks. My assessment approach includes written examinations, quizzes, assignments, laboratory work, simulation reports, project reports, presentations, peer feedback, and individual reflection. My recent pedagogical training in legal certainty and effectiveness in teaching has further strengthened my focus on fair assessment, clear rubrics, transparent grading criteria, and consistent feedback.

Teaching Experience and Curriculum Areas

Örebro University, Sweden	Senior Lecturer, Mechanical Engineering, 2025–present. I teach and develop mechanical engineering courses, including <i>Dynamics</i> and <i>Production Development with Sustainability</i> . My role combines teaching, course responsibility, supervision, research, and course development. I integrate research findings, industrial cases, sustainability thinking, simulation, and practical engineering applications into teaching. I have supervised 6 bachelor projects and 2 master projects to date.
Mälardalen University, Sweden	Assistant Professor–Research, 2023–2025. I taught mechanical engineering subjects including <i>Materials</i> , <i>Mechanical Vibration</i> , <i>Production Simulation</i> , <i>Simulation of Virtual Production</i> , and dynamical systems-related topics. I supervised 2 master projects and supported students in connecting modelling, simulation, diagnostics, and engineering design to practical applications.
Nottingham University, UK	Senior Research Fellow in Control Systems, 2022–2023. I contributed to teaching in <i>Dynamical Systems</i> while working on a Cornerstone-funded project with the University of Oxford, Imperial College London, and Rolls-Royce. My teaching support connected control theory, optimisation, and dynamic system behaviour to gas turbine applications.
University of Cambridge, UK	Control Engineering Tutor, 2023. I delivered online tutoring, academic guidance, assessment support, and feedback for control engineering projects. This experience strengthened my ability to maintain engagement, clarity, and academic standards in a remote learning environment.
University of the West of England, UK	Assistant Professor in Mechatronics, 2020–2022. I taught <i>Control Engineering</i> , <i>Dynamical Systems</i> , and <i>Mechatronics</i> . I served as Module Leader for <i>Control Engineering</i> , Theme Leader for Control Engineering/Mechatronics projects, and Programme Leader/Link Tutor for a Degree Apprenticeship programme. I supervised bachelor projects, master projects, and master group projects, and used MATLAB/Simulink, SolidWorks, LabVIEW, Blackboard, and Canvas in teaching and assessment.
Örebro University, Sweden	Postdoctoral period, 2018–2020. I supported teaching in <i>Solid Modelling and Engineering Drawing</i> , including lectures and SolidWorks laboratory activities, and helped maintain Blackboard course environments for engineering courses.
Sir Padampat Singhania University, India	Assistant Professor, 2012–2013. I taught undergraduate and postgraduate mechanical and control engineering courses, including <i>Mechatronics</i> , <i>Linear Control</i> , <i>Nonlinear Control</i> , <i>Control Systems</i> , <i>Solid Mechanics</i> , <i>Strength of Materials</i> , <i>Fluid Mechanics</i> , <i>Engineering Drawing</i> , <i>Elements of Mechanical Engineering</i> , <i>Instrumentation and Control</i> , <i>Hydraulic Machines</i> , <i>Machine Drawing</i> , <i>Solar Energy</i> , and <i>Engineering Management</i> . I also supervised undergraduate projects and supported laboratory-based learning.
Sikkim Manipal Institute of Technology, India	Assistant Professor, 2009–2012. I taught <i>Instrumentation and Control</i> , <i>Hydraulic Machines</i> , <i>Fluid Mechanics</i> , <i>Thermodynamics</i> , <i>Machine Drawing</i> , <i>Solar Energy</i> , <i>Mechatronics</i> , <i>Control Systems</i> , <i>Engineering Drawing</i> , <i>Elements of Mechanical Engineering</i> , and <i>Mechanical Workshop</i> . I supervised student projects and contributed to department-level teaching administration.

Supervision and Mentoring

I view supervision as a structured mentoring process in which students learn how to define a problem, review literature, select a method, manage time, analyse results, and communicate engineering decisions clearly. My supervision style combines regular meetings, milestone planning, technical feedback, and encouragement for independent thinking.

- **Örebro University:** supervised 6 bachelor projects and 2 master projects in mechanical engineering-related topics.
- **Mälardalen University:** supervised 2 master projects, mainly in mechanical engineering, production simulation, and dynamical systems-related areas.
- **University of the West of England:** supervised bachelor projects, master projects, and master group projects in Mechanical Engineering, Mechatronics, and Electrical Engineering; old portfolio records include 1 master project and 7 bachelor projects.
- **Sir Padampat Singhanian University:** supervised several undergraduate final-year projects in Robotics, Manufacturing, Thermodynamics, and Fluid Mechanics. One notable outcome was the project “Conceptual Design and Development of Automated Drilling System,” which was later published in an international journal.
- **Sikkim Manipal Institute of Technology:** supervised undergraduate final-year projects in Robotics, Thermodynamics, Fluid Mechanics, and application-oriented mechanical engineering topics.

