

Short Intern projects 2019

Ural Federal University, Ekaterinburg, Russia
June 17 – July 27, 2019

destination for your education

Summer University UrFU

is an International short-term program, annually implemented at Ural Federal University, Ekaterinburg, Russia.

Benefits.

Program participants under the guidance of teachers of the Ural Federal University will solve pressing problems in their area of training. The result of the work will be a project. All projects are as practical as possible. Depending on the project chosen, students will visit the leading enterprises of the Urals Federal Region. In some cases, their work will be checked by representatives of the production. After successful defense, students will receive certificates. The best works will be marked by letters of recommendation.

Engineering projects for 6 weeks:

- Mechanical Engineering;
- Robotics;
- Power Engineering;
- Civil Engineering;
- Water treatment.




Contacts

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Short Intern projects descriptions.

| Mechanical Engineering | projects | description | partners: |
|------------------------|--|--|--|
| | 1. Design of Automated System for Utilization (Compression Briquetting) of Municipal Solid Waste | This project is about designing, automating, feasibility study of automated municipal solid waste utilization system. The system could be used as a first stage of recycling of municipal waste and can help to save space on the landfills. | Local waste service  |
| | 2. Design of Equipment for Automation of Processing Lines | This project is about designing, automating, controlling and optimizing overhead cranes, their components and operation. Those could be used for lifting and transporting loads in any automated manufacturing or warehouse facilities. | Ural locomotives  |
| | 3. Design of Bridge Crane Trolley for Specified Manufacturing Environment | This project is about designing, automating, controlling and optimizing overhead cranes, their components and operation. Those could be used for lifting and transporting loads in any automated manufacturing or warehouse facilities. | Uralmash plant  |

| | projects | description |
|------------------------|---|--|
| Mechanical Engineering | 4. Design of Car Repair Shop | The project has practical oriented approach. Students collect the initial data, such as market analysis, logistics of a specific location, demand, cost, etc. to make an investigation. Based on the data, students carry out their project in auto repair shop. All equipment, the number of employees, must have a business case. The use of this or that equipment should have reasonable reasons. |
| Computing | 1. Cyber security. | |
| Water treatment | <ol style="list-style-type: none"> 1. Preparation of drinking water from surface and underground water sources. 2. Purification and reuse of industrial wastewater. Industrial wastewater treatment and reuse. 3. Cooling water treatment. | Drinking water is necessary for people as well as clean air. Students choose the project most appropriate to the conditions of their home region. As part of the project, they develop an order (algorithm) for solving the problem on the basis of what kind of water is used for drinking, which sources of pollution are major in the region (industrial enterprises, organic pollution, chemicals from agriculture, etc.). The volume of water reserves and the load on it are taken into account. |

partners:

Ural locomotives



Local Water supply company Vodokanal



Robotics

projects

1. Two-way labyrinth with the shortest path calculation.
2. Trajectory with the elements of artificial intelligence for the automatic adjustment of the regulator's PID control coefficients.
3. Creation of a manipulator to solve the problem of the Hanoi Tower.
4. Flexible manufacturing cells.

description

All three projects are organized and carried out in the laboratory. Students need from the existing designers to assemble, program and test robots that solve specific technical problems.

partners:

ABB robotics



Robotics Club
"РобоКод"



ABB



IDGC of Urals



Power Engineering

1. Artificial Intelligence in Power engineering

The project concerns modern power supply and innovative energy management technologies.

projects

description

partners:

1. Design of cast-in-place reinforced structures of multistory building.

This project is about designing of flat slab and column of cast in place multiple store building.

Construction company
Atomstroy

2. Design of precast reinforced structures of multistory building.

This project is about designing of precast panel, beam, and column. Building is multiple store.



3. Design of main bearing steel structures of multistory building.

This project is about designing of steel frame main element and joints. Industrial building can be one-store or multiple store.

Building materials
plant Teplit

4. Design of main bearing steel structures of single storey industrial building.

This project is about designing of steel frame main element and joints. Industrial building can be one-store or multiple store.



5. Design of main bearing steel structures of long-span building

This project is about designing of steel frame main element and joints. Industrial building can be one-store or multiple store.

