

THE SINGAPORE INSTITUTE OF MANUFACTURING TECHNOLOGY (SIMTECH) & ADVANCED REMANUFACTURING AND TECHNOLOGY CENTRE (ARTC) OF A*STAR



Photo is for illustration purpose. (please send a high-resolution photo of the activity if possible)

Write-up pointers (500 words)

1. What is A*STAR?
2. The technology that is being used.
3. What is the activity about?
4. Why is this experience unique and how it will impact the future?

Example Template

As Singapore's leading research organization in Science and Technology, the Agency of Science, Technology and Research (A*STAR) drives mission-oriented research that advances scientific discovery and technological innovation. We play a key role in nurturing and developing talent and leaders for our Research Institutes, the wider research community, and industry.

The Singapore Institute of Manufacturing Technology (SIMTech) and Advanced Remanufacturing and Technology Centre (ARTC) are two of A*STAR's Research Institutes which focus on developing high value advanced manufacturing and remanufacturing technologies for and in collaboration with various multinational and local companies across a wide range of industry sectors – Precision Engineering, MedTech, Aerospace, Automotive, Marine & Offshore, Electronics, etc.

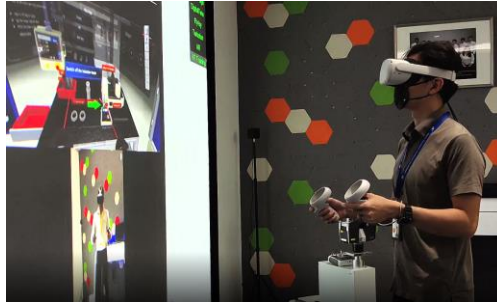
The proposed programme would consist of basic introductions to manufacturing, remanufacturing along with sharing of the future outlook and overview of key technologies in next generation manufacturing, followed by a guided tour of ARTC and/or SIMTech facilities and Model Factories. Two options are available for the tour – physical (if situation permits) and virtual. The physical tour will provide students an in-person walkthrough of modern / future manufacturing environments, coupled with on-site interaction with engineers and researchers as well as some hands-on activities. Examples of hands-on activities include experiencing VR technology for manufacturing and guided opportunity for students to perform certain manufacturing-related tasks. The virtual option will still allow a walkthrough of the ARTC facility in a guided format with a focus on selected stations; engineers and researchers may still be able to guest speak and participate in ask-me-anything sessions.

Key domains / technologies of advanced manufacturing and remanufacturing that can be covered in the programme are broadly categorized into the following:

- Smart Manufacturing and Internet of Things – e.g. digitalisation, augmented / virtual reality (AR/VR), connectivity, big data, data processing and analytics, etc.
- Advanced, Intelligent Robotics and Automation Systems
- Additive Manufacturing, i.e. industrial 3D printing
- Sustainability

In the tour and particularly during the interactions with our engineers and researchers, we will provide examples (and if possible, demonstrate) how such technologies are reshaping and revolutionizing manufacturing. Three examples are briefly described below.

The use of AR/VR allows for the interlacing of digital models and data with actual manufacturing environments for operators to work with higher efficiency and less errors.



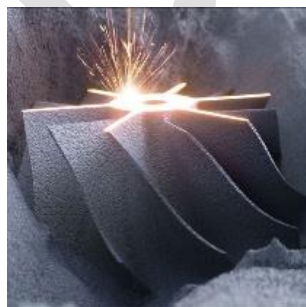
Use of AR/VR for a manufacturing operation in ARTC

The development and deployment of intelligent robots / automation systems are paving the way towards autonomous (or “lights out”) manufacturing where the machines are able to gather information from their surroundings and be able to make decisions, emulating human intelligence and performing tasks with better control and repeatability.



Smart picking robot in ARTC

Additive manufacturing allows for parts with complex geometries and material compositions to be printed or repaired with greater ease and efficiency, opening up greater opportunities to manufacturing and remanufacturing.



Additive manufacturing technologies for printing of complex parts (left) and repair (right)

While all these point towards increasing levels of autonomy, the key question “are humans still required” will be addressed where we aim to show how the roles of engineers will change and that there remains a need for upskilled manpower.

The programme is exclusively customized by CETRAN x IMDA for students to encourage and ignite Secondary school students' curiosity and creativity in applying scientific principles to develop smart solutions for a better future.

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