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| **1. COURSE SYLLABUS OF** **Mechanics and Structural Design for Energy Engineering** **MODULE: Fundamentals of Structural Design**Accad. year 2013/14 |
| 2. PROFESSOR Oreste S. Bursi (responsible of the course)Riccardo Zandonini |  | **3. ECTS CREDITS** | 3 |
| **OFFICE** DICAM,University of Trento |  | **SCIENTIFIC FIELD** | ICAR/09 |
| **E-MAIL ADDRESS** | orestesalvatore.bursi@unitn.it riccardo.zandonini@unitn.it;  | **OFFICE PHONE** | 0461-2825210461-282530 |
| **4. COURSE HOURS** |  | **LECTURES** | 24 |
| **EXERCISES AND LABS** | 6 |
| **OTHERS** | 0 |
| **5. STUDY PROGRAMME** | Master in Energy Engineering | **6. MAJOR IN** | ..... |
| **7. YEAR** | 2nd | **SEMESTER** | 1st |
| **8. PROGRAMME STATUS** | **INSERT:** Compulsory  | **9. COURSE LANGUAGE** | English |
| **10. DESCRIPTION** | The analysis and design of joints, members and steel supporting structures for energy engineering-based systems is the core objective of the course. The course covers the analysis and main design methodologies for joints, members and steel supporting structures. Finally, the course treats the exam of specific static and dynamic problems relevant to wind turbines.  |
| **11. TEACHING FORMAT and ORGANIZA-TION** | Part I is organized in 8 hours -instructor: Oreste S. Bursi-, Part II in 16 hours -instructor: Riccardo Zandonini- Part III in 6 hours -instructor: Oreste S. Bursi- |
| **12. LEARNING OUTCOMES** | At the end of the course, students should be able to:1. understand modern national and European standards and analysis methods;2. be able to carry out design check on members and joints;3. have a detailed knowledge about analysis and design of a wind turbine mast. |
| **13. TOPICS** | Part I: Modern standards and analysis methods – 8 hours, Oreste S. Bursi-Design based on modern national and European standards. Global analysis of structures. Stiffness and strength of elements.Part II: Members and joints – 16 hours, Riccardo Zandonini- Resistance of members (Tension, Compression, Bending, Shear, Buckling). Welded Connections and Joints. Bolted Joints. Connections and Joints subject to fatigue.Part III: Exercises – 6 hours, Oreste S. Bursi- Verification of a Wind Turbine Mast. |
| **14. BASIC BIBLIOGRAPHY** |  Cocco, D., Palomba, C., Puddu, P., "Tecnologie delle Energie Rinnovabili", SGEditoriali , Padova, 2010 Bursi, O.S., Pucinotti, R., Zanon, G., Progettazione di Giunzioni e Strutture Tubolari in Acciaio, Flaccovio , September 2012 | ISBN: 978-88-579-0158-9 Battisti, L., Gli Impianti Motori Eolici, Editore L. Battisti , Agosto 2012. Monte, A., Elementi di Impianti Industriali, Vol. 2, Edizioni Cortina Torino , 2009. |
| **15. ELIGIBILITY** |  |
| **16. RECOMMAN-DATIONS**  | For a fruitful attending of the course basic understanding of topics typically treated in courses of structural mechanics and structural design are needed. |
| **17. STUDENT ASSESSMENT**  | Course work will be weighted as follows: final oral exam (80%), presentation of the homework (20%).  |