


NAFEMS Education and Training

*PRACE-ETP4HPC Workshop on
HPC Education and Training for Industry Users
On-line, 18 March 2021*

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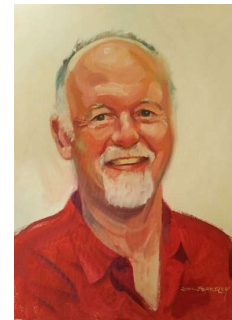
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now...

- Consultant, Trainer, Certification

before...

- Finite Element Methods developer
 - general purpose software
 - parallel processing
- Software creator
 - metal and sheet forming (auto, aero, packaging)
 - metal casting (mould filling and solidification)
- Consultant and software reseller
 - automatic process integration
 - multi-objective optimization
- R&D project manager (simulation helping industry)



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NAFEMS The International Association for the Engineering Modelling, Analysis & Simulation Community

A not-for-profit organisation, our principal aims are to:

- **Improve the professional status** of all persons engaged in the use of engineering simulation
- Establish **best practice** in engineering simulation
- Provide a focal point for the **dissemination and exchange of information** and knowledge relating to engineering simulation
- Promote **collaboration** and communication
- Act as an **advocate** for the deployment of simulation
- Continuously improve the **education and training** in the use of simulation techniques
- Be recognised as a **valued independent authority** that operates with neutrality and integrity



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NAFEMS Community

Technical Working Groups

Drawn exclusively from our international membership, the working groups identify areas of interest to the simulation community which require educational

NAFEMS Technical Working Groups currently include:

Business Impact	Impact, Shock and Crash
Composites	Manufacturing Process Simulation
Computational Electromagnetics	Multibody Dynamics
Computational Fluid Dynamics	Multiphysics
Computational Structural Mechanics	Optimization
Education and Training	Simulation Data Management
Engineering Data Science	Simulation Governance & Management
Geotechnics	Stochastics
High Performance Computing	System Modelling & Simulation

Technical Communities

Vendor Network



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NAFEMS Events

NAFEMS hosts over 50 independent events every year focused on the issues and trends in engineering simulation

World Congress 17-20 June 2019, Quebec City, Canada.
25-29 October 2021, Salzburg, Austria.

NAFEMS World Congress is a biennial global conference which has been a fixture on the simulation calendar for over 30 years. Bringing together the international community in a neutral forum recent Congresses have attracted about 700 attendees including industrial users, software vendors and academics.

Conferences

Throughout the year, NAFEMS holds a number of conferences including dedicated regional conferences (alternate years) and specific events across the globe.

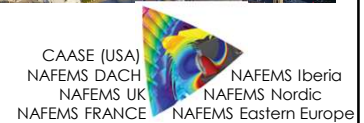
Seminars

Several seminars are hosted every year focusing on current areas of interest as well as emerging topic areas.

Webinars

Online webinars take place frequently allowing members to attend our events, no matter where in the world they are.

NAFEMS members benefit from seminar credits enabling many events to be attended inclusive of membership. Members also receive significant discounts on the World Congress and Training.



NAFEMS Publications

NAFEMS has published over 200 analysis and simulation publications. Widely acknowledged as the premier source for analysis and simulation information.

Every year NAFEMS produces approximately 8-10 new publications including textbooks, reports, benchmarks and journals.

BENCH MARK

The quarterly international magazine for engineering designers and analysts, Benchmark has commanded respect for being the only truly independent magazine specifically focused on analysis and simulation.

eLibrary

Available exclusively to NAFEMS members, an optional e-Library subscription gives instant access to over 140 of NAFEMS publications.

NAFEMS members receive a library of 20 of their chosen publications when they join. Discounts are also available on additional publications. In addition, members receive copies of all new publications as and when they are produced.



