School of **Computing, Engineering & Digital Technologies**

Engineering

Laboratory Facilities

Teesside
University

Contents

Introduction

The School of Computing, Engineering & Digital Technologies at Teesside University is a centre of excellence across engineering, computing, games and animation, media, communications and the digital arts.

Our specialist engineering, digital production facilities and specialist teaching studios cover a range of disciplines and are all at the forefront of digital and technological innovation.

Our engineering laboratories include designated areas for aerospace engineering, civil engineering and the built environment, computer-aided design and manufacture, power plants, control systems and automation, electrical engineering and telecommunications. We also have specialist pilot plant facilities for chemical and mechanical engineering.

Flight Simulation Laboratory

This laboratory contains a MP521 Merlin Engineering Flight Simulator and a MP500-1 Air Vehicle Design / Development Simulation System. A facility in which students can design an aeroplane and test it in flight simulation. Also included in this laboratory is an extensive range of equipment which is used to develop and enhance the process engineering skills of students.

Thermofluids Laboratory

Includes Heat Exchangers, Fluid Friction Measurement, Pressure drop apparatus, Chemical Reaction equipment, Flow in Pipe Networks, Armfield Flume, S3 Tilting 3M Long, Hydraulic Benches.

Civil Engineering and Built Environment Laboratory

Materials / Structure / Equipment Testing Facility, 5 T Overhead Crane and a strong floor fitted with securing points. Enables full scale structural testing (ie. Bridge Sections). Includes Universal Testing Machine, Dennison T42B / 7614.

Universal frames and Stands, structure forces, beam forces, torsion, shear, Triaxial Test Apparatus, Compressive Strength of Rock Test Loading Frame.

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Electro-technology Laboratory

This laboratory contains an automated assembly system plus modular experimental equipment which includes a wide range of electrical equipment, instrumentation, sensors and signal conditioning experiments.

Control Systems Laboratory

This laboratory has numerous computer interfaced control systems with up-to-date instrumentation. It has leading industry software, Matlab, which is used for a large proportion of the control, linear systems, instrumentation and project work. Teamed with real-time control executive Simulink and a range of specialist tool-boxes, it is linked to analyse and synthesise real-time control of physical systems.

SCADA Laboratory

A SCADA (Supervisory, Control and Data Acquisition) Delta V system is installed in this laboratory, the SCADA system is industry standard equipment used extensively for controlling power stations and major chemical plants.

Electronics and Communications Laboratory

This laboratory is a facility for the design and testing of analogue and digital systems for electronics. The laboratory includes analogue, digital electronic experiments and communication systems.

Power Engineering Laboratory

Electrical / Electronics: Contains Power engineering equipment which allows students to explore the practical aspects of power generation and distribution systems including smart grids, renewable energy sources, real time embedded control systems. The facility replicates characteristics of major power stations and wind generation facilities.

Computing Laboratories in Stephenson building

The School has a number of computer laboratories, these computers are used for both timetabled and freelance activities.

In addition there are many computers linked to equipment in the specialist laboratories. The computers are equipped with general and specialised software.

Engineering Projects Laboratory

Formula Student: A laboratory in which students can undertake practical work associated with the design, manufacture and assembly of a racing car. This includes a formula student car.

Electric Motorbike Project: A team of students are designing, developing and converting a petrol engine motorbike into an electrically propelled motorbike.

Aerospace: A laboratory in which students can undertake practical work associated with aerospace engineering. Contains an Aeroplane built in the 1980s which has not yet flown, however it is intended to have this aeroplane approved for flight in approximately 18 months.

Mechanical Science Laboratory

This specialised facility includes a 3D scanner, VisEng photo-elastic stress analysis equipment, universal mechanical experiments, bending and shear stress equipment, viscosity experiments.

SEM Laboratory

This Hitachi scanning electron microscope is used extensively for research and project work. The laboratory also includes materials characterisation equipment, EDX, XRF.

