TruServices
Training
Full Potential - Professional development

We live in a world where technology is constantly changing and advancing. Keeping up with the change has become both a challenge and a necessity for you and your company. That is why TRUMPF is committed to providing the best training in the industry for its customers. No matter your skill level, no matter your background, you will obtain the critical skills and knowledge that you need to stay competitive. In our modern training centers we provide different hands-on training, technology courses, workshops and individual consultation. This makes working with TRUMPF machines even easier and more efficient. Knowledge leads to success.

Discover our range of courses now.
At TRUMPF, learning is experiencing

Advanced technology subjects must be taught in an appropriate manner. This is why we design our training courses to be practical, effective and enjoyable. Our state-of-the-art training centers and facilities provide a safe and stimulating learning environment. You will interact with fellow students, your instructor and our training team. No matter whether in the classroom or at your machine and no matter your learning style, your training at TRUMPF will be both a unique opportunity for you to develop professionally and a rewarding and lasting experience. But during a day of training, you do not only learn more about our products – breaks provide the ideal opportunity to get to know other participants or the trainers.

Discover some facts about our training centers and our range of courses.
So far, the participants have come from more than 70 countries.
Always on the right course

Many customers have been with TRUMPF for years. Due to changing markets and technological developments, there are always new areas of application for our products. To stay ahead of the rapid advances in technology, TRUMPF never stops exploring new areas in which our products can be applied. It is not just our machines that are continuously modernized with the latest technologies. We make it our priority to help you identify the right courses that suit your needs and that will set you off on the right track from the very beginning. We will show you the correct procedures and steps, which will ensure that your work processes are carried out with efficiency and safety. You’ll know that you’ve made the right choice when you train with us.

Discover what TRUMPF can provide for your individual requirements.

Skills Levels

- **Basic Level**
  Whenever you buy a new machine, you don’t have to wait until your machine is up and running. Instead, you can receive the fundamental training on how to operate your new machine right away. Should you switch to a similar product from the TRUMPF product family, then we have other training courses available for ensuring a smooth transition to your new system.
Once you have completed the basic courses at TRUMPF and have set up your machine at your facilities, you can deepen your knowledge with further training. For example, our maintenance training courses will teach you how to keep your machine running smoothly. The practical maintenance advice and basic troubleshooting tips will help you to keep your machine down time to a minimum.

TRUMPF offers supplementary in-depth courses for experienced users. In these training courses, you not only have a refresher of what you have learnt before, but also gain specific expert knowledge. These courses provide you with the perfect opportunity to develop your area of expertise even further. They also help your company to remain at the forefront of the latest technological innovations.
Knowledge acquisition with E-Learning programs

Knowledge is one of the most important keys to success. This is why we support you with new learning formats and technologies. The range combines online units with classroom-based courses and therefore provides you with a completely new learning experience. Benefit from knowledge transfer and develop your market position.

Benefit from our E-Learning range.
Your advantages at a glance

**Individual & self-guided learning**
It is you who determines the time and location of your own training, based on your personal preferences. You may also repeat the training as often as you want.

**Blended Learning**
Benefit from the combination of E-Learning and classroom-based sessions, linked with an integrated teaching and learning concept.

**Collective Learning**
Learn together with colleagues and benefit from the exchanging of experiences and discussions.

**Cost effective and time saving**
E-Learning reduces the time in which employees are away and, therefore, saves costs for your company.
The fast route to my training program

TRUMPF’s training courses are as diverse as you. No matter whether you’re looking for entry-level courses to learn how to operate your machine, or advanced courses that focus more on programming – TRUMPF has the right program for every participant. Our training catalog is easy to navigate and will quickly help you to identify the courses that are best suited to your personal training objectives. The following pictures explain how this training catalog has been structured and illustrate the type of information that you will find on each page.

What technologies are there? Which courses are offered?

Introduction to the different technologies, machines and their application areas

Overview diagram of the range of available courses

Display of all of the course modules offered for the respective technology

Classification of the courses according to skills level

Comprehensive information on course content, learning objectives and participant requirements
What training courses are there for my machine?

Overview of the entire range of courses

Further information on the course structure and timings.

How do I register?

Registration for training courses

Contact details for the TRUMPF training centers

You can now find out more and register online:
www.mytrumpf.com/training
www.trumpf.com
2D Lasers

Take full advantage of the power of your TruLaser machine. Our machine and programming courses provide step by step guidance on how to use your machine with maximum efficiency. You'll not only learn how to improve the fast cutting process but also understand how to optimize the upstream and downstream processes.

Machine types

## Training

2D Lasers – range of courses

### Machine courses

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### Laser courses

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You will find further information in the chapter **Laser Devices**

Our range of courses is categorized into three skill levels which each build on one another.
## Machine courses

### Beginner Operation

**Objectives**
You will learn the basics of how to use the technology and the machine. You will master the skill of preparing, introducing and influencing the production sequence.

**Course content**
- Machine set up and assembly and overview of machine functions
- Handling the user interface, the operating elements, diagnostics and online help
- Set-up processes and executing programs
- Structure and setting of the cutting unit
- Optimization of the cutting technology
- Machine and technology options

**Requirements**
Operator course on a predecessor machine or at least 3 months of experience in using the machine.

### Beginner Operation and Programming

**Objectives**
You are able to generate practical programs for the machine. You can prepare, initiate and influence the production process.

**Course content**
- Introduction to the machine, its functions and user interface
- Construction and adjustment of the cutting unit
- Introduction to the programming system and its relevant functions

**Requirements**
Operator course of your machine and programming course Cut 2D-Laser.

### LiftMaster Operation

**Objectives**
You will become familiar with the new features compared to your previous machine and will learn how to use these new features in your production sequences.

**Course content**
- Structure and function of the LiftMaster Compact/LiftMaster Sort
- Handling the user interface and the operating elements with a separate control panel
- Set-up processes and executing programs using a LiftMaster Compact/LiftMaster Sort
- Automation options

**Requirements**
Beginner / Changeover, Operation.

### Changeover Operation

**Objectives**
You will become familiar with the new features compared to your previous machine and will learn how to use these new features in your production sequences.

**Course content**
- New features in the structure of the machines, the user interface, the operating elements, diagnostics and online help
- Changes regarding the structure and setting of the cutting unit
- New machine and technology options

**Requirements**
Operator course on a predecessor machine or at least 3 months of experience in using the machine.

### Changeover Operation and Programming

**Objectives**
You are able to generate practical NC-programs for the machine. You can prepare, initiate and influence the production process.

**Course content**
- Innovations in the construction of the machine, the operator interface, the operating elements
- Changes in the structure and adjustment of the cutting unit
- New machine and technology options
- Import drawings and administer them in the HomeZone
- Interleave and edit parts to order
- Setting and programming of practical processing strategies

**Requirements**
Operator course of your machine and programming course Cut 2D-Laser.

### Storage Connection Operation

**Objectives**
You are able to operate the storage connection of the machine and to detect simple errors in connection with the automated system and to remedy them on your own. In addition, you learn complete materials management.

**Course content**
- Basic concepts of store management
- Material storage and removal
- Store operation in connection with the machine
- Creation and processing of a production plan and production package
- Fault elimination

**Requirements**
Participation in the operator course Beginner or Changeover.
**Machine courses**

### RotoLas Operation

**Objectives**
You will learn how to set up the tube cutting system for the machining process and master the skill of preparing, introducing and optimizing production sequences.

**Course content**
- Structure and function of the tube cutting system
- Handling the user interface and the operating elements
- Set-up processes and executing programs
- Optimization of the cutting technology and clamping system

**Requirements**
Beginner / Changeover, Operation

### Machine and Laser Maintenance

**Objectives**
You will acquire the skills to carry out maintenance work on the machine in accordance with the specified maintenance intervals.

**Course content**
- Setting work and handling
- Diagnostics options
- Maintenance work on the machine and machine options

**Requirements**
Basic electrical knowledge for maintenance work at the electrical cabinet

### Production Support

**Objectives**
You will gain confidence in handling your machine and acquire the basic skills for productive manufacturing.

**Course content**
Support for smooth production start-up. Content can be customized, for example:
- Joint preparation and setting up of the machine
- Running in of individual production parts
- Explanation of influencing factors on the production process
- Initial optimization of process parameters
- Programming support

**Requirements**
Course in Operation and Programming

### Laser Cutting Technology

**Objectives**
You will learn how to optimize your cutting quality and determine the cutting parameters for special materials.

**Course content**
- Cutting-specific basics for lasers
- Influential parameters on laser cutting, such as process, machine, laser and workpiece parameters
- Laser power control influential parameters
- Cutting of special materials
- Quality assessment and optimization of laser cuts

**Requirements**
Beginner / Changeover Operation course and at least 3 months of experience in using the machine

### Application Consulting

**Objectives**
You will gain confidence in handling your machine and acquire the basic skills for productive manufacturing.

**Course content**
- Analyzing and optimizing production and programming
- Teaching of application expertise directly on your machine. The content can be customized to you
- Support and optimization of technology parameters
- Strategies to reduce production times
- Programming support
- Processing of special materials

**Requirements**
Course in Operation and Programming and first experience in machine operation and / or programming

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Basic Level | Advanced Level | Expert Level
### Programming courses

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<th>Beginner</th>
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<th>Cut 2D Laser</th>
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<tr>
<td><strong>Objectives</strong></td>
<td>You are able to generate practical programs for the machine. You can prepare, initiate and influence the production process.</td>
<td>You will gain basic technical knowledge regarding the technology and the machine as preparation for the programming course.</td>
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<tr>
<td><strong>Course content</strong></td>
<td>■ Introduction to the machine, its functions and user interface &lt;br&gt;■ Construction and adjustment of the cutting unit &lt;br&gt;■ Introduction to the programming system and its relevant functions</td>
<td>■ Structure and assembly of the machines and their functions &lt;br&gt;■ Technical data &lt;br&gt;■ Basics of laser processing &lt;br&gt;■ Machine and technology options &lt;br&gt;■ Framework conditions and correlations when programming the machine</td>
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<tr>
<td><strong>Requirements</strong></td>
<td>Operator course of your machine and programming course Cut 2D-Laser</td>
<td>Basics course in programming or extensive experience in using the machine</td>
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<th>Design Module I 2D</th>
<th>Design 2D and 3D for Experienced 3D Designers</th>
<th>Drawing and Nesting</th>
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<tr>
<td><strong>Objectives</strong></td>
<td>You will learn how to create and import 2D geometries. You will understand how to redesign these in line with production requirements.</td>
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<tr>
<td><strong>Course content</strong></td>
<td>■ Introduction to the CAD system &lt;br&gt;■ Creation of simple 2D drawings &lt;br&gt;■ Importing and processing of 2D geometries</td>
<td>■ Introduction to the CAD system &lt;br&gt;■ Creation of simple 2D drawings and 3D models &lt;br&gt;■ Importing and processing of 2D geometries and 3D models &lt;br&gt;■ Unfolding of individual 3D parts in line with production requirements &lt;br&gt;■ Reduced practice phases in comparison to individual courses</td>
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<td><strong>Requirements</strong></td>
<td>Recommendation: participation in a TruTops Boost Technology Programming course</td>
<td>Comprehensive experience in the use of parameterized 3D CAD systems</td>
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## Programming courses

### Technology
**TruTops Laser**

**Objectives**
You will understand how to create practical NC programs.

**Course content**
- Introduction to the programming system
- Modification of laser technology
- Output of NC programs
- Maintenance and adaptation of the database

**Requirements**
Basics course in programming or extensive experience in using the machine and TruTops Drawing and Nesting course

### Changeover
**Programming**

**Objectives**
You are able to generate practical NC-programs for the machine and the programming system. You can use the innovations in the production process.

**Course content**
- New programming-relevant machine and technology options
- Innovations and changes in the programming system
- Setting and programming of practical processing strategies

**Requirements**
Experience in programming TRUMPF-machines with comparable technology

### Cut 2D Automation SortMaster
**TruTops Boost**

**Objectives**
You will learn how to program automation processes and how to create practical NC programs.

**Course content**
- Structure and function of the SortMaster
- Definition and programming of unloading and sorting strategies in line with processes
- Output of NC programs

**Requirements**
Cut 2D Laser TruTops Boost

### Design Module II 3D
**TruTops Boost**

**Objectives**
You will understand how to create and import 3D models. You will learn how to redesign and unfold these in line with production requirements.

**Course content**
- Creation of simple 3D models
- Importing and processing of 3D models
- Unfolding of individual 3D parts in line with production requirements

**Requirements**
Design Module I 2D TruTops Boost

### Automation SortMaster
**TruTops Laser**

**Objectives**
You will learn how to program automation processes and how to create practical NC programs.

**Course content**
- Structure and function of the SortMaster
- Definition and programming of unloading and sorting strategies in line with processes
- Output of NC programs

**Requirements**
Technology TruTops Laser

### RotoLas
**TruTops**

**Objectives**
You will know how to create cutting geometries for tube processing in TruTops Tube and output practical NC programs.

**Course content**
- Tube cutting technology
- Programming of round and rectangular tubes and all profile types
- Drawing unfolded contours
- Programming and optimizing processing
- Output of NC programs

**Requirements**
TruTops Drawing and Nesting and TruTops Laser Technology

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**Basic Level**

**Advanced Level**

**Expert Level**
Programming courses

3D Tube Construction
TruTops

Objectives
You will understand how to design individual tubes and complex 3D tube models and how to create tube unfoldings for further processing in TruTops Tube.

Course content
- Introduction to 3D design
- Creation of tube models in 3D
- Importing and processing of 3D models
- Programming and optimizing tube processing
- Exporting tube designs

Requirements
TruTops Drawing and TruTops Tube Technology

3D Tube Construction for Experienced 3D Designers
TruTops

Objectives
You will understand how to design individual tubes and complex 3D tube models and how to create tube unfoldings for further processing in TruTops Tube.

Course content
- Creation of 3D models
- Importing and processing of 3D models
- Programming and optimizing tube processing
- Exporting tube designs
- Reduced practice phases

Requirements
TruTops Drawing and TruTops Tube Technology

Design Module III Professional
TruTops Boost

Objectives
You will deepen your knowledge of 3D modeling and of the application of TruTops Boost – Design.

Course content
- Creation of complex 3D models
- Importing, analysis and processing of assemblies and solids
- Adaptation of system settings

Requirements
Design Module II 3D TruTops Boost or Design 2D and 3D for Experienced 3D Designers TruTops

Professional
TruTops Laser

Objectives
You will develop the knowledge to use the TruTops functions more effectively, increase process reliability on the machine and reduce part times.

