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UNIVERSITY

Western Sydney University's Centralised Facilities Instrumentation List

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Advanced Materials Characterisation	Description	Campus	Building
Digital Instruments Multimode Scanning Probe Microscope	The Digital Instruments Multimode Scanning Probe Microscope is a low noise, high resolution scanning probe microscope. It operates in a number of modes e.g. contact, tapping, and STM.	Parramatta South	EHa
Fourier Transform InfraRed (FTIR)	Achieve qualitative and quantitative analysis of a wide range of organic and inorganic samples. FTIR is frequently used for polymer testing and pharmaceutical analysis, but the technique offers virtually limitless applications. Instrument has ATR, various crystals cold stage and heating stage. Also attached is a Hyperion optical microscope ATR system.	Parramatta South	EHa
Hybrid Fourier Transform/ Dispersive Raman Micro-Spectrometer	This combination provides full spectroscopic characterisation and optimizes the strengths of the both techniques for your complex micro-analysis samples. By utilizing the multiple wavelengths, from 1064 nm to 532 nm on a single microscopic spot, the Raman Scope III delivers excellent insight into many demanding applications, including forensics, pharmaceutical, carbon-based nano-materials and polymer science.	Parramatta South	EHa
JEOL 6510V	Tungsten filament low vacuum (LV) Scanning Electron Microscope JEOL JSM 6510LV able to be used in variable pressure (VP) mode and can be used for natural state analysis, requires minimal sample preparation. Instrument has the Moran SDD microanalysis system for x-ray analysis of elements present (Qualitative and Quantitative analysis).	Parramatta South	EHa

JEOL 840	The JEOL JSM-840A scanning electron microscope is a conventional medium resolution instrument used for micro-structural analysis and chemical analysis. Used for X-ray micro analysis and X-ray mapping. A Moran Scientific Microanalysis system is interfaced to allow qualitative and quantitative analysis to be performed. Analytical capabilities of the system include elemental line- scan, quantitative elemental mapping and digital image acquisition.	Parramatta South	EHa
JEOL 7001F	Schottky Field Emission Scanning Electron Microscope Joel JSM 7001FA with EDS. Provides high resolution and very high magnification analysis. Can be used in STEM mode.	Parramatta South	EHa
JEOL 8600 Probe	The JEOL 8600 is an electron microprobe with EDS and WDS spectrometers. Used for quantitative analysis and X-ray mapping and designed for the non-destructive x-ray microanalysis and imaging of solid materials. It is capable of high spatial resolution and relatively high analytical sensitivity.	Parramatta South	EHa
Micrometrics	Able to determine surface area and pore size below 2nm.	Parramatta South	EHa
Optical Imaging	Various optical microscopes with digital image collection. Stereoscope microscope.	Parramatta South	EHa
Pycnometer	Determine density of materials.	Parramatta South	EHa
Sample preparation Equipment	Various sample preparation equipment is located in the AMCF. These include: Cutting saws, Grinding equipment, Polishing, Mounting, Micotome.	Parramatta South	EHa
Thermal Characterisation	Thermal analysis offers a perfect tool for the characterisation of all kinds of organic and inorganic solids and liquids during heating or cooling. Thermodynamic transitions, thermal stability, decomposition and chemical reactions are detected and quantified with high accuracy across a broad temperature range.	Parramatta South	EHa
XRD Bruker	Able to determine the crystalline phases present in a sample as well as quantitative phase analysis. Contains a high temperature stage for high temperature X-ray analysis within different environments.	Parramatta South	EHa

Mass Spectrometry Facility	Description	Campus	Building
Xevo TQ mass spectrometer (ESI-QqQ MS) from Waters	The triple-quadrupole mass spectrometer (QqQ) is used for quantitative analyses as well as compound I.D. in low resolution. It has an ability to analyse polar and semi-polar compounds in the range of 50 to 2000 of their molecular weight.	Campbelltown	30
Xevo QToF mass spectrometer (ESI-qToF MS) from Waters	The time-of-flight mass spectrometer is a high-resolution instrument that allows an accurate mass measurement (AMM) of the analytes in complexes matrices, such as environmental, pharma, lipid, bio- samples. It has an ability to analyse polar and semi-polar compounds.	Campbelltown	30
Acquity UHPLC from Waters	The uHPLC (ultra-high performance liquid chromatography) instrument performs a separation of the analytes using high-pressure up to 15 000 psi.	Campbelltown	30
nanoAcquity (nanoHPLC) from Waters	The nanoHPLC (nano-high performance liquid chromatography) instrument performs a high-sensitivity separation of the analytes. Mostly used in large molecules applications, *i.e.* protein, oligo- or biomarker discovery applications.	Campbelltown	30
TLC-MS interface from Camag	The TLC interface for mass spectrometry (Thin-layer Chromatography) is used for direct analysis of the separated bands on TLC plate. Coupled to mass spectrometer creates a fantastic tool for a research.	Campbelltown	30
Acquity UPLC FLR detector from Waters	The high-sensitivity fluorescence (FLR) detector is optimised for UPLC/UHPLC separations. It extends the benefits of UPLC technology for the analysis of polynuclear aromatic hydrocarbons (PAHs), drugs of abuse, vitamins and any other compounds that have chemiluminescent properties.	Campbelltown	30
Acquity UPLC PDA detector from Waters	The Photodiode Array (PDA) detector provides sensitive spectral information to aid analyses with spectral range from 190 to 500 nm. It is the ideal detector for any laboratory application, from compound identification to method development as well as routine analyses.	Campbelltown	30

