

**AMT
CE**

Ionad Oiliúna
Barr Feabhais
Ard-Déantúsaíochta
Advanced
Manufacturing Training
Centre of Excellence

POST PRIMARY SCHOOLS INFORMATION BOOKLET



**LMETB AMTCE FET ADVANCED MANUFACTURING PATHWAYS
SCHOOLS PROJECT 2022/2023 ACADEMIC YEAR**

Introduction

to the LMETB Advanced Manufacturing Training Centre of Excellence (AMTCE)
Mr. Martin G. O'Brien, Chief Executive, LMETB



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Chief Executive, LMETB

The LMETB Advanced Manufacturing Training Centre of Excellence (AMTCE) is a state-of-the-art training facility based in Dundalk, Co Louth which was established in January 2021.

The purpose of the AMTCE is to provide training on state-of-the-art equipment and processes which will underpin the transition of Irish companies to industry 4.0 based operations. The centre provides a dynamic catalogue of training courses which are tuned to the needs of industry and delivered by leading industry training practitioners.

At present, the AMTCE is offering world class skills training, apprenticeships, and level 5/6 courses in Robotic Processes, Cobotics, Additive Manufacturing, IIoT, CAD/CAM, Industrial Control, Cybersecurity, Process Optimisation (Lean 6 Sigma), BioPharma and Food Processing amongst other areas.

Pathways & Transitioning Opportunities

the Further Education and Training (FET) Directorate LMETB



Ms. Sadie Ward McDermott
Director of FET, LMETB

The LMETB FET Directorate provides courses and programmes in a wide array of disciplines to both a broad and targeted audience, which includes school leavers, persons seeking upskilling and reskilling, those researching career change, the unemployed, those not in the workforce and those who are seeking employment. FET programmes and courses focus on experiential learning, alongside the acquisition of knowledge, skills and competency development.

As part of the FET Directorate provision, LMETB also provides for structured Pathways and Transitioning opportunities for students and learners to participate in and experience FET. The AMTCE FET Advanced Manufacturing Pathways Schools Project is one such programme, which combines access to cutting edge technologies in a state of the art FET premises, thus facilitating creative exploration

and application of innovative and problem solving skills to project challenges.

This schools pathways programme also critically provides CPD opportunities for teachers which then facilitates cascading of skills, knowledge and competencies within subject departments in school settings.

The LMETB FET Directorate, supported by DFHERIS and SOLAS are acutely aware of the synergies and potential for expansion of such a programme. In this regard we look forward to welcoming the next group of schools, teachers and learners to the AMTCE for the forthcoming expanded AMTCE FET Advanced Manufacturing Pathways Schools Project during the 2022/2023 Academic Year.

The AMTCE Further Education and Training (FET) Advanced Manufacturing Pathways

Schools Project

Ms. Fiona Kindlon, Director of Schools, LMETB

With the opening of the LMETB's AMTCE, LMETB schools were provided with exciting and innovative new opportunities to enhance the student learning experience by establishing linkages with the Centre.

In late 2021, the AMTCE commenced the roll out on a pilot basis of the Further Education and Training (FET) Advanced Manufacturing Pathways Schools Project.

The programme's project challenge introduces students and teachers to real-world applications of STEM and technologies used in advanced manufacturing, enabling both teachers and students to learn new skills that allow them to better contextualise what is taught in schools with the requirements of the modern workplace. Students experience real-life applications of engineering/ICT whilst also interacting with engineers from diverse backgrounds, highlighting potential career paths available to them in all areas of STEM, whilst teachers also have the opportunity to

upskill in design software and 3D printing technologies.

The FET Advanced Manufacturing Pathways Schools Project was piloted with four LMETB Post Primary Schools and Colleges, two in Co. Louth and two in Co. Meath. The four Post Primary Schools were delighted to be involved in this unique and innovative project incorporating the latest technologies such as Virtual Reality (VR), Augmented Reality (AR) and Robotics.

For the Academic Year 2022/2023 the AMTCE is now expanding the availability of this programme to all Post Primary Schools in LMETB.

