



# Integrating EPICS And Industry 4.0 Projects Into Engineering Curricula To Develop Graduate Attributes

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# STEM Education

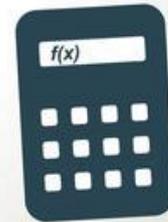
SCIENCE



TECHNOLOGY

STEM

ENGINEERING



MATHEMATICS



# The Two Examples

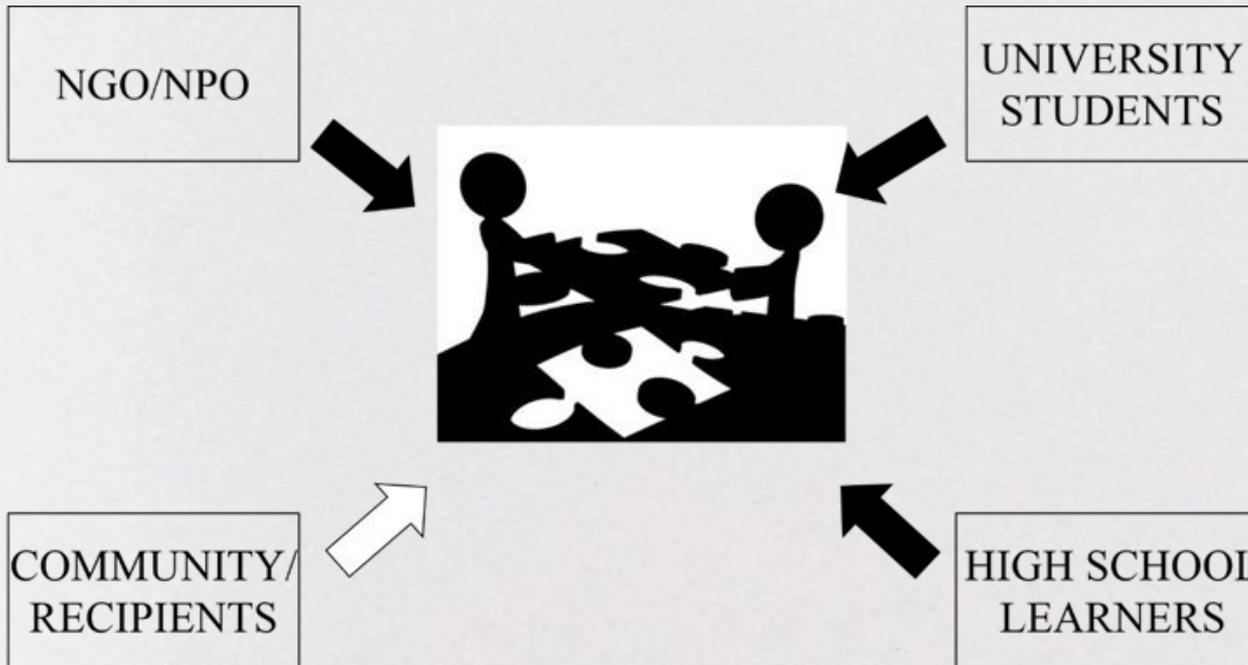
1. **Engineering projects in community services (EPICS) / Community engagement**
2. **Industry 4.0**



