

Advance in Design Connection

AIAS Summer School

For PhD students and young researchers

Ferrara, June 11-14, 2018 – AIAS (The Italian Scientific Society of Mechanical Design)

	<i>Monday</i>	<i>Tuesday</i>	<i>Wednesday</i>	<i>Thursday</i>
	June 11, 2018	June 12, 2018	June 13, 2018	June 14, 2018
		9:30-12:30	9:30-12:30	9:30-12:30
<i>morning</i>		Prof. Davide Castagnetti and Ing. Andrea Spaggiari	Ing. Luca Costa	Prof. Alessandro Pirondi University of Parma
		University of Reggio Emilia	IIS PROGRESS srl	
		<i>Threaded connections: testing and applications</i>	<i>Engineering approach for design of welded structures</i>	<i>Bonded joints design and failure modelling</i>
	14:00 <i>Registration, Opening of course</i>	13:00 – 14:00 <i>lunch</i>	13:00 – 14:15 <i>lunch</i>	13:30 – 14:15 <i>lunch</i>
<i>afternoon</i>				
	14:30-18:30	14:30-18:00	14:30-18:00	14:15-16:00
	Prof Eugenio Dragoni	Ing. Luca Costa	Prof. Per Jahn Haagenzen	Prof. Laura Vergani
	University of Reggio Emilia	IIS PROGRESS srl	Norwegian University of Science and Technology	Politecnico di Milano
	<i>Threaded connections: modelling and design</i>	<i>Design code for welded structures.</i>	<i>Fatigue Analysis in Offshore Structures</i>	<i>Final test and Ph.D. activity presentation</i>

Conference Venue, IUSS – Ferrara 1391 - Corso Porta Mare, n. 2 - 44121 Ferrara

Local Organising Committee

Prof. E. Dragoni – Università di Reggio Emilia

Prof. P. Livieri – Università di Ferrara

Prof. R. Tovo – Università di Ferrara

Prof. L. Vergani – Politecnico di Milano

Secretary

Prof. P. Livieri

Engineering Department of Ferrara

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Program

Monday June 11, 2018

Prof. Eugenio Dragoni
University of Reggio Emilia (Italy)

Afternoon

Threaded connections: modelling and design

Basics

Definitions

Terminology

Standards

Applications

Manufacturing

Materials

Tightening the joint

Preload functions

Preload magnitude

Preload control

Load sharing

Load introduction

Nonlinear effects

Preload retention

Case study

Bolt loads

Tension

Torsion

Bending

Shear

Combined tension-torsion

Bolt strength

Static strength (stress triaxiality, design equation)

Fatigue strength (stress concentrations, GS charts)

Stress analysis

Beam model

3D photoelasticity

Strain gauges

Fatigue testing

Finite elements

Boundary elements

Design summary

Effect of bolt geometry

Effect of bolt material

Effect of bolt manufacturing

Effect of nut geometry

Effect of nut material

Effect of thread shape

Effect of thread pitch

Effect of thread bonding

References and outlook

Tuesday June 12, 2018

Morning

Prof. Davide Castagnetti and Dr. Andrea Spaggiari
University of Reggio Emilia (Italy)

Threaded connections: testing and applications

Design optimization

Stress concentrations

Optimization tools

Literature review

Nut design

Bolt shank

Bolt's head fillet

Testing and Applications

High strength bolts applications

Typical design

Design Issues

Technological aspects

Case Study

Experimental tests

Accelerated methods

Fatigue limit, S/N curves

Failure Analysis

Results

Conclusions

Afternoon

Ing. Luca Costa:
IIS PROGRESS srl (Italy)

Design code for welded structures.

Wednesday June 13, 2018

Morning

Ing. Luca Costa:
IIS PROGRESS srl (Italy)

Design code for welded structures.

Afternoon

Prof. Per Jahn Haagenen:
Norwegian University of Science and Technology

Fatigue Analysis in Offshore Structures

- *Introduction with historical overview and case studies*
- *Basic aspects of fatigue of welded structure; crack initiation and growth, main influencing factors*
- *Fatigue life assessment methodologies*
- *Improved design & life extension*

Thursday June 14, 2018

Morning

Prof. Alessandro Pirondi:
University of Parma (Italy)

Bonded joints design and failure modelling

- *Design principles,*
- *Calculation methodologies,*
- *Damage and failure modelling*

Afternoon

Prof. Laura Vergani:
Politecnico di Milano (Italy)

FINAL TEST AND PH.D. ACTIVITY PRESENTATION