NAFEMS Projects



A New Interface Standard for Integrated **V**irtual
Material Modelling in Manufacturing Industry
• in April 2021 VMAP SC e.V. will be a legal association



Simulation **B**est Practice and State of the Art



Competency in **G**eotechnical **A**nalysis



The **F**orging Industry Needs Better Training Materials



Engineering **A**nalysis **S**imulation **I**nnovation **T**ransfer²



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NAFEMS Professional Simulation Engineer (PSE)

Gain recognition for achieved competency



PSE Certification

- Multi-level certification scheme that recognises achievement of PSE competencies (experienced simulation engineers and those in the early stages of their career)
- Independently assessed by NAFEMS
- Online Application

Online Competency Framework and Management System

The **PSE Competency Tracker** is a:

- Competency Framework comprising 26 Technical Areas (1400 competency statements specific to analysis and simulation)
- Educational Resource Guide
- Online Competency and Management System (track and manage competency)



<https://www.nafems.org/professional-development/>

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NAFEMS wealth of experience in analysis and simulation uniquely places us as a provider of quality and worthwhile training.

NAFEMS Training is based on:

Quality

- All courses are fully NAFEMS accredited
- Courses led by industry-respected and experienced tutors

Variety

- Basic to Advanced
- Courses added/updated regularly
- Custom

Flexibility

- Classroom training
- e-Learning
- On-line
- Modular



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Quality



NAFEMS accredited

- Initial approval of course
 - avoid duplicate and unnecessary courses
- All courses must be accredited by "Education & Training Working Group"
 - defined process
- Software neutral courses
 - avoid references to software
 - avoid specific software issues

Tutors

- Mostly from engineering practice
- Focus on their speciality
- Some academic or ex-academic



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Variety



Different levels... lifelong

INTRODUCTORY	MID-LEVEL	ADVANCED
<ul style="list-style-type: none"> CFD for Structural Designers and Analysts FEA Day-to-Day Introduction to CFD Analysis: Theory and Applications Introduction to Dynamics Using FEA Introduction to Practical CFD Practical Introduction to Finite Element Analysis (FEA) Why do Engineering Simulation? 	<ul style="list-style-type: none"> 10 Steps to Successful Explicit Dynamics Analysis Practical Modelling of Joints and Connections Essential Principles of Simulation Data Management Practical Introduction to Non-Linear FEA Composite FEA Fatigue & Fracture Mechanics in FEA Structural Optimization in FEA Complete Guide to Automatic Design Optimization 	<ul style="list-style-type: none"> Elements of Turbulence Modelling Verification & Validation in Engineering Simulation Advanced Dynamic FEA Verification & Validation of Computational Models Verification & Validation in Scientific Computing Advanced Computational Fluid Dynamics (CFD)



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Variety



Courses added and/or updated regularly

- Changing industrial requirements
- Simulation user profile changes (e.g. analyst, engineer, designer)

Custom

- Company requests for specific courses or packs of courses
- Avoid overlap with software vendor courses
 - software neutral courses
- Avoid overlap with engineering consultants
 - care to not perform engineering consultancy within a course



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Variety



Free courses

- Promotion ("Master Class")
- Modular (on-demand courses considered to provide knowledge)
- Webinar type (specific series or topics, e.g. "Tony's Talking Shop")
- Informative webinars that may be considered a form of training

Registration & Attendance for "free"

- Registration usually high (several hundred)
- Attendance usually about 50% ("paid" events closer to 100%)



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Variety: Different focus



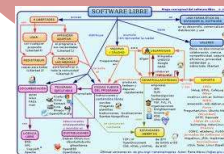
academic training
FOCUS
student learning
basics... and more



NAFEMS training
FOCUS
engineers using
a software tool
to obtain the
best answers for
engineering design



software training
FOCUS
user carrying
out an
analysis process



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Variety: Try to fill the gap



academic training
basic concepts,
equations,
mathematics,
etc.

NAFEMS training
explanatory,
practical methods,
best practice,
reduced maths,
examples,
etc.

software training
processes,
menus,
etc.



