

PTC Academic Program
Creo Trainers' Guide

PTC



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Acknowledgements	
Feedback	To ensure these materials are of the highest quality, users are asked to report errors to the author.
tbrotherhood@ptc.com	Suggestions for improvements and other activities are welcome.
Product code	PTC-TRA-GLO-C2

The following organisations share a common goal of promoting STEM subjects and endorse PTC's Academic Programme.



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PTC in middle and high schools

PTC supports schools by helping them teach science, technology, engineering, and mathematical skills by providing real world product development tools, curriculum, projects and design challenges.

Our aims are twofold. To help pupils become discerning consumers in an increasingly technological society and, to boost the supply of designers and engineers for PTC customers.

PTC provides schools with:

- Free design and engineering software
- Free [online software training](#)
- Challenging [design competitions](#)
- [Online communities](#) for collaboration and learning
- [Support](#) from our engineers and educators

Lead organisations

Coordination in a region is very important. A lead centre that understands education and local businesses is a huge asset. We work with the following organisations to manage local trainer networks and support schools.



Australia – A long term relationship with INTAD provides training and support for teachers and schools in Australia.



China – PTC reseller Semia supports schools and teachers in this region.



England – PTC manages a team of trainers who deliver accreditation, training and support at a number of levels.



New Zealand – The University of Auckland provides training and support for teachers and schools.



Scotland – PTC is a partner in the SQA DIVA software scheme and manages a team of trainers offering accredited training and follow-on courses.



Thailand – This region is covered by PTC reseller Comgraph who provide training and support for teachers and schools.



Wales – PTC works closely with STEM Cymru who manages a team of trainers offering courses for accreditation and classroom implementation.

Linked documents

This guide should be read in conjunction with the teacher document;
[PTC Schools Programme 2013](#).

Becoming a trainer

PTC has established a route to becoming a trainer.

1. Accredited teacher using Creo Parametric Academic Edition or Commercial.
2. Track record of teaching, lecturing, training or instructing.
3. Complete 'Intro to Creo Fundamentals' PLMS course with 80% or greater score.
4. PTC monitors a training event with survey and/or 'in person'.
5. PTC will consider equivalent experience and expertise.

Trainer responsibilities

1. Creo proficiency.
 - 1.1. Core techniques; Modelling, Assembly, Render, Drawing, Mechanism. Sheet Metal basics, Simulation basics.
 - 1.2. At least one specialist area at intermediate or higher level.
2. Manage trainer details, course listings, teacher registrations and accreditation on the PTC education training web app.
3. Contribute to school forums on PTC Communities.
4. Take part in two updates each year covering - networking, new developments, feedback to PTC, learn new skills and see Creo being used in commercial or education setting.
5. Provide an annual report on activities to include:
 - 5.1. Dates and durations of courses for the year
 - 5.2. Focus and duration (hours) of training:
 - 5.3. Register or teachers trained including school and contact information,
 - 5.4. Constructive feedback on the PTC schools programme.