Course content
- Optimization possibilities for processing with increased reliability and efficiency
- Geometry processing
- Use of interactive processing functions and customer cycles
- Manipulation of NC texts
- Creating technology tables and rules
- Use of fixtures

Requirements
TruTops Laser Technology or at least 3 months of experience in programming
## 2D Lasers

### Overview of Range of Courses

- **Attendance seminar**
- **E-Learning**
- **Blended Learning**
- Upon request

### 2D Lasers

#### TruLaser Series
- 1000
- 2000
- 3000
- 5000
- 7000
- 8000

#### TruLaser Center 7030

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### Machine Courses

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### TruTops Boost Courses

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<tr>
<th>Course</th>
<th>Beginner Operation and Programming</th>
<th>Basics Programming</th>
<th>Cut 2D Laser TruTops Boost</th>
<th>Design Module I 2D TruTops Boost</th>
<th>Design 2D and 3D for Experienced 3D Designers TruTops Boost</th>
<th>Changeover Programming</th>
<th>Cut 2D Automation SortMaster TruTops Boost</th>
<th>Design Module II 3D TruTops Boost</th>
<th>Design Module III Professional TruTops Boost</th>
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### TruTops Programming Courses

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### Additional Offers

- Additional offers for process optimization and part design can be found in the chapter **Consulting**
Additive Manufacturing

Additive Manufacturing has shifted the boundaries in industrial-scale production. Take advantage of this new technological development by using the Laser-Metal-Fusion systems from TRUMPF, which are guaranteed to lead your business to even greater success. Benefit from our range of integrated solutions – all designed to be used on an industrial scale. These include various machines, lasers, software and services, and industrial parts and powder management. Why not also take part in our training courses or the Seminar on part design and acquire the relevant knowledge to give you a leading edge in the market.

Machine types
TruPrint Series 1000 | TruPrint Series 2000 | TruPrint Series 3000 | TruPrint Series 5000
### Machine courses

<table>
<thead>
<tr>
<th>Beginner</th>
<th>Production Support</th>
<th>Application Consulting</th>
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<tbody>
<tr>
<td>Operation</td>
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### Programming courses

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<tr>
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<th>Siemens NX</th>
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<tr>
<td>Programming</td>
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<tr>
<td>CAMbridge</td>
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<td>Programming</td>
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</table>

You can find further information to „Part Design in Additive Manufacturing“ in the chapter Consulting.
## Machine courses

### Beginner Operation

**Objectives**
You will learn the basics of how to use the technology and the machine. You will master the skill of preparing, introducing and influencing the production sequence.

**Course content**
- Preparatory e-Learning
- Basics of the laser metal fusion process
- Machine set up and assembly and overview of machine functions
- Handling the user interface, the operating elements, diagnostics and online help
- Set-up processes and executing programs
- Handling powder
- Maintenance
- Material exchange

### Production Support

**Objectives**
You will gain confidence in handling your machine and acquire the basic skills for productive manufacturing.

**Course content**
Support for smooth production start-up. Content can be customized, for example:
- Joint preparation and setting up of the machine
- Running in of individual production parts
- Explanation of influencing factors on the production process
- Initial optimization of process parameters
- Programming support

**Requirements**
Courses on Operation and Programming

### Application Consulting

**Objectives**
You will improve the potential of your machine and the part quality and produce with greater productivity.

**Course content**
- Analyzing and optimizing production and programming
- Teaching of application expertise directly on your machine. The content can be customized to you
- Support and optimization of technology parameters
- Strategies to reduce production times
- Programming support
- Processing of special materials

**Requirements**
Courses on Operation and Programming and first experience in machine operation and / or programming
Programming courses

**Magics**

**Objectives**
Processing and preparation of components in STL format for the laser metal fusion process. You will learn to adapt parameters to components and carry out initial optimization processes.

**Course content**
- Preparatory e-Learning
- Digital process chain
- Adapting and optimizing components in STL format
- Managing machines and laser metal fusion parameters
- Support generation for components
- Parameter adaptation for optimizing the LMF process
- Special functions for component analysis and series production

**Requirements**
Knowledge and experience in CAD/CAM programming

**CAMbridge**

**Objectives**
Processing and preparation of dental components for the laser metal fusion process. You will learn how to adapt dental components and carry out initial optimization of the LMF process.

**Course content**
- Digital process chain
- Managing machines and laser metal fusion parameters
- Support generation for dental components
- Parameter adaptation for optimizing the LMF process
- Importing and processing of file formats

**Requirements**
Knowledge of CAD/CAM programming

**Siemens NX**

**Objectives**
Processing and preparation of components for the laser metal fusion process. You will learn how to adapt components and carry out initial optimization of the LMF process.

**Course content**
- Preparatory e-Learning
- Design of simple components
- Digital process chain
- Functions of the AM module
- Managing machines and laser metal fusion parameters
- Support generation for components
- Parameter adaptation for optimizing the LMF process
- Importing and processing of file formats

**Requirements**
In-depth knowledge of CAD/CAM programming
## ADDITIVE MANUFACTURING

<table>
<thead>
<tr>
<th>COURSES</th>
<th>TruPrint Series 1000</th>
<th>TruPrint Series 3000</th>
<th>TruPrint Series 5000</th>
<th>Course Length in days</th>
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<tr>
<td><strong>MACHINE COURSES</strong></td>
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<tr>
<td>Beginner Operation</td>
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<td>Production Support</td>
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<td>Individual</td>
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<td>Application Consulting</td>
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<td><strong>PROGRAMMING COURSES</strong></td>
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- ▲ = Attendance seminar  ■ = E-Learning  ▲ = Blended Learning  ★ = Upon request

Additional offers for process optimization and part design can be found in the chapter **Consulting**
3D Lasers

In this day and age, 3D components, 3D profiles and 3D tubes are used in almost every type of industry. At TRUMPF we can provide you with a full range of tools for your 3D laser processing. This doesn’t just entail the actual laser devices, but also entire machines and systems. Our tailored courses will equip you with all of the practical knowledge that you need, in order to succeed in the world of 3D lasers.

Machine types
TruLaser Cell Series 3000 | TruLaser Cell Series 5000 | TruLaser Cell Series 7000
TruLaser Cell Series 8000 | TruLaser Station
# Machine courses

<table>
<thead>
<tr>
<th>Level</th>
<th>Course</th>
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<tbody>
<tr>
<td><strong>Beginner</strong></td>
<td>Training 3D Lasers – range of courses</td>
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<tr>
<td><strong>TruLaser Station</strong></td>
<td>Operation and Programming</td>
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<tr>
<td><strong>Technology</strong></td>
<td>TruTops Cell</td>
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<tr>
<td><strong>Professional</strong></td>
<td>Manual Programming Cell</td>
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<td><strong>Variable Programming</strong></td>
<td>Manual Programming Cell</td>
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<td><strong>Professional</strong></td>
<td>Manual Programming Cell</td>
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<tr>
<td><strong>Variable Programming</strong></td>
<td>Manual Programming Cell</td>
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<tr>
<td><strong>Design Module II 3D</strong></td>
<td>TruTops Boost</td>
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<td><strong>Design Module III Professional</strong></td>
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# Programming courses

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<th>Level</th>
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<td><strong>Cut 2D Laser</strong></td>
<td>TruTops Boost</td>
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<td><strong>Design Module I 2D</strong></td>
<td>TruTops Boost</td>
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<td><strong>Changeover</strong></td>
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<td><strong>Manual SeamLine</strong></td>
<td>Manual Programming Cell</td>
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<td><strong>Rotary Axis</strong></td>
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<td><strong>Fixture Construction</strong></td>
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<td><strong>DepositionLine</strong></td>
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<td><strong>SeamLine</strong></td>
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<td><strong>Machine and Laser Maintenance</strong></td>
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<td><strong>Production Support</strong></td>
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# Laser courses

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<td><strong>Laser Devices</strong></td>
<td>Operation</td>
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<td><strong>Laser Devices</strong></td>
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Our range of courses is categorized into three skill levels which each build on one another.

You will find further information in the chapter Laser Devices.
Machine courses

**Basics**
Operation and Programming

**Objectives**
You will gain basic knowledge for the beginner operator course and the technological foundations for programming with TruTops Cell.

**Course content**
- Structure and assembly of the machines and their functions
- Basics of 3D processing and programming
- Programming of processing with different types of motion
- Optimizing the travel behavior of the machine
- Subroutine technology

**Beginner**
Operation

**Objectives**
You will learn the basics of how to use the technology and the machine. You will master the skill of preparing, introducing and influencing the production sequence.

**Course content**
- Structure and assemblies
- Handling the user interface and the operating elements
- Setting work
- Set-up processes and executing programs
- Basics of teaching
- Running in and optimization on the machine
- Machine and technology options

**Requirements**
Basics course in Operation and Programming

**TruTops Cell Basic**
Programming

**Objectives**
You will understand how to correct grafically supported NC programs.

**Course content**
- Introduction to and operation of the programming system
- Optimizing processing specifications (e.g. microjoints, distance regulation, zero point)

**Requirements**
Basics course in Operation and Programming

**TruLaser Station**
Operation and Programming

**Objectives**
You are able to operate the machine, you know its functions and you can create and edit programs.

**Course content**
- Structure and assemblies of the machine and its functions
- Interfaces and safety devices to the laser system
- Using the user interface and operating elements
- Programming of the system with axis functions, rotation, scaling and mirroring as well as integration of laser programs
- Maintenance of the machine

**DepositionLine**
Operation

**Objectives**
You will be confident in dealing with the theoretical and practical influencing factors on laser metal deposition.

**Course content**
- General introduction to laser metal deposition, technology and conventional filler materials
- Operating, maintaining and calibrating the powder feeder
- Handling and setting work on the laser optics
- Nozzle adjustment
- Initial tests based on flat samples

**Requirements**
Beginner Operation course or at least 3 months of experience in using the machine

**SeamLine**
Operation

**Objectives**
You will learn how to use SeamLine and will be able to prepare, introduce and influence the measurement process.

**Course content**
- Handling the user interface, operating elements, monitor, diagnostics and online help
- Incident light / light section measuring procedure
- Calibrating the seam sensor
- Adapting parameters for the image analysis

**Requirements**
Beginner Operation course or at least 3 months of experience in using the machine and in programming measuring sensors and SeamLine
**Machine courses**

### Machine and Laser Maintenance

**Objectives**
You will acquire the skills to carry out maintenance work on the machine in accordance with the specified maintenance intervals.

**Course content**
- Setting work and handling
- Diagnostics options
- Maintenance work on the machine and machine options

**Requirements**
Beginner Operation course and training as a trained electrician for specified activities

---

### Production Support

**Objectives**
You will gain confidence in handling your machine and acquire the basic skills for productive manufacturing.

**Course content**
Support for smooth production start-up. Content can be customized, for example:
- Joint preparation and setting up of the machine
- Running in of individual production parts
- Explanation of influencing factors on the production process
- Initial optimization of process parameters
- Programming support

**Requirements**
Courses on Operation and Programming

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### Configurable Control Interface Operation and Programming

**Objectives**
You will acquire the theoretical and practical foundations for programming and operating the machine and will learn to use the configurable control interface to the full extent.

**Course content**
- Programming the configurable control interface
- Handling the user interface, the operating elements, diagnostics and online help
- Creating, configuring and activating a module
- Integrating module configuration into automatic operation

**Requirements**
Beginner Operation course

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### VisionLine Detect Operation and Programming

**Objectives**
You will learn how to use VisionLine Detect, operate the image processing and easily adapt it to your components.

**Course content**
- Incident light measuring procedure
- Setting the monitor and operating the interface
- Calibrating the camera
- Adapting parameters for the image analysis
- Creating NC programs

**Requirements**
Beginners Operation course or at least 3 months of experience in using the machine and experience in NC programming and mathematical skills (e.g. sin / cos)

---

### Laser Welding Technology

**Objectives**
You will gain the theoretical and practical basics for laser welding.

**Course content**
- Welding-specific setting work
- Influential parameters during welding
- Effect of the process parameters on the welding process
- Welding different materials
- Assessing the weld seam

**Requirements**
Basics course in Operation and Programming

---

### Application Consulting

**Objectives**
You will improve the potential of your machine and the part quality and produce with greater productivity.

**Course content**
- Analyzing and optimizing production and programming
- Teaching of application expertise directly on your machine. The content can be customized to you
- Support and optimization of technology parameters
- Strategies to reduce production times
- Programming support
- Processing of special materials

**Requirements**
Courses on Operation and Programming and first experience in machine operation or programming
## Programming courses

### Basics
**Operation and Programming**

**Objectives**
You will gain basic knowledge for the operator course and the technological foundations for programming with TruTops Cell.

**Course content**
- Structure and assembly of the machines and their functions
- Basics of 3D processing and programming
- Programming of processing with different types of motion
- Optimizing the travel behavior of the machine
- Subroutine technology

### Technology
**TruTops Cell**

**Objectives**
You will understand how to create practical NC programs.

**Course content**
- Introduction to the programming system
- Importing and processing of 3D models
- Positioning of 3D models in the work area
- Optimizing processing
- Retrospective corrections of the processing data
- Creation of NC programs

**Requirements**
Basics course in Operation and Programming or extensive experience in using the machine

### Cut 2D Laser
**TruTops Boost**

**Objectives**
You will learn how to create practical NC programs

**Course content**
- Introduction to the programming system
- Importing of drawings in line with production requirements
- Managing parts and orders in the HomeZone
- Nesting and processing parts in an order-based manner
- Modification of laser technology
- Specification and programming of practical processing strategies
- Output of NC programs
- Creation and processing of special materials

**Requirements**
Basics course in Operation and Programming or extensive experience in using the machine

### Design Module I 2D
**TruTops Boost**

**Objectives**
You will learn how to create and import 2D geometries. You will understand how to redesign these in line with production requirements.

**Course content**
- Introduction to the CAD system
- Creation of simple 2D drawings
- Importing and processing of 2D geometries

**Requirements**
Recommendation: participation in a TruTops Boost Technology Programming course

### Design 2D and 3D for Experienced 3D Designers
**TruTops Boost**

**Objectives**
You will acquire the skills to create and import 2D geometries and 3D models. You will develop the skills to redesign and unfold these in line with production requirements.

**Course content**
- Introduction to the CAD system
- Creation of simple 2D drawings and 3D models
- Importing and processing of 2D geometries and 3D models
- Unfolding of individual 3D parts in line with production requirements
- Reduced practice phases in comparison to individual courses

**Requirements**
Comprehensive experience in the use of parameterized 3D CAD systems

### Changeover
**Programming**

**Objectives**
You are able to generate practical NC-programs for the machine and the programming system. You can use the innovations in the production process.

**Course content**
- New programming-relevant machine and technology options
- Innovations and changes in the programming system
- Setting and programming of practical processing strategies

**Requirements**
Experience in programming TRUMPF-machines with comparable technology
Objectives
You will understand how to create and import 3D models. You will learn how to redesign and unfold these in line with production requirements.

Course content
■ Creation of simple 3D models
■ Importing and processing of 3D models
■ Unfolding of individual 3D parts in line with production requirements

Requirements
Design Module I 2D TruTops Boost

Objectives
You will gain the skills to program the measurement functions for ControlLine, the measuring sensors and SeamLine, both manually and in TruTops Cell.