Across these roles, I have learned that good supervision requires both technical depth and human support. Students often need help not only with equations or simulation tools, but also with problem framing, confidence, academic writing, and professional communication. I therefore encourage students to present progress regularly, justify design choices, and reflect on limitations as well as achievements.

Teaching Methods, Tools, and Assessment Practice

My teaching methods are selected according to the level of the course, the background of the students, and the intended learning outcomes. I regularly use the following approaches.

- **Lectures and lectorials:** structured explanations combined with numerical examples, engineering interpretation, and interactive questioning.
- **Flipped learning:** pre-recorded or pre-session material followed by active classroom problem solving.
- **Laboratories and demonstrations:** SolidWorks, MATLAB/Simulink, LabVIEW, Plant Simulation, mechanical workshop demonstrations, fluid mechanics labs, hydraulic machines labs, and drawing laboratories.
- **Simulation-driven learning:** modelling and simulation tasks where students test parameters, observe system behaviour, and relate numerical results to engineering decisions.
- **Project-based learning:** open-ended projects that require analysis, design, implementation, evaluation, reporting, and presentation.
- **Peer and formative feedback:** structured feedback cycles to help students learn from each other and develop professional judgement.

One method I have used successfully is a two-assignment peer-feedback structure. In this model, one group of students receives peer feedback on Assignment 1, while another group receives peer feedback on Assignment 2. This ensures that every student experiences peer assessment at least once and learns how to evaluate alternative solutions, communicate feedback respectfully, and improve their own work based on comments from peers.

Critical Reflection on Teaching Practice

Dynamics

During my time as an Assistant Professor at the University of the West of England, I taught Dynamics to a cohort of students with varied backgrounds. I planned the sessions by first identifying prerequisite knowledge and then using a flipped delivery approach. Students reviewed core material before the session, and classroom time was used for four problem-based numerical questions linked to the key concepts. This approach helped students move from watching and listening to doing, interpreting, and explaining.

The session also showed me that participation levels can vary even when the material is well structured. Some students were highly interactive, while others remained quiet. In response, I developed a stronger focus on inclusive participation strategies, such as small-group discussion, shorter checkpoints, breakout activities, and plenary feedback. I also used carefully designed PowerPoint slides, an iPad, and digital pencil annotations to build solutions step by step. Student responses indicated that they valued the movement from basic concepts to deeper analysis and the visual clarity of the worked examples.

Control Engineering

In Control Engineering, my main learning objective was to help students understand both the mathematics and the meaning of classical control concepts. The class included full-time and part-time students, some with industrial experience and others with more traditional academic backgrounds. I used prior-year questionnaires to improve content, sequence, methodology, and assessment structure.

For topics such as block diagrams, system response, stability, and controller design, I combined flipped videos with in-class lectorials and numerical practice. A session on Block Diagrams was observed by my line manager, and the feedback was positive regarding the structure, sequence, learning objectives, and student-friendly environment. I learned that students become more confident when the lecturer solves representative problems first and then gives them a similar but independent problem to attempt. I also reviewed lecture recordings after sessions and used self-observation notes to improve pacing, explanation, and student engagement.

Production Development with Sustainability

At Örebro University, my teaching in Production Development with Sustainability has strengthened my ability to integrate engineering design, production systems, simulation, sustainability, and professional responsibility. In this area, students need to understand not only how to improve production performance, but also how decisions affect environmental, social, safety, and organisational outcomes. I therefore use industrially relevant cases, sustainability-oriented project work, and structured reflection to help students evaluate solutions from multiple perspectives.

This teaching area is also important for preparing students for modern engineering practice. Engineers are increasingly expected to work with digital tools, simulation, sustainable production, circularity, risk, and cross-functional collaboration. My teaching aims to help students see these topics as connected rather than separate.

Course Leadership, Curriculum Development, and Administration

I have taken on a range of teaching leadership and administrative duties across institutions. At the University of the West of England, I was Module Leader for *Control Engineering*, Theme Leader for Control Engineering/Mechatronics projects, and Programme Leader/Link Tutor for the *Product Design and Development Engineer* Degree Apprenticeship programme. These roles involved course planning, assessment design, student support, programme coordination, and quality assurance.

At Örebro University, I have contributed to course responsibility, course development, supervision, and

maintenance of online learning environments such as Blackboard. During my earlier postdoctoral period at Örebro University, I maintained Blackboard environments for *Introduktion till ingenjörsarbete inom maskinteknik* (HT19, MT501G) and *Solidmodellering och ritteknik* (HT18, MT101G).

In India, I carried out department-level teaching administration. At Sikkim Manipal Institute of Technology, I served as time-table officer for the Mechanical Engineering Department, prepared timetables, maintained attendance records, and entered marks into online systems. At Sir Padampat Singhania University, I prepared timetables for third- and fourth-year Mechanical Engineering students and supported attendance and marks administration.

Pedagogical Training and Teaching Qualifications

My teaching practice is supported by formal pedagogical training from the United Kingdom, Sweden, and India. These qualifications have helped me develop a more reflective, inclusive, and evidence-informed approach to teaching.

