

UNIVERSITY

WEST

STUDY PROGRAMMES 2023



UNIVERSITY WEST

“WELCOME TO UNIVERSITY WEST. *Work Integrated Learning (WIL) is our profile, and our mission as an academic institution is to interact closely with business community and society –at-large. Together we create insights, solutions, education and development that responds to current and future needs and challenges relevant to society.”*

Martin Hellström, Vice-chancellor



Photo: Kent Eng

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This is printed information that can be subject to change. For the most up-to-date information, please check www.universitywest.se

OUR PROGRAMMES

Name	Level	Tuition Fees SEK/sem*	Duration year	Campus/ Distance	Page
International Programme in Politics and Economics	Bachelor	50 000	3	Campus	11
International Mechanical Engineering (Spring 2023)	Bachelor	57 500	3	Campus	11
Finance	Master	57 500	1	Campus	12
IT and Management	Master	57 500	1	Campus	13
Work Integrated Political Studies	Master	57 500	2	Campus	13
International Business	Master	57 500	1	Campus	14
Leadership in Digitalised Organisation	Master	57 500	2	Campus	15
Sustainable Development	Master	57 500	2	Campus	15
Cybersecurity	Master	65 000	1	Campus	16
Welding Technology	Master	65 000	2	Campus	17
Electromechanical Vehicle Engineering	Master	65 000	1	Campus/Distance	17
Manufacturing Engineering	Master	65 000	1 and 2	Campus	18
Robotics and Automation	Master	65 000	1 and 2	Campus/Distance	19
AI and Automation	Master	65 000	1 and 2	Campus/ Distance	20
Electrical Vehicle Development (Spring 2024)	Master	65 000	1	Campus	21
Operations and Supply Chain Management (Spring 2024)	Master	65 000	2	Campus	21
Operations Management (Spring 2024)	Master	65 000	2	Campus	16

* EU/EEA and Swiss citizens do not pay tuition fees.

The English language requirement

All our programmes taught in English require the equivalent of English studies at the upper secondary (high school) level in Sweden. The following tests are accepted as equivalent:

IELTS Academic

An overall mark of 6.5 and no section below 5.5

TOEFL iBT

- Paper-based: Score of 4.5 (scale 1-6) in written test, total score of 575
- Internet-based: Score of 20 (scale 0-30) in written test, total score of 90

For more information, go to www.universitywest.se/englishproficiency



LINKING THEORY WITH WORKING LIFE

University West is a modern university offering programmes in close collaboration with working life in an attractive and modern study environment. The university has about 5 500 students on campus (in total 13,600) and 675 employees. The university campus is centrally located in the town of Trollhättan close to cafés, cinemas, restaurants and sport facilities, but also close to beautiful landscapes. The campus is constructed with the students' needs in focus. The international atmosphere is informal and dynamic.

WORK INTEGRATED LEARNING – University West is founded on the principle that knowledge is acquired everywhere, not just in universities. Integrating work situations into study programmes – so-called Work Integrated Learning – exemplifies the important relationship between the university and the outside world. Work Integrated Learning provides students with many opportunities to learn from real working life situations through, for example, project work, field studies, mentorship projects and sometimes even work placements.



University West offers programmes and courses taught in English at both the undergraduate and graduate level.

PRODUCTION TECHNOLOGY WEST

The research team Production Technology West conduct cutting-edge in production technology in close collaboration with industry. The team is located at the Production Technology Center, PTC, a modern engineering laboratory and a collaboration arena run jointly by University West, GKN Aerospace, Research Institute of Sweden, and Innovatum Science Park.

WORK INTEGRATED LEARNING

University West have many different research fields and Work Integrated Learning is the common denominator. Our research is defined by co-creation and based on the conditions and challenges of the outside world. Through Work Integrated Learning, both the quality and the societal impact of our research increases.



Photo: Doris Beling



Photo: Simon Paulin



Photo: Simon Paulin



Photo: Per Pixel Petersson

Photo in the middle: © Nobel Media AB 2015. Photo: Pi Frisk

SWEDEN – ONE OF THE MOST INNOVATIVE COUNTRIES IN THE WORLD

You have probably already read or heard a lot about Sweden: the Vikings, Scandinavia, beautiful nature, herring, the Nobel Prize, Volvo, and IKEA. A modern, sustainable country with a high standard of living. But did you know that Sweden is one of the most innovative countries in the world and that it tops the 2021 Innovation Union Scoreboard of the European Commission?

Swedes are early adopters of new technology and the country's non-hierarchical society creates a fertile environment for new ideas. The Swedish government invests a higher proportion of GDP in R&D than most other countries. Generations of innovation have led to a long list of world-changing inventions like the three-point seatbelt, the pacemaker, the adjustable wrench and safety matches. More recent Swedish inventions are Spotify and Skype. Come and study in the country that lives and breathes innovation!