Applied Materials Laboratory

The Applied Materials laboratory has an extensive range of materials preparation and testing equipment. These facilities allow students the opportunity to develop the skills and expertise in materials and their applications. The laboratory includes Instron testing machines, universal testing machines, Vickers hardness testing machines, Manumould injection moulding machines, microscopes, small furnaces, polymer processing equipment, X-ray diffraction, surface roughness experiments, 3D printing and laser cutting.
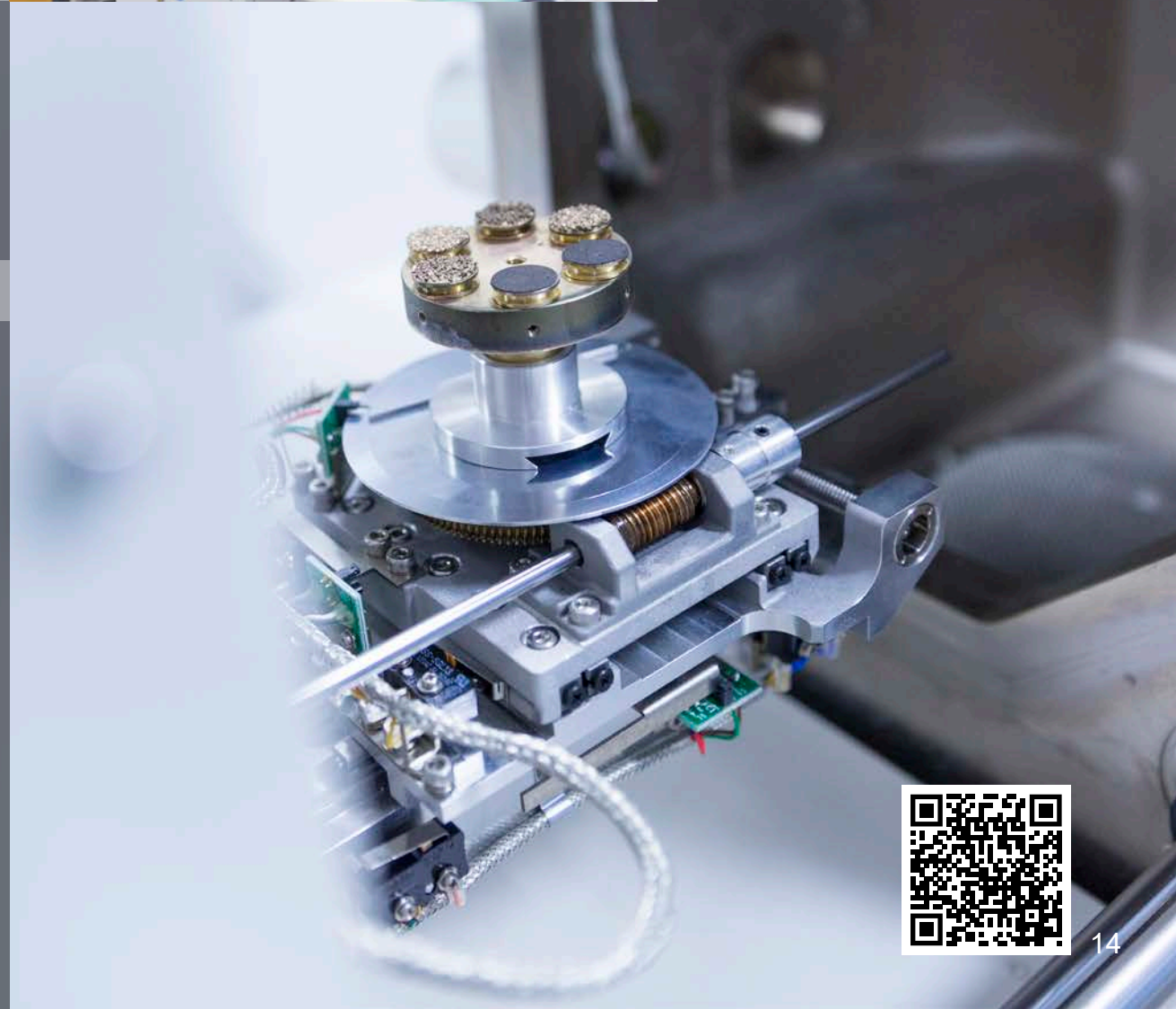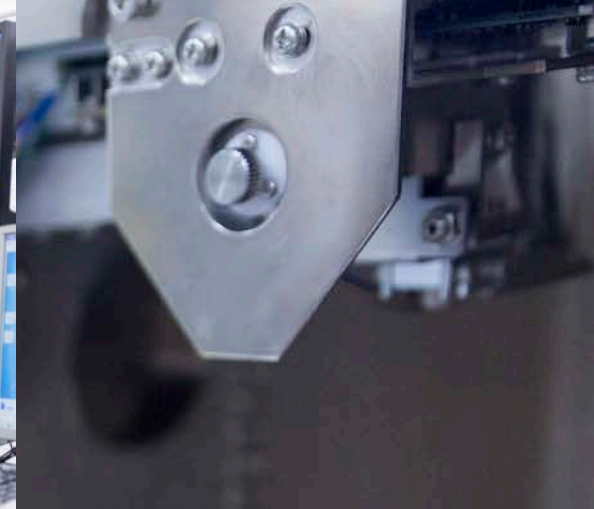
Engineering Workshop and Foundry