Course content
■ Manual programming of the measurement functions
■ Programming of the calculation cycles for correcting the coordinate system
■ Programming the measurement functions in TruTops Cell

Requirements
Basic TruTops Cell
## Programming courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Objectives</th>
<th>Course content</th>
<th>Requirements</th>
</tr>
</thead>
</table>
| **Professional** Manual Programming Cell | You will become proficient in the further optimization of NC programs. | ■ Further NC functions that are not supported by TruTops Cell (e.g. laser power control, laser welding)  
■ Further options for zero point correction (e.g. flipping, scaling)  
■ Limiting distance regulation | Basics course in Operation and Programming  |
| **Variable Programming** Manual Programming Cell | You will be able to enhance NC programs using variable programming (e.g. superordinate automation program, processing macros, etc.). | ■ Types of variables  
■ Operators  
■ Functions  
■ Jump commands  
■ Control structures  
■ Subprograms  
■ Global programs | Basics course in Operation and Programming  |
| **Design Module III Professional** TruTops Boost | You will deepen your knowledge of 3D modeling and of the application of TruTops Boost – Design. | ■ Creation of complex 3D models  
■ Importing, analysis and processing of assemblies and solids  
■ Adaptation of system settings | Design Module II 3D TruTops Boost or Design 2D and 3D for Experienced 3D Designers TruTops Boost |
### 3D Lasers – Overview of Range of Courses

**MACHINE COURSES**

<table>
<thead>
<tr>
<th>Course Type</th>
<th>Course Code</th>
<th>Course Length in Days</th>
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<tbody>
<tr>
<td><strong>3D Lasers</strong></td>
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<tr>
<td><strong>TruLaser Cell Series</strong></td>
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<tr>
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<td><strong>Production Support</strong></td>
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<td><strong>Configurable Control Interface</strong></td>
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<tr>
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**Additional offers for process optimization and part design can be found in the chapter Consulting.**

* = Attendance seminar  □ = E-Learning  △ = Blended Learning  ▲ = Upon request
Bending

At TRUMPF, you'll always be able to find the right solution for your bending processes, no matter whether they are manual or fully automatic. We are certain that you'll be impressed with our range of dynamic, state of the art bending machines. Their various functions not only save resources but also make the entire operating process easier and guarantee the highest level of quality. We want your bending processing to be enjoyable and a success from the very start. Our training covers a wide array of topics, including programming, operation and maintenance of your TRUMPF bending machine.

Machine types
TruBend Series 3000 | TruBend Series 5000 | TruBend Series 7000 | TruBend Series 8000
TruBend Cell Series 5000 | TruBend Cell Series 7000
TruBend Center Series 5000 | TruBend Center Series 7000
# Bending – range of courses

Our range of courses is categorized into three skill levels which each build on one another.

## Machine courses

<table>
<thead>
<tr>
<th>Level</th>
<th>Course Name</th>
<th>Sub-level</th>
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<tbody>
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<td>Beginner</td>
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<td>Beginner</td>
<td>TecZone Bend Machine Programming (Operator)</td>
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<td>Beginner</td>
<td>TruBend Machine Tandem Version</td>
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<td>Beginner</td>
<td>Profile-T 2D and 3D Delem Programming</td>
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<td>TruBend Cell Operation</td>
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## Programming courses

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<tr>
<td>Automation</td>
<td>TruTops Bend</td>
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</table>

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Basic Level | Advanced Level | Expert Level

- Basics
- Intermediate
- Advanced
- Expert
Machine courses

Basics
TruBend Operation

Objectives
You will gain basic technical knowledge regarding the technology and the machine as preparation for the operator course.

Course content
- Basics on the bending process
- Machine structure and assemblies and their functions
- Basics of the tool system
- Machine and technology options
- Press beam cycle
- Calculations and tool selection criteria

Beginner
TruBend Operation

Objectives
You will learn how to operate and program your machine.

Course content
- Structure of the machines, the user interface, the operating elements, diagnostics and online help
- Set-up processes, executing and handling programs
- Tool system
- Program creation at the user interface
- Optimizing the bending technology
- Machine and technology options

Beginner
TruBend Center Operation

Objectives
You will become familiar with the new features of your machine and be able to operate it. It will be possible to optimize production sequences and programs.

Course content
- Structure of the machines, the user interface, the operating elements, diagnostics and online help
- Set-up processes, executing and handling programs
- Tool system
- Program creation at the user interface
- Optimizing the bending technology
- Machine and technology options

Requirements
TruBend Operation basics or 3 months of experience in using the machine

TecZone Bend Machine Programming (Operator)

Objectives
You will develop the knowledge to create practical NC programs for the machine.

Course content
- Introduction to the programming interface
- Importing of drawings in line with production requirements
- Managing parts in the HomeZone
- Defining bending strategies in TecZone Bend
- Modification of the bending sequence
- Creation of NC programs

Requirements
Programming Basics or extensive experience in using the machine

TruBend Machine Tandem Version

Objectives
You will gain proficiency in operating, programing and setting up a tandem system and ensuring part quality.

Course content
- Introduction to the user interface
- Numerical and graphical program creation
- Program optimization and handling
- Executing various programs with / without LCB sensor tool and / or bending aid

Requirements
Programming Basics or extensive experience in using the machine

Profile-T 2D and 3D
Delem Programming

Objectives
You will learn how to define bending strategies and understand how to output practical NC programs.

Course content
- Basics of bending technology
- Importing and processing of 2D geometries
- Defining bending strategies
- Modification of the bending sequence
- Product visualization for collision checks
- Creation of feasibility studies and tool checks
- Insights into database management
- Output of NC programs

Requirements
Operation Basics course or at least 3 months’ experience in using the machine
**Machine courses**

**Beginner**
**TruBend Cell Operation**

**Objectives**
You will become familiar with the new features of your machine and be able to operate it. It will be possible to optimize production sequences and programs.

**Course content**
- Structure of the machines, the user interface, the operating elements, diagnostics and online help
- Set-up processes, executing and handling programs
- Function of the manual control unit and conveyor belt
- Assembly of gripper systems
- Machine and technology options

**Requirements**
Operation basics course or at least 3 months of experience in using the machine

**Machine**
**Maintenance**

**Objectives**
You will acquire the skills to carry out maintenance work on the machine in accordance with the specified maintenance intervals.

**Course content**
- Setting work and handling
- Diagnostics options
- Maintenance work on the machine, machine options and, if present, on automation units

**Requirements**
Operator course

**Bending**
**Technology**

**Objectives**
You will become familiar with the machine structure and assemblies and their functions.

**Course content**
- Machine and technology options
- Characteristics of TRUMPF bending tools
- Tool and material management
- Bend deduction and bending part dimensioning
- Bending methods and application technology
- Tool selection criteria
- Special tools

**Requirements**
At least 3 months of experience in programming, operating, or in work preparation

**Production Support**

**Objectives**
You will gain confidence in handling your machine and acquire the basic skills for productive manufacturing.

**Course content**
Support for smooth production start-up. Content can be customized, for example:
- Joint preparation and setting up of the machine
- Running in of individual production parts
- Explanation of influencing factors on the production process
- Initial optimization of process parameters
- Programming support

**Requirements**
Courses on Operation and Programming

**Application Consulting**

**Objectives**
You will improve the potential of your machine and the part quality and produce with greater productivity.

**Course content**
- Analyzing and optimizing production and programming
- Teaching of application expertise directly on your machine. The content can be customized to you
- Support and optimization of technology parameters
- Strategies to reduce production times
- Programming support
- Processing of special materials

**Requirements**
Courses on Operation and Programming and first experience in machine operation and / or programming

**Database Management**
**Delem Programming**

**Objectives**
You will understand how to manage the machine database.

**Course content**
- Maintenance and optimization of the database
- Adaptation of unfolding to the correct deduction values
- Creation of materials and special upper and lower tools
- Transfer of own bending factors
- Creation of bending curves
- Awarding of user rights

**Requirements**
Machine Basics course
## Programming courses

### Basics

**Program**: Programming

**Objectives**
You will gain basic technical knowledge regarding the technology and the machine as preparation for the programming course.

**Course content**
- Basics on the bending process
- Structure and assembly of the machines and their functions
- Basics of the tool system
- Machine and technology options
- Programming possibilities and framework conditions

**Requirements**
Comprehensive experience in the use of parameterized 3D CAD systems

### TecZone Bend

**Program**: TruTops Boost

**Objectives**
You will develop the knowledge to create practical NC programs for the machine.

**Course content**
- Introduction to the programming system
- Importing of the drawing and management in the HomeZone
- Defining bending strategies
- Modification of the bending sequence
- Adaptation of the tool and material database
- Creation of NC programs

**Requirements**
Basics course in Programming or extensive experience in using the machine

### Design Module I 2D

**Program**: TruTops Boost

**Objectives**
You will learn how to create and import 2D geometries. You will understand how to redesign these in line with production requirements.

**Course content**
- Introduction to the CAD system
- Creation of simple 2D drawings
- Importing and processing of 2D geometries

**Requirements**
Recommendation: participation in a TruTops Boost Technology Programming course

### Design 2D and 3D for Experienced 3D Designers

**Program**: TruTops Boost

**Objectives**
You will acquire the skills to create and import 2D geometries and 3D models. You will develop the skills to redesign and unfold these in line with production requirements.

**Course content**
- Introduction to the CAD system
- Creation of simple 2D drawings and 3D models
- Importing and processing of 2D geometries and 3D models
- Unfolding of individual 3D parts in line with production requirements
- Reduced practice phases in comparison to individual courses

**Requirements**
Comprehensive experience in the use of parameterized 3D CAD systems

### Stand Alone

**Program**: TecZone Bend/Fold

**Objectives**
You will develop the knowledge to create practical NC programs for the machine.

**Course content**
- Introduction to the programming system
- Importing of drawings
- Defining bending strategies
- Modification of the bending sequence
- Adaptation of the tool and material database
- Creation of NC programs

**Requirements**
Basics course in Programming or extensive experience in using the machine

### Drawing

**Program**: TruTop

**Objectives**
You will acquire the skills to draw part geometries and to import drawings in TruTop. You will develop the knowledge to create and import workpiece geometries. You will understand how to redesign these in line with production requirements.

**Course content**
- Introduction to the CAD system
- Creation of simple workpiece geometries
- Importing and processing of 2D geometries
**Programming courses**

### Technology
**TruTops Bend**

**Objectives**
You will acquire the know-how to enter the necessary bending data, to select suitable processing strategies and to create practical NC programs.

**Course content**
- Introduction to the programming system
- Creation of simple profiles with the profile editor
- Creation and adaptation of unfolding processes
- Entry of bending lines and bending sequences
- Simulation of the bending sequence
- Output of NC programs
- Database maintenance / adaptation

**Requirements**
Basics course in Programming or extensive experience in using the machine and TruTops Drawing

### Changeover
**Programming**

**Objectives**
You are able to generate practical NC-programs for the machine and the programming system. You can use the innovations in the production process.

**Course content**
- New programming-relevant machine and technology options
- Innovations and changes in the programming system
- Setting and programming of practical processing strategies

**Requirements**
Experience in programming TRUMPF-machines with comparable technology

### Design Module II 3D
**TruTops Boost**

**Objectives**
You will become confident in creating and importing 3D models. You will develop the skills to redesign and unfold these in line with production requirements.

**Course content**
- Creation of simple 3D models
- Importing and processing of 3D models and unfolding of individual 3D parts in line with production requirements

**Requirements**
Design Module I 2D TruTops Boost

### Automation
**TruTops Bend**

**Objectives**
You will learn how to program automation processes and how to create practical NC programs.

**Course content**
- Structure and function of the automation process
- Definition and programming of automation strategies in line with processes
- Output of NC programs

**Requirements**
Technology TruTops Bend

### Design Module III Professional
**TruTops Boost**

**Objectives**
You will deepen your knowledge of 3D modeling and of the application of TruTops Boost – Design.

**Course content**
- Creation of complex 3D models
- Importing, analysis and processing of assemblies and solids
- Adaptation of system settings

**Requirements**
Design Module II 3D TruTops Boost or Design 2D and 3D for Experienced 3D Designers TruTops Boost

---

*Basic Level*  
*Advanced Level*  
*Expert Level*
Range of courses – bending
## Training

### BENDING

<table>
<thead>
<tr>
<th>Machine Courses</th>
<th>TruBend Series 3000</th>
<th>TruBend Series 5000</th>
<th>TruBend Series 7000</th>
<th>TruBend Series 8000/Tandem</th>
<th>TruBend Cell Series 5000</th>
<th>TruBend Cell Series 7000</th>
<th>TruBend Center Series 5000</th>
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### TRUMIPS BOOST

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<th>TruTops Boost</th>
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<td>TecZone Bend TruTops Boost</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Design Module I 2D TruTops Boost</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Design 2D and 3D for Experienced 3D Designers TruTops Boost</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Changeover Programming</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Design Module II 3D TruTops Boost</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Design Module III Professional TruTops Boost</td>
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</tr>
</tbody>
</table>

### TRUMIPS

| Additional Offers for Process Optimization and Part Design | 
|——— | 
| 2D Lasers | 
| 3D Lasers | 
| Additive Manufacturing | 
| Bending | 
| Laser Tube Cutting | 
| Laser Welding | 
| Laser Devices | 
| Marking | 
| Punching | 
| Punch-Laser | 
| Smart Factory | 
| Consulting | 

Additional offers for process optimization and part design can be found in the chapter **Consulting**.
Laser Tube Cutting

Laser tube cutting has become a lucrative business venture. Laser-cut tubes are used in all manner of industries, including plant engineering and furniture construction. This is a market that is currently experiencing a steep growth trajectory and will continue to offer excellent return on investment for a long time to come. The laser cutting machines from TRUMPF will open up a whole new world of design possibilities, which will give you and your customers that crucial competitive edge. In our training courses, you will gain all the necessary skill that you need to succeed.

Machine types
TruLaser Tube Series 5000 | TruLaser Tube Series 7000
# Laser Tube Cutting – range of courses

<table>
<thead>
<tr>
<th>Machine courses</th>
<th>Programming courses</th>
<th>Laser courses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Beginner</strong></td>
<td><strong>Changeover</strong></td>
<td><strong>Laser Devices</strong></td>
</tr>
<tr>
<td>Operation</td>
<td>Operation</td>
<td>Operation</td>
</tr>
<tr>
<td><strong>Changeover</strong></td>
<td><strong>Adaptive Clamping System</strong></td>
<td><strong>Special Profiles</strong></td>
</tr>
<tr>
<td>Operation</td>
<td>Operation</td>
<td><strong>Maintenance</strong></td>
</tr>
<tr>
<td><strong>Tube Cutting</strong></td>
<td><strong>Technology Package for Tapping</strong></td>
<td><strong>Application Consulting</strong></td>
</tr>
<tr>
<td>Technology</td>
<td>Operation</td>
<td></td>
</tr>
<tr>
<td><strong>Basic Level</strong></td>
<td><strong>Basic</strong></td>
<td><strong>Operation</strong></td>
</tr>
<tr>
<td><strong>Advanced Level</strong></td>
<td><strong>Changeover</strong></td>
<td><strong>Programming</strong></td>
</tr>
<tr>
<td><strong>Advanced Level</strong></td>
<td><strong>3D Tube Construction</strong></td>
<td><strong>Laser Devices</strong></td>
</tr>
<tr>
<td><strong>Expert Level</strong></td>
<td><strong>Adaptive Clamping System</strong></td>
<td><strong>Operation</strong></td>
</tr>
<tr>
<td><strong>Expert Level</strong></td>
<td><strong>Technology Package for Tapping</strong></td>
<td><strong>Maintenance</strong></td>
</tr>
<tr>
<td><strong>Technology</strong></td>
<td><strong>Special Profiles</strong></td>
<td><strong>Application Consulting</strong></td>
</tr>
<tr>
<td><strong>Software</strong></td>
<td><strong>Simulation</strong></td>
<td></td>
</tr>
<tr>
<td><strong>TruTops</strong></td>
<td><strong>Technology Package for Tapping</strong></td>
<td><strong>Application Consulting</strong></td>
</tr>
<tr>
<td><strong>TruTops Tube</strong></td>
<td><strong>Special Profiles</strong></td>
<td></td>
</tr>
</tbody>
</table>

Our range of courses is categorized into three skill levels which each build on one another.