Trainer forum – PTC Communities

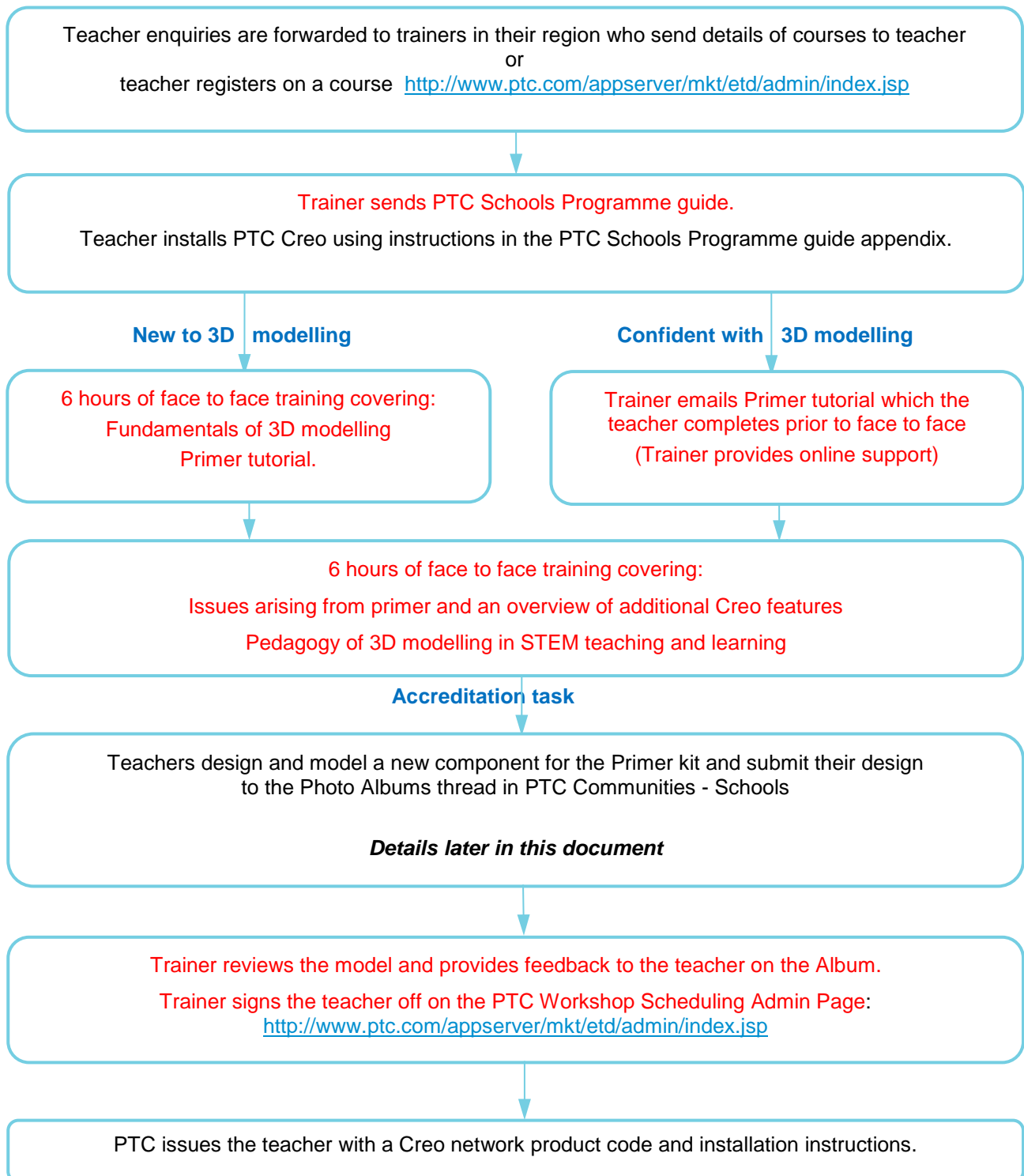
PTC provides a private forum for trainers in PTC Communities where they share the latest documentation, presentations and demonstrations with trainers. PTC also uses the Trainers' Forum to get feedback on planned developments to inform strategic planning of the schools programme.

You will be invited to the forum and can then access it here:

<http://communities.ptc.com/groups/creo-trainers-uk-schools?view=overview>

Trainers should monitor activity, contribute ideas, provide feedback and share any problems they encounter.

Trainer role in training teachers



Note: All Creo Academic Edition licenses last for two years and are renewable. Student Edition licenses are for one year and renewable.

Education training web application

1. Where an experienced teacher expresses an interest, PTC reviews their expertise and, subject to approval, adds them to the list of accredited trainers for Creo.
2. Trainers attend a webinar showing them how to use the trainer application
3. PTC upgrades the trainer's PTC.com account allowing them to post details of their courses.
4. Trainers update their own profiles here:
<http://www.ptc.com/appserver/mkt/etd/profile/profile.jsp>
5. Trainers use the links on the right of their admin page to update their profile.

Education Training Application

Profile

Please use the "Edit" link to the right of each section to make your edits. This information helps us to let you know about upcoming workshops that may interest you. All required fields must be complete before you may register for a course.

