

BRIGHT International Summer School on: **3D printing** for medical applications

The main aim is to bring together professors, students, industrial and medical organizations and institutes in order to share knowledge and good practice experience and expertise in developing, producing and testing of medical parts that represent one stringent need in supporting hospitals that are trying to save lives of patients in the context of the CoVID.

**19 - 30
July
2021**

WHO CAN APPLY

More informations: www.bright-project.eu

Bachelor students (BSc)
Master students (MSc)
PhD students

SPECIALIZATIONS:

Manufacturing Engineering
Mechatronics & Robotics
Mechanical & Bio-Mechanical Engineering
Science of Materials
Physics & Chemistry
Medicine & Pharmacy

Organized by

in cooperation with
BRIGHT consortium



Register here



www.bright-project.eu

Registration until 1st of July 2021

MONDAY

19.07

9:00 - 9:30 Opening and Welcome ceremony:
9:30 - 10:00 Virtual tour (presentation of TU Cluj-Napoca)
 10:00 - 10:30 BRIGHT project presentation
 10:30 - 11:00 Partners presentation
 11:00 - 12:00 Presentation made by Medical institution: How engineers can support hospitals in the context of pandemic
 12:00 - 13:00 Lunch break
 13:00 - 13:30 Presentation related to the BRIGHT aims and objective of the International Summer school
 13:30 - 13:45 Presentation of the medical parts to be developed and realized by 3D printing + launching of teams competition
 13:45 - 14:00 Dividing in teams
14:00 - 15:00 CAD – Computer Aided Design (lecture)
15:00 - 16:00 CAD laboratory part 1 (working on medical parts prototypes design)

TUESDAY

20.07

9:00 - 10:00 CAD laboratory part 2 (working on medical parts prototypes design)
10:00 - 11:00 Validation of the proposed solutions by CAD experts – feedback (workshop / seminar)
11:00 - 12:00 CAE - Computer Aided Engineering (lecture)
 12:00 - 13:00 Lunch break
13:00 - 14:00 CAE laboratory part 1 (working on medical parts prototypes design)
14:00 - 15:00 CAE company presentation
15:00 - 16:00 CAE laboratory part 2 (working on medical parts prototypes design)

WEDNESDAY

22.07

9:00 - 10:00 Validation of the proposed solutions by CAE experts – feedback (workshop / seminar)
10:00 - 11:00 3D printing and Rapid Tooling (lecture)
11:00 - 12:00 3D printing company presentation
 12:00 - 13:00 Lunch break
13:00 - 14:00 Selecting of the adequate methods for printing the parts in cooperation with 3D printing experts (workshop / seminar)
14:00 - 15:00 Virtual Reality laboratory / Augmented reality experience
15:00 - 16:00 3D printing laboratory 1 (preparing the medical parts to be printed)

THURSDAY

23.07

9:00 - 10:00 3D printing experience – feedback of the experts (workshop / seminar)
 10:00 - 11:00 Discussion of issues occurred during the 3D printing process / improvements / corrections made in cooperation with 3D printing experts
11:00 - 12:00 3D printing laboratory 2 (preparing the medical parts (improved variants) to be printed)
 12:00 - 13:00 Lunch break
13:00 - 14:00 Process optimization and software control (lecture)
14:00 - 15:00 3D scanning and CMM control laboratory
15:00 - 16:00 3D printing experience – final feedback on behalf of the 3D printing experts (workshop / seminar)

FRIDAY

24.07

9:00 - 10:00 Laboratory on Topological optimization of CAD models / Optimization of 3D printing processes
10:00 - 11:00 Medical imaging and project based learning laboratory
 11:00 - 12:00 Conclusions and round table discussion with all participants at the end of the 1st week
 12:00 - 13:00 Lunch break
13:00 - 15:00 Virtual city tour of Cluj-Napoca

MONDAY

26.07

- 9:00 - 9:30 Welcome introduction speech about the aims and objective of week no. 2
- 9:30 - 10:30 Materials Science and Strength of Materials in medicine (lecture)**
- 10:30 - 11:00 Defining the specific types of samples to be realized by 3D printing and to be tested (workshop / seminar)
- 11:00 - 12:00 CAD designing of samples (laboratory)**
- 12:00 - 13:00 Lunch break
- 13:00 - 14:00 Topological / structural optimization of samples (laboratory)**
- 14:00 - 15:00 CAE of realized samples (laboratory)**
- 15:00 - 16:00 Game on competition**

TUESDAY

27.07

- 9:00 - 10:00 Preparing the samples to be 3D printed / setting of parameters (laboratory)**
- 10:00 - 11:00 3D printing of the samples (laboratory)**
- 11:00 - 12:00 Testing of mechanical methods (laboratory)**
- 12:00 - 13:00 Lunch break
- 13:00 - 14:00 Testing of mechanical parts realized by 3D printing processes (laboratory)**
- 14:00 - 15:00 Validation and interpretation of the results by mechanical testing experts – feedback (workshop / seminar)**
- 15:00 - 16:00 Company visit / presentation**

WEDNESDAY

28.07

- 9:00 - 10:00 Biomedical applications and challenges (laboratory)**
- 10:00 - 11:00 Medical engineering standards and tests (lecture)**
- 11:00 - 12:00 SEM / medical analysis experience (laboratory)**
- 12:00 - 13:00 Lunch break
- 13:00 - 14:00 Interpretation of the SEM results with the support of the experts – feedback (workshop / seminar)**
- 14:00 - 15:00 BRIGHT hospital / Medical institute visit**
- 15:00 - 16:00 BRIGHT challenge Debate**

THURSDAY

29.07

- 9:00 - 10:00 Flexible manufacturing systems in medical applications (lecture)**
- 10:00 - 11:00 Using and integrating CAD / CAM solutions and Robotic systems in creating of new 3D printing equipment (laboratory)**
- 11:00 - 12:00 Robotic factory / Hybrid manufacturing company visit**
- 12:00 - 13:00 Lunch break
- 13:00 - 14:30 BRIGHT evaluation of students
- 14:30 - 16:00 BRIGHT test corrections

FRIDAY

30.07

- 9:00 - 10:00 Presenting of the 3D printed parts and reports related to the research performed by the teams (workshop / seminar)**
- 10:00 - 11:00 Round table with medical and industrial partners of BRIGHT
- 11:00 - 12:00 BRIGHT closing ceremony