COURSE FEE

The course fee, which includes teaching material, lunch and coffee breaks is €440.00 (+ VAT 20%) (fee for NAFEMS members €350.00 +VAT 20%).

ENROLMENT FORM

Name (s) and Surname _____

Company/Body_____

Address _____

Town_____Post Code_____Country _____

Tel_____ Fax _____

VAT registration (if applicable) _____

Email _____

Date_____ Signature_____

Please fax this Enrolment Form to +39 035 362 970 **together with a copy of the bank transfer** for € 528 (VAT inclusive) (€ 420VAT inclusive for Nafems members) in favour of TCN S. Cons. s r. l. Address of beneficiary: via Malfatti, 21 - 38100 Trento. Current account number 03/ 304330, Italian bank codes: ABI 08304, CAB 01804. Name of bank: CASSA RURALE DI TRENTO. Bank address: Ag. Via Don Sordo.

The invoice will be issued at the end of the course.

Enrolment for the course and payment by credit card or bank transfer is also possible online at: www.consorziotcn.it.

The maximum number of participants is 25.

The Certificate of Attendance is valid under the European initiative of the Chartered Certified Analysts.

VENUE

EnginSoft – Bergamo office
Exit at the Bergamo Motorway junction (A4 Milan / Venice)
Take the road signed for Alzano (2.8 km)
At the roundabout take the exit for the Volkswagen dealer on the right. Enter the flyover and take the first exit on the right, signed for the Centro Don Orione.

For greater detail on the venue visit www.consorziotcn.it

FOR FURTHER INFORMATION

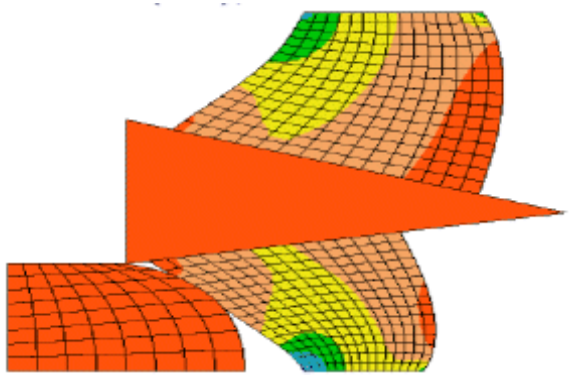
Course Administrator
Ms. Mirella Prestini
Consorzio TCN
Via Galimberti 1, 24124 Bergamo
Tel. +39 035 368 711, Fax. +39 035 362 970
info@ consorziotcn. it

Tecnologie per il calcolo numerico
:: Centro Superiore di Formazione

TRAINING COURSES 2004

MCBTA1-04

An introductory course on numerical methods for contact problems with friction and thermomechanical coupling



Bergamo - May 10-11, 2004

The course is included in the TCN Consortium (Tecnologie per il Calcolo Numerico) training programme. Founded by CRS4 (Calgary), FIAT Research Centre (Orbassano), ITC- IRST (Trento) and EnginSoft (Trento),the objective of the consortium is to promote high level training to prepare key human resources through targeted training programmes to ensure company competitively by exploiting the potential offered by new technologies - see www.consorziotcn.it

An introductory course on numerical methods for contact problems with friction and thermomechanical coupling

Level: basic
Type: theoretical-applicative course
Teachers:
Prof. P. Wriggers – University of Hannover, Germany;
Prof. G. Zavarise – The Turin Polytechnic, Italy

SHORT DESCRIPTION

Contact between solids takes place in several phases of industrial processes. Among them we cite metal and plastic forming, movement of machinery components, joints, surfaces cleaning/finishing, and several others. Contact mechanics and its numerical modelling is a field still requiring important developments.

TARGET

Contact algorithms are available in several Finite Element codes. The target of the course consists in the development of a basic, wide knowledge for the correct employment of these formulations. Contact problems usually involve various kinds of nonlinearities. Hence a detailed knowledge of the mathematical background is needed. Also, discretization techniques and constitutive models for solids constitute a basic requirement to perform correct computations. The specific knowledge of the above-cited characteristics constitutes a valuable instrument for the user. This knowledge permits to set up a correct model, to deal with difficulties within the solution process, to critically evaluate results.

REQUIRED QUALIFICATION

The course treats the topic at an introductory level. Despite this fact, a ground-level knowledge on the Finite Element Method and on the algorithms for the solution of nonlinear problems is required.

PARTICIPANTS

Specialists, researchers and team leaders, both from industry and University. People interested on comprehension of the power and limits of the FE method when applied to contact problems. Young engineers interested in numerical methods applied to contact mechanics.

COURSE HANDOUT

Each participant will receive a set of notes/papers that cover all the treated topics. Moreover a photocopy of the transparents/powerpoint presentations will be available.

PROGRAMMA

I DAY

9: 30 Introduction to the course
9: 45 Minimal theoretical basis on contact mechanics
10: 30 2D discretization techniques
11: 30 Coffee break
11: 45 3D discretization techniques
12: 15 Practical basic examples
13: 00 Solution methods: Penalty e Lagrangian Multipliers
13: 30 Lunch
14: 30 Micromechanical contact constitutive laws
15: 30 Thermomechanical coupling
16: 00 Coffee break
16: 15 Applicative examples for enhanced applied technology
17: 30 Conclusion

II DAY

9: 30 Special techniques for mesh refinement and interpolation
11: 00 Contact models for beam elements
11: 30 Coffee break
11.45 Special techniques for augmentation
12: 30 Large penetration algorithms
13: 30 Lunch
14: 00 Special techniques for error estimate
14: 45 Practical and pathological examples
16: 00 Coffee break
16: 15 Advanced type examples
17: 00 Final discussion

REMARKS: Presentation of Prof. Zavarise will be in Italian, (or in English, upon request of the audience); presentations of Prof. Wriggers will be in English.