Contact Information

Given Name: * Timothy

Family Name: * Brotherhood

Email Address: * tbrotherhood@ptc.com

Alternate Email Address:

Edit

School Information

School Name: * PTC

Address: * The old School

City: * Stafford

Edit

6. Trainers create and administer their courses from the Admin page in the training web app:
<https://www.ptc.com/appserver/common/login/ssl/login.jsp?dest=%252Fappserver%252Fmkt%252Fsecure%252Fauth.jsp%253F%2526dest%253D%25252Fappserver%25252Fmkt%25252Fetd%25252Fadmin%25252Findex.jsp&msg=1>

Education Training Application

Administration: Main Menu

Teachers

[Add a New Lead](#)
Add a new teacher to the Education Training Application. An email will be sent notifying them of their addition.

[Edit/Review an Existing Teacher Profile](#)
Search for any teacher based on multiple parameters. Then, you can edit the description, attendee status, and register new teachers.

Workshops

[Add a New Workshop](#) **L1**
Add a new workshop to the Education Training Application.

[Edit/Review an Existing Workshop](#)
Search for any workshop based on multiple parameters. Then, you can edit the description, attendee status, and register new teachers.

Admin Functions

[Reports](#)

Teachers can view/search the list of scheduled courses and sign up online here.
<http://www.ptc.com/appserver/mkt/etd/workshop.jsp?&dbkey=1072>

7. Trainers manage applications for their courses using their admin page and communicate with teachers pre and post course.
8. On completion of the accreditation task, trainer sign teachers off on their admin page.
9. PTC academic team is alerted automatically to send the teacher their school network pack.

Points to remember

- You can also register a teacher for a course using their email address providing they already have an academic account on www.ptc.com
- If you update the information for a course you need to email the update to teachers who are already registered. Export CSV and open in Excel will let you capture emails of participants.
- Deleting a course – Remove all participants before you can delete a course.

Creo training and development

Types of training/development sessions

- **Taster**; e.g. a very short demo and brief hands-on activity
- **Creo accreditation** – focussed on the Primer or an equivalent.
- **Specialist technique**; e.g. Render, Surfacing, Sheet Metal, FEA.
- **Curriculum project**; e.g. Scalextric4Schools or FIRST robotics.

Taster (2-3 hours)

Activities to “hook” teachers should be short and have a “wow” factor. Pace is critical and practice is the key to ensuring this and being able to narrate at the same time. Typical techniques include:

- Assembly using component interface – Alphabet Soup.
- Complete final stages of modelling and demonstrate – S4S mould to body shell
- Drag “Insert Here” flag or replay trail files to show modelling sequence faster than real time.
- Demonstrate operation of a completed model – Virtual Science labs.

Creo accreditation (12 hours)

The sole objective for this training is to provide teachers with the essential knowledge skills and understanding for them to begin using Creo in their classrooms. Key to this is as much hands-on time as possible.

Note: Trainers should resist the temptation to show teachers intermediate or advanced features. Experience has shown this overwhelms teachers and reduces confidence.

There are two tracks for teachers wishing to get a network license for Creo.

Beginner – Teachers who are new to 3D modelling should attend 12 hours of face to face training.

Fast track - Experienced users of 3D parametric modelling are, at the discretion of their trainer, eligible for the fast track training where the Primer tutorial is completed as supported self-study in lieu of day one.

The following timetable outlines the two tracks and what should be covered in each one.

Programme – Day one

Beginners

09.30	Arrival
10.00	Welcome, introductions and domestics
	Overview
10.30	Navigating Creo
	Part modelling – Primer cube
12.00	Lunch - feedback on task
12.45	Examples of work in schools.
13.00	Part modelling – Primer strut
14.15	Assembly
	Tea/coffee as required!
	Creating an Academic account on www.ptc.com
	Downloading Creo
	Installation and configuration
15.00	Primer render and drawing
	Summary and feedback
16.30	Finish

Fast track

Target: Experienced users of 3D parametric modelling software.

Trainers review with teachers whether their experience would enable them to complete the introductory Primer prior to attending face to face training.

Fast track teachers complete the Primer as supported self-study in lieu of day one face-to-face.

During this period, the trainer offers email, telephone and, where necessary, online shared desktop support.