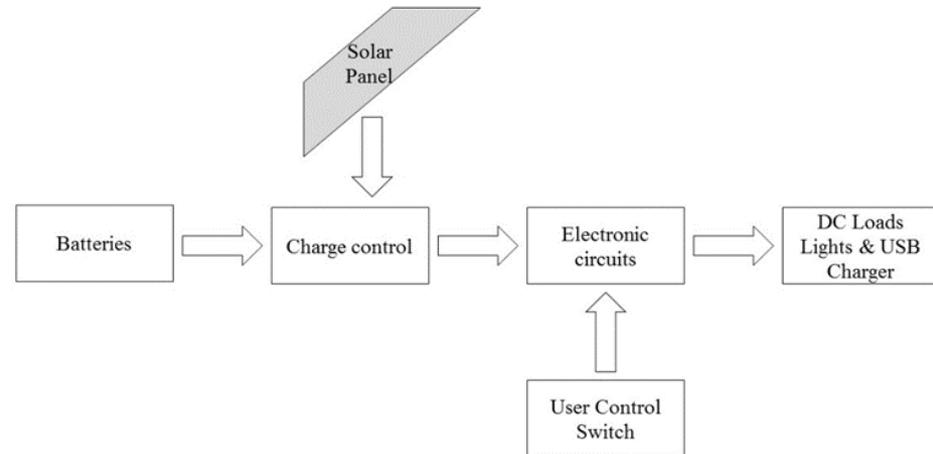
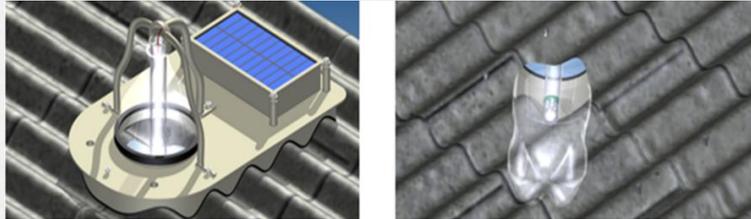
# What is EPICS?

**EPICS**  
**IN** **IEEE**

Engineering Projects in  
Community Service



# “Light (Sun in a Bottle).”

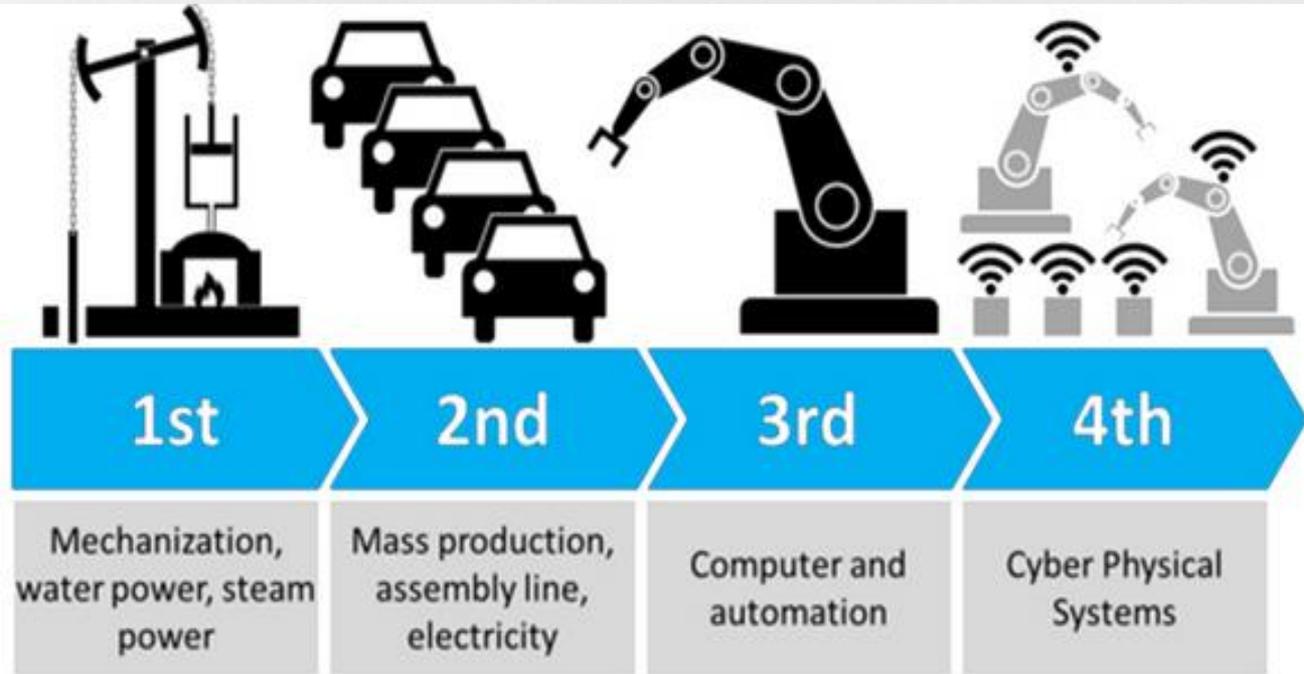


# Results of the EPICS project

1. University final-year/capstone engineering design projects and exit-level outcomes were achieved;
2. Participants worked as a team on engineering-related projects for a local NGO and its community;
3. The project prepared engineering graduates for the professional world;
4. The initiative took the engineering, engineering technology and built environment disciplines to the community through the “social innovation” EPICS-in-IEEE concept;
5. UJ value system was instilled while achieving technical/professional outcomes in preparing students for careers in the private, public and non-profit sectors.
6. Finally STEM education FOR high school learners.