Photo: Clive Tompsett

DID YOU KNOW THAT ...

... **the DJ Avicii**, the football star Zlatan Ibrahimovic, the YouTuber PewDiePie, the environmental activist Greta Thunberg, the inventor Alfred Nobel, and the artist Zara Larsson are all Swedes?

... **Swedes** rank #1 in the world for speaking English as a second language?

... **Midsummer** is one of the most celebrated holidays in Sweden?

... **less than three** per cent of Sweden's land area is developed and that forests cover 69 per cent of the country?

... **the video game** Minecraft was created by the Swedish game developer Markus Persson?

... **IKEA**, Volvo, Ericsson, Tetra Pak and H&M are successful Swedish brands?



A UNIQUE UNIVERSITY IN THE CENTRE OF TROLLHÄTTAN

Photo: JOACHIM NYWALL

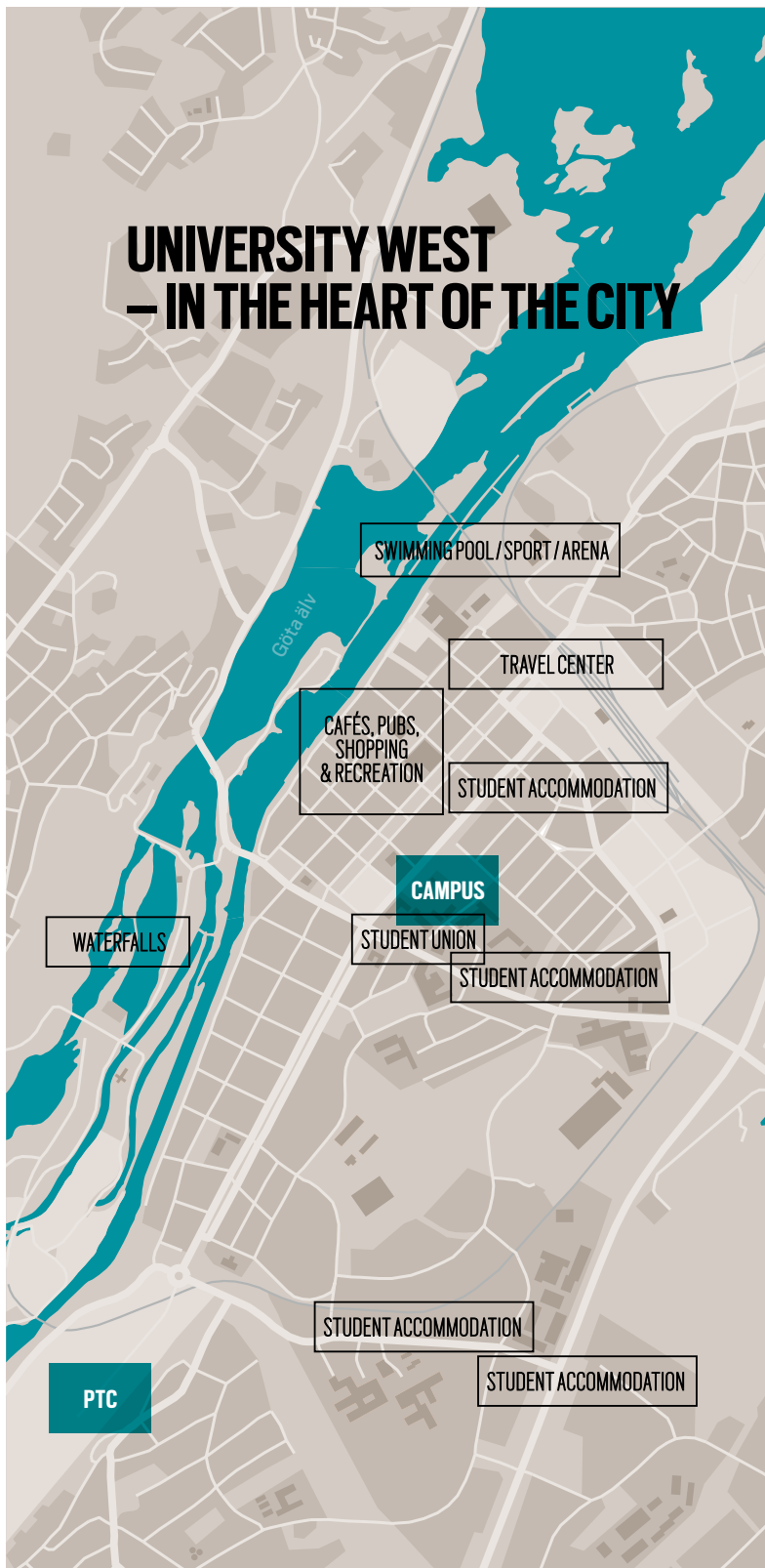
University West is located near the west coast of southern central Sweden, in Trollhättan. The city, with its 60,000 inhabitants, is a well-known destination, attracting thousands of visitors every year. It is a creative city – a place with room for both development and a vision for the future.