Programme – Day two

09.00	Arrival - Review day one and any homework.
09.30	Demonstrate Freestyle (vacuum nozzle) and Creo Direct .
10.30	Editing and correcting faults.
11.00	Demonstrations - Sheet metal, mechanism, FEA. (customise items for region, e.g. surfacing for Scotland qualifications).
	Accreditation – Demonstrate saving images from Creo and uploading to PTC Communities.
12.30	Lunch.
13.15	Pedagogy - 3D modelling in STEM teaching and learning.
14.15	Tea/coffee as required!
	Planning – Assist teachers plan how they will introduce Creo into their courses.
15.30	Demonstration of further resources:
	<ul style="list-style-type: none"> • www.ptcschools.com. • Precision LMS including pupil access. • PTC Communities. • Learning exchange.
	Summary and feedback.
	Reminder for teachers to complete and submit their accreditation task.
16.30	Finish.

Specialist techniques

PTC will support you developing an expertise in at least one specialist 3D modelling technique so that you can lead training for teachers in this specialism. The suggestions that follow are not an exhaustive list.

Software focus

1. **Advanced Framework Extension** – Space frames for vehicle chassis, furniture, etc.
2. **Assembly** – static, kinematic, mechanism.
3. **Creo Direct** – History free modelling.
4. **Creo Illustrate** – Technical illustration from line drawings to service videos.
5. **Freestyle** – Easy to use sub-division surfacing create organic shapes really easy.
6. **Manufacture** – Output via STL or through the CNC module for turning, milling.
7. **Manikin** – Design of products where humans interact.
8. **Mechanism dynamics** – The physics of mechanical systems.
9. **Part modelling** – direct features, freestyle and full surfacing.
10. **Render** – Photo-realistic visualisations
11. **Sheet Metal** – Sheet material designs from the solid or built up from flat surfaces.
12. **Simulate** - FEA for structure, thermal, resonance

Subject focus

It is assumed teachers are familiar with the basic techniques introduced in the Primer. The following suggestions are additional techniques that might be suitable for the subjects listed.

Subject area and concepts

Product Design - Shape creation especially organic shapes, Ergonomics, Surface textures, Controls and Visual displays.

Resistant Materials – Geometric shapes and sections. Joining methods, Simple mechanisms, Manufacture. Exploded models, Assembly sequences

Graphic Products – Point of sale, Packaging,

Systems and control – Mechanical systems, integration of PCBs.

Science – Materials Structures, Mass, Motion, Inertia, Forces, Friction, Coefficient of Restitution, Heat transfer, Vibration, Resonance.

Mathematics – Shape and space, length, area, volume, mass, 2D/3D geometry, Pythagoras, loci, nets, tessellations, symmetry, trajectories.

Creo tools and techniques

Freestyle, Surfacing, ISDX, Manikin, Render.

Component operations for joints, Sheet metal tools applied to metals and plastics, Kinematic motion, Mechanism connections, Saved views, Animation.

Sheet metal applied to card and thin plastics. Animation of folding sequence.

Mechanism connections, Kinematic motion, Loci of datum points, Mechanism dynamics.

Materials, FEA, Analyses, Measurements, Kinematics, Mechanism Dynamics/

Sketcher 2D geometry, features 3D geometry, analysis, kinetics, mechanism dynamics.

Curriculum projects

The use of Creo in curriculum projects has the advantage of showing teachers how Creo can be used in a particular situation.

Trainers should consider offering sessions of varying duration demonstrating how Creo can be used in a particular project. PTC has developed a number of these and supports many others with free software and in some cases software tutorials and project guides.

F1 in Schools – Comprehensive STEM curriculum, software tutorial and manufacturing guide.

First Tech Challenge Robotics - Comprehensive STEM curriculum, software tutorial, presentations, hands on workshops, manufacturing tutorials and project guide.

Formula SAE (Formula Student in the UK) – Hands-on workshop and demonstration models.

Greenpower – Software and support. Hands-on workshop and demonstration models.

Gravity Racing – Software and support. Hands-on workshop and demonstration models.

Real World Design Challenge – Aviation and automotive STEM challenges (US only).

Scalextric4Schools – Comprehensive STEM curriculum, software tutorial, presentations, hands on workshops, manufacturing tutorials and project guide.