# What is Industry 4.0?





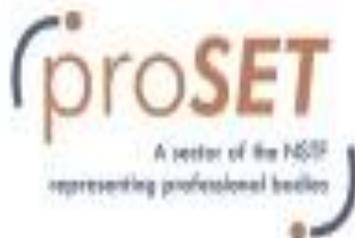
UNIVERSITY  
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UNIVERSITY OF JOHANNESBURG  
**MAKERSPACE**  
DOORNFONTEIN CAMPUS



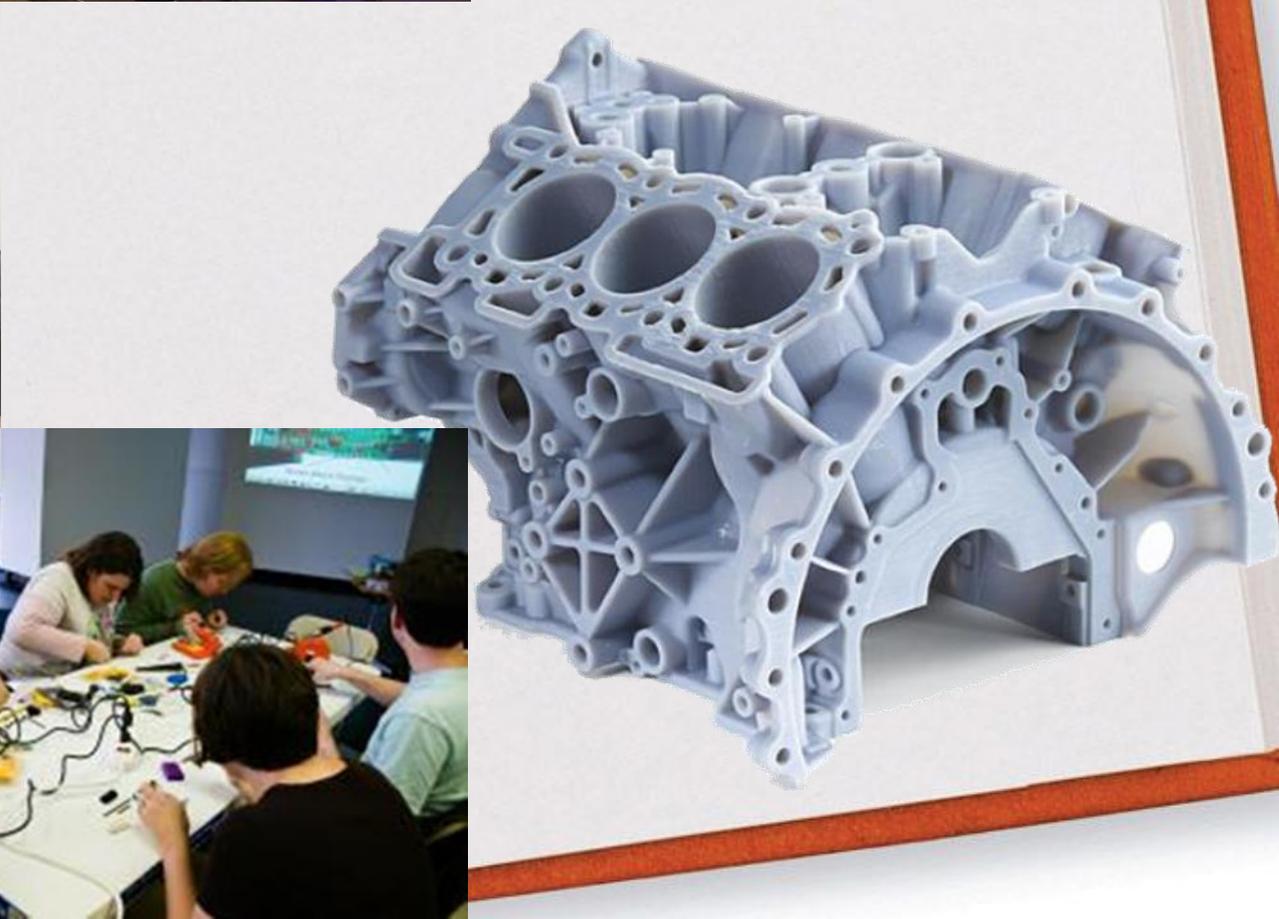
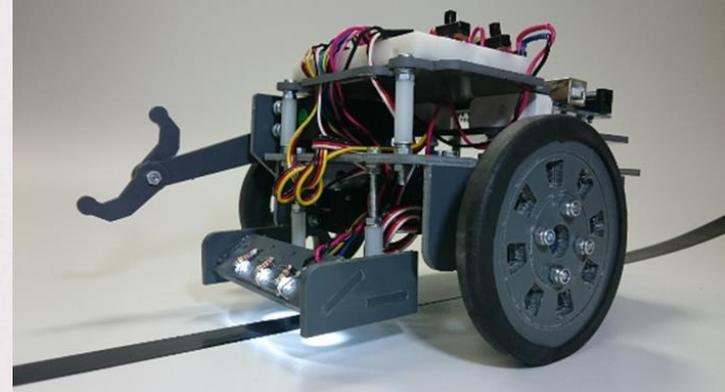
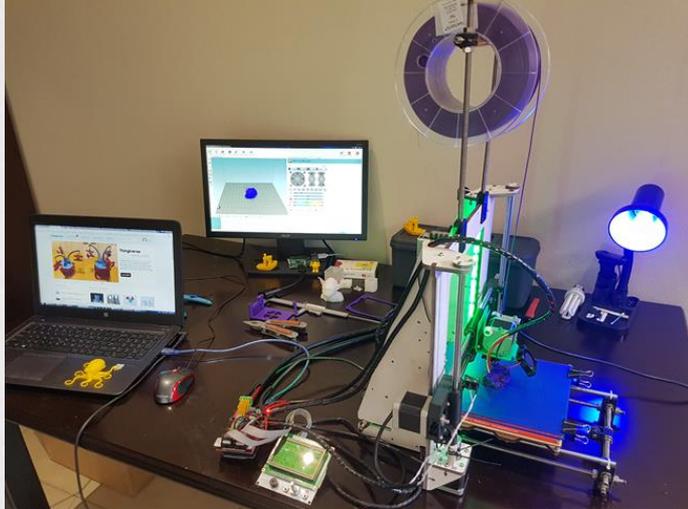
The Faculty of Engineering and the Built Environment (FEBE) in partnership with the UJ Library invite you to the

**MAKERSPACE Open Day**



*TechnoLab*

THE *Art* OF ACCOMPLISHMENT





# Conclusion

With technology for humanity in mind, there is room for vast improvement in engineering pedagogy in emerging countries, whether in the schooling, tertiary or working environments. South Africa is trying to emerge from the social inequalities that are the legacy of apartheid. In this regard, UJ makes an immense contribution, as its students are from diverse regions, socio-economic groups and cultural backgrounds. These graduates are transformed into individuals who in turn change the country; they frequently and quickly take up senior management positions. The individuals, however, at times get disconnected from their own areas of upbringing and this issue needs much attention. These areas are currently served by under-capacitated municipalities and NGOs. Expanding the approaches mentioned here in this presentation thus connects students early on to “real-world” engineering, makes a positive impact on communities, develops and sustains partnerships, STEM education and closes the loop on several ELOs that students need to attain in any case.



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“EDUCATION  
IS THE MOST  
POWERFUL  
WEAPON  
WHICH YOU  
CAN USE TO  
CHANGE THE  
WORLD.”

NELSON MANDELA