A general engineering, machining, fabrication and foundry facility. In which students develop their skills and understanding of engineering machine tools, fabrication and foundry work. Students then have the option of using these facilities to complete aspects of practical project work. Includes CNC Lathe, CNC Milling Machines, Drilling Machines, Fabrication Equipment.

A metal casting facility is also located in this laboratory, this facility is used to develop the skills and understanding of mould preparation and aluminium casting techniques. Includes a Flame fast CM350 crucible furnace and extraction unit, metal moulds and associated hand tools.

Distillation Process Laboratory

Includes Methanol / Water pilot scale Distillation columns and an Absorption column.

Oil and Gas Engineering Laboratory

A specialist laboratory which is equipped with enhanced oil recovery, core analysis equipment and Surface characterisation. The facilities allows the study of the properties of rocks, particularly the measurement of porosity and evaluation of fluid flow through porous media. Includes Zeta Analyser (rock surface analysis), Mud Measuring equipment (density, rheology, filtration), Helium Porosimeter, Gas Permeameter, age), Unsteady State Permeameter System and a Quantachrome BET Analyser.
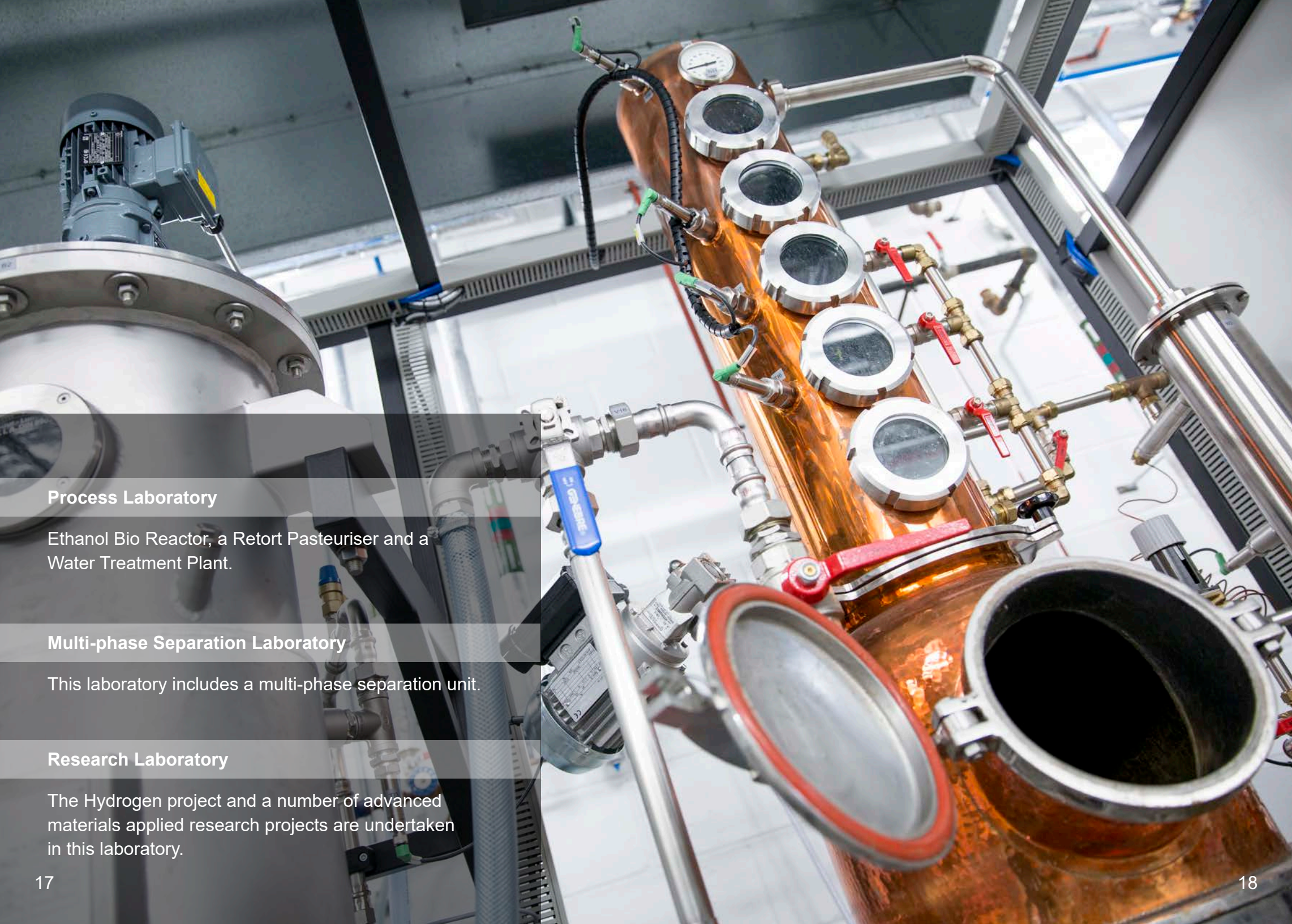
Process Laboratory

Ethanol Bio Reactor, a Retort Pasteuriser and a
Water Treatment Plant.

### Multi-phase Separation Laboratory

This laboratory includes a multi-phase separation unit.

Research Laboratory

The Hydrogen project and a number of advanced
materials applied research projects are undertaken
in this laboratory.