Further information on the AMTCE is available on www.amtce.ie



Ms. Fiona Kindlon
Director of Schools, LMETB

Introduction to Advanced Manufacturing

Advanced Manufacturing is a hugely important part of the Irish Economy and accounts for more than 30% of GDP. Manufacturing is currently undergoing to what is commonly referred to as the 4th industrial revolution or the transition to Industry 4.0. At the heart of the Industry 4.0 is the transition to fully digitised manufacturing. This requires the use of a variety of technologies and the development of the hands-on skills to deploy and use these technologies. Many exciting and well-paid jobs are emerging as a result of this transition.

The LMETB AMTCE FET Advanced Manufacturing Pathways Schools Project provides a fantastic opportunity for students

to learn about developing career opportunities in advanced manufacturing and to acquire key skills which they can use in their future career development journey. Participating in the project gives students and teachers the opportunity to see and to get hands-on experience with cutting edge technologies in the AMTCE. My staff and I are looking forward to seeing you here in the centre in the near future as we embark on this exciting journey.



Mr. Michael McGrath
Technical Director, AMTCE

The AMTCE Further Education and Training (FET) Advanced Manufacturing Pathways

Schools Project

The AMTCE Further Education and Training (FET) Advanced Manufacturing Pathways Schools Project incorporates the latest technologies such as Virtual Reality (VR), Augmented Reality (AR) and Robotics available in state-of-the-art FET or similar centres, to enhance and enrich the learning experience.

The aims of engagement with the project include:

- » Provide a unique opportunity for students and teaching staffs to engage in active learning in a FET or similar centre in the region affording access to state of the art equipment and technologies.
- » Enable, support, and encourage students participating to see career pathways from school to FET and onwards into employment in the areas of Advanced Manufacturing and Digital technologies.
- » Provide awareness of the ever-growing manufacturing, advanced manufacturing and technology sector
- » Promote awareness of digital skills for the workplace
- » Foster awareness of current industry initiatives
- » Deliver a diverse sampling of technology use in the manufacturing setting
- » Provide students with an understanding of Robotics operation and applications
- » Provide opportunities for students to further develop their skills including communication, being creative, managing information and thinking, research, working with others and working with digital technology
- » Provide an environment for students to discuss and engage in modelling ideas and structured innovation with skilled engineers
- » Facilitate students in engaging with the process of 3D Modelling and optimisation for printing
- » Provide students with hands on experience of using a variety of 3D printing technologies used in Additive Manufacturing
- » Inspire students to consider tech careers and advise on appropriate career paths
- » Facilitate students in shaping their career ambition and in realising their career goals
- » Promote linkages with post-primary education, training, and employment opportunities
- » Develop awareness of the importance and skills of cyber security



Integration

into Transition Year

The Transition Year Programme is a unique, one-year programme that promotes the personal, social, vocational and educational development of students and prepares them for their role as autonomous, participative and responsible members of society (Transition Year Guidelines, 1994, Department of Education). TY provides a bridge to enable students to make the transition from the more dependent type of learning associated with Junior Cycle to the more independent learning environment associated with Senior Cycle. It encourages the development of a wide range of transferable critical thinking and creative problem solving skills.

A key feature of Transition Year should be the use of a wide range of teaching/learning methodologies and situations. The goals and objectives of the programme can best be achieved by placing particular emphasis on negotiated learning, personal responsibility in learning, activity-based learning, team teaching approaches, group work, discussion, debate, interview, project work and research, visiting

speakers and seminars, study visits and field trips and work experience and work simulation.

The combination of activities in the AMTCE Further Education and Training (FET) Advanced Manufacturing Pathways Schools Project programme including visits in to the school, visits out to the AMTCE and other research centres, brainstorming sessions with groups of students, idea generation, concept and prototype development, practical workshops and opportunities to consider career opportunities for the future will really enhance and enrich the learning experience for all students going forward and enable them to further develop their individual skills and qualities.

Transition Year Co-ordinators will be delighted therefore that the AMTCE Further Education and Training (FET) Advanced Manufacturing Pathways Schools Project could easily be incorporated into the TY Specific Layer of their school's Transition Year Programme.



Schools Programme Timeline

for the Academic Year
2022/2023

For the 2022/2023 Academic Year, the project will have a minimum of twenty Transition Year students per school.