THE UNIVERSITY CAMPUS is situated in the heart of the city centre, close to cafés, cinemas, restaurants and sports facilities, but also near a beautiful natural landscape. You don't have to waste time in traffic queues or feel stressed in overcrowded subways. As a student in Trollhättan you have all you need close by.

THE GÖTA RIVER and its great waterfalls are within walking distance from campus. The falls have provided the local economy with power for several hundred years, and Sweden's first hydropower plant was established here.

TODAY TROLLHÄTTAN is home to a number of high-tech companies. One of the best known is GKN Aerospace, a company that not only sends its jet engines, out into the world but also out into space through its development of rocket engine technology. An exciting part of Trollhättan's proud industrial history is the entertainment industry, with entrepreneurs in media and film production. Trollhättan has also become the home of the Chinese company NEVS (National Electric Vehicle Sweden) which is currently developing its platform for the future generation of electric cars in the former SAAB Automobile factory. Trollhättan is a part of the wider Västra Götaland region and is located **not more than a 35-minute train ride from Gothenburg**, the second largest city in Sweden.

UNIVERSITY WEST – IN THE HEART OF THE CITY



ABOUT THE CAMPUS

- A library with more than 350 places to study in different sections
- Two restaurants/cafeterias with seating for a total of 300 people
- More than 50 group rooms for studying
- Five student kitchenettes with dining areas
- An auditorium that seats 500 people
- Plenty of seating areas for studying or socializing

“What I really like about University West is that all facilities are modern, fresh and easy accessible.”

Jia-Juan Tsai, student of the International Programme in Politics and Economics

ABOUT UNIVERSITY WEST

- 5,500 students at campus (13,600 students in total)
- 675 employees (researchers, teaching staff and administrative staff)
- 60 professors
- 60 of its own doctoral students of which one third are employed in industry
- Four departments/schools
- Three vital research environments and six centres of expertise
- A commission from the Swedish Government to develop Work Integrated Learning
- One of Sweden's highest numbers of applicants per seats
- Students and staff from all over the world
- Member of the European University Association (EUA) and the International Student Exchange Programme (ISEP)

"At University West everybody is considered equal. It doesn't matter which race, gender or ethnicity you have. I really like that."

Robin van Popering, alumnus of the Master in International Business



INTERNATIONAL PROGRAMME IN POLITICS AND ECONOMICS (IPPE) (3 YEARS)

The International Programme in Politics and Economics (IPPE) is a multidisciplinary bachelor’s programme. It provides theoretical knowledge and practical skills suitable for political economy-oriented professions in public administration, organizations and private corporations that operate in an international environment.

IPPE includes focus areas such as development and inequality, foreign policy, international political economy, and human rights. It emphasizes the value of ethnic and cultural diversity, gender equality and sustainability. IPPE is a liberal arts-inspired education, designed to develop students academically, intellectually, socially, and emotionally.

Why study IPPE at University West?

- A unique multidisciplinary education
- An international environment with students and staff from all over the world
- The possibility of studying or to do an internship abroad
- A strong link between theory and practice
- A foundation for pursuing a master’s degree
- Prepares you for an international career

“I REALLY LIKE *the familiar atmosphere at the university*”

Veronika Strupf Bowen, student from Germany



INTERNATIONAL MECHANICAL ENGINEERING (3 YEARS)

This Bachelor in International Mechanical Engineering is a multidisciplinary programme, built in collaboration with industry to prepare you for work or advanced study in integrated systems.

Successful engineers need knowledge of manufacturing processes, materials science, robotics and automation, electric vehicles and supply chain management.

During your studies you’ll develop an understanding of future factories, materials and production.

Your programme will cover the main aspects of production technology, where its base is mechanical engineering.

Why study Bachelor in International Mechanical Engineering at University West?

- Courses developed in partnership with industry
- Throughout your studies, you will have opportunities to engage with and learn from company experts
- A unique multidisciplinary education
- University West offers an intimate campus environment
- The possibility of working for an international company over 1-2 semesters



“IT’S REALLY INTERESTING *and I can clearly see the applications*”

Derek Clifford Louis, student from Canada



FINANCE

(1 YEAR)

The Master in Finance is aimed at students who aspire to have a successful career as a financial analyst. The programme has a strong analytical focus and emphasizes the knowledge and skills needed in today's global financial environment. It includes advanced learning techniques such as financial modelling, forecasting and computer applications.