- **Basic Level**
- **Advanced Level**
- **Expert Level**

You will find further information in the chapter **Laser Devices**.
Machine courses

**Beginner**
Operation

**Objectives**
You will learn the basics of how to use the technology and the machine. You will master the skill of preparing, introducing and influencing the production sequence.

**Course content**
- Machine set up and assembly and overview of machine functions
- Handling the user interface, the operating elements, diagnostics and online help
- Set-up processes and executing programs
- Structure and setting of the cutting unit
- Optimization of the cutting technology
- Machine and technology options

**Requirements**
Beginner

**Changeover**
Operation

**Objectives**
You will become familiar with the new features compared to your previous machine and will learn how to use these new features in your production sequences.

**Course content**
- New features in the structure of the machines, the user interface, the operating elements, diagnostics and online help
- Changes regarding the structure and setting of the cutting unit
- New machine and technology options

**Requirements**
Operator course on a predecessor machine

**Adaptive Clamping System**
Operation

**Objectives**
You will be confident in handling both options and can load special profiles fully automatically and produce them with process reliability.

**Course content**
- Structure and function of the adaptive clamping system and profile detection
- Handling the user interface and the operating elements
- Manual set-up in conjunction with open profiles
- Automatic set-up of closed profiles with profile detection
- Set-up processes and executing programs

**Requirements**
Beginner / Changeover, Operation

**Technology Package for Tapping**
Operation

**Objectives**
You will acquire the know-how to set up and operate the tools and learn how to produce threads with process reliability.

**Course content**
- Structure and function of this option
- Handling the user interface and the operating elements
- Manual set-up of the tools
- Creating bores using (flow) drilling
- Creating threads using thread cutter / forming tap

**Requirements**
Beginner / Changeover, Operation

**Machine and Laser**
Maintenance

**Objectives**
You will acquire the skills to carry out maintenance work on the machine in accordance with the specified maintenance intervals.

**Course content**
- Setting work and handling
- Diagnostics options
- Maintenance work on the machine and machine options

**Requirements**
Basic electrical knowledge for maintenance work at the electrical cabinet

**Production Support**

**Objectives**
You will gain confidence in handling your machine and acquire the basic skills for productive manufacturing.

**Course content**
Support for smooth production start-up. Content can be customized, for example:
- Joint preparation and setting up of the machine
- Running in of individual production parts
- Explanation of influencing factors on the production process
- Initial optimization of process parameters
- Programming support

**Requirements**
Courses on Operation and Programming
### Machine courses

<table>
<thead>
<tr>
<th>Tube Cutting</th>
<th>Special Profiles</th>
<th>Application Consulting</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objectives</strong>&lt;br&gt;You will learn how to optimize your cutting quality and determine the cutting parameters for special materials.</td>
<td><strong>Objectives</strong>&lt;br&gt;You will gain confidence in planning and processing special profiles systematically.</td>
<td><strong>Objectives</strong>&lt;br&gt;You will improve the potential of your machine and the part quality and produce with greater productivity.</td>
</tr>
<tr>
<td><strong>Course content</strong>&lt;br&gt;- Cutting-specific basics for lasers&lt;br&gt;- Influential parameters on laser cutting, such as Process, machine, laser and workpiece parameters&lt;br&gt;- Laser power control influential parameters&lt;br&gt;- Cutting of special materials&lt;br&gt;- Quality assessment and optimization of laser cuts</td>
<td><strong>Course content</strong>&lt;br&gt;- Systematic procedure for processing of open special profiles and subsequent practical implementation</td>
<td><strong>Course content</strong>&lt;br&gt;- Analyzing and optimizing production and programming&lt;br&gt;- Teaching of application expertise directly on your machine. The content can be customized to you&lt;br&gt;- Support through and optimization of technology parameters&lt;br&gt;- Strategies to reduce production times&lt;br&gt;- Programming support&lt;br&gt;- Processing of special materials</td>
</tr>
<tr>
<td><strong>Requirements</strong>&lt;br&gt;Beginner / Changeover Operation course and programming experience with TruTops Tube or at least 3 months of experience in using the machine</td>
<td><strong>Requirements</strong>&lt;br&gt;Operator course and programming experience with TruTops Tube or at least 3 months of experience in using the machine</td>
<td><strong>Requirements</strong>&lt;br&gt;Courses on Operation and Programming and first experience in machine operation and / or programming</td>
</tr>
</tbody>
</table>
# Programming courses

<table>
<thead>
<tr>
<th>Basics</th>
<th>Programming</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objectives</strong></td>
<td>You will gain the necessary basic technological knowledge for participation in a programming course for TruLaser Tube.</td>
</tr>
</tbody>
</table>
| **Course content** | ■ Structure and assembly of the machines and their functions  
■ Basics of laser and tube processing  
■ Machine and technology options  
■ Framework conditions and correlations when programming the machine |

<table>
<thead>
<tr>
<th>Drawing</th>
<th>TruTop</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objectives</strong></td>
<td>You will acquire the skills to draw part geometries and to import drawings in TruTop. You will develop the knowledge to create and import workpiece geometries. You will understand how to redesign these in line with production requirements.</td>
</tr>
</tbody>
</table>
| **Course content** | ■ Introduction to the CAD system  
■ Creation of simple workpiece geometries  
■ Importing and processing of 2D geometries |

<table>
<thead>
<tr>
<th>Technology</th>
<th>TruTop Tube</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objectives</strong></td>
<td>You will gain proficiency in creating practical tube programs.</td>
</tr>
</tbody>
</table>
| **Course content** | ■ Introduction to the programming system  
■ Creation of round and rectangular tubes and any profiles  
■ Programming of tube processing  
■ Modification of the tube technology  
■ Output of NC programs and production plans |
| **Requirements** | Basics course in Programming or extensive experience in using the machine and TruTop Drawing |

<table>
<thead>
<tr>
<th>Changeover</th>
<th>Programming</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objectives</strong></td>
<td>You are able to generate practical NC-programs for the machine and the programming system. You can use the innovations in the production process.</td>
</tr>
</tbody>
</table>
| **Course content** | ■ New programming-relevant machine and technology options  
■ Innovations and changes in the programming system  
■ Setting and programming of practical processing strategies |
| **Requirements** | Experience in programming TRUMPF-machines with comparable technology |

<table>
<thead>
<tr>
<th>3D Tube Construction</th>
<th>TruTop</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objectives</strong></td>
<td>You will understand how to design individual tubes and complex 3D tube models and how to create tube unfoldings for further processing in TruTop Tube.</td>
</tr>
</tbody>
</table>
| **Course content** | ■ Introduction to 3D design  
■ Creation of tube models in 3D  
■ Importing and processing of tube geometries and 3D models  
■ Contour preparation for special profile and bevel cut processing  
■ Programming and optimizing tube processing  
■ Exporting tube designs |
| **Requirements** | TruTop Drawing and TruTop Tube Technology |

<table>
<thead>
<tr>
<th>3D Tube Construction for Experienced 3D Designers</th>
<th>TruTop</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objectives</strong></td>
<td>You will understand how to design individual tubes and complex 3D tube models and how to create tube unfoldings for further processing in TruTop Tube.</td>
</tr>
</tbody>
</table>
| **Course content** | ■ Creating, importing and processing of 3D models  
■ Contour preparation for special profile and bevel cut processing  
■ Programming and optimizing tube processing  
■ Exporting tube designs  
■ Reduced practice phases |
| **Requirements** | TruTop Drawing and TruTop Tube Technology and comprehensive experience in using parameterized 3D CAD systems |
### LASER TUBE CUTTING

<table>
<thead>
<tr>
<th>Course Type</th>
<th>TruLaser Tube Series 5000</th>
<th>TruLaser Tube Series 7000</th>
<th>Course Length in Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginner Operation</td>
<td></td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Changeover Operation</td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Adaptive Clamping System Operation</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Technology Package for Tapping</td>
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<td></td>
<td>3</td>
</tr>
<tr>
<td>Machine and Laser Maintenance</td>
<td></td>
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<td>3</td>
</tr>
<tr>
<td>Production Support</td>
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<td></td>
<td>Individual</td>
</tr>
<tr>
<td>Tube Cutting Technology</td>
<td></td>
<td></td>
<td>4</td>
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<tr>
<td>Special Profiles Technology</td>
<td></td>
<td></td>
<td>1</td>
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<tr>
<td>Application Consulting</td>
<td></td>
<td></td>
<td>Individual</td>
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</tbody>
</table>

### PROGRAMMING COURSES

<table>
<thead>
<tr>
<th>Course Type</th>
<th>TruLaser Tube Series 5000</th>
<th>TruLaser Tube Series 7000</th>
<th>Course Length in Days</th>
</tr>
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<tbody>
<tr>
<td>Basics Programming</td>
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<tr>
<td>Drawing TruTops</td>
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<tr>
<td>Technology TruTops Tube</td>
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<td>4</td>
</tr>
<tr>
<td>Changeover Programming</td>
<td></td>
<td></td>
<td>Individual</td>
</tr>
<tr>
<td>3D Tube Construction TruTops</td>
<td></td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>3D Tube Construction for Experienced 3D Designers TruTops</td>
<td></td>
<td></td>
<td>2.5</td>
</tr>
</tbody>
</table>

Additional offers for process optimization and component design can be found in the chapter Consulting.
Laser Welding

Almost no other production step in the sheet metal process chain has the potential to produce such high savings as the joining of sheet metal. Using lasers for this process means that you can manufacture seams of the highest quality, very often without the need for any rework. They also have the potential for welding extremely quickly and efficiently. Register for one of our training sessions, so that you’re armed with the necessary skills for producing more orders more quickly, using your TRUMPF laser welding system.

Machine types
TruLaser Robot Series 5000 | TruLaser Weld Series 5000
Our range of courses is categorized into three skill levels which each build on one another.

### Machine courses

<table>
<thead>
<tr>
<th>Module I</th>
<th>Module II</th>
<th>Machine courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation and Programming</td>
<td>Operation and Programming</td>
<td>TeachLine Technology</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FusionLine TruLaser Weld Technology</td>
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<tr>
<td></td>
<td></td>
<td>Welding Wire TruLaser Robot Technology</td>
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<tr>
<td></td>
<td></td>
<td>DepositionLine TruLaser Robot Operation</td>
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<tr>
<td></td>
<td></td>
<td>Production Support</td>
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<tr>
<td></td>
<td></td>
<td>SeamLine/TeachLine Image Processing Technology</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Laser Cutting TruLaser Robot Technology</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DepositionLine TruLaser Robot Technology</td>
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<tr>
<td></td>
<td></td>
<td>Application Consulting</td>
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</tbody>
</table>

### Programming courses

<table>
<thead>
<tr>
<th>Module I</th>
<th>Module II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation and Programming</td>
<td>Operation and Programming</td>
</tr>
<tr>
<td>Weld TruTops</td>
<td></td>
</tr>
</tbody>
</table>

### Laser courses

<table>
<thead>
<tr>
<th>Laser Devices</th>
<th>Laser Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation</td>
<td>Maintenance</td>
</tr>
</tbody>
</table>

You will find further information in the chapter **Laser Devices**

---

Basic Level | Advanced Level | Expert Level
# Machine courses

## Module I
**Operation and Programming**

**Objectives**
You will learn the basics of how to use the technology and the machine. You will master the skill of preparing, introducing and influencing the production sequence.

**Course content**
- Preparatory e-Learning
- Machine set up and assembly and overview of machine functions
- Handling the user interface, the operating elements
- Set-up processes, executing and optimizing programs
- Additional axes
- Creating welding programs and using welding parameters
- Video tutorials providing support after your training course

**Requirements**
Module I Operation and Programming and at least 3 months of experience in robot operation and programming

---

## Module II
**Operation and Programming**

**Objectives**
You will become proficient in creating more in-depth program structures, learn how to switch signals and modify welding parameters to your requirements.

**Course content**
- Switching of digital signals
- Use of syntax programming
- Adaptation of extended welding parameters

**Requirements**
Module I Operation and Programming

## TeachLine
**Technology**

**Objectives**
You will learn about the necessary theoretical and practical basics for operating and programming the TeachLine sensor system and be able to use TeachLine in an appropriate manner when laser welding.

**Course content**
- Incident light and light section measuring procedure
- Offline measurement system for edge position detection
- Operation of PC sensor system
- Setting fundamental parameters for the image analysis
- TeachLine programming

**Requirements**
Module I and II Operation and Programming and at least 3 months of experience in operating and programming

---

## FusionLine
**TruLaser Weld Technology**

**Objectives**
You will know how to determine and optimize welding parameters and become confident in using the welding wire.

**Course content**
- Introduction to tolerant laser welding
- Adapting parameters for the welding wire
- Welding wire programming on the robot control
- Welding wire technology

**Requirements**
Module I Operation and Programming and at least 3 months of experience in robot operation and programming

---

## Welding Wire
**TruLaser Robot Technology**

**Objectives**
You will know how to determine and optimize welding parameters and become confident in using the welding wire.

**Course content**
- Welding with a supplementary wire
- Welding wire feed and roll change
- Adapting parameters for the welding wire
- Welding wire programming on the robot control
- Welding wire technology

**Requirements**
Module I and II Operation and Programming and at least 3 months of experience in robot operation and programming

---

## DepositionLine
**TruLaser Robot Operation**

**Objectives**
You will be confident in dealing with the theoretical and practical influencing factors on laser metal deposition.

**Course content**
- General introduction to laser metal deposition, technology and conventional filler materials
- Operating, maintaining and calibrating the powder feeder
- Handling and setting work on the laser optics
- Nozzle adjustment
- Initial tests based on flat samples

**Requirements**
Module I and II Operation and Programming and at least 3 months of experience in robot operation and programming
Machine courses

Production Support

**Objectives**
You will gain confidence in handling your machine and acquire the basic skills for productive manufacturing.

**Course content**
- Support for smooth production start-up. Content can be customized, for example:
  - Joint preparation and setting up of the machine
  - Running in of individual production parts
  - Explanation of influencing factors on the production process
  - Initial optimization of process parameters
  - Programming support

**Requirements**
Courses on Operation and Programming

SeamLine / TeachLine Image Processing Technology

**Objectives**
You will become proficient in developing solutions for image processing with utmost process reliability and in creating parameters for this purpose.

