

MECHATRONICS AND ROBOTICS WEEK 2024

COLLEGE OF POLYTECHNICS JIHLAVA

OBJECTIVES

To present mechatronics and robotics in an entertaining way using modern teaching methods and practical demonstrations of real industrial systems.

DESCRIPTION

The Blended Intensive Programme (BIP) – Mechatronics and Robotics Week will briefly present the basic principles of mechanics, computer-aided design, electro-pneumatics, cyber-physical factories of Industry 4.0, additive technologies, and others. The presentations will be combined with simple examples and demonstrations on real industrial equipment. The BIP is intended for university students, especially for bachelor study programmes. However, students of master or doctoral study programmes are welcome as well.

METHODS

Interactive presentations and seminars, practical demonstrations, visits to industrial enterprises, running discussions.

OUTCOMES

Compact overview of mechatronics and robotics branches as revision (repetition) or vision (preview) for the future study and work; Insight into contemporary industrial systems and machine tools.

VIRTUAL COMPONENT DESCRIPTION

- before: preliminary personal mutual introduction, brief programme introduction, cultural excursions, physical activities, city sightseeing;
- after: comments, notes, suggestions, lost and found, how to proceed.

PROGRAMME IN BRIEF – JUNE 23-28, 2024

- Sunday 23/06/2024 Registration of participants on site
- Monday 24/06/2024 Morning professional programme | Afternoon tour of the historic centre of Jihlava
- Tuesday 25/06/2024 Morning professional programme | Afternoon visit to the Bosch plant
- Wednesday 26/06/2024 All-day trip to technology and culture
 - 8:15 Jihlava
 - 8:50 Třebíč town (unesco) individual or organized 60 min. tour
 - 10:30 Dukovany Nuclear Power Plant 90 min. joint professional tour
 - 13:00 Telč town (unesco) joint lunch 60 min. including a walk through the centre
 - 14:30 Telč Chateau organized tour 50 min.
 - 15:50 Třešť Chateau, individual tour of the chateau park
 - 17:00 Jihlava
- Thursday 27/06/2024 Morning professional programme | Afternoon outdoor physical activities programme
- Friday 28/06/2024 Morning professional programme | Afternoon free programme, Conclusion, Farewell

BIP www: <https://konference.vspj.cz/konference/109/429>



College of Polytechnics Jihlava

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| Sunday | June 23, 2024 | Registration 16:00 – 18:00, Dinner 18:00 – 19:00 | DETAILED BIP PROGRAMME |
|------------------|----------------------|--|--|
| Monday | June 24, 2024 | <p style="text-align: center;">OPENING 8:50 – 9:00</p> <p style="text-align: center;">MODELLING 8:50 – 13:00</p> <p>9:00 – 10:30 • Mechanics for Mechatronics and Robotics – Statics (force analysis for construction of mechatronic and robotic systems) – Kinematics (definition of forward and inverse problem; trajectory planning and timing) – Dynamics (forward and inverse problem; classical mechanics of multibody systems)</p> <p style="text-align: center;">Break 10:30 – 10:40</p> <p>10:40 – 12:00 • Computer Aided Design (industrial modelling – technical documentation without drawings)</p> <p style="text-align: center;">Break 12:00 – 12:10</p> <p>12:10 – 13:00 • Applied Finite Element Methods (continuum mechanics: modelling and simulation)</p> <p style="text-align: center;">Lunch 13:00 – 13:30, rest time 13:30 – 14:30</p> <p>14:30 – 17:30 • Jihlava city sightseeing – centre, church towers (learning about history and the present)</p> <p style="text-align: center;">Dinner 18:00 – 19:00</p> | M E C H A T R O N I C S |
| Tuesday | June 25, 2024 | <p style="text-align: center;">MECHATRONICS 9:00 – 13:00</p> <p>9:00 – 10:30 • Mechatronics (milestones; structural and functional elements: electrotechnics, pneumatics)</p> <p style="text-align: center;">Break 10:30 – 10:40</p> <p>10:40 – 11:30 • Artificial Intelligence (principles, methods, and current technologies in artificial intelligence)</p> <p style="text-align: center;">Break 11:30 – 11:40</p> <p>11:40 – 13:00 • Cyber-Physical Factory (practical exercise in the school cyber-physical factory – Part 1)</p> <p style="text-align: center;">Lunch 13:00 – 13:30, rest time 13:30 – 14:30</p> <p>14:30 – 17:30 • Bosch Company (guided tour of robotic production)</p> <p style="text-align: center;">Dinner 18:00 – 19:00</p> | N I C S |
| Wednesday | June 26, 2024 | <p style="text-align: center;">Full-day TRIP to technology and culture 8:00 – 17:00</p> <p style="text-align: center;">Třebíč Chateau, Nuclear Power Plant Dukovany, Telč Chateau, Třešť Chateau Park</p> <p style="text-align: center;">Lunch 13:00 – 14:00, Dinner 18:00 – 19:00</p> | and R O B O T I C S |
| Thursday | June 27, 2024 | <p style="text-align: center;">ROBOTICS 9:00 – 13:00</p> <p>9:00 – 10:00 • Artificial Intelligence (practical demonstrations, applications)</p> <p style="text-align: center;">Break 10:00 – 10:10</p> <p>10:10 – 11:30 • Robotics (milestones; structural and functional elements, modelling) • Control Design, Reference Design and Planning (model-based approach in design)</p> <p style="text-align: center;">Break 11:30 – 11:40</p> <p>11:40 – 13:00 • Laboratory of Industrial Automation (design of modern teaching laboratory)</p> <p style="text-align: center;">Lunch 13:00 – 13:30, rest time 13:30 – 14:30</p> <p>14:30 – 17:30 • Physical activities (relaxed recreational activities under the guidance of the school expert)</p> <p style="text-align: center;">Dinner 18:00 – 19:00</p> | T I C S |
| Friday | June 28, 2024 | <p style="text-align: center;">APPLICATIONS 9:00 – 13:00</p> <p>9:00 – 9:30 • Laboratory of Production Processes (employment of CAD in manufacturing)</p> <p>9:30 – 10:00 • Laboratory of Additive Technologies (custom filament production, 3D printing in practice)</p> <p style="text-align: center;">Break 10:00 – 10:10</p> <p>10:10 – 11:30 • Cyber-Physical Factory (practical exercise in the school cyber-physical factory – Part 2)</p> <p style="text-align: center;">Break 11:30 – 11:40</p> <p>11:40 – 13:00 • Laboratory of Physical Activities (biomechanics: 3D recording and evaluation of body motion)</p> <p style="text-align: center;">Lunch 13:00 – 13:30, rest time 13:30 – 14:30</p> <p>14:30 – 16:00 • Leisure, discussions</p> <p style="text-align: center;">ENDING and Farewell</p> <p style="text-align: center;">Dinner 17:00 – 18:00</p> | W E E K 2024 CPJ |