- **Fellow of the Higher Education Academy (FHEA), Advance HE, UK** – recognition of attainment against the UK Professional Standards Framework for teaching and learning support in higher education.
- **Postgraduate Certificate in Higher Education / Academic Professional Practice, University of the West of England, UK** – completed with Merit; included *Enquiry into Academic Practice*, *Enhancing Learning and Teaching in Higher Education*, and *Higher Education Theory and Practice*.
- **Developing Teaching and Learning, Örebro University, 2026** – 3 weeks of full-time study.
- **International Perspectives in Higher Education, Örebro University, 2026** – 2 weeks of full-time study.
- **Legal Certainty and Effectiveness in Teaching, Örebro University, 2026** – 1 week of full-time study.
- **Supervising PhD Students, Örebro University, 2026** – equivalent to 3 weeks of full-time study.
- **Student Learning in Higher Education, PEA947, Mälardalen University, Sweden.**
- **Course Design, PEA926, Mälardalen University, Sweden.**
- **A Practical Introduction to Teaching, Örebro University, 2019** – five-week course corresponding to two weeks (80 hours) of full-time study, covering student-oriented lecturing, seminars, labs, tutorials, challenging classroom situations, digital tools, and assessment with student learning in focus.
- **Faculty Development Programme: Intensive Course on Teaching Skills, Sikkim Manipal University, India, 2009.**
- **Introduction to Research Methodologies, IIT Mumbai and MHRD, Government of India, 2012** – covered literature collection and classification, research opportunity definition, planning and design of experimental and analytical methods, result interpretation, and validation.
- **Grant and External Funding Courses, Örebro University and Tecnológico de Monterrey** – professional development related to externally funded academic work.

Laboratory and Practice-Based Teaching

Laboratory teaching has been an important part of my academic development. I have supervised and managed practical learning environments where students develop confidence with engineering tools, measurements, design, and system behaviour.

- At **Sir Padampat Singhania University**, I was in charge of the Hydraulic Machines Laboratory, Mechanical Workshop Laboratory, and SolidWorks Laboratory.
- At **Sikkim Manipal Institute of Technology**, I was in charge of the Fluid Mechanics Laboratory, Mechanical Workshop Laboratory, and Engineering Drawing Laboratory.
- In Sweden and the UK, I have used MATLAB/Simulink, SolidWorks, LabVIEW, Plant Simulation,

Blackboard, and Canvas to support software-based learning, modelling, simulation, and assessment.

My future laboratory teaching will continue to combine physical experiments, simulation, and recorded demonstrations. This is particularly useful when equipment access is limited or when students need repeated exposure to procedures before they become confident.

Future Teaching Contributions

For Assistant Professor and Associate Professor roles, I can contribute to both core and advanced teaching in Mechanical Engineering, Mechatronics, Control Engineering, Production Systems, and Intelligent Engineering Systems. I am prepared to teach and develop courses such as:

- Control Systems, Linear Control, Nonlinear Control, Digital Control, and Robust Control;
- Dynamics, Mechanical Vibration, System Dynamics, and Modelling of Dynamic Systems;
- Mechatronics, Instrumentation and Control, Robotics, and Automation;
- Fault Detection, Predictive Maintenance, Condition Monitoring, and Industrial Diagnostics;
- MATLAB/Simulink-based Modelling and Simulation;
- Production Simulation, Virtual Production Systems, and Production Development with Sustainability;
- Fluid Mechanics, Thermodynamics, Hydraulic Machines, Engineering Drawing, Machine Drawing, Solid Modelling, and Elements of Mechanical Engineering.

I also aim to develop interdisciplinary teaching that connects control engineering, artificial intelligence, simulation, sustainability, and industrial reliability. Such courses can prepare students for modern engineering roles where they must work across mechanical systems, data, digital tools, and decision-making under uncertainty.

Personal Teaching Qualities

Students need teachers who are technically strong, approachable, organised, and patient. My personal teaching qualities include teamwork, enthusiasm, willingness to learn, patience, discipline, professionalism, and a strong commitment to student success. I try to create a classroom culture where students feel able to ask questions, make mistakes, improve through feedback, and gradually build the confidence needed to become independent engineers.

Additional Professional Development

In addition to pedagogical qualifications, I have completed professional training that supports digital, technical, and analytical teaching. This includes the Connect Program by Infosys/VIT University, covering Operating Systems, Programming and Testing, Object-Oriented Concepts, RDBMS, and Problem-Solving Techniques, and Certified Software Tester training from Arcus Infotech, India. These experiences support my ability to teach software-supported engineering topics, digital tools, and systematic problem solving.

Closing Statement

My goal as an engineering educator is to help students become technically competent, reflective, ethical, and industry-ready professionals. I bring an international teaching background, formal pedagogical preparation, research-informed expertise, project supervision experience, and strong commitment to student-centred learning. I am confident that this combination will allow me to contribute effectively to undergraduate and postgraduate teaching, curriculum development, supervision, programme leadership, and the wider academic mission of a university.