Special Short Intern projects descriptions.

| | projects | description |
|-------------------------------|--|---|
| Mechanical Engineering | <ol style="list-style-type: none"> 1. Forecasting the volume of repair work and their cost by groups of equipment and assessing the possibility of transferring equipment to service according to actual condition. | <p>This project is the result of the cooperation of the Ural Federal University with the Group of Companies of the Chelyabinsk Tube Rolling Plant. Within the course students learn how the work is organized and the technological processes are set up at one of the leading Russian enterprises for the production of pipes of different diameters. They will be asked to solve a specific production task as part of their educational project. The project will be led by professors of UrFU. Specialists from the factory will check and assess the results of the work.</p> |
| Computer Science | <ol style="list-style-type: none"> 1. Management of production equipment using machine learning. 2. Forecasting the cost of resources (scrap). 3. Forecasting power consumption. | <p>These projects are the result of the cooperation of the Ural Federal University with the Group of Companies of the Chelyabinsk Tube Rolling Plant. Within the course students learn how the work is organized and the technological processes are set up at one of the leading Russian enterprises for the production of pipes of different diameters. They will be asked to solve a specific production task as part of their educational project. The project will be led by professors of UrFU. Specialists from the factory will check and assess the results of the work.</p> |

partners:

Chelpipe group



CHELPIPE
GROUP

Schedule structure:

| WEEK 1. Orientation | | | | | | | |
|---|---|---|-----------------|-----|----------------|------------------------------------|----------|
| | MON | TUE | WED | THU | FRI | SAT | SUN |
| Morning | Breakfast | | | | | Activities offered by Buddy System | Free Day |
| | Opening Ceremony | Entrance test | General Lecture | | | | |
| Afternoon | Lunch | | | | | | |
| | Introduction | General Lecture | | | | | |
| Evening | Organizational issues | Culture Activities offered by Organizers and Buddy System | | | | | |
| WEEK 2. Project oriented Theory & Practices | | | | | | | |
| | MON | TUE | WED | THU | FRI | SAT | SUN |
| Morning | Breakfast | | | | | Activities offered by Buddy System | Free Day |
| | Lectures | | | | Industry Visit | | |
| Afternoon | Lunch | | | | | | |
| | Practices | | | | Industry Visit | | |
| Evening | Culture Activities offered by Organizers and Buddy System | | | | | | |

| WEEK 3. Project oriented Theory & Practices | | | | | | | |
|---|---|-----------------|-----|-----|----------------|------------------------------------|----------|
| | MON | TUE | WED | THU | FRI | SAT | SUN |
| Morning | Breakfast | | | | | Activities offered by Buddy System | Free Day |
| | Lectures | | | | Industry Visit | | |
| Afternoon | Lunch | | | | | | |
| | Practices | | | | Industry Visit | | |
| Evening | Culture Activities offered by Organizers and Buddy System | | | | | | |
| WEEK 4. Project development | | | | | | | |
| | MON | TUE | WED | THU | FRI | SAT | SUN |
| Morning | Breakfast | | | | | Activities offered by Buddy System | Free Day |
| | Introduction to the Projects | Individual work | | | Industry Visit | | |
| Afternoon | Lunch | | | | | | |
| | Group work. Work Plan and Tasks division | Consultations | | | Industry Visit | | |
| Evening | Culture Activities offered by Organizers and Buddy System | | | | | | |

| WEEK 5. Project development | | | | | | | |
|--|---|-----------------------------|-----------------|------------------|------------------|------------------------------------|---------------|
| | MON | TUE | WED | THU | FRI | SAT | SUN |
| Morning | Breakfast | | | | | Activities offered by Buddy System | Free Day |
| | Testing or Checking the first Results | Individual work | | | Industry Visit | | |
| Afternoon | Lunch | | | | | | |
| | Work Plan Correction | Consultations | | | Industry Visit | | |
| Evening | Culture Activities offered by Organizers and Buddy System | | | | | | |
| WEEK 6. Project finalization and Defence | | | | | | | |
| | MON | TUE | WED | THU | FRI | SAT | SUN |
| Morning | Breakfast | | | | | Departure day | Departure day |
| | Project Finalization | Preliminary Project defence | Preparation day | Projects Defence | Closing Ceremony | | |
| Afternoon | Lunch | | | | | | |
| | Consultation | Final Consultation | Preparation day | Final Defence | | | |
| Evening | Culture Activities offered by Organizers and Buddy System | | | | | | |