Accreditation

The accreditation for teachers is to design a new component for the kit that features in the Creo Parametric Primer. The task is described more fully at the back of the Primer booklet.

Note: Teachers can negotiate an alternative modelling task providing this is done with you *prior to them starting modelling* and it must involve an equivalent or higher level modelling challenge.

To complete their accreditation, teachers should upload a photo album of their work with Creo to PTC Communities. <http://communities.ptc.com/community/academic-program/schools-program>

During training, demonstrate the process of saving/capturing images of their Creo designs. This is described in the document: **PTC Schools Programme 2013.pdf**

The Photo Album the teacher submits should contain a minimum of:

Title – Teacher Showcase – Teacher Name

Description – a paragraph explaining the inspiration for the new model and its function plus a paragraph describing the Creo modelling techniques used and the process they followed.

Image 1 – the new component they have designed and modelled in Creo.

Image 2 – a Creo render of the new component built into an assembly

Image 3 – a Creo Engineering drawing of their design to BS8888 with three orthographic views plus isometric, several dimensions and a couple of annotations.

Additional images would be welcome particularly where they show a manufactured product.

Reviewing accreditation tasks

One week after training

If they have not already done so, email teachers reminding them to complete the accreditation task and offering support.

Monitor PTC Communities Schools Album

Review your teacher's submissions adding comments highlighting key achievements and making it clear whether they have reached the required standard. Add recommendations for extending their use of Creo including Precision LMS.

Accrediting a teacher

Once a teacher has successfully completed the accreditation task:

1. Send the teacher a congratulatory email with their certificate attached and asking them to complete the evaluation form.
 - a. Evaluation form (Word document supplied)
 - b. Completion certificate (PPT file supplied).
2. Log in to your PTC Workshop Scheduling Admin Page:
<http://www.ptc.com/appserver/mkt/etd/admin/index.jsp>

Access the records for the training session and change the teacher's status to **Completed**.

This will trigger PTC sending the teacher a network pack containing:

- 1 network product code.
- 100 single seat codes. Accredited schools can request additional codes from support@ptc.com
- Installation instructions.

