DOSIGN ACADEMY

Piping Design & Engineering Course



Dosign Academy

"Building a future on knowledge"

PIPING DESIGN & ENGINEERING

Our training teaches you everything about the design process and what it entails.

Do you have a background in mechanical engineering and possess creativity and spatial awareness? Then there are vast career opportunities for you as a Piping Engineer in industries such as (petro)chemicals and the oil & gas sector. With a diploma from Dosign Academy, you take a significant step forward in your career!

DEVELOP YOUR TECHNICAL FUTURE

The Piping Design & Engineering course at Dosign Academy offers you the opportunity to specialize in a crucial technical field. Whether it involves complex piping systems in the oil & gas industry, chemical plants, or sustainable energy projects, piping engineers play an essential role. This practice-oriented course provides you with the knowledge and skills to make a valuable contribution to a wide range of technical projects.

WHAT MAKES OUR COURSE UNIQUE?

At Dosign Academy, practical learning is at the core of our approach. This course combines the latest industry knowledge with a strong focus on real-world application. The curriculum is fully aligned with the needs of the job market, ensuring that you are well-prepared for the challenges in the field. Whether you are just starting or already have some experience, this course offers both a solid foundation and deeper specialization.

Upon completion, you will receive a recognized certificate that sets you apart in the technical sector. Personalized guidance from experienced trainers and small group sizes ensure that you receive the attention and support needed to reach your full potential.

PRACTICAL INFORMATION

Duration: 2 calendar years, starting every September.

Classes: Every two weeks from 17:30 to 22:00, alternating between online sessions and in-person lessons at our location. The program also includes company visits to renowned businesses.

Location: Dosign Academy in Rotterdam or Hoogerheide. Starting from September 2025, also available in Limburg!

Costs: €6,625 (excluding VAT) for 2 years.

Included: Classes, study materials, (hot) meals, (mock) exams, certificates, and the diploma.

Language: The standard course is offered in Dutch. From September 2025, the course will also be available in English!

STRUCTURE OF PIPING DESIGN & ENGINEERING

SEMESTER 1	SEMESTER 2
Lesson 1.1 – Introduction to Piping, P&IDs, Line Table &	Lesson 2.1 – Heat Exchangers
Project Structure	Lesson 2.2 – Basic Pipe Stress (Company Visit)
Lesson 1.2 – Metallurgy, Pipe Specifications, Pipe Compo-	Lesson 2.3 – Tank Storage
nents & Wall Thickness Calculations	Lesson 2.4 – Interdisciplinary Checks, Secondary Supporting
Lesson 1.3 – Fittings, Valves & Valve Specifications	& Start of Plot Plan Development
Lesson 1.4 – Design, Scanning, 3D Design & Piping Plan	Lesson 2.5 – Supporting
(Company Visit)	Lesson 2.6 – PED (Pressure Equipment Directive)
Lesson 1.5 – Piperacks	Lesson 2.7 – Ergonomics
Lesson 1.6 – Utilities	Lesson 2.8 – Fire Protection
Lesson 1.7 – Instrumentation	Lesson 2.9 – Insulation
Lesson 1.8 – Pumps	Lesson 2.10 – Exam
Lesson 1.9 – Vessels	
Lesson 1.10 – Exam	

SEMESTER 3

Lesson 3.1 – Plot Plan Development (Continuation) & Plant	Lesson 4.1 – Tracing / Jacketing of Piping
Layout	Lesson 4.2 – Solid Handling Conveying
Lesson 3.2 – Detailed Pipe Stress Analysis	Lesson 4.3 – Plastic Piping (Guest Lectur

Lesson 3.3 - Process Technology Lesson 3.4 – Prefabrication & Installation (Company Visit)

Lesson 3.5 – Underground Piping Lesson 3.6 – Towers & Columns Lesson 3.7 - Cooling Towers

Lesson 3.8 - Furnaces Lesson 3.9 - Compressors

Lesson 3.10 - Exam

Lesson 4.3 – Plastic Piping (Guest Lecturer: Arno Jordans)

Lesson 4.4 – Materials Lesson 4.5 - Corrosion

SEMESTER 4

Lesson 4.6 – Cryogenic Piping and Tie-ins

Lesson 4.7 – Planning

Lesson 4.8 – Estimating (Company Visit)

Lesson 4.9 - Exam

Lesson 4.10 - Diploma Ceremony

Inschrijven of meer informatie?