The project will be launched on the 20th of October 2022 at a meeting of Principals/Deputy Principals/Guidance Counsellors/Transition Year Co-ordinators and Technology Subject Co-ordinators in the AMTCE.

Information booklets and a link to a promotional video will be provided on the day along with application forms for schools to become involved in the project.

The closing date for submission of application forms will be 5pm on Friday 28th October 2022.



In advance of the programme commencing with the students, teachers in each of the schools will be in a position to avail of training by the AMTCE to support them in the development and implementation of the programme in their classrooms. Full details will issue to schools after the launch of the project.

The project will commence in November 2022 and conclude in May 2023. The different elements of the programme are outlined below

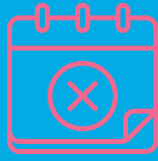
Stages in the programme	Indicative Timelines	Duration
1. Teaching Training in advance of the students commencing the project (up to four teachers per participating school)	November 2022	1 – 3 Days
2. One School Visit to meet with Teachers & Students to explain the project/ commence the project etc	November/December 2022	Max 2 Hour Workshop
3. One School Offsite Workshop sampling/ using Advanced Manufacturing Technology. This will be held in the AMTCE and/or similar Advanced Manufacturing Facility. This will include Teachers and Students.	January/February 2023	Half day duration for workshop
4. One Follow up School Visit to meet with Teachers & Students to review project to date and discuss progression of project idea	March/April 2023	Max 2 hour Workshop
5. Attendance at Awards Ceremony	May 2023	Full day duration

Further information on each of these stages is included over the next two pages of this Information Booklet.



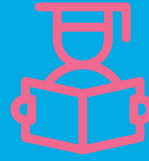
Project Launch

20th
October
2022



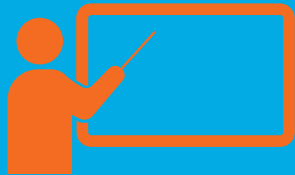
Submissions Closing Date

Friday 28th
October
2022



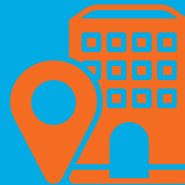
Min.
20

Transition
Year Students
per school



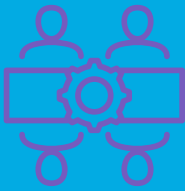
Teaching Training

November
2022



School Visit

November
/December
2022



Offsite workshop

January
/February
2022



Follow up school visit

March
/April
2022



Awards Ceremony

May 2023

Stage 1 **Teacher/Staff PD/CPD Training**

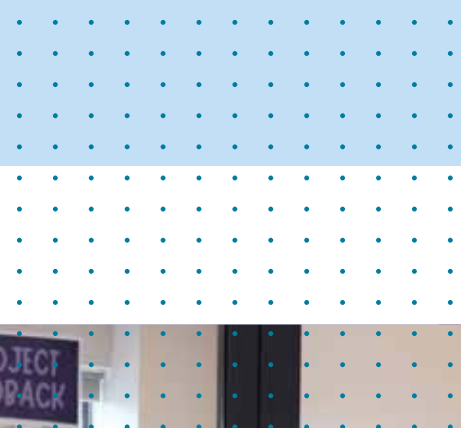
- » Delivery of 3D modelling and 3D printing training to teachers and staff teams involved in the programme.
- » The training aims to ensure that teachers can support their students during the development of each activity and resolve any challenge students might have with the 3D printer.
- » The training session may take place during the weekend, daytime or after school
- » Teachers will have full time /continuous access to the project's tutors and consultants.
- » Activities: 3D Stage 1- Printing Workshop.
- » Understanding of the design process and design thinking methodology.
- » Familiarising with 3D modelling software.
- » Get involved in the 3D printing process.
- » Use and maintenance of 3D printers.
- » Familiarising with robotics.
- » Familiarising with the importance and skills of cyber security.