**Course content**
- Basics of image processing
- Becoming familiar with the components and parameters
- Setting the camera
- Influence of the parameters
- Solutions for image processing with utmost process reliability

**Requirements**
TeachLine Technology course

Laser Cutting

**Objectives**
You will be confident in handling the operation and programming of the cutting optics and be able to determine and improve cutting parameters.

**Course content**
- Cutting-specific basics for lasers
- Robot programming for laser cutting programs
- Influential parameters on the laser cut, such as process, machine, laser and workpiece parameters
- Cutting different materials

**Requirements**
Module I and II Operation and Programming and at least 3 months of experience in robot operation and programming

DepositionLine TruLaser Robot Technology

**Objectives**
You will gain the skills to determine and optimize process parameters for a specific application.

**Course content**
- Procedure for developing and setting process parameters
- Performance of tests based on a defined application
- Analysis and characterization of the samples produced

**Requirements**
DepositionLine TruLaser Robot Operation

Application Consulting

**Objectives**
You will improve the potential of your machine and the part quality and produce with greater productivity.

**Course content**
- Analyzing and optimizing production and programming
- Teaching of application expertise directly on your machine. The content can be customized to your machine. The content can be customized to you
- Support through and optimization of technology parameters
- Strategies to reduce production times
- Programming support
- Processing of special materials

**Requirements**
Courses on Operation and Programming and first experience in machine operation and / or programming

SeamLine / TeachLine Image Processing Technology

**Objectives**
You will become proficient in developing solutions for image processing with utmost process reliability and in creating parameters for this purpose.

**Course content**
- Basics of image processing
- Becoming familiar with the components and parameters
- Setting the camera
- Influence of the parameters
- Solutions for image processing with utmost process reliability

**Requirements**
TeachLine Technology course

**Application Consulting**

**Objectives**
You will improve the potential of your machine and the part quality and produce with greater productivity.

**Course content**
- Analyzing and optimizing production and programming
- Teaching of application expertise directly on your machine. The content can be customized to your machine. The content can be customized to you
- Support through and optimization of technology parameters
- Strategies to reduce production times
- Programming support
- Processing of special materials

**Requirements**
Courses on Operation and Programming and first experience in machine operation and / or programming

**DepositionLine TruLaser Robot Technology**

**Objectives**
You will gain the skills to determine and optimize process parameters for a specific application.

**Course content**
- Procedure for developing and setting process parameters
- Performance of tests based on a defined application
- Analysis and characterization of the samples produced

**Requirements**
DepositionLine TruLaser Robot Operation

**SeamLine / TeachLine Image Processing Technology**

**Objectives**
You will become proficient in developing solutions for image processing with utmost process reliability and in creating parameters for this purpose.

**Course content**
- Basics of image processing
- Becoming familiar with the components and parameters
- Setting the camera
- Influence of the parameters
- Solutions for image processing with utmost process reliability

**Requirements**
TeachLine Technology course

**Application Consulting**

**Objectives**
You will improve the potential of your machine and the part quality and produce with greater productivity.

**Course content**
- Analyzing and optimizing production and programming
- Teaching of application expertise directly on your machine. The content can be customized to your machine. The content can be customized to you
- Support through and optimization of technology parameters
- Strategies to reduce production times
- Programming support
- Processing of special materials

**Requirements**
Courses on Operation and Programming and first experience in machine operation and / or programming
Programming courses

**Module I**
Operation and Programming

**Objectives**
You will learn the basics of how to use the technology and the machine. You will master the skill of preparing, introducing and influencing the production sequence.

**Course content**
- Preparatory e-Learning
- Machine set up and assembly and overview of machine functions
- Handling the user interface, the operating elements, diagnostics and online help
- Set-up processes, executing and optimizing programs
- Additional axes
- Creating welding programs and using welding parameters
- Video tutorials providing support after your training course

**Module II**
Operation and Programming

**Objectives**
You will be able to create more in-depth program structures, create new tools as well as bases, and will be able to adapt the welding parameters to your needs.

**Course content**
- Measuring and positioning of new tools
- Switching of digital signals
- Use of syntax programming
- Adaptation of extended welding parameters

**Requirements**
Module I Operation and Programming

---

**Weld**
TruTops

**Objectives**
You will understand how to create practical NC programs.

**Course content**
- Introduction to the programming system
- Importing and processing of 3D models
- Optimizing processing
- Adapting the 3D models to the actual position of the workpiece in the machine
- Processing the 3D models with the aid of the rotary tilting table

**Requirements**
Module I Operation and Programming
### LASER WELDING

<table>
<thead>
<tr>
<th>Module</th>
<th>Course Description</th>
<th>TruLaser Robot Series 5000</th>
<th>TruLaser Weld Series 5000</th>
<th>Course Length in Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module I</td>
<td>Operation and Programming</td>
<td>▲</td>
<td>▲</td>
<td>5</td>
</tr>
<tr>
<td>Module II</td>
<td>Operation and Programming</td>
<td>○</td>
<td>○</td>
<td>3</td>
</tr>
<tr>
<td>TeachLine Technology</td>
<td></td>
<td>○</td>
<td>○</td>
<td>2</td>
</tr>
<tr>
<td>FusionLine TruLaser Weld Technology</td>
<td></td>
<td>○</td>
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<tr>
<td>Welding Wire TruLaser Robot Technology</td>
<td></td>
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<tr>
<td>DepositionLine TruLaser Robot Operation</td>
<td></td>
<td>○</td>
<td>○</td>
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<tr>
<td>Production Support</td>
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<td>○</td>
<td>Individual</td>
<td></td>
</tr>
<tr>
<td>SeamLine/TeachLine Image Processing Technology</td>
<td></td>
<td>○</td>
<td>○</td>
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</tr>
<tr>
<td>Laser Cutting TruLaser Robot Technology</td>
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<tr>
<td>DepositionLine TruLaser Robot Technology</td>
<td></td>
<td>○</td>
<td>○</td>
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</tr>
<tr>
<td>Application Consulting</td>
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<td></td>
<td>Individual</td>
<td></td>
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</tbody>
</table>

### PROGRAMMING COURSES

<table>
<thead>
<tr>
<th>Module</th>
<th>Course Description</th>
<th>TruLaser Robot Series 5000</th>
<th>TruLaser Weld Series 5000</th>
<th>Course Length in Days</th>
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<tbody>
<tr>
<td>Module I</td>
<td>Operation and Programming</td>
<td>▲</td>
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<tr>
<td>Weld TruTops</td>
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<td>Module II</td>
<td>Operation and Programming</td>
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</tr>
</tbody>
</table>

Additional offers for process optimization and part design can be found in the chapter **Consulting**

- ▲ = Attendance seminar
- □ = E-Learning
- △ = Blended Learning
- ★ = Upon request
Laser Devices

No matter if you want to weld, cut, braze or label with your laser device – TRUMPF offers you the right training. The Training Center qualifies you from the very beginning according to your application of the laser device. You will acquire skills in operation, maintaining or programming your device and you will be able to use the complete range of process sensor technology in a targeted and application-oriented manner.

Laser types

TruDisk | TruMicro | TruPulse | TruDisk Green | TruDiode | TruFiber | Process sensor systems | CO₂ Laser
Our range of courses is categorized into three skill levels which each build on one another.

### Laser courses

<table>
<thead>
<tr>
<th>Laser Device</th>
<th>Training Type</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>TruDisk</td>
<td>Operation</td>
<td>Basic Level</td>
</tr>
<tr>
<td>TruDisk</td>
<td>Maintenance</td>
<td>Advanced Level</td>
</tr>
<tr>
<td>TruMicro</td>
<td>Operation &amp; Maintenance</td>
<td>Expert Level</td>
</tr>
<tr>
<td>TruPulse</td>
<td>Operation</td>
<td>Basic Level</td>
</tr>
<tr>
<td>TruPulse</td>
<td>Maintenance</td>
<td>Advanced Level</td>
</tr>
<tr>
<td>TruDisk Green</td>
<td>Operation</td>
<td>Basic Level</td>
</tr>
<tr>
<td>TruDisk Green</td>
<td>Maintenance</td>
<td>Advanced Level</td>
</tr>
<tr>
<td>TruDiode</td>
<td>Operation</td>
<td>Basic Level</td>
</tr>
<tr>
<td>TruDiode</td>
<td>Maintenance</td>
<td>Advanced Level</td>
</tr>
<tr>
<td>TruFiber</td>
<td>Operation &amp; Maintenance</td>
<td>Expert Level</td>
</tr>
<tr>
<td>TruFlow Modul I</td>
<td>Maintenance</td>
<td>Basic Level</td>
</tr>
<tr>
<td>TruFlow Modul II</td>
<td>Maintenance</td>
<td>Advanced Level</td>
</tr>
<tr>
<td>TruFlow Modul III</td>
<td>Maintenance</td>
<td>Expert Level</td>
</tr>
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</table>

### Process sensor systems

<table>
<thead>
<tr>
<th>System</th>
<th>Training Type</th>
<th>Level</th>
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<tbody>
<tr>
<td>TruDisk Green</td>
<td>Operation</td>
<td>Basic Level</td>
</tr>
<tr>
<td>TruDisk Green</td>
<td>Maintenance</td>
<td>Advanced Level</td>
</tr>
<tr>
<td>TruDiode</td>
<td>Operation</td>
<td>Basic Level</td>
</tr>
<tr>
<td>TruDiode</td>
<td>Maintenance</td>
<td>Advanced Level</td>
</tr>
<tr>
<td>TruFiber</td>
<td>Operation &amp; Maintenance</td>
<td>Expert Level</td>
</tr>
<tr>
<td>TruFlow Modul I</td>
<td>Maintenance</td>
<td>Basic Level</td>
</tr>
<tr>
<td>TruFlow Modul II</td>
<td>Maintenance</td>
<td>Advanced Level</td>
</tr>
<tr>
<td>TruFlow Modul III</td>
<td>Maintenance</td>
<td>Expert Level</td>
</tr>
<tr>
<td>VisionLine Detect – PFO</td>
<td>Operation</td>
<td>Basic Level</td>
</tr>
<tr>
<td>BEO D50 TPC</td>
<td>Operation</td>
<td>Advanced Level</td>
</tr>
<tr>
<td>Welding Depth Monitoring (SE20)</td>
<td>Operation</td>
<td>Expert Level</td>
</tr>
</tbody>
</table>

### Requirement

Operator or Maintenance course for a Laser Device

### Quality Data Store (QDS 2)

Programming

In this training course, examples from TRUMPF are used.
Laser courses

### TruDisk
**Operation**

**Objectives**
You will be able to operate the laser device correctly, make changes to laser programs and create new programs.

**Course content**
- Basics of laser technology, laser safety
- Structure and function of the TruDisk solid-state laser, generations 4C, 6C and FD27
- Structure of the laser control
- Operation of the laser using TruControl 1000

### TruDisk
**Maintenance**

**Objectives**
You will become confident in operating the laser device correctly, performing maintenance work on the laser, replacing assemblies and control components, rectifying malfunctions and performing fault diagnosis.

**Course content**
- Basics of laser technology, laser safety
- Structure and function of the TruDisk solid-state laser
- Structure of the laser control
- Operation of the laser using TruControl 1000
- Electrical and mechanical maintenance
- Diagnostics and practical troubleshooting
- Electrical repair work

### TruMicro
**Operation & Maintenance**

**Objectives**
You will acquire the knowledge how to perform maintenance work on the laser, replace assemblies and control components, rectify malfunctions and perform fault diagnosis.

**Course content**
- Basics of laser technology, laser safety
- Structure and function of the laser head and the supply unit
- Structure of the laser control
- Operation of the laser using TruControl 1000
- Maintenance work
- Diagnostics and practical troubleshooting
- Electrical repair work

### TruPulse
**Operation**

**Objectives**
You will be able to deal with the laser, make changes to laser programs and create new programs.

**Course content**
- Basics of laser technology, laser safety
- Structure and function of TruPulse
- Structure of the laser control
- Operation of the laser using TruControl 1000
- Mechanical maintenance

### TruPulse
**Maintenance**

**Objectives**
You will be able to operate the laser device correctly, perform maintenance work on the laser, replace assemblies and control components, rectify malfunctions and perform error diagnosis.

**Course content**
- Basics of laser technology, laser safety
- Structure and function of TruPulse solid-state laser of the respective generations
- Structure of the laser control
- Operation of the laser using TruControl 1000
- Electrical and mechanical maintenance
- Diagnostics and practical troubleshooting
- Electrical repair

### TruDisk Green
**Operation**

**Objectives**
You will be able to operate the laser device correctly, make changes to laser programs and create new programs.

**Course content**
- Basics of laser technology, laser safety
- Structure and function of TruDisk Pulse
- Structure of the laser control
- Operation of the laser using TruControl 1000
- Mechanical maintenance
## Laser courses

<table>
<thead>
<tr>
<th>TruDisk Green maintenance</th>
<th>TruDiode operation</th>
<th>TruDiode maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objectives</strong></td>
<td>You will be able to operate the laser device correctly, make changes to laser programs and create new programs.</td>
<td>You will become confident in operating the laser device correctly, performing maintenance work on the laser, replacing assemblies and control components, rectifying malfunctions and performing fault diagnosis.</td>
</tr>
</tbody>
</table>

**Course content**
- Basics of laser technology, laser safety
- Structure and function of laser device and supply unit
- Structure of the laser control
- Operation of the laser using TruControl 1000
- Electrical and mechanical maintenance
- Diagnostics and practical troubleshooting
- Electrical repair work

<table>
<thead>
<tr>
<th>TruFiber operation &amp; maintenance</th>
<th>TruFlow Modul I maintenance</th>
<th>PFO operation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objectives</strong></td>
<td>You will acquire the knowledge how to perform maintenance work on the laser, replace assemblies and control components, rectify malfunctions and perform error diagnosis.</td>
<td>You will know how to operate the programmable focusing optics (PFO) and become familiar with their structure. You will also be able to create, integrate and call up PFO programs.</td>
</tr>
</tbody>
</table>

**Course content**
- Basics of laser technology, laser safety
- Structure and function of the laser head and the supply unit
- Structure of the laser control
- Operation of the laser using TruControl 1000
- Maintainence work
- Diagnostics and practical troubleshooting
- Electrical repair work

**Course content**
- Structure of the TruFlow Laser, control cabinet and safety circuit
- Basics of gas, vacuum and cooling system
- Maintenance work on the laser, RF generator and process cooler
- Replacing the output coupling mirror, mode adjustment power measurement
- Fault diagnosis

**Course content**
- Structure and function of the programmable focusing optics
- Interfaces between the optics and the laser device
- Operation and programming in TruControl 1000
- Setting up the PFO Editor including teaching in the optics
- Introduction to TruTops PFO programming system

**Requirements**
Operator or maintenance course for a laser device
## Laser courses

<table>
<thead>
<tr>
<th>Application</th>
<th>Training Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objectives</strong></td>
<td>You will gain an overview of laser welding using the solid-state laser, and will be able to assess different welding results.</td>
</tr>
</tbody>
</table>
| **Course content** | ■ Basic knowledge of laser welding  
■ Material properties of selected metals  
■ Influence of the welding parameters on the welding result  
■ Overview of BrightLine Weld |
| **Requirements** | Operation or Maintenance course on the laser device |

<table>
<thead>
<tr>
<th>TruFlow Modul II</th>
<th>Maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objectives</strong></td>
<td>You will be able to understand functional sequences of the Laser, carry out maintenance, electrical and mechanical service jobs, localize and troubleshoot laser malfunctions and communicate error diagnostics to the technical service department.</td>
</tr>
</tbody>
</table>
| **Course content** | ■ Structure, function and communication of the TASC 3 / 4  
■ Measurement and diagnosis gas, vacuum and cooling system  
■ Working on the beam generator, resonator, mirror system and mirror cleaning  
■ Structure of the frequency converter, laser turbo machine and magnetic bearing electronics |
| **Requirements** | Maintenance Course TruFlow Module I |

<table>
<thead>
<tr>
<th>TruFlow Modul III</th>
<th>Maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objectives</strong></td>
<td>You will be able to understand the functions and structure of the RF generator and carry out adjustment and setting works as well as troubleshooting.</td>
</tr>
</tbody>
</table>
| **Course content** | ■ Assemblies in the radio frequency generator (tubes)  
■ HV power supply, power distributor, driver stage, output stage and control unit  
■ Setup and measurements on the RF generator  
■ Exchange and adjustment of assemblies  
■ Fault diagnosis |
| **Requirements** | TruFlow Modul II Maintenance |
Process sensor systems

### Quality Data Store (QDS 2) Programming

**Objectives**
You will know how to install the software product and adjust and configure QDS-2 at its arrangement. You will know how to make the necessary adjustments in the TruControl and the sensoric UI.