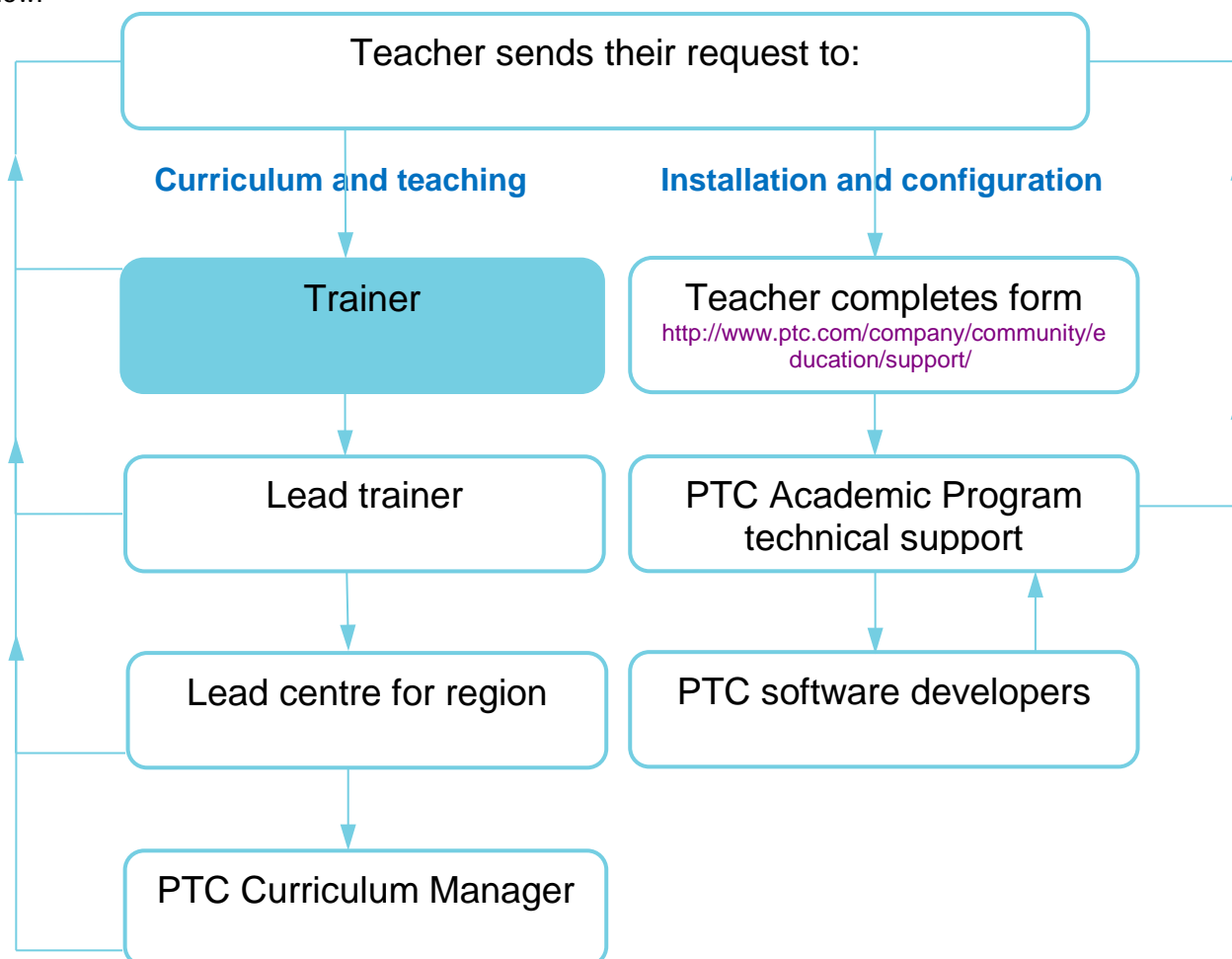
Support for teachers

Teachers should send all installation and configuration enquiries through the support web page listed below.

Trainers have been carefully selected for their teaching skills and expertise using Creo. To ensure the best possible experience for teachers, PTC provides trainers with regular updates, face to face sessions and online support.

With your local knowledge and familiarity with education and the teachers you train, you should be the first point of contact if a teacher needs curriculum support.

In the event you cannot answer the question, route your enquiry via the lead trainer for your region shown below.



If you or your teachers need to contact PTC academic support direct, complete the web form:
<http://www.ptc.com/company/community/education/support/>

or

email: schools@ptc.com

Course Evaluation

On completion of the course, please issue teachers with the course evaluation form.

Ask teachers to complete and return the form to the email address at the bottom.


Creo evaluation form.doc

Creo training - Evaluation

Teacher name:

PTC.com e-mail:

Trainer name:



Fast track Yes ☐ No ☐

Location of training:

Date(s) of training:

Strongly agree					Strongly disagree
5	4	3	2	1	

Training Materials

The mix of lectures, demonstrations and exercises was properly balanced.

The modules of the course were logically sequenced for my learning.

The level of detail in the course materials (slides, training guide, etc.) was appropriate.

The difficulty, length and number of exercises was appropriate.

The knowledge checks and post-course assessment assisted my learning

Based on your previous responses, please list suggestions that you may have for improving the course content.

Trainer

The trainer understood my skill level and learning needs, and adjusted accordingly.

The trainer used a variety of **methods** (group discussions, storytelling, etc.) and **media** (whiteboard, hand outs, etc.).

The trainer was knowledgeable about the subject matter and its practical application.

The trainer kept me engaged and motivated throughout the training.

The trainer genuinely cared about my progress through the learning materials.

I would recommend the trainer to my colleagues.

List two things the trainer did well that enhanced your learning.

List one thing the trainer could improve upon.

Strongly agree					Strongly disagree
5	4	3	2	1	

The trainer recommended additional training courses (classroom, virtual class or Precision LMS course based on my specialism

The trainer explained PTC's Precision LMS libraries and showed me how to access the eLearning content,

Yes <input type="checkbox"/>	No <input type="checkbox"/>
Yes <input type="checkbox"/>	No <input type="checkbox"/>

Certificate of completion

A PowerPoint certificate template is provided for you to add details and issue to teachers when they complete training.

Teacher certificate – Creo.ppt



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