Stage 2 **Student Training Onsite in School**

- » Introduction to Additive Manufacturing & 3D Printing Challenge
- » Students will be introduced to the challenge they will be working on.
- » This challenge will be rooted in project-based learning
- » The project will start with an idea and finish with the production of a product. This way the programme becomes more interesting and motivating for students.
- » Material on design thinking methodology will be provided.
- » Engagement and visits to the AMTCE by students and staff involved in the Pathways project allows for the students to step out of the school environs into the highly specialised FET centre of Excellence, AMTCE, located in Dundalk, Co Louth. The visits to the centre will take the form of workshops, seminars alongside active learning to support student's engagement in the project alongside introducing the students to the FET centre.
- » The training aims to ensure that teachers can support their students during the development of each activity and resolve any challenge students might have with the 3D printer.
- » The training session may take place during the weekend, daytime or after school
- » Teachers will have full time /continuous access to the project's tutors and consultants.
- » Activities: 3D Stage 1- Printing Workshop.
- » Understanding of the design process and design thinking methodology.
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Stage 3 Student Advanced Manufacturing Training Centre of Excellence (AMTCE) Site Visits

- » The idea during the visits to the AMTCE is to introduce the teachers and students to Industry Standard Facilities, what they do, and the new technologies used in Industry 4.0 by taking part in interactive demos. This will show them how manufacturing is evolving and adapting. It will also allow them to interact with researchers that come from science and engineering backgrounds changing the stereotype that all engineers wear boots and helmets.
- » As part of the demonstrations and active learning opportunities, each group will meet with the External Technical Consultants for the programme to discuss their ideas/projects, the feasibility of them and how they could be improved.
- » Each group of students, will have completed preparatory project scoping in advance of visiting the AMTCE. This information will be reflected on a Mood Board and based on the feedback each group will start to work on their own prototype activities:
- » The AMTCE has adopted the use of advanced and innovative technologies and equipment as it works alongside industry to enable and support company upskilling and re skilling of staff teams. thus, access to technologies in Robotics is a key advantage for the Pathways project participants. During the visits to the AMTCE, structure inputs involving hands on training is supported in Robotics and AI.
- » Through use of adapted FET curricula training delivered appropriately to students utilising active learning and AI technologies available in the FET centre. Artificial Intelligence: Students learn what AI is, how it works and different applications available in the industry.
- » It is expected that the External Technical Consultants will visit the school up to 4 times during the project term.



Stage 4

Additional visits to School (if needed)

- » Should further help be requested by the teachers or students regarding the modelling or printing of the project the External Technical Consultants may visit the school again if required.

Stage 5

Student Presentation of Results

Each school who engages with the AMTCE FET Advanced Manufacturing Pathways School Project will host a Student Celebration of Creativity and Innovation in their school as part of the TY Programme in April 2023. At this event a panel of adjudicators appointed by the AMTCE FET Advanced Manufacturing Pathways Schools Project Team will visit the school to meet with students and find out more about their journey through the project and discuss the project ideas and concepts. Students will be asked to prepare posters, journals, prototypes for this event to assist the panel in discussing the steps taken by the group during the project. Typical discussions at this event will be focused on:

- » The background or context of the idea
- » The different ideas they came up with before choosing the final one
- » Problems /hurdles encountered, and strategies /solutions identified and deployed
- » Problems faced while developing the product and how they solved these problems,
- » Impact of their product on people's lives
- » Improvements that could be added to their design
- » Advice for incoming TY students on the benefits of this programme

At this event each student who has engaged in the programme will be presented with a Certificate of Participation and Engagement with the Programme. This Certificate can be included in the student's Transition Year Portfolio and will prove extremely beneficial for the student when completing CV's and application forms for jobs and/or college. Engagement with the project will also provide students attending interviews with practical examples of how they have developed their skills and qualities during their time in school.

The team of adjudicators will nominate two groups from the school to represent the school at the Annual Student Awards Ceremony.

In May 2023 students who have engaged with the project and have been nominated by the team of adjudicators to represent their school will be invited to participate in the AMTCE Further Education and Training (FET) Advanced Manufacturing Pathways Schools Project Awards Ceremony in Dundalk, Co. Louth. Each school will have an opportunity to showcase two projects and the judging panel on the day will award a 1st, 2nd and 3rd Prize to conclude the competition.



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For further information on the AMTCE FET Advanced Manufacturing Pathways Schools Project please email: amtce@lmetb.ie

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