**Course content**
- Use of the installation
- Procedure at setting

**Requirements**
Windows Knowledge

### I-PFO Operation

**Objectives**
You will become familiar with the structure of the I-PFO system, be able to operate it together with the robot and teach it on components.

**Course content**
- Structure and function of the I-PFO
- Interfaces between the laser device and the I-PFO system
- Operation and programming of the I-PFO editor
- Setting up, teaching function and communication with the robot

**Requirements**
Operator or Maintenance course on the laser device

### PFO Operation

**Objectives**
You will know how to operate the programmable focusing optics (PFO) and become familiar with their structure. You will also be able to create, integrate and call up PFO programs.

**Course content**
- Structure and function of the programmable focusing optics
- Interfaces between the optics and the laser device
- Operation and programming in TruControl 1000
- Setting up the PFO Editor including teaching in the optics
- Introduction to TruTops PFO programming system

**Requirements**
Operator or Maintenance course on the laser device

### VisionLine Detect – PFO Operation

**Objectives**
You will gain the knowledge to detect contours using VisionLine Detect programming and to implement a complete application using self-created PFO programs.

**Course content**
- All course contents from the course PFO
- Basics of the image processing software VisionLine Detect with PFO
- Calibration of VisionLine Detect with PFO
- Creating programs for VisionLine Detect PFO

**Requirements**
Operator or Maintenance course on the laser device

### TruTops PFO Programming

**Objectives**
You will become adept at creating simple 2D CAD drawings, converting and integrating them in a laser program and implementing a complete application.

**Course content**
- All course contents from the course PFO
- Introduction to TruTops PFO
- Creation of 2D CAD programs
- Conversion in TruTops PFO, integration and execution in TruControl 1000

**Requirements**
Operator or Maintenance course on the laser device

### BEO D50 TPC Operation

**Objectives**
You will be able to create working processes by means of different editors and to optimize them.

**Course content**
- Structure and function and programming of the BEO TPC
- Operating and programming of the different editors
- Use of the software for temperature control

**Requirements**
Operator or Maintenance course on the laser device

---

**Laser Devices – range of courses**

- Quality Data Store (QDS 2)
- I-PFO Operation
- PFO Operation
- VisionLine Detect – PFO Operation
- TruTops PFO Programming
- BEO D50 TPC Operation

**Objectives**
- You will know how to install the software product and adjust and configure QDS-2 at its’ arrangement. You will know how to make the necessary adjustments in the TruControl and the sensoric UI.
- You will become familiar with the structure of the I-PFO system, be able to operate it together with the robot and teach it on components.
- You will know how to operate the programmable focusing optics (PFO) and become familiar with their structure. You will also be able to create, integrate and call up PFO programs.
- You will gain the knowledge to detect contours using VisionLine Detect programming and to implement a complete application using self-created PFO programs.
- You will become adept at creating simple 2D CAD drawings, converting and integrating them in a laser program and implementing a complete application.
- You will be able to create working processes by means of different editors and to optimize them.
## Process sensor systems

### Welding Depth Monitoring (SE20)
**Operation**

<table>
<thead>
<tr>
<th>Objectives</th>
<th>You will be able to parametrize a welding depth measurement with the sensor operating interface during laser processing.</th>
</tr>
</thead>
</table>
| Course content | ■ Structure and function of the sensor arrangement  
■ Adjustment of the sensor at the processing optics  
■ Use of operating interface |
| Requirements | Operator or Maintenance course on the laser device |

### TruTops I-PFO
**Programming**

<table>
<thead>
<tr>
<th>Objectives</th>
<th>You will acquire the skills to operate TruTops I-PFO and the know-how to create, adapt and optimize programs.</th>
</tr>
</thead>
</table>
| Course content | ■ Structure and function of the I-PFO  
■ Creation of robot programs (working and teaching programs)  
■ Theoretical and practical declaration of variables  
■ Practical application and improvement of I-PFO programs |
| Requirements | PFO Operation |

### PFO 20-2 PO
**Operation**

<table>
<thead>
<tr>
<th>Objectives</th>
<th>You will be able to create processes by means of different editors and to optimize them.</th>
</tr>
</thead>
</table>
| Course content | ■ Structure and function of the PFO 20-2 PO with temperature control  
■ Operating and programming of the different editors  
■ Use of the software for temperature control |
| Requirements | Operator or Maintenance course on the laser device and knowledge in operating a PFO |

### SeamLine OCT
**Operation**

<table>
<thead>
<tr>
<th>Objectives</th>
<th>You will be able to operate the SeamLine Remote OCT system and to create, adapt and optimize programs.</th>
</tr>
</thead>
</table>
| Course content | ■ Structure and function of the SeamLine Remote OCT  
■ Operating and programming of programs related to all system components  
■ Theoretical and practical declaration of variables  
■ Teaching the complete system  
■ Adaption of program parameters and program improvement |
| Requirements | Operator or Maintenance course on the laser device and knowledge in operating a PFO |

### SeamLine Remote
**Operation**

<table>
<thead>
<tr>
<th>Objectives</th>
<th>You will understand how to operate the SeamLine Remote system and learn how to create, adapt and optimize programs.</th>
</tr>
</thead>
</table>
| Course content | ■ Structure and function of SeamLine Remote  
■ Operation and creation of programs, taking into account all components of the system  
■ Theoretical and practical declaration of variables  
■ Teaching of the entire system  
■ Adaptation of the program parameters and program optimization |
| Requirements | Operator or Maintenance course on the laser device |
## LASER DEVICES

**Operation** | **Maintenance** | **Operation & Maintenance** | **Programming** | **Technology** | **Course length in days**
--- | --- | --- | --- | --- | ---

### LASER COURSES

<table>
<thead>
<tr>
<th>Device</th>
<th>Operation</th>
<th>Maintenance</th>
<th>Operation &amp; Maintenance</th>
<th>Programming</th>
<th>Technology</th>
<th>Course length in days</th>
</tr>
</thead>
<tbody>
<tr>
<td>TruDisk 4C</td>
<td>●</td>
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<tr>
<td>TruDisk 6C</td>
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<tr>
<td>TruDisk FD27</td>
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<tr>
<td>TruDisk FD33</td>
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<td>TruMicro 2000</td>
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<tr>
<td>TruMicro 5000</td>
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<tr>
<td>TruMicro 7000</td>
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<tr>
<td>TruPulse</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
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<td>2–3</td>
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<tr>
<td>TruDisk Green</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td>2–3</td>
</tr>
<tr>
<td>TruDiode &lt; 1 kW</td>
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<td></td>
<td>3</td>
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<tr>
<td>TruDiode &gt; 1 kW</td>
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<tr>
<td>TruFiber</td>
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<tr>
<td>TruFlow</td>
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<td>PFO</td>
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<tr>
<td>Application</td>
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</tbody>
</table>

### PROCESS SENSOR SYSTEMS

<table>
<thead>
<tr>
<th>Device</th>
<th>Operation</th>
<th>Maintenance</th>
<th>Operation &amp; Maintenance</th>
<th>Programming</th>
<th>Technology</th>
<th>Course length in days</th>
</tr>
</thead>
<tbody>
<tr>
<td>QDS 2 (Quality Data Store)</td>
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<td></td>
<td></td>
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<td>2</td>
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<tr>
<td>I-PFO</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>PFO</td>
<td>●</td>
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<td></td>
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<td>1</td>
</tr>
<tr>
<td>VisionLine Detect – PFO</td>
<td></td>
<td></td>
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<td></td>
<td>3</td>
</tr>
<tr>
<td>TruTops PFO</td>
<td></td>
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</tr>
<tr>
<td>BEO D50 TPC (Plastic)</td>
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<td></td>
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<td></td>
<td>3</td>
</tr>
<tr>
<td>Welding Depth Monitoring (SE20)</td>
<td>▲</td>
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<td></td>
<td></td>
<td>3</td>
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<tr>
<td>TruTops I-PFO</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>PFO 20-2 PO (Plastic)</td>
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<td>SeamLine OCT</td>
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<tr>
<td>SeamLine Remote</td>
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<td></td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

○ = Attendance seminar  ■ = E-Learning  ▲ = Blended Learning  ★ = Upon request

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Basic Level | Advanced Level | Expert Level

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Laser Devices – overview of range of courses
Marking

From chunky apples to almost invisible microchips – TRUMPF's marking lasers allow you to mark materials and components of almost any shape or size. All of our marking lasers have a modular build, and we take painstaking efforts to ensure that their integration into existing systems is seamless and hassle-free. Whether you’re new to this field or already a seasoned marker – register for one of our machine and programming training courses and attain the know-how you need to make your mark.

**Machine types**

TruMark Series 3000 | TruMark Series 5000 | TruMark Series 6000 | TruMicro Mark 2000
Our range of courses is categorized into three skill levels which each build on one another.
## Machine courses

### Module I
#### Maintenance

**Objectives**
You will acquire the skills to identify laser safety and the basic functions of a marking laser and be able to perform the necessary maintenance work on the marking laser.

**Course content**
- Laser safety
- Laser theory
- Product introduction
- Structure and function
- Maintenance work (OEM and/or workplace) based on the Operator’s Manual

**Requirements**
Module I or II Programming and proof of corresponding operator knowledge

### Module I
#### Application Consulting

**Objectives**
You will become confident in finding and optimizing laser parameters for certain materials and in assessing the marking quality.

**Course content**
- Physical basics of laser marking
- Guided and independent performance of application tasks on plastic or metals, as desired
- We recommend that you bring your own samples to the application training course

**Requirements**
Module I or II Programming and proof of corresponding operator knowledge

### Module II
#### Programming

**Objectives**
You will become familiar with the basic laser processes in terms of theory and practice and learn to perform all types of metal marking. You will gain the knowledge to optimize data matrix codes and barcodes and to apply the TruTops Mark functions practically.

**Course content**
- Deepening of application processes for laser theory – data matrix code and barcode theory
- Solving application tasks on different IR marking lasers, predominantly on metals
- Using TruTops Mark functions

**Requirements**
Module II Programming
## Programming courses

### Module I
Programmed

**Objectives**
You will become confident in handling a marking laser and in configuring and operating it correctly. You will gain basic knowledge of CAD functions and be able to make changes to existing drawings, e.g. adapting and optimizing laser parameters.

**Course content**
- Introduction
- Documentation
- Operating the marking laser
- Settings in the graphical user interface GUI (OEM functions and workplace module)
- Basics of the CAD editor
- Laser parameter settings

**Requirements**
Module I Programming

### Module II
Programmed

**Objectives**
You will become proficient in the operation and configuration of your machine and be able to create functional marking files with different variable data and texts. You will understand how to import graphics. You will acquire the skills to create a simple sequential program.

**Course content**
- Operation and configuration
- Creating marking files
- Working with data objects, graphic formats
- Sequential programming
- Navigator function

**Requirements**
Module I Programming
Training

Range of courses – Marking
## MARKING

<table>
<thead>
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<th>MACHINE COURSES</th>
<th>TruMark 5010</th>
<th>TruMark 1110</th>
<th>TruMark Series 3000</th>
<th>TruMark Series 5000</th>
<th>TruMark Series 6000</th>
<th>TruMicro Mark 2000</th>
<th>Course length in days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module I Maintenance</td>
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<tr>
<td>Module I Application</td>
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<tr>
<td>Module II Application</td>
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</tr>
</tbody>
</table>

## PROGRAMMING COURSES

| Module I Programming     |              |              |                      |                      |                      |                     | 1                     |
| Module II Programming    |              |              |                      |                      |                      |                     | 1                     |

Additional offers for process optimization and part design can be found in the chapter **Consulting**
There is so much more to punching than the simple perforating of sheet metal. In fact, punching has proven to be revolutionary when it comes to saving time and money – across a wide range of applications. The possibilities are endless. Punching machines can be used to produce parts in their entirety, design contours and create different shapes. Our selection of training courses will equip you with the requisite know-how to steer your manufacturing process towards greater efficiency and productivity, and will lead your business to even greater success.

**Machine types**
TruPunch Series 1000 | TruPunch Series 2000 | TruPunch Series 3000 | TruPunch Series 5000
### Machine courses

<table>
<thead>
<tr>
<th>Basics</th>
<th>Operation</th>
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<tr>
<td>Beginner</td>
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<tr>
<td>SheetMaster/SortMaster</td>
<td>Operation</td>
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</tbody>
</table>

### Programming courses

<table>
<thead>
<tr>
<th>Basics</th>
<th>Programming</th>
<th>Automation</th>
<th>TruTops Boost</th>
<th>Changeover</th>
<th>Programming</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cut Punch</td>
<td>TruTops Boost</td>
<td>TruTops Boost</td>
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<tr>
<td>Cut Punch Extension</td>
<td>TruTops Boost</td>
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<tr>
<td>Design Module I 2D</td>
<td>TruTops Boost</td>
<td>Design Module II 3D</td>
<td>TruTops Boost</td>
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</tr>
<tr>
<td>Design 2D and 3D for Experienced 3D Designers</td>
<td>TruTops Boost</td>
<td>Design Module III Professional</td>
<td>TruTops Boost</td>
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<tr>
<td>Drawing and Nesting</td>
<td>TruTops</td>
<td>Automation</td>
<td>TruTops Punch</td>
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</tr>
<tr>
<td>Technology</td>
<td>TruTops Punch</td>
<td>Automation</td>
<td>TruTops Punch</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Our range of courses is categorized into three skill levels which each build on one another.
# Machine courses

## Basics

**Operation**

**Objectives**
- You will gain the basic knowledge necessary for the operation course for beginners.

**Course content**
- Basic setup of the machines
- Technical information on punching, nibbling and forming
- Structure of the tool system, tool types and tool maintenance
- Adjusting, setting up and measuring tools
- Tool selection criteria

**Requirements**
- Operation Basics course and training as a trained electrician for specified activities

## Beginner

**Operation**

**Objectives**
- You will become familiar with the new features of your machine and will be able to prepare, introduce and optimize production sequences.