Would you like to learn more about the Piping Design & Engineering course? Visit our website, contact us at +31 10 244 09 44, or send an email to info@dosign-academy.com. Our team is ready to assist you!

WHO IS THIS COURSE DESIGNED FOR?

A tailored course for professionals, beginners, and career switchers with a passion for engineering.

The Piping Design & Engineering Course at Dosign Academy is ideal for anyone with a passion for engineering who wants to specialize in a challenging field. Whether you are taking your first steps into the technical world or already have experience and wish to expand your knowledge, this course offers a suitable learning path. With a strong focus on practical application and up-to-date industry insights, this program is designed to accommodate various backgrounds and ambitions.

PROFESSIONALS LOOKING TO DEEPEN THEIR KNOWLEDGE

This course is ideal for technical professionals already working in the industry who want to further specialize in their field. Think of mechanical engineers looking to expand their expertise in the process industry, including hydrogen production plants, (petro)chemicals, and the oil & gas sector. Our practice-oriented approach allows you to apply the latest techniques and insights directly to your daily work.

FOR TECHNICAL STARTERS

Recently graduated in a technical field or ready to kick-start a career in engineering? This course provides a solid foundation. We prepare you for a career in innovative sectors such as sustainable energy and the chemical industry. With this training, you build a strong foundation for your future.

CAREER SWITCHERS LOOKING FOR A NEW CHALLENGE

Do you have a technical background but want to take a new direction? This course offers the opportunity to start a career in piping design and engineering. For career switchers who need extra support, Dosign Academy provides an intensive summer course in mathematics and physics.

FOR ENGINEERS AND FUTURE ENGINEERS IN THE PROCESS INDUSTRY

This course provides a solid foundation for aspiring engineers and mechanical engineers looking to pursue a career in the process industry. Relevant sectors include hydrogen production plants, (petro)chemicals, and the oil & gas industry. With this training, you become an indispensable link in these fields.

ADMISSION REQUIREMENTS: PIPING DESIGN & ENGINEERING

To enroll in the Piping Design & Engineering course, a technical background is required. You must have completed an MBO (senior secondary vocational education), HBO (higher professional education), or university-level degree in a technical discipline such as mechanical engineering or electrical engineering. Additionally, a strong understanding of mathematics and physics is essential, as these skills are critical in this field. For those who need extra support. Dosign Academy offers an intensive summer course to refresh this knowledge, ensuring you are well-prepared for the program.

SUCCESS STORIES!



Rob van der Boor

For me, engineering is about understanding and improving the things around me. This requires knowledge and experience, and the knowledge I gain during this course aligns perfectly with that. Each lesson focuses on a new and interesting topic, helping me engage with my colleagues and work more efficiently. Every instructor is always willing to answer questions and share their experience whenever I encounter challenges—whether at work or with the course material. As I progress through the program and the lessons become more specialized, I realize that I would never have been able to grasp my work as effectively without this course.

Wim Raats (SPPD)

Both offshore and onshore, the chemical and petrochemical industries are in great need of experienced piping design engineers," says Wim Raats, secretary of the Stichting Platform Piping Design. "This applies to both the maintenance of existing installations and the design of new ones. All these challenges demand a high level of expertise from piping design engineers. Piping design is truly specialized work.



Juliëtta den Toom

The lessons were truly interesting and informative, and they aligned well with real-world practice. All topics—such as heat exchangers, insulation, and supporting—are crucial within piping. The instructor provided excellent examples from his own industry experience and shared valuable tips that you won't find in the textbooks. That was perhaps the most valuable part for me.

4 PIPING DESIGN & ENGINEERING PIPING DESIGN & ENGINEERING

WHAT WILL YOU LEARN DURING THE COURSE?

THE DEMAND FOR KNOWLEDGE AND SKILLED PER-SONNEL IS GROWING EXPONENTIALLY

The Piping Design & Engineering course offers an in-depth, practice-oriented learning experience that prepares you for the complex challenges of the process industry. From fundamental theoretical principles to advanced design techniques, you will develop skills that are immediately applicable in the field. The focus is on combining technical knowledge with practical applications, ensuring that you are ready to contribute effectively from day one after completing the course.