ASAP probe from Waters	The ASAP probe (Atmospheric Solids Analysis Probe) allows a rapid direct analysis of volatile and semi-volatile, solid and liquid samples. It is especially useful for non-polar or semi-polar compounds not amenable to ESI (electrospray ionisation) or APCI (atmospheric pressure chemical ionisation) as an inlet for the mass spectrometer.	Campbelltown	30

Secondary Ion Mass Spectrometer Facility	**Description**	**Campus**	**Building**
SIMS Cameca IMS 5fE7	A highly specialised surface analysis tool for high resolution depth profiling as well as surface analysis and ion imaging. The SIMS has many fields of application, including: • Semiconductor devices • Energy conversion components • Materials science • Geology • Biological and marine materials	Hawkesbury	M8

Confocal Bio Imaging Facility	**Description**	**Campus**	**Building**
Leica SP5 & Multiphoton	Leica TCS SP5 laser scanning Confocal microscope - This system uses AOBS variable spectral detection instead of traditional emission filters and has the following laser lines: 405, 458, 476, 488, 496, 514, 561, 594 and 633 nm. It has micro-spectral detection capability and has a fully tunable Multi-Photon imaging system.	Hawkesbury	S8
Ocean Optics Spectrometer	Fluorescence and absorption spectrometer with an optical probe detection system.	Hawkesbury	S8
Olympus E1 5	Megapixel digital camera with macro lens, infra-red and UV filters.	Hawkesbury	S8
Olympus Pm C35DX	35mm camera and control unit for photo Micrography.	Hawkesbury	S8
Upright Leica DM6000B SPS	Upright Leica SP5 (with DM6000B microscope) with 458, 476, 488, 514, 543 and 633 nm laser lines and the Horiba Raman spectral detection capability.	Hawkesbury	S8

Next Generation Sequencer Facility	Description	Campus	Building
Illumina HiSeq 2500	The Illumina HiSeq 2500 is a new high-throughput next generation sequencer allowing for massively parallel sequencing technology. The new High Output v4 SBS chemistry allows for increased data output of 1.4 terabases (Tb) per two runs using the extended 2x125bp read length. New v2 SBS chemistry for rapid runs allows for longer read lengths up to 2x250bp.	Hawkesbury	L9
Illumina HiSeq 1500	The Illumina HiSeq 1500 is a high-throughput next generation sequencer allowing for massively parallel sequencing technology. This instrument utilizes the v.3 SBS generating up to 500 gigabases (Gb) of data using 2x100bp read length.	Hawkesbury	L9
Illumina cBot (2QTY)	Creates clonal clusters from single molecule DNA templates, preparing them for sequencing by synthesis on the HiSeq. Enables division of templates for sequencing on individual lanes (8 lanes for High Output, 2 lanes for Rapid).	Hawkesbury	L9
Illumina MiSeq	The Illumina MiSeq is a desktop sequencer focusing on applied sequencing applications such as metagenomics, small genome sequencing, and amplicon sequencing. New v3 chemistry allows for higher output and longer reads up to 2x300bp.	Hawkesbury	L9
Agilent TapeStation 4200	The Agilent 4200 Tapestation is a tape based automated 'walk-away' electrophoresis platform allowing for high-throughput quality assessment of nucleic acid samples in a 96 well plate. Used for quality control of submitted DNA/RNA as well as completed library preparations.	Hawkesbury	L9
Agilent Bioanalyser 2100	For determining the size, quality and concentration of DNA, RNA, amplicons, and prepared libraries. Specific settings make it most useful platform for determining the RIN of plant samples. Low sample throughput.	Hawkesbury	L9
Caliper LabChip XTe	The Caliper Life Sciences LabChip XTe system is an automated system that uses microfluidic chips for nucleic acid separation. A self-contained system that replaces agarose gels and the need for hazardous chemicals, and exposure to UV light.	Hawkesbury	L9
Covaris S220 Focused-Ultrasonicator	The ultrasonicator is required in a number of Illumina protocols to shear genomic DNA to specific fragment lengths. Allows tailoring of library sizes specific to sequencing run length.	Hawkesbury	L9
PerkinElmer LabChip DS	UV-VIS absorption spectrometer utilising microliter microplates enabling the assessment of the quality and quantity of nucleic acid samples. Software has the ability to provide a spectral breakdown of nucleic acid components (DNA/RNA/nucleotides) as well as contaminants such as salts, carbohydrates, phenol and protein.	Hawkesbury	L9