**Course content**
- New features in the structure of the machines and the user interface, the operating elements, diagnostics and online help
- Set-up processes, executing and optimizing programs

**Requirements**
- Operation Basics course or at least 3 months of experience in using the tool system

## SheetMaster/SortMaster

**Operation**

**Objectives**
- You will become confident in machine operation with the SheetMaster and will learn to prepare, introduce and optimize production sequences.

**Course content**
- Structure and function of the components assemblies
- Set-up processes, execution and optimization with the aid of the SheetMaster

**Requirements**
- Operator course

## Machine maintenance

**Operation**

**Objectives**
- You will become confident in carrying out maintenance work on the system in accordance with the specified maintenance intervals.

**Course content**
- Setting work and handling
- Diagnostics options
- Maintenance work on the machine and machine options

**Requirements**
- Operation Basics course and training as a trained electrician for specified activities

## SheetMaster/SortMaster maintenance

**Operation**

**Objectives**
- You will become confident in carrying out maintenance work on the system in accordance with the specified maintenance intervals.

**Course content**
- Setting work and handling
- Diagnostics options
- Maintenance work on the system

**Requirements**
- Basics course in Operation

## Production Support

**Operation**

**Objectives**
- You will gain confidence in handling your machine and acquire the basic skills for productive manufacturing.

**Course content**
- Support for smooth production start-up. The content can be customized to you, for example:
  - Joint preparation and setting up of the machine
  - Running in of individual production parts
  - Explanation of influencing factors on the production process
  - Initial optimization of process parameters
  - Programming support

**Requirements**
- Course in Operation and Programming
Machine courses

**Punching Technology**

**Objectives**
You will become confident in applying different manufacturing methods, such as punching, nibbling and forming, and will learn how to optimize production sequences.

**Course content**
- Basics of the punching process
- Framework conditions on the machine
- One-sided trimming
- Working with forming tools
- Causes of collisions
- Tool maintenance
- Active descending die
- Forming and calibration tool

**Requirements**
Basics course in Operation

**Application Consulting**

**Objectives**
You will improve the potential of your machine and the part quality and produce with greater productivity.

**Course content**
- Analyzing and optimizing production and programming
- Teaching of application expertise directly on your machine. The content can be customized to you
- Support and optimization of technology parameters
- Strategies to reduce production times
- Programming support
- Processing of special materials

**Requirements**
Course in Operation and Programming and first experience in machine operation and / or programming
## Programming courses

### Basics Programming

**Objectives**
You will gain basic technical knowledge regarding the technology and the machine as preparation for the programming course.

**Course content**
- Structure and assembly of the machines and their functions
- Technical data
- Basics of punch and laser processing and the tool system
- Machine and technology options
- Framework conditions and correlations when programming the machine

**Objectives**
You will gain the skills to create practical NC programs for the machine and automation.

**Course content**
- Introduction to the programming system
- Importing and managing drawings in the HomeZone
- Nesting and processing parts in an order-based manner
- Modifying punch laser processes
- Specification and programming of practical processing strategies
- Creation of NC programs
- Creation and processing of special materials

**Requirements**
Basics course in Programming or extensive experience in using the machine

### Cut Punch TruTops Boost

**Objectives**
You will gain the skills to create practical NC programs for the machine and automation.

**Course content**
- Introduction to the programming system
- Importing and managing drawings in the HomeZone
- Nesting and processing parts in an order-based manner
- Modifying punch laser processes
- Specification and programming of practical processing strategies
- Creation of NC programs
- Creation and processing of special materials

**Requirements**
Basics course in Programming or extensive experience in using the machine

### Cut Punch Extension TruTops Boost

**Objectives**
You will gain the skills to create practical NC programs for the machine and automation.

**Course content**
- Extension to the TruTops Boost Cut Combi technology
- Processing strategies of a pure punching machine
- Creation of NC programs

**Requirements**
Cut Combi Module I TruTops Boost

### Design Module I 2D TruTops Boost

**Objectives**
You will learn how to create and import 2D geometries. You will understand how to redesign these in line with production requirements.

**Course content**
- Introduction to the CAD system
- Creation of simple 2D drawings
- Importing and processing of 2D geometries

**Requirements**
Recommendation: participation in a TruTops Boost Technology Programming course

### Design 2D and 3D for Experienced 3D Designers TruTops Boost

**Objectives**
You will acquire the skills to create and import 2D geometries and 3D models. You will be able to redesign and unfold these in line with production requirements.

**Course content**
- Introduction to the CAD system
- Creation of simple 2D drawings and 3D models
- Importing and processing of 2D geometries and 3D models
- Unfolding of individual 3D parts in line with production requirements
- Reduced practice phases in comparison to individual courses

**Requirements**
Comprehensive experience in the use of parameterized 3D CAD systems

### Drawing and Nesting TruTops

**Objectives**
You will gain the knowledge to create and import 2D geometries. You will understand how to redesign these in line with production requirements and know how to create sheet layouts.

**Course content**
- Introduction to the CAD system
- Creation of simple 2D drawings
- Importing and processing of 2D geometries
- Manual and order-based nesting of part geometries on sheets
## Programming courses

### Technology
**TruTops Punch**

**Objectives**
You will become proficient in defining processing strategies and in the output of practical NC programs.

**Course content**
- Programming of punching, nibbling, laser and forming processes
- Implementing sheet layout strategies, blank processing, and repositioning
- Optimizing processing
- Output of NC programs
- Maintenance and adaptation of the database

**Requirements**
Basics course in Programming or extensive experience in using the machine and TruTops Drawing and Nesting

### Automation
**TruTops Boost**

**Objectives**
You will learn how to program automation processes and how to create practical NC programs.

**Course content**
- Structure and function of the automation process
- Definition and programming of loading and unloading strategies in line with processes
- Output of NC programs

**Requirements**
Cut Punch TruTops Boost

### Changeover
**Programming**

**Objectives**
You are able to generate practical NC-programs for the machine and the programming system.

**Course content**
- New programming-relevant machine and technology options
- Innovations and changes in the programming system
- Setting and programming of practical processing strategies

**Requirements**
Experience in programming TRUMPF-machines with comparable technology

### Design Module II 3D
**TruTops Boost**

**Objectives**
You will become confident in creating and importing 3D models. You will develop the skills to redesign and unfold these in line with production requirements.

**Course content**
- Creation of simple 3D models
- Importing and processing of 3D models
- Unfolding of individual 3D parts in line with production requirements

**Requirements**
Design Module I 2D TruTops Boost

### Automation
**TruTops Punch**

**Objectives**
You will learn how to program automation processes and how to create practical NC programs.

**Course content**
- Structure and function of the automation components
- Definition and programming of loading and unloading strategies in line with processes
- Output of NC programs

**Requirements**
TruTops Punch Technology

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**Basic Level**

**Advanced Level**

**Expert Level**
## Programming courses

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<th>Design Module III Professional</th>
<th>Professional</th>
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</thead>
<tbody>
<tr>
<td><strong>TruTops Boost</strong></td>
<td><strong>TruTops Punch</strong></td>
</tr>
</tbody>
</table>

**Objectives**
You will deepen your knowledge of 3D modeling and of the application of TruTops Boost – Design.

**Course content**
- Creation of complex 3D models
- Importing, analysis and processing of assemblies and solids
- Adaptation of system settings

**Requirements**
Design Module II 3D TruTops Boost or Design 2D and 3D for Experienced Designers TruTops Boost

---

**Objectives**
You will develop the knowledge to use the TruTops functions more effectively, increase process reliability on the machine and reduce part times.

**Course content**
- Optimization possibilities for processing with increased reliability and efficiency
- Optimization of geometry processing
- Special and forming tools
- Use of interactive processing functions
- Creating removal rules

**Requirements**
TruTops TruMatic Technology or at least 3 months of experience in programming
### PUNCHING

<table>
<thead>
<tr>
<th>COURSES</th>
<th>TruPunch Series 1000</th>
<th>TruPunch Series 2000</th>
<th>TruPunch Series 3000</th>
<th>TruPunch Series 5000</th>
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<td>Machine Maintenance</td>
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<td>✔️</td>
<td>✔️</td>
<td>2–4</td>
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<td>SheetMaster/SortMaster Maintenance</td>
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<td>Individual</td>
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<td>Individual</td>
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### TRUTOPS

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<tr>
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<th>TruTops Punch</th>
<th>TruTops Punch Professional</th>
<th>TruTops Punch Professional</th>
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<tbody>
<tr>
<td>Basics Programming</td>
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<tr>
<td>Cut Punch TruTops Boost</td>
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<td>Cut Punch Extension TruTops Boost</td>
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<tr>
<td>Design Module I 2D</td>
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<td>Design 2D and 3D for Experienced 3D Designers TruTops Boost</td>
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<tr>
<td>Drawing and Nesting TruTops</td>
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<td>Technology TruTops Punch</td>
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<tr>
<td>Professional TruTops Punch</td>
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<td>✔️</td>
</tr>
</tbody>
</table>

- ✔️ = Attendance seminar
- □ = E-Learning
- ▲ = Blended Learning
- ★ = Upon request

Additional offers for process optimization and part design can be found in the chapter Consulting.
Punch-Laser

At TRUMPF we are constantly innovating to meet our clients’ needs. That is why we have combined all of the advantages of punching and laser processing to produce specific punch laser machines, so that you can have the best of both worlds. Combining two technologies in one machine not only results in a simplified logistics process but also reduces your throughput times. Sign up for one of our tailored courses and acquire the relevant skills to ensure that you’re taking full advantage of your TruMatic machine.

**Machine types**

TruMatic Series 1000 | TruMatic Series 3000 | TruMatic Series 6000 | TruMatic Series 7000
Our range of courses is categorized into three skill levels which each build on one another.
### Machine courses

<table>
<thead>
<tr>
<th>Basics</th>
<th>Beginner</th>
<th>SheetMaster/SortMaster</th>
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</thead>
<tbody>
<tr>
<td><strong>Objectives</strong></td>
<td>You will gain the basic knowledge necessary for the operation course for beginners.</td>
<td>You will become familiar with the new features of your machine and will be able to prepare, introduce and optimize production sequences.</td>
</tr>
</tbody>
</table>
| **Course content** | ■ Basic setup of the machines  
■ Technical information on punching, nibbling and forming  
■ Structure of the tool system, tool types and tool maintenance  
■ Adjusting, setting up and measuring tools  
■ Tool selection criteria | ■ New features in the structure of the machines and the user interface, the operating elements, diagnostics and online help  
■ Set-up processes, executing and optimizing programs | ■ Structure and function of the components assemblies  
■ Set-up processes, execution and optimization with the aid of the SheetMaster |
| **Requirements** | Operation Basics course and training as a trained electrician for specified activities | Operation Basics course or at least 3 months of experience with the tool system | Operator course |

<table>
<thead>
<tr>
<th>Machine and Laser</th>
<th>SheetMaster/SortMaster</th>
<th>Production Support</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objectives</strong></td>
<td>You will become confident in carrying out maintenance work on the system in accordance with the specified maintenance intervals.</td>
<td>You will become confident in carrying out maintenance work on the system in accordance with the specified maintenance intervals.</td>
</tr>
</tbody>
</table>
| **Course content** | ■ Setting work and handling  
■ Diagnostics options  
■ Maintenance work on the machine and machine options | ■ Setting work and handling  
■ Diagnostics options  
■ Maintenance work on the system | Support for smooth production start-up. The content can be customized, for example: |
| **Requirements** | Operation Basics course and training as a trained electrician for specified activities | Basics course in Operation | ■ Joint preparation and setting up of the machine  
■ Running in of individual production parts  
■ Explanation of influencing factors on the production process  
■ Initial optimization of process parameters  
■ Programming support |
| **Requirements** | | | Course in Operation and Programming |
Machine courses

Punching Technology

Objectives
You will become confident in applying different manufacturing methods, such as punching, nibbling and forming, and will learn how to optimize production sequences.

Course content
- Basics of the punching process
- Framework conditions on the machine
- One-sided trimming
- Working with forming tools
- Causes of collisions
- Tool maintenance
- Active / descending die
- Forming and calibration tool

Requirements
Basics course in Operation

Laser Cutting Technology

Objectives
You will learn how to optimize your cutting quality and determine the cutting parameters for special materials.

Course content
- Cutting-specific basics for lasers
- Influential parameters on the laser cut, such as process, machine, laser and workpiece parameters
- Laser power control
- Cutting different materials
- Quality assessment of laser cuts
- Cutting tool

Requirements
Basics course in Operation

Application Consulting

Objectives
You will improve the potential of your machine and the part quality and produce with greater productivity.

Course content
- Analyzing and optimizing production and programming
- Teaching of application expertise directly on your machine. The content can be customized to you
- Support and optimization of technology parameters
- Strategies to reduce production times
- Programming support
- Processing of special materials

Requirements
Course in Operation and Programming and first experience in machine operation and / or programming

Basic Level
Advanced Level
Expert Level
Programming courses

<table>
<thead>
<tr>
<th>Course Name</th>
<th>Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Basics</strong></td>
<td>You will gain basic technical knowledge regarding the technology and the machine as preparation for the programming course.</td>
</tr>
<tr>
<td><em>Programming</em></td>
<td></td>
</tr>
<tr>
<td><strong>Cut Combi</strong></td>
<td>You will gain the skills to create practical NC programs for the machine and automation.</td>
</tr>
<tr>
<td><em>TruTop Boost</em></td>
<td></td>
</tr>
<tr>
<td><strong>Cut Combi Extension</strong></td>
<td>You will gain the skills to create practical NC programs for the machine and automation.</td>
</tr>
<tr>
<td><em>TruTop Boost</em></td>
<td></td>
</tr>
<tr>
<td><strong>Design Module I 2D</strong></td>
<td>You will learn how to create and import 2D geometries. You will understand how to redesign these in line with production requirements.</td>
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<td><em>TruTop Boost</em></td>
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<tr>
<td><strong>Design 2D and 3D for Experienced 3D Designers</strong></td>
<td>You will acquire the skills to create and import 2D geometries and 3D models. You will develop the skills to redesign and unfold these in line with production requirements.</td>
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<tr>
<td><em>TruTop Boost</em></td>
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<tr>
<td><strong>Drawing and Nesting</strong></td>
<td>You will learn how to create and import 2D geometries. You will understand how to redesign these in line with production requirements and know how to create sheet layouts.</td>
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<td><em>TruTop</em></td>
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**Course content**
- Structure and assembly of the machines and their functions
- Technical data
- Basics of punch and laser processing and the tool system
- Machine and technology options
- Framework conditions and correlations when programming the machine

**Requirements**
Recommendation: participation in a TruTop Boost Technology Programming course

**Course content**
- Introduction to the programming system
- Importing and managing drawings in the HomeZone
- Nesting and processing parts in an order-based manner
- Modifying punch laser processes
- Specification and programming of practical processing strategies
- Creation of NC programs
- Creation and processing of special materials

**Requirements**
Basics course in Programming or extensive experience in using the machine

**Course content**
- Extension to the TruTop Boost Cut Punch technology
- Processing strategies of a punch laser machine
- Processing parts in TecZone
- Modifying laser processes
- Creation of NC programs

**Requirements**
Cut Punch Module I TruTop Boost
Programming courses

Technology
TruTop TruMatic

Objectives
You will become proficient in defining processing strategies and in the output of practical NC programs.