The Piping Design & Engineering course offers a comprehensive program where you will learn everything about designing, analyzing, and optimizing piping systems. From material science to tracing, and from wall thickness calculations to 3D modeling—each topic is covered with a strong focus on practical application. Below is an overview of the key subjects covered in the course.

3D MODELING & ISOMETRIC DRAWINGS

Utilize advanced software such as AutoCAD Plant 3D and SmartPlant 3D to model piping systems. Practice creating isometric drawings that accurately depict the location, dimensions, and materials of a piping system. Additionally, learn how to check models for consistency and feasibility.

MATERIAL SCIENCE & METALLURGY

Understand the properties and behavior of different materials such as steel, stainless steel, and exotic alloys.

Learn how the iron-carbon diagram is used to make material selections for high-temperature, high-pressure, and corrosive environments. Explore metallurgical processes such as heat treatment and welding procedures and how they influence material properties.

TRACING & JACKETING

Learn how tracing and jacketing protect and optimize piping systems. Delve into steam tracing and electrical tracing, including their energy requirements, installation guidelines, and maintenance procedures. Discover the role of jacketing in process pipelines that are sensitive to temperature fluctuations. You will work on case studies to optimize tracing designs.

FLANGE CONNECTIONS & FITTINGS

Gain in-depth knowledge of flange design, valves, and fittings. Analyze the functional differences between blind flanges, orifice flanges, and butterfly valves, and learn how to correctly install and maintain these components in complex piping systems. Additionally, explore gasket and bolt material selection for different process conditions.

WALL THICKNESS CALCULATIONS

Master wall thickness calculations according to the ASME B31.3 standard. Understand how factors such as medium pressure, medium temperature, and pipe diameter influence the dimensioning of piping systems. Throughout the course, you will work on practical assignments to calculate and optimize piping designs.

3D MODELING & ISOMETRIC DRAWINGS

Explore different techniques for transporting solids, such as pneumatic conveying, belt conveyors, and screw conveyors. Learn how factors such as wear, dust formation, and energy consumption affect design choices. You will learn how to design systems that function efficiently and safely.

SAFETY & REGULATIONS

Learn how to comply with stringent safety standards such as PED, ASME, and ATEX. Delve into guidelines for designing explosion-proof systems and integrating safety at every stage of the design process. You will work on assignments that involve conducting safety analyses and making recommendations.

CERTIFICATION PROJECT

Complete your course with a practical project that combines all the knowledge and skills you've acquired into a realistic design. This demonstrates that you are ready for a role as a piping engineer.

By combining this knowledge and practical experience, you will be fully prepared for challenging projects in the process industry. Whether it's designing a complex piping system or optimizing existing processes, you will be ready to make an impact as a piping engineer.



WHAT DOES A PIPING ENGINEER DO?

LEARN EVERYTHING ABOUT MANAGING A CONSTRUCTION TEAM WITH A FOCUS ON SAFETY, QUALITY, AND SCHEDULING

A piping engineer plays a key role in the process industry and is responsible for designing, analyzing, and optimizing complex piping systems. These systems ensure the controlled transport of liquids and gases in industrial installations such as refineries, chemical plants, power plants, and offshore platforms. Piping engineers work within multidisciplinary teams and must consider strict safety standards, thermal expansion, pressure differences, and the chemical compatibility of materials.

DESIGN AND ENGINEERING

A piping engineer translates process designs into detailed piping diagrams and construction drawings. This starts with developing a Piping & Instrumentation Diagram (P&ID), which schematically represents the logical connections between equipment and piping. Next, a 3D model is developed, considering aspects such as pipe routing, expansion loops, supports, and interference with other disciplines. The goal is to create an optimal piping system that is both functional and economically feasible.

MATERIAL SELECTION AND SPECIFICATIONS

Material selection is a fundamental part of piping engineering. Depending on process conditions—such as temperature, pressure, and chemical aggressiveness—materials are chosen that meet the required mechanical strength, corrosion resistance, and lifespan. Engineers follow international standards such as ASME B31.3 for process piping and EN 13480 for metallic industrial piping. Factors such as manufacturability, weldability, thermal conductivity, and compatibility with transport media are also taken into account when making engineering decisions.