Lecture Theatres

The department has several large lecture theatres with capacities up to 300 for teaching and as a venue for annual events such as the Animex Conference.
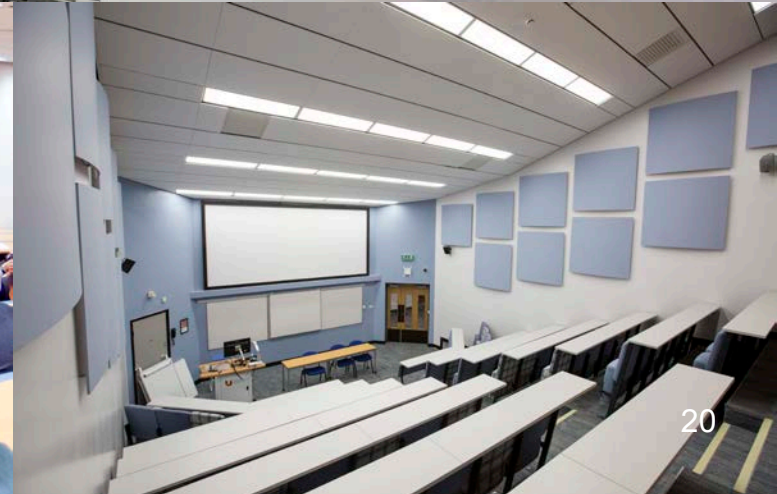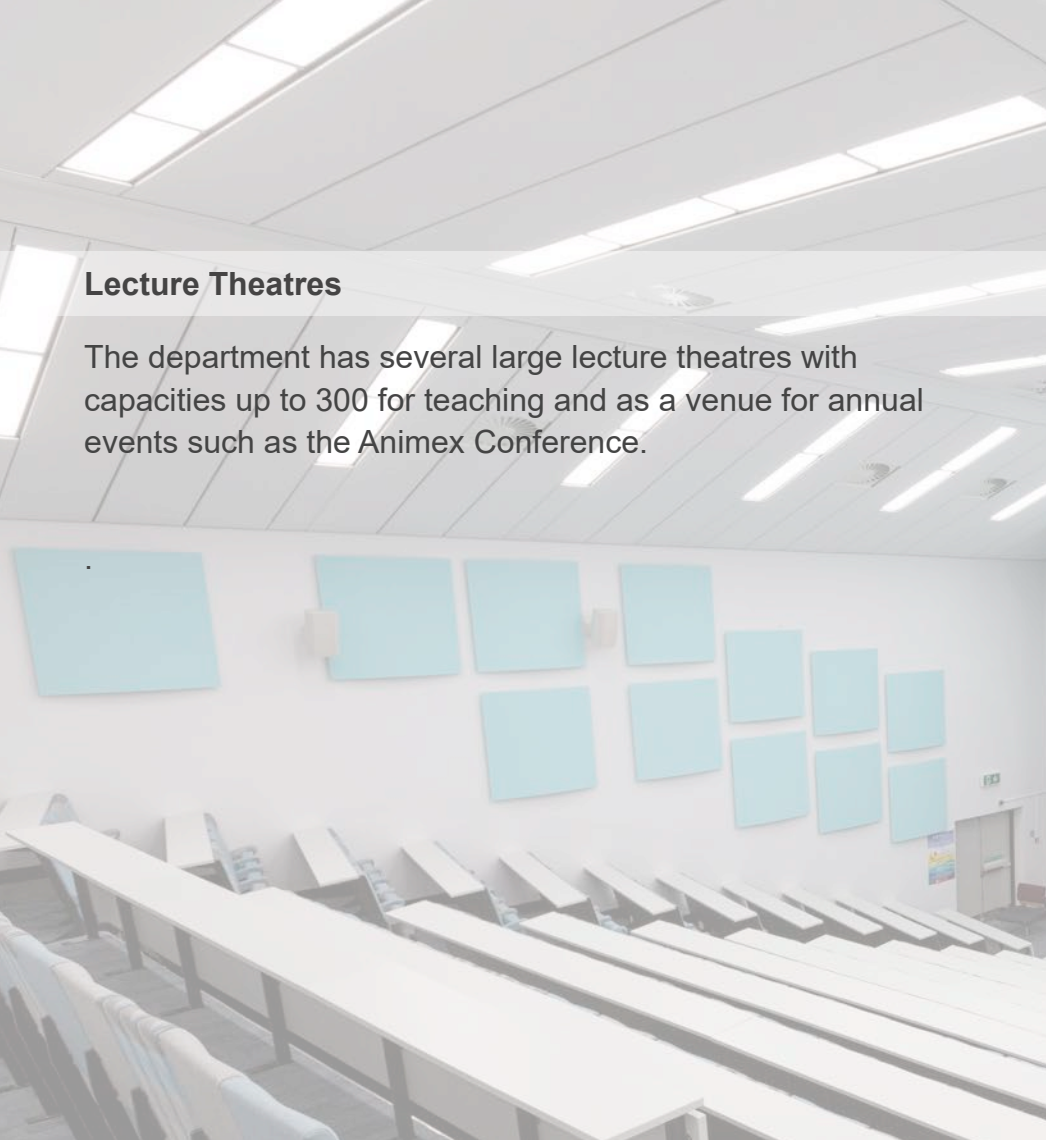
Appendix One: Studios & Laboratories