Course content
■ Programming of punching, nibbling, laser and forming processes
■ Implementing sheet layout strategies, blank processing and repositioning
■ Optimizing processing
■ Output of NC programs
■ Maintenance and adaptation of the database

Requirements
Basics course in Programming or extensive experience in using the machine and TruTop Drawing and Nesting

Objectives
You will become proficient in defining processing strategies and in the output of practical NC programs.

Course content
■ Programming of punching, nibbling, laser and forming processes
■ Implementing sheet layout strategies, blank processing and repositioning
■ Optimizing processing
■ Output of NC programs
■ Maintenance and adaptation of the database

Requirements
Basics course in Programming or extensive experience in using the machine and TruTop Drawing and Nesting

Automation
TruTop Boost

Objectives
You will learn how to program automation processes and how to create practical NC programs.

Course content
■ Structure and function of the automation process
■ Definition and programming of loading and unloading strategies in line with processes
■ Output of NC programs

Requirements
Cut Combi TruTop Boost

Objectives
You will learn how to program automation processes and how to create practical NC programs.

Course content
■ Structure and function of the automation process
■ Definition and programming of loading and unloading strategies in line with processes
■ Output of NC programs

Requirements
Cut Combi TruTop Boost

Changeover
Programming

Objectives
You are able to generate practical NC-programs for the machine and the programming system. You can use the innovations in the production process.

Course content
■ New programming-relevant machine and technology options
■ Innovations and changes in the programming system
■ Setting and programming of practical processing strategies

Requirements
Experience in programming TRUMPF-machines with comparable technology

Objectives
You will learn how to program automation processes and how to create practical NC programs.

Course content
■ Structure and function of the automation components
■ Definition and programming of loading and unloading strategies in line with processes
■ Output of NC programs

Requirements
TruTop TruMatic Technology

Objectives
You will learn how to program automation processes and how to create practical NC programs.

Course content
■ Structure and function of the automation components
■ Definition and programming of loading and unloading strategies in line with processes
■ Output of NC programs

Requirements
TruTop TruMatic Technology
Programming courses

**Design Module III Profi**
TruTops Boost

**Objectives**
You will deepen your knowledge of 3D modeling and of the application of TruTops Boost – Design.

**Course content**
- Creation of complex 3D models
- Importing, analysis and processing of assemblies and solids
- Adaptation of system settings

**Requirements**
Design Module II 3D TruTops Boost or Design 2D and 3D for Experienced 3D Designers TruTops Boost

**Professional**
TruTops TruMatic

**Objectives**
You will develop the knowledge to use the TruTops functions more effectively, increase process reliability on the machine and reduce part times.

**Course content**
- Optimization possibilities for processing with increased reliability and efficiency
- Optimization of geometry processing
- Special and forming tools
- Use of interactive processing functions
- Creating technology tables and rules for removal

**Requirements**
TruTops TruMatic Technology or at least 3 months of experience in programming
### PUNCH-LASER

<table>
<thead>
<tr>
<th>COURSES</th>
<th>TruMatic Series 1000</th>
<th>TruMatic Series 3000</th>
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### PROGRAMMING COURSES - TRUTOPS BOOST

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### TRUTOPS

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Additional offers for process optimization and part design can be found in the chapter Consulting.
Smart Factory

In any business, optimization is key. Within a production facility, the greatest potential for optimization lies in between the individual processing steps. TRUMPF can support you in viewing your production process from a different perspective and help in identifying areas for optimization. We have various training courses and consultation sessions available for this very purpose. Or register for one of our individual workshops and work together with some of our TRUMPF experts. Get in touch and find your optimization potential.
Programmings courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Level</th>
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<tbody>
<tr>
<td>Quickjob Module</td>
<td>Basic</td>
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<tr>
<td>Production Module</td>
<td>Basic</td>
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<tr>
<td>Storage Module (Manual Store Management)</td>
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<tr>
<td>Purchase Module</td>
<td>Basic</td>
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<td>Customer Module</td>
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<td>Calculation Module</td>
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<tr>
<td>Administration</td>
<td>Basic</td>
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<tr>
<td>Calculate</td>
<td>Basic</td>
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</table>

Our range of courses is categorized into three skill levels which each build on one another.
Programmed courses

**Quickjob Module**
TruTops Fab

**Objectives**
You will acquire the know-how to successfully introduce and operate the TruTops Fab Quickjob Module.

**Course content**
- System overview
- TruTops Fab user interface
- Workplace management
- Definition of operations and work plans
- Management and controlling of production orders
- Important aspects of materials management
- Maintenance of material and customer data
- Monitor function

**Requirements**
TruTops Fab Quickjob Module

**Production Module**
TruTops Fab

**Objectives**
You will gain the knowledge of how to successfully use the TruTops Fab Production Module.

**Course content**
- Management and controlling of production orders with a focus on assemblies
- Definition of assembly-specific operations and work plans
- Creation of corresponding workstations and workstation groups

**Requirements**
TruTops Fab Quickjob Module

**Storage Module (Manual Store Management)**
TruTops Fab

**Objectives**
You will learn to configure and operate a manual store.

**Course content**
- Basic concepts of store management (manual store)
- Creation and management of different storage locations and storage areas
- Batch management
- Graphical display of material process

**Requirements**
TruTops Fab Quickjob Module

**Purchase Module**
TruTops Fab

**Objectives**
You will learn how to manage requests and orders and to maintain supplier data.

**Course content**
- Management of requests
- Orders
- Supplier management

**Requirements**
TruTops Fab Quickjob Module

**Customer Module**
TruTops Fab

**Objectives**
You will become proficient in using the TruTops Fab Customer Module.

**Course content**
- Customer order function area
- Management and controlling of customer orders from the tender to invoicing
- Focus on: customer data management, tender preparation, order confirmation, production, delivery and invoicing, and dunning and credit notes

**Requirements**
TruTops Fab Quickjob Module

**Calculation Module**
TruTops Fab

**Objectives**
You will develop the knowledge to calculate your costs for workpieces and assemblies.

**Course content**
- Software adaptation and data administration
- Calculations for individual workpieces and assemblies
- Vectorization of graphic files (option)

**Requirements**
TruTops Fab Quickjob Module

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**Programming courses**

- **Quickjob Module**
- **Production Module**
- **Storage Module (Manual Store Management)**
- **Purchase Module**
- **Customer Module**
- **Calculation Module**

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**Range of courses – Smart Factory**
Programming courses

**Administration**
TruTops Fab

**Objectives**
You will gain the skills to support a TruTops Fab system as an IT administrator.

**Course content**
- Adapting the system
- Data administration
- Print layout
- Adaptation
- Fault diagnosis and response

**Requirements**
Excellent knowledge of the field of IT: PC, databases, network administration

**Calculate**
TruTops

**Objectives**
You will develop the knowledge to calculate your costs for workpieces and assemblies.

**Course content**
- Software adaptation and data administration
- Calculations for individual workpieces and assemblies
- Vectorization of graphic files (option)
Training

Range of courses – Smart Factory
### SMART FACTORY

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<thead>
<tr>
<th>Course</th>
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- ○ = Attendance seminar
- ■ = E-Learning
- ▲ = Blended Learning
- ★ = Upon request

### MACHINE COURSES

- Basic Level
- Advanced Level
- Expert Level
Consulting

What potential is hidden within your parts? Find out now at our workshops and seminars on part optimization for sheet metal and tubes. Whether you wish to manufacture parts more profitably, produce new parts, or enter new types of technology – the relevant knowledge regarding sheet metal design will help you trim your parts for success, while saving money as well. Because cost-efficiently designed parts are the key to efficient manufacturing, require fewer process steps and reworking, and pave the way to networked production.
Consulting – range of courses

Our range of courses is categorized into three skill levels which each build on one another.

| Basic Level | Advanced Level | Expert Level |

Consulting for part design

- Consulting for Sheet Design
- Consulting for Laser Welding Design
- Consulting for Fixture Design
- Consulting for Tube Design
- Consulting for Tube Fixture Design
- Consulting for Part Design in Additive Manufacturing

Production support / Application consulting

Production Support

Application Consulting
Consulting for part design

**Consulting for Sheet Design**

**Objectives**
You will be provided with potential solutions for cost-effective component design, taking into account the current production possibilities using sheet metal.

**Course content**
- Drafting design and construction rules
- Learning approaches for new, economical designs which are optimized in terms of the process
- Consideration of current production options for sheet metal processing
- Application of what has been learnt on parts from your daily design and production routine

**Consulting for Laser Welding Design**

**Objectives**
You will be provided with potential solutions for cost-effective component design, taking into account the current production possibilities of laser welding in sheet metal processing.

**Course content**
- Construction rules for laser welding-compliant fixtures
- Learning approaches for new, economical designs which are optimized in terms of the process
- Consideration of current production options for flexible sheet metal processing
- Application of what has been learnt on parts from your daily design and production routine

**Consulting for Fixture Design**

**Objectives**
You will be provided with potential solutions for cost-effective design of fixtures made from sheet metal for laser welding with TRUMPF.

**Course content**
- Construction rules for laser welding-compliant fixtures
- Becoming familiar with the structure and design options for fixtures made from sheet metal
- Learning approaches for new, economical fixture solutions which are optimized in terms of the process
- Application of what has been learnt on parts from your daily design and production routine

**Requirements**
Only for customers with TRUMPF laser welding systems

**Consulting for Tube Design**

**Objectives**
You will be provided with potential solutions for cost-effective component design, taking into account the current production possibilities of laser-cut tubes.

**Course content**
- Drafting design and construction rules
- Learning approaches for new, economical designs which are optimized in terms of the process
- Consideration of current production options for tube processing
- Application of what has been learnt on parts from your daily design and production routine

**Consulting for Tube Fixture Design**

**Objectives**
You will be provided with potential solutions for cost-effective fixture design for the welding of semi-finished products, taking into account the current production possibilities of laser-cut tubes.

**Course content**
- Drafting design and construction rules
- Becoming familiar with the structure and design options of laser-cut tubes
- Consideration of production options for tube processing
- Learning approaches for new, economical fixture solutions which are optimized in terms of the process
- Application on parts from your daily design and production routine

**Consulting for Part Design in Additive Manufacturing**

**Objectives**
You will be provided with potential solutions for cost-effective component design, taking into account the current production possibilities using metal 3D printing (Laser Metal Fusion).

**Course content**
- Overview of the metal 3D printing (Laser Metal Fusion) process chain including pre- and post-processing steps
- Overview of the current TruPrint portfolio with regard to printable geometries and materials
- Part identification, design methodology and design rules for economical metal 3D printing (Laser Metal Fusion)
- Components tips and tricks for CAD modeling
Production support / Application consulting

**Production Support**

- **Objectives**
  You will gain confidence in handling your machine and acquire the basic skills for productive manufacturing.

- **Course content**
  Support for smooth production start-up. Content can be customized, for example:
  - Joint setting up of the machine
  - Running in of individual production parts
  - Explanation of influencing factors on the production process
  - Initial optimization of process parameters
  - Programming support

- **Requirements**
  Course in Operation and Programming

**Application Consulting**

- **Objectives**
  You will improve the potential of your machine and the part quality and produce with greater productivity.

- **Course content**
  - Analyzing and optimizing production and programming
  - Teaching of application expertise directly on your machine. The content can be customized to you
  - Support and optimization of technology parameters
  - Strategies to reduce production times
  - Programming support
  - Processing of special materials

- **Requirements**
  Course in Operation and Programming and first experience in machine operation and / or programming
## CONSULTING FOR PART DESIGN

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<td>Part Consulting</td>
<td>Technology Day</td>
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<td>Manufacturing knowledge: Machines, technologies, processes, state of the art</td>
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<td>Design knowledge: Design systems, component design exercises, production of an optimized component</td>
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<td>Part optimization: Finding/evaluating ideas for modification possibilities for customer-specific components</td>
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<td>Trainer / Participants</td>
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### Topics / Course length in days

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<td>Sheet Design</td>
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<td>Tube Design</td>
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### Courses
- **Course independent from the machine**
- **Course length in days**
- **Attendance seminar** = □
- **E-Learning** = ■
- **Blended Learning** = ▲
- **Upon request** = ★

## CONSULTING

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### Production Support / Application Consulting
- **Consulting**
- **Individual**

### Contents
- **Consulting – overview of range of courses**
- **Basic Level**
- **Advanced Level**
- **Expert Level**
Your way to knowledge

The aim of this training catalog is to provide a glimpse into the diversity of the courses offered by TRUMPF and to give you an initial idea of the content that you will cover. We hope that, through having categorized the courses by technology type and by skill level, you have been able to find a course that meets your personal needs, learning objectives and prior knowledge. We would be delighted to be given the opportunity to welcome you to a training course in one of our TRUMPF training centers in the very near future.

Registration for the courses

Simply register online using the TRUMPF training portal. There you can find an overview of all dates and course offerings. As each training course only has a limited number of spaces, we recommend that you obtain the necessary information early on and analyze the training requirements in your company.

Further information

You can find further information about the diverse range of courses in the training portal. A handy filter function allows you to search for specific training courses according to different parameters. Whether it’s the training location, machine type, or course duration – TRUMPF has the right offer to meet any requirement and personal situation.

Register today at:
www.mytrumpf.com/training
www.trumpf.com
Contacting the TRUMPF training centers

Do you have a question regarding our training courses, would like to place an individual course request, or have another suggestion for us? The teams at our TRUMPF training centers will be happy to help. Please use the contact form on our website, or give us a call.

TRUMPF Training Center
Ditzingen
Schuckertstraße 16
71254 Ditzingen, Germany
Telephone
+49 (0)7156 303-32900
E-mail training@trumpf.com

TRUMPF Training Center
Schramberg / Dunningen
Benzstraße 5
78655 Dunningen, Germany
Telephone
+49 (0)7422 515-590
E-mail training.tls@de.trumpf.com

TRUMPF Training Center
Grüsch
TRUMPF Straße 8
7214 Grüsch, Switzerland
E-mail training@lasermarking.trumpf.com
TRUMPF is certified to ISO 9001
(Find out more: www.trumpf.com/s/quality)