The design of the programme creates synergy between theory and practice by employing highly qualified, renowned researchers, lecturers, and professors and representatives from business and NGOs. Participating academic staff both from Sweden and abroad actively conduct research and give the programme a solid academic focus, making clear connections between research, education, business, and society.

The structure and content of the courses is based on the Candidate Body of Knowledge (CBOK), used by the Chartered Financial Analyst Institute (CFAI) in the accreditation

process for financial analysts. This means that the programme gives a good preparation for CFA exams.

Why study Master in Finance at University West?

- A solid academic and analytical basis for practical decision-making in economics and finance
- A strong link between theory and industry
- A multicultural and international learning environment
- A small-scale programme with an informal atmosphere
- A valuable MSc degree which opens doors to both further studies and research, and a career as financial analyst

“THE BEST THING ABOUT Sweden is the people, the peaceful environment, and the pure air.”

Yen le Dinh Hai, student from Vietnam



IT AND MANAGEMENT

(1 YEAR)

IT and Management is a future-focused master’s programme aimed at students with a background in social or computer science who are interested in analyzing, developing, implementing, and evaluating ICT interventions in organizations.

The programme is developed in collaboration with industries and municipalities and focuses on current IT issues. It integrates work practice with research and theory. During your studies you will learn best practices in ICT.

After taking two courses, students will choose one of the following majors:

- Advanced software development – Full Stack Developer
- Virtual and augmented reality (VR/AR) – Immersive computing
- IT-strategy and architecture – IT management

Why study Master in IT and Management at University West?

- A focus on current IT issues
- It is developed in collaboration with industry
- A strong link between research, theory, and work practice
- A multicultural and international learning environment
- A high teacher-student ratio
- A MSc degree which opens doors to both further studies and a career in industry

“THE UNIVERSITY APPLIES *much work integrated learning*”

Samira Abdoljavadi, alumna from Iran



WORK INTEGRATED POLITICAL STUDIES

(2 YEARS)



“I KNOW IT *would prepare me for a job.*”

Madeleine Hoffman, alumna from the United States

Work Integrated Political Studies (WIPS) is a international programme that leads to a MA degree in Work Integrated Learning (WIL). Through collaboration between University West and the University of the Western Cape in South Africa, the programme provides real applied research tasks related to politics.

The WIL approach provides new perspectives, analysis and solutions. The international collaboration provides unique opportunities for students to conduct applied research projects in Sweden or South Africa.

Why study Master in Work Integrated Political Studies at University West?

- A unique programme combining WIL and political studies
- Collaboration between Univer-

sity West and the University of the Western Cape, South Africa

- A blend of theoretical knowledge and practical skills
- An internship system that enables students to work the second year of the programme abroad
- A multicultural and international learning environment
- Small-scale with an informal atmosphere
- A MA degree which provides you with access to a variety of careers



INTERNATIONAL BUSINESS

(1 YEAR)

University West offers a one-year Master's programme in International Business that is tailored for those who have international career ambitions.

This programme is aimed at helping you develop into a cross-culturally intelligent and knowledgeable international business professional, able to make informed decisions in multiple contexts of cross-border business operations. The programme establishes clear connections between current business practices, business research, and your learning.

The master's programme gives you a solid foundation in the four core pillars of international business: International management, international marketing, international finance, and international accounting. The programme finishes off with

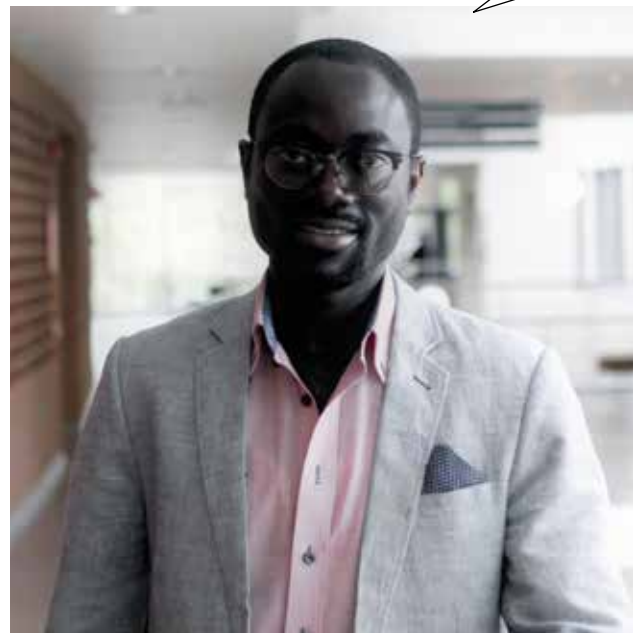
a master's thesis. This project aims at developing your ability to identify, critically reflect upon, analyse, and solve problems related to international business activities by incorporating different business research methods into your study.