Athena

AG.06	Convergent Newsroom (PC Lab)
AG.09	Broadcast News Studio
AG.10a	Sound Control (Connected to TV Control & Broadcast News Studio)
AG.10b	TV Control (Connected to Sound Control & Broadcast News Studio)
AG.11	Media Production Lab
AG.12	Athena Edit Lab
A2.01	Comics
A2.03	Stop Motion
A2.05	Games Studio
A2.06	Games Studio
A2.07	Concept Art
A2.08	Games Studio
A2.09	Games Studio
A3.02	Linux Studio & Digital Media Programming & Database Studio
A3.04	Stop Motion
A3.05	Drawing Studio
A3.07	Drawing Studio
A3.08	Digital Media Programming and Database Studio with Editshare.
A3.09	Games Studio
A3.10	Games Studio

Aurora

AU1.04	TUCan Studio
AU0.05	Aurora TV Studio

Greig

G1.47	Meeting Room

Stephenson

IC0.18:	Enterprise Laboratory.
IC0.19:	Civil Engineering / Built Environment Laboratory.
IC0.26 / 0.28,	Engineering Workshop and Foundry
IC0.33:	Electro-technology Laboratory.
IC0.34:	Control Systems Laboratory
IC0.35:	SCADA Laboratory
IC0.37A	Flight Simulation
IC0.37B	Thermo-fluids Laboratory
IC0.38	Mechanical Science Laboratory
IC0.39	SEM Laboratory
IC0.42	Applied Materials Laboratory
IC0.47A	Engineering Projects Laboratory (Formula Student, Electric Motorbike & Aerospace).
IC0.47B	Power Engineering Laboratory
IC1.01a	Animation and Visual Effects Studio + Games Studio
IC1.01b	Animation and Visual Effects Studio
IC1.01c	Animation and Visual Effects Studio
IC1.01d	Meeting Room (Screening room)
IC1.60	Motion Capture
IC1.61	Virtual Reality
IC1.63	Computer Laboratory
IC1.65	Computer Laboratory
IC1.69	Electronics and Communications Laboratory
IC1.72	Computer Laboratory
IC1.73	Computer Laboratory
IC1.76	Computing Laboratory
IC1.77	Digital Media Programming and Database Studio

Europa

IT0.11	Final Year Studio
IT0.13	MAC Studio (Mobile Programming)
IT0.15	Linux Studio
IT0.31	Traditional Animation Studio
IT1.08	Digital Media Programming and Database Studio
IT1.10	Digital Media Programming and Database Studio
IT1.11	Linux Studio
IT1.30	Freelance Studio
IT1.35	Freelance Studio
IT1.31	Digital Media Programming and Database Studio
IT1.34	Collaborative Learning Environment Studio
IT2.34	Networks Studio
IT2.41	Networks Studio
IT2.42	Networks Studio
OL3	Concept Art Studio
OL8	Games Programming Studio
OL9	Games Programming Studio

Mercuria

MC0.04	Hall
MC0.06	Dance Studio
MC0.10	Music Studio

Middlesbrough Tower

M8.04	Hydrogen Project / Research Laboratory
M10.08	Research Laboratory

Orion Building

CE0.01	Distillation Process Laboratory
CE0.02	Process Laboratory
CE0.03	Open Access Computer Laboratory
CE1.01	Distillation Column Laboratory
CE1.02	Oil and Gas Engineering Laboratory
CE1.03	Open Access Computer Laboratory
CE1.13	Computer Laboratory
CE1.20	Process Engineering Laboratory
CE2.01	Distillation Column Laboratory
CE2.02	Multi-phase Separation Laboratory.
CE2.03	Open Access Computer Laboratory

Phoenix

PG.07	Music Lab
PG.16	Sound Stage
P2.10	Postgraduate Studio – Concept Art
P2.11	Postgraduate Studio

Parkside West

PSW0.22	Dark Room
PSW0.13	Photography Studio 1
PSW0.14	Photography Studio 2

Waterhouse

W2.01	Performance Prep Space
W2.02	Performance for Live & Recorded Media Studio

Please contact the School of Computing, Engineering & Digital Technologies on 01642 342631 or email scedt-enquiries@tees.ac.uk.

Teesside University