STRESS ANALYSIS AND STRENGTH CALCULATIONS

Piping engineers perform advanced stress analyses to ensure that piping systems can withstand mechanical loads. Factors such as thermal expansion, pressure differences, vibrations, and external forces can cause structural damage if not properly addressed. Using software packages, these forces are modeled and analyzed to ensure that systems meet design specifications and code requirements. Special attention is given to support structures and compensators to prevent excessive stress and material fatigue.

INSTALLATION AND MAINTENANCE

In addition to design and calculations, a piping engineer plays a crucial role in the installation and operational control of piping systems. This includes:

- Work preparation and planning: Creating technical drawings, isometric projections, material selection lists, and welding procedures.
- Quality control and pressure testing: Inspecting welded joints, conducting hydrostatic tests, and performing non-destructive testing (NDT) such as radiography and ultrasound.
- Inspection and maintenance: Through periodic checks
 using methods like wall thickness measurements and
 corrosion calculations, potential defects and degradations
 are identified early to ensure operational reliability.

APPLICATIONS AND INDUSTRIES

Piping engineers operate in a wide range of sectors, including:

- Power plants and hydrogen technology (steam and gas turbine systems, hydrogen production and storage)
- Food industry (controlled production environments with stainless steel piping systems)
- Pharmaceutical industry (sterile piping systems according to GMP standards)
- Offshore and maritime sector (piping designs for drilling platforms and shipbuilding)

CAREER AND GROWTH OPPORTUNITIES

A career as a piping engineer offers various growth opportunities. Engineers can specialize in disciplines such as piping stress engineering, project management, or corrosion analysis. They can also advance to positions such as lead piping engineer, engineering manager, or consultant in industrial piping systems. Pursuing additional certifications, such as the Piping Design & Engineering course at Dosign Academy, enhances technical competencies and broadens career prospects.

Piping engineers contribute to the reliability, efficiency, and safety of process installations. With their expertise in design, material science, and stress analysis, they ensure that piping systems meet the highest industry standards and requirements.

WHY TAKE THIS COURSE AT DOSIGN ACADEMY?

The Piping Design & Engineering course at Dosign Academy is the only program in the Netherlands specifically focused on training piping engineers at this level. Through the strong combination of theoretical knowledge and practice-oriented assignments, you will not only learn the fundamental principles but also develop skills that are directly applicable in the industry. Thanks to close collaboration with renowned companies and industry specialists, this course is perfectly aligned with the sector's needs. This ensures that you are fully prepared to start working as a piping engineer in the field.

THE TRAINERS

Experienced Professionals: The Trainers at Dosign Academy

At Dosign Academy, the Piping Design & Engineering course is taught by a team of experienced and knowledgeable trainers. These professionals have years of hands-on industry experience and combine this with their passion for education. Thanks to their in-depth knowledge and practical approach, students not only gain insight into the theory but also learn how to apply it directly in realistic scenarios.

EXPERTISE AND EXPERIENCE

The trainers at Dosign Academy have earned their reputation across various industries. Their hands-on experience allows them to guide students with realistic cases and practical examples that align with the current developments in the industry.

PRACTICAL APPROACH

What sets the trainers apart is their hands-on teaching method. In addition to theory, students work on design assignments, case studies, and simulations. With small classes and interactive lessons, students receive personalized guidance and direct feedback. This accelerates the learning process and enhances understanding of complex piping designs.

INNOVATIE EN TECHNOLOGIE

The piping industry continues to innovate, and Dosign Academy addresses this by integrating the latest technologies and trends into the curriculum. Topics such as 3D scanning, sustainable energy, and digital twins are covered, ensuring students are well-prepared for modern applications. Guest lectures and company visits further strengthen the practical aspect of the course and provide insight into the working environment of a piping engineer.

PERSONALIZED GUIDANCE & NETWORKING

Personalized guidance is a core value at Dosign Academy. The trainers serve not only as instructors but also as mentors. With their extensive industry network, they can connect students to companies and professionals, providing valuable career opportunities. Additionally, students develop essential soft skills such as project management and communication.

WHY CHOOSE THE TRAINERS AT DOSIGN ACADEMY?