Why study Master in International Business at University West?

- A challenging programme with a focus on large, small, and medium-sized enterprises
- A truly international learning environment
- A relatively small-scale programme with an informal atmosphere
- A valuable MSc degree which opens doors to both further studies/research and a career in industry, both in Sweden and abroad
- An academic programme with a link to industry, through Work Integrated Learning

"UNIVERSITY WEST *has taught me a lot.*"

Patrik Kankam, alumnus from South Africa



LEADERSHIP IN DIGITALISED ORGANISATIONS

(2 YEARS)

Are you active, curious and have a drive for change? Prepare for a leading role in the transition to Industry 4.0 in this Master in Leadership in Digitalised Organisations. You'll learn to lead, develop and organise digital change within business and industry.

You'll build the theoretical and practical knowledge needed to be a responsible and adaptive leader in changing and sustainable digitalised organisations. You may even go on to influence new approaches to management and governance of organisations of the future.

You'll build hands-on experience in how knowledge is created, disseminated and implemented sustainably in digitalised organisations.

Why study Master in Leadership in Digitalised Organisations at University West?

- The possibility to spend a semester abroad with a corporate and university partner
- University West offers an intimate campus environment
- Learn from instructors with international experience
- There is a high demand for leaders with these new skills
- It's a multidisciplinary programme that includes informatics, business administration, pedagogy and more



"DEVELOP ACTIVE LEADERS with an agile leadership."

Kristina Johansson, vice dean of the School of Business

SUSTAINABLE DEVELOPMENT

(2 YEARS)



"YOU WILL HAVE advanced skills in seeing the possibilities."

Thomas Winman, Dean of the School of Business

This Master in Sustainable Development is suited for creative thinkers and problem-solvers who want to be a part of building a more sustainable world. You will learn how to be an active leader in organisations playing their part in evaluating and implementing sustainable development goals.

In this programme we address real issues in sustainable development faced by organisations. With a dual competency in sustainability and organisational development, you'll have the skills to contribute to innovative long-term solutions in ecological, social or economic sustainability.

This programme is for students and professionals with diverse backgrounds.

Why study Master in Sustainable Development at University West?

- Gain real work experience with an internship
- Study together with people from a wide range of backgrounds, academically, professionally, and culturally
- The programme was built in close collaboration with public, private and non-profit partners
- There is a high demand for leaders with these skills

CYBERSECURITY

(1 YEAR)

There is high demand for cybersecurity specialists with a big-picture understanding of the technical aspects of cybersecurity. This Master in Cybersecurity offers the broadest available training in full range of cybersecurity areas.

It covers advanced topics related to cybersecurity standards and regulations, Cyber Physical Systems security (CPSs), risk assessment and management, cyber forensics, network and cloud security and penetration testing. Additionally, you'll receive complementary training to obtain your CCNA cybersecurity, "CyberOps", certification.

Why study Master in Cybersecurity at University West?

- The industry demand for professionals in cybersecurity has never been higher
- You will develop the most in-demand cybersecurity skills
- You'll gain hands-on experience in designing complete security solutions
- The programme is founded on the pressing needs of governments and leading companies
- Your instructors have much industry experience

"ONE OF THE BEST SCHOOLS in the field of cybersecurity"

Salah Hashemi, Combitech Unit Manager in Secure IoT



OPERATIONS MANAGEMENT

(2 YEARS)



"A LOT OF THINGS are changing in society and production."

Per Nylén, Dean of the Department of Engineering

This Master in Operations Management prepares you for a leadership role in the manufacturing industry. By the end of your studies, you'll have advanced skills in production technology, management and organisation, and digital technologies.

You'll strengthen your technical skills while developing advanced business knowledge to be able to bridge the gap between production and the rest of the business. The programme is built around three central areas of study within a production context: management, organisation and production technology, with insight into digital technologies.

Why study Master in Operations Management at University West?

- Through collaborations with industry you'll build real-world skills
- There's a high demand for production managers with special knowledge of production technology and management
- Sweden is home to more global manufacturing companies per capita than any other country
- The option for an international industrial placement

WELDING TECHNOLOGY

(2 YEARS)

Do you have a desire to enter a rapidly-growing field? Earn a degree in production technology with a specialisation in Welding Technology. Based on the International Welding Engineer syllabus, this programme prepares you to enter the workforce as a certified welding professional.

Rapid market growth in various industrial sectors have resulted in a growing need for welding professionals. This fully English-taught, prepares you for a career as a member of a welding coordination team who oversees cutting-edge practices. Throughout your studies, corporate partners will provide you with insight and project work.

Why study Master in Welding Technology at University West?