BMG Labtech Optima FLUOstar	Multimode microplate reader, commonly used for fluorescence based assays such as Picogreen and qubit. Programs are optimised using computer based software. Medium sample throughput.	Hawkesbury	L9
EpMotion M5073 and EpMotion 5075t (2QTY)	Automated pipetting systems designed for routine pipetting tasks and to improve accuracy and precision. Enables a 'hands-off' approach to free up time for other tasks. Enables the high throughput processing of 384 sample plates within a shorter time frame. Reduces risk of manual handing errors and repetitive strain injury. The 5075t instruments include 14.5 deck positions including two temperature stations. The 5073M includes six deck positions. Both instruments include stations for three-dimensional tilt mixing and magnetic separation fingers for 1.5mL tubes.	Hawkesbury	L9
Thermocycler (Eppendorf Mastercycler® pro S) 96 well (3QTY) and 384 well (1QTY)	For performing heat cycling and incubation relevant to PCR. Programs and cycling specifications are set-up specific to the samples and target region.	Hawkesbury	L9
Qubit 3.0 (2QTY)	For the accurate and precise quantification of dsDNA (High sensitivity or broad range) and for the quantification of RNA. Low sample throughput.	Hawkesbury	L9
Eppendorf Concentrator Plus	This instrument is used in the concentration of DNA samples. Problematic samples eluted in water with a concentration lower than protocol requirements (and high volume) can be concentrated to the required concentration.	Hawkesbury	L9
Eppendorf Centrifuges 5424R; 5810R; 5804R and Minispin Plus (3QTY)	Centrifuges commonly required for samples for the prevention of aerosols. Centrifugation is also required for pelleting and producing a supernatant or eliminating waste during column filtration. Each centrifuge is tailored to different sizes and volumes required for different sample types.	Hawkesbury	L9
Eppendorf Mixmate (4 QTY)	Used for the vortexing of samples or reagents individually or for mixing samples within plates or cartridges. Essential to ensure homogenisation of samples and chemical composition of reagents.	Hawkesbury	L9
Eppendorf Thermomixer 1.5mL and Grant QBD2 (2QTY) incubators	Used for the incubation of samples and reagents ≥1.5mL.	Hawkesbury	L9
Elmi skyline vortexer and spinner (2QTY)	For mixing and/or centrifugation of samples within the one device. Suitable for micro test tubes ranging from 0.2mL to 2mL.	Hawkesbury	L9

Biomedical Magnetic Resonance Facility	Description	Campus	Building
BRUKER AVANCE III 600 MHz Wide Bore NMR/MRI Spectrometer (14.1 T)	Equipped with high field XYZ gradient amplifiers capable of generating up to 3000 G/cm. It is equipped with various probes and accessories that enable it to be used for a wide range of NMR experiments such as diffusion, micro-imaging, and high-resolution protein structure determination.	Campbelltown	17
BRUKER AVANCE II 500 MHz Wide Bore NMR/MRI Spectrometer (11.7 T)	Equipped with high field XYZ gradient amplifiers capable of generating up to 3000 G/cm. It is equipped with various probes and accessories that enable it to be used for a wide range of NMR experiments such as diffusion, micro-imaging, high-resolution MAS, and high-resolution protein structure determination.	Campbelltown	17
BRUKER AVANCE 400 MHz NMR Spectrometer (9.4 T)	Equipped with high resolution gradients (i.e., up to ~55 G/cm). Suited for heteronuclear NMR studies and for diffusion studies of small molecules to moderately sized polymers.	Campbelltown	17
VARIAN MERCURY 300 MHz NMR Spectrometer (7.0 T)	Equipped with 4-nuclei inverse probe with z-axis gradients. The probe was specially modified to simultaneously tune to four nuclei namely ^{1}H, ^{19}F, ^{13}C and ^{31}P. Suited for routine 1D and 2D NMR experiments.	Campbelltown	17
MAGRITEK SpinSolve 42 MHz NMR Spectrometer (1.0 T)	Equipped with 2-nuclei probe with z-axis gradients for ^{1}H and ^{19}F experiments. Suited for routine 1D and 2D NMR experiments.	Campbelltown	17
PerkinElmer Quantum GX microCT	Computed Tomography X-ray scanner for microimaging. Suited for objects up to rabbit size with imagining resolution down to 4.5 µm.	Campbelltown	17