The trainers at Dosign Academy are the backbone of the Piping Design & Engineering course. Their combination of subject matter expertise, practical experience, and teaching skills ensures that students are optimally prepared to enter the job market. Through close collaboration with the industry and continual updates to the curriculum to reflect the latest trends, Dosign Academy offers a strong foundation for a successful career in piping engineering.



Wil Maassen

"Teaching Piping Design & Engineering is more than sharing knowledge—it's about passing on years of experience to the next generation. At Dosign Academy, we challenge students to think critically, solve complex engineering problems, and stay ahead of industry developments. Designing new assignments and refining course materials to match the latest trends keeps the learning experience dynamic and relevant. Seeing students grow in their technical skills and confidence, and knowing they will shape the future of the industry, is what makes teaching so rewarding."

Hans Mouws

"Piping Design & Engineering is a challenging field where technology, creativity, and collaboration come together. At Dosign Academy, students not only learn how to design efficient and safe installations but also how to operate within a multidisciplinary team. Our slogan, 'Creating Connections,' goes beyond just pipelines—it's about connecting people, knowledge, and industry. It's truly rewarding to guide students in their growth and see them develop into successful piping engineers."



Milan Blom

"Piping Design & Engineering is an ever-evolving field, and at Dosign Academy, we make sure our students stay ahead of the curve. As a teacher, it's incredibly rewarding to see students grow from theory to practice, applying their knowledge to real-world challenges. I enjoy creating interactive lessons and hands-on assignments that bring complex concepts to life. Watching students gain confidence and develop innovative solutions for the industry's future is what makes teaching at Dosign so exciting."

PRACTICAL ASSIGNMENTS

Curious about what you'll learn in the course and can't wait to get started?

Here you will find 6 multiple-choice questions and a drawing assignment to help you practice! Test your knowledge and that of others with this multiple-choice quiz! If you're eager to get started, try completing the drawing assignment. Send your work to info@dosign-academy.com, and we will review it for you. Post it on LinkedIn and tag @dosignacademy for a chance to win a great prize

Multiple Choice Questions:

- 1. Which factor is the most determining when selecting an appropriate pipe material for a process installation with high pressures and temperatures?
- A) The corrosion resistance and mechanical strength of the material
- B) The availability of the material in the region
- C) The color coding of the pipes
- D) The cost of the material
- 2. What is the primary purpose of an expansion joint in a piping system?
- A) To compensate for thermal expansion and contraction
- B) To reduce pressure losses in the system
- C) To lower the pump load
- D) To prevent turbulence in the pipes
- 3. Welke van de volgende leidingspecificaties is van toepassing op hogedrukprocesleidingen in een chemische fabriek?
- A) ASME B31.1
- B) ASME B31.3
- C) ASME B31.8
- D) ASME B31.4

- 4. Why are double-walled pipes often used in the industry?
- A) To speed up the transport of hot liquids B) To double the strength of the pipe
- C) For additional protection against leaks and environmental contamination
- 5. Which factor has the greatest influence on the choice of material for a piping system in a chemical plant?
- D) De locatie van de operatoren ChatGPT zei:
- A) The color of the pipes
- B) The temperature and chemical properties of the fluid
- C) The distance the fluid must travel
- 6. What is the function of a strainer in a piping system?
- A) Controlling the pressure in the system
- B) Filtering solid particles from the fluid flow
- C) Preventing backflow in a piping system
- D) Maintaining a constant temperature in the piping network

Drawing Assignment: Design a simple piping system consisting of a pump, a valve, and a storage tank by hand.

This system must meet the following requirements:

- The pump transports a fluid from a storage tank to a process pipe.
- A valve must be placed between the pump and the process pipe to regulate the flow
- Use basic P&ID symbols for the pump, valve, and storage tank.
- Indicate the correct flow direction of the fluid.
- Work out the assignment on paper and ensure the sketch is clear and organized.

PIPING DESIGN & ENGINEERING DOSIGN ACADEMY ANSWERS: 1A, 2A. 3B, 4C, 5B, 6C

WHY DOSIGN ACADEMY?

Thé training institute for professionals in the technical industry

Since its establishment in 1985, Dosign has gained a prominent position in the technical sector. Originally founded as an engineering firm in Rotterdam, the company has evolved into a multidisciplinary service provider focused on connecting talented engineers with leading clients. In 2011, Dosign Academy was founded to meet the growing demand for specialized technical education and training.