- Access to world-leading facilities relevant to welding technologies
- Sweden is a leading country with in the development of advanced technologies
- Linkage to an internationally known organisation - International Institute of Welding (IIW)
- The opportunity to be part of cutting-edge research

“OUR STUDENTS GET *the guarantee that, after graduation, they can be integrated in companies without any problems.”*

Paul Kah, Professor in Welding Technology



ELECTROMECHANICAL VEHICLE ENGINEERING

(1 YEAR)

This Master in Electromechanical Vehicle Engineering was designed in collaboration with the automotive industry to prepare you for a high-demand career in electric vehicles and electric powertrain.

Through this programme you can develop the knowledge you need to work as a highly qualified designer, test engineer or development engineer in the automotive industry. Multinational Swedish-Chinese employers, located near the university, are looking for specialised mechanical engineers with the competencies gained through this programme, companies such as NEVS and Volvo Cars, and CEVT.

Why study Master in Electromechanical Vehicle Engineering at University West?

- Study either on campus or online
- The programme is influenced by the real-world needs of companies
- You'll have opportunities to engage with, and learn from company experts
- You'll be highly sought after by corporations
- Access to the Production Technology Centre, one of the largest and most updated manufacturing laboratories in Sweden

“I BELIEVE SWEDEN *is the best place to develop my career as an engineer in the Automotive Industry”.*

Carlos Martinez Armendariz, student from Spain





MANUFACTURING ENGINEERING

(1 AND 2 YEARS)

The Master's programme in Manufacturing Engineering is a one or two year master's programme, taught completely in English. The programme has been developed in close cooperation with industrial companies to be able to respond to rapidly changing needs in industry.

You can register to the one-year or the two-year options of this programme. The one-year option is appropriate for those with few years of experience as engineers, while the two-year option is more suitable for new graduates. In both programmes, using a scientific approach, you study several manufacturing processes: machining, welding, additive manufacturing, surface engineering and thermal spraying. The two-year programme additionally includes courses on welding metallurgy, material characterization and non-destructive testing, an "industrial placement" along with elective courses on subjects such as simulation, robotics, operations management, and statistical process control.

Why study Master in Manufacturing Engineering at University West?

- A high-quality education, developed in close cooperation with industry
- A valuable MSc degree which opens doors to both further studies / research and a career in industry, both in Sweden and abroad
- A strong link between theory and practice through the concept of Work Integrated Learning
- Access to one of Sweden's largest and newest manufacturing laboratories where business and academia come together
- Small-scale, personal, and international character

"I ENJOY A COMBINATION of practical and theoretical work."

Lennart de Haan, alumnus from the Netherlands



Photo: KENT ENG



ROBOTICS AND AUTOMATION

(1 AND 2 YEARS)

There is an ongoing digitalization taking place all around the world, and this has brought about an explosive growth in the use of robots and automation solutions, a development that implicates not only industry but entire cultures. What we are witnessing is the fourth industrial revolution (Industry 4.0).

We not only have smart robots, but units with sensors and inbuilt systems that are connected to networks (Internet of Things, IoT). This together with advanced simulation (digital twins) and artificial intelligence (AI) is the foundation for smart factories.

This is a master's programme offered both on campus in Trollhättan and web-based (distance learning with two physical meets in Trollhättan). It has been created through collaboration between industry and researchers at University West and distinguishes itself from many other programmes through the integration of working life situations and theory.

The courses offer you in-depth knowledge of smart factories, and you will learn design and programming of robots and automation systems.

Why study Master in Robotics and Automation at University West?

- A strong focus on applications for industry
- A valuable MSc degree which opens doors to further studies/research and a career in industry
- Access to a modern lab that meets the highest international standards (Production Technology Centre)
- Small-scale, personal, and international

“THE UNIVERSITY’S ‘LEARNING-BY-DOING’ approach helped me to foresee real-time challenges”

Akshay Sarode, alumnus from India



Photo: KENT ENG



AI AND AUTOMATION

(1 AND 2 YEARS)

This Master in AI and Automation is aimed at those who are interested in the latest technologies and software – and in working within a challenging field that is constantly developing. Earn a degree in production technology, with a unique combination of specialisations: AI and automation.

We built this programme in close collaboration with corporate partners, who will provide insight and project work throughout the studies. Additionally, you'll collaborate with industry through real project work.

Your programme combines learning in production technology and computer science. This allows you to build a unique expertise in both AI and automation, entering the job market as an innovative engineer, where you will shape new production systems and products.

The courses and instructors are based in the research of Production Technology West (PTW), internationally recognised for work in pro-

duction systems and processes in the manufacturing industry.

Why study Master in AI and Automation at University West?

- The market for smart manufacturing is expected to grow 12.4 % annually, from 2020 to 2025
- Students from around the globe come together to create a unique and international environment
- Design and complete your master's thesis in collaboration with a company
- University West offers an intimate campus environment
- Most of your instructors also have international experience in both research and education

"I SEE GREAT OPPORTUNITIES in AI and automation."