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Flexibility



Classroom (face-to-face)

- Fixed content courses (hotel, training facility, etc.)
- Custom courses in-house (company site)

Virtual classroom (on-line)

- Since covid this has been the new norm
 - many courses converted from classroom to online
- Generally open Q&A access and discussion (tutor dependent)

About 20-30 Classroom (face-to-face + online) courses per year

custom classes

OUR CUSTOM CLASSES COVER WHATEVER TOPICS YOU NEED, WITH EXAMPLES RELATED TO YOUR INDUSTRY. IN A PRIVATE, ONLINE DELIVERY FORMAT THAT SUITS YOU AND YOUR TEAM PRECISELY.

[CREATE YOUR COURSE](#)

virtual classrooms

OUR BEST-IN-CLASS PUBLIC TRAINING COURSES, NOW BEING DELIVERED ENTIRELY ONLINE. COMPLETE COURSES DELIVERED IN FULL DAY SESSIONS OVER THE COURSE OF ONE OR MORE DAYS.

[FULL DETAILS](#)



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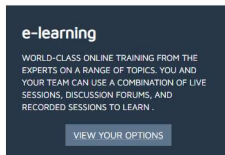
Flexibility



eLearning

- Fixed content courses
- Up to 6 sessions (each 2 to 3 hours)
- Q&A
 - Live via on-line chat
 - Off-line via Forum (open for some weeks after course)
- Live attendance usually about 50%
 - Others view course while it is open

About 40-50 eLearning courses per year
Grew about 35% during last year (covid)



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Flexibility



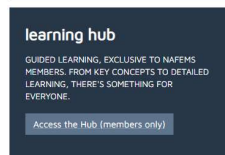
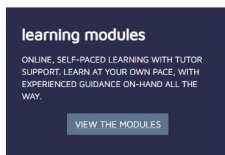
Modules

- On-demand fixed content courses
- Tutor support ("on request" basis)
- Traditional learning style documentation

Hub

- On-demand fixed content courses
- Hub currently freely available for members
- No tutor support
- Recorded video teaching style (mainly)

Reasonably new offer so only a few courses



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Some notes of Flexibility



Different approaches are required

- Digital tools imply different training methods

Content needs changing

- Different training methods require more/less detail
- Digital presentations (e.g. documents, videos, voice, etc.)

Awareness of audience

- Monitoring face-to-face attention is simpler
- May not be an issue



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Thank you!



Any questions?

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<p>e-learning</p> <p>WORLD-CLASS ONLINE TRAINING FROM THE EXPERTS ON A RANGE OF TOPICS. YOU AND YOUR TEAM CAN USE A COMBINATION OF LIVE SESSIONS, DISCUSSION FORUMS, AND RECORDED SESSIONS TO LEARN.</p> <p>VIEW YOUR OPTIONS</p>	<p>virtual classrooms</p> <p>OUR BEST-IN-CLASS PUBLIC TRAINING COURSES, NOW BEING DELIVERED ENTIRELY ONLINE. COMPLETE COURSES DELIVERED IN BULLY-DAY SESSIONS OVER THE COURSE OF ONE OR MORE DAYS.</p> <p>FULL DETAILS</p>	<p>custom classes</p> <p>OUR CUSTOM CLASSES COVER WHATEVER TOPICS YOU NEED, WITH EXAMPLES RELATED TO YOUR INDUSTRY, IN A PRIVATE, ONLINE DELIVERY FORMAT THAT SUITS YOU AND YOUR TEAM PRECISELY.</p> <p>CREATE YOUR COURSE</p>
<p>learning modules</p> <p>ONLINE, SELF-PACED LEARNING WITH TUTOR SUPPORT. LEARN AT YOUR OWN PACE, WITH EXPERIENCED GUIDANCE ON-HAND ALL THE WAY.</p> <p>VIEW THE MODULES</p>	<p>learning hub</p> <p>GUIDED LEARNING, EXCLUSIVE TO NAFEMS MEMBERS. FROM KEY CONCEPTS TO DETAILED LEARNING, THERE'S SOMETHING FOR EVERYONE.</p> <p>Access the Hub (members only)</p>	



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