EXPERIENCE AND EXPERTISE

With decades of experience in the technical sector, Dosign understands the dynamics and demands of the field like no one else. This in-depth knowledge is directly applied to the courses and training programs offered by Dosign Academy, allowing students to benefit from both theoretical insights and practical applications.

PRACTICE-ORIENTED TRAINING

Dosign Academy is known for its practice-oriented approach. The courses are designed to closely align with the daily realities of technical professionals. Through realistic case studies, hands-on projects, and simulations, students are prepared for the challenges they will encounter in the field.

HIGHLY QUALIFIED TRAINERS

The strength of Dosign Academy lies in its team of experienced and dedicated trainers. These professionals not only have extensive knowledge of their field but also years of hands-on experience. They share their expertise with passion and are open to the wishes and suggestions of students, creating an interactive and dynamic learning environment.

QUALITY AND RELIABILITY

Dosign Academy strives for the highest quality standards in all its courses and training programs. The positive feedback from students and the long-term relationships with clients are a testament to the reliability and success of the programs offered.

STRONG NETWORK IN INDUSTRY

Thanks to its years of presence in the technical sector, Dosign has built an extensive network of leading companies and professionals. Students of Dosign Academy benefit from this network through guest lectures, company visits, and networking events, which significantly broaden their career prospects.

FLEXIBILITY

It is recognized that every professional has unique learning needs. That's why Dosign Academy offers customized learning paths tailored to the specific needs of both individuals and organizations. Whether it's in-company training or bespoke training programs, the flexibility of Dosign Academy ensures that each participant gets the most out of their learning experience.



Sophie Feuth (Education advisor)

"At Dosign Academy, we help technical professionals specialize in piping design. Our course combines practice and theory, allowing students to gain immediately applicable knowledge. We see them grow in their field and confidently take steps into the industry."

STRONG CONNECTION WITH THE INDUSTRY

Since the establishment of Dosign Engineering in 1985, Dosign Academy has built strong partnerships with leading companies in the technical sector. Thanks to these close ties, the courses are perfectly aligned with real-world practice, enabling students to gain directly relevant knowledge and skills that are in demand in the industry.

PRACTICE-ORIENTED LEARNING WITH EXPERIENCED TRAINERS

The courses at Dosign Academy are taught by professionals with years of experience in the technical field. Through realistic case studies, design assignments, and interactive lessons, students not only gain theoretical knowledge but also learn how to apply it in real-world work situations.

FLEXIBLE TRAINING OPTIONS

Dosign Academy understands that every professional has different learning needs. That's why the courses are offered in various formats, such as classroom-based, online, and in-company, allowing students to effectively combine their studies with their work. The lessons take place every other week in the evening from 18:00 - 22:00, alternating between in-person sessions at the location or online. A warm meal is provided for each lesson so students can fully focus on their development. Thanks to this flexible approach, participants can continue to develop in a way that best suits their career and schedule.



DOSIGN ACADEMY. THE RIGHT CHOICE FOR YOU?

At Dosign Academy, technical professionals can access training advice and a wide range of technical courses, specialized modules, and training programs to broaden or deepen their technical expertise. In addition, we develop custom technical education and training programs tailored to the specific needs of companies.

Thanks to our knowledge and years of experience in engineering, we understand the challenges technical professionals face. We translate this into up-to-date course materials and real-life scenarios that professionals can relate to. Our training programs are continuously evaluated and adapted to meet the ever-evolving demands of the industry. With high-quality technical education and training, we bring the future of engineering into today's practice—ensuring that investments pay off immediately.

MÉÉR DAN EEN TECHNISCHE OPLEIDING:

When you enroll in a technical program at Dosign Academy, you can count on:

- Tailored education advice;
- · Customized training recommendations;
- Practice-oriented lessons;
- Skilled and certified instructors:
- Personal attention and interactive learning.

INTERESTED?

Clients and employers are eager for skilled technical professionals who not only have expertise in their field but also understand other technical disciplines. Are you looking for a technical course to broaden your knowledge? Or do you want to specialize in a (new) technical discipline? Explore the wide range of programs and opportunities at Dosign Academy!

Interested? Get in touch with us. Call us at $+31\ 10\ 244\ 09\ 44$ or send an email to info@dosign-academy.com.

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