Per-Lage Götvall, Senior Research Engineer at Volvo





ELECTRICAL VEHICLE DEVELOPMENT

(1 YEAR)

Almost 30% of the world's energy is consumed by the transport sector. Therefore, there is a great interest in further developing electric propulsion systems. But, since the development of these technologies is becoming increasingly complex, companies are in need of new skills.

To cater to the automotive industry's new needs, University West is currently developing a new master's programme within the field of Electrical Vehicle Development.

Through working closely with the automotive industry when developing this programme, University West is able to ensure that the students, after graduation, will be ready to develop new technical solutions and systems for electric vehicles.

During your studies you will work closely with industry.

– I believe this experimentally oriented education program within electrical engineering gives the students what they want and the industry what the need, says Boel Ekerlgård, senior lecturer and programme director

The programme will be fully taught in English and offered both as campus and distance education.

OPERATIONS AND SUPPLY CHAIN MANAGEMENT

(2 YEARS)

The ongoing digital industrial revolution continues. One big challenge lies in creating intelligent production and logistics systems that make it possible to produce and deliver needed products and services, while contributing to sustainable development.

Through increased use of information technology, great opportunities are created, but this also places new demands on competence and understanding of the opportunities and challenges this entails. Information technology fundamentally affects the businesses' strategies, organizations and operational work.

Since the needs of skills for operational managers and developers are changing, University West is now developing a new master's pro-

gramme in Operations and Supply Chain Management.

This English-taught programme brings together technical and organizational aspects of the management, design, planning and development of industrial operations and supply chains. A particular focus is placed on information technology and the opportunities it creates, but also the challenges that follow.

AMONG ROBOTS & HUMANS

Volvo engineer on AI and Automation

Per-Lage Götvall is Senior Research Engineer at Volvo. He initiates, drives and coordinates research activities in the area of flexible manufacturing. His responsibilities include project planning, detailed technical discussions and collaborations with other companies in the fields of management, production engineering, computer vision, autonomous vehicles, AI and mechatronics.

■ What exciting developments is Volvo working on around AI and automation?

– In the field of flexible manufacturing, we see the future as humans working together with robots. When we say “robots,” this could mean traditional robot arms working alone or side by side with humans, or autonomous transporters working in the same environment as human operators.

– We aim to create a unified environment where humans and robots are working on equal terms. In other words, while safety is of utmost importance, the human and robot have equal responsibility in the relationship. When we work with other humans, we are obligated not to hurt or injure them. The same is true when working with robots. We must work responsibly with these machines. This is a new way of looking at safety and the relationship between robots and humans.

– As a part of this, we are working with Generic Photogrammetry-based Sensor Systems (GPSS) to give machines the ability to see. Very often, cameras are placed on top of robots so they only see where they’re looking, which creates a funnel and leaves a lot of room for error. Now, we are placing many cameras in the ceiling



“We are working to create safer and more efficient working relationships between humans and robots”

Per-Lage Götvall is Senior Research Engineer at Volvo

and stitching their pictures together for a complete (and safer) view.

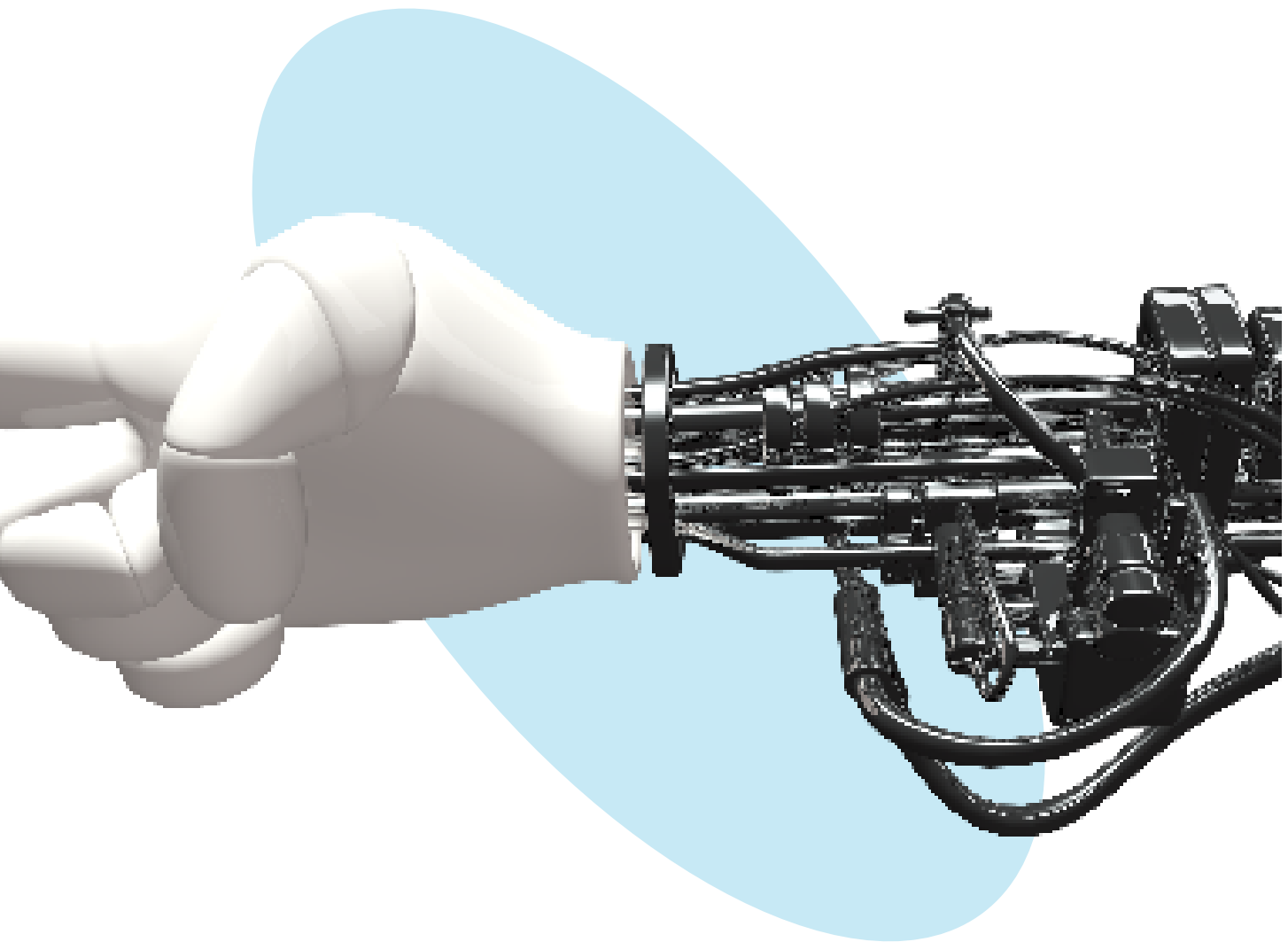
– It is interesting, because in a way, industry is behind society in adopting new technologies. We have no concerns, for example, about having automated vacuum cleaners in our homes, but if you

introduce that type of technology in industry, people raise concerns about it not being safe enough. Why are we more eager to use automated technologies at home but not at work?

– We are working to create safer and more efficient working relationships between humans and robots, and to demonstrate to society that modern collaborative robots have lower risk than many other activities we consider normal. We let children ride horses but are concerned about skilled adults working side by side with autonomous robots, when collaborative robots are much safer and more predictable than horses! We are working on the social and cognitive aspects of this issue as well as the technical.

■ Does this work factor into climate change and/or the circular economy?

– It depends on the technology you are making and for what purposes. At Volvo, we have a business branch called remanufacturing: taking in used components, such as engines and gear boxes, tearing them apart, replacing worn out parts with new/renovated ones and putting them together again. This is good for the climate and also



contributes to the circular economy. We are continually working to reduce the amount of energy it takes to remanufacture, making the entire process smoother and faster.

– Volvo is also developing various kinds of autonomous vehicles, allowing us to remove the large and heavy cab, for example. We (Volvo) are reducing the material used by 30% (which reduces weight and energy consumption).

■ **Will students have a chance to connect with Volvo? In what ways?**

– I see great opportunities in AI and automation. Volvo is dependent on dedicated and ambitious people with the knowledge of these new technologies. It's developing really fast. Our relationship with academia is very beneficial. I think it's great that we can learn from students and they can learn from us.

■ **What skills do you expect graduates of these programmes to have?**

– Sensor fusion, the ability to draw conclusions from various sources of information, all aspects of computer vision, mastering various methods of offering AI, and, of course, everything in real time.

■ **Is there anything else you'd like students to know?**

– It's great fun being an engineer in this field!

WHAT WE CAN OFFER

Included in the tuition fee (in addition to the programme you are admitted to) are the following:

- 24/7 student insurance
- Support in arranging accommodation
- Arrival service at airports in the region on arrival day
- Free membership in the student union
- A general introduction for all international students
- Guidance counselling, Career counselling, IT support/ free Wi-Fi everywhere on campus
- Academic support (in academic writing, math, etc.)
- Swedish courses

Scholarships

The University West Scholarship Programme is open for fee-paying students admitted to most of our master's programmes. Check www.universitywest.se/scholarships for more information.



More information:
universitywest.se

 UniversityWest  UniversityWest_Sweden

study@universitywest.se