MEDIA RELEASE

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Republic Polytechnic partners with Shimadzu to unveil the first cloud-based laboratory in an Institute of Higher Learning

- ***The new cloud-based system will spur innovation and support talent development in areas such as agri-food, nutraceuticals, sustainable materials and specialty chemicals***

- ***Two new Pre-Employment Training programmes will be introduced in Academic Year 2023, namely the Common Arts, Design and Media Programme and the Diploma in Tourism Management with Technology***

SINGAPORE, 6 January 2023 – Republic Polytechnic (RP) launched the new Sustainable Technology & Analytical Research Laboratory (STAR Lab) today during its Open House 2023. The lab was launched in collaboration with Japanese precision instruments and medical equipment manufacturer Shimadzu (Asia Pacific). The 3,000 square-foot RP-Shimadzu STAR Lab is equipped with Laboratory 4.0 features and will support RP's focus in the study of agri-food, nutraceuticals, sustainable materials and specialty chemicals.

The event was graced by Mr Chan Chun Sing, Minister for Education, who officiated the opening of the STAR Lab.

The STAR Lab is the first facility in an Institute of Higher Learning (IHL) in Singapore to have its analytical instruments connected to a cloud-based system, where staff and students can remotely monitor experiments, collecting and analysing data in real-time. More details of the STAR Lab's features can be found in the **Appendix**.

A total of 400 Pre-Employment Training (PET) and Continuing Education and Training (CET) students per year from the School of Applied Science diploma programmes will benefit from this new facility. It will facilitate the training of students from the Diploma in Biotechnology, the Diploma in Applied Chemistry and the Diploma in Pharmaceutical Science in the areas of analytical chemistry to prepare them for careers in quality assurance and quality control across various sectors.

"We are delighted to be expanding and deepening our partnership with Shimadzu as part of our industry engagement and digitalisation efforts. The new RP-Shimadzu STAR Lab serves as a learning space for both staff and students to harness emerging technologies across disciplines that are key to the sustenance of our nation," said Mr Yeo Li Pheow, Principal/Chief Executive Officer, Republic Polytechnic.

"It is crucial for us to embrace Industry 4.0 to be at the forefront of this industrial shift, as we continue to seek out new and meaningful partnerships that can give our students real-world exposure, equipping them with skills and relevance to keep operating at the cutting edge. This fits hand-in-glove with our RP Transformation 2025 plan that sees us committed to building a budding pool of talent in support of our nation's drive towards greater sustainability and more specifically, ensuring our food security and sustainability," Mr Yeo added.

Paired with the knowledge and expertise gained from industry collaborations, the STAR Lab serves as a learning platform for staff and students in areas such as laboratory techniques, analytical instrumentation, laboratory automation, data management and instrument

connectivity. The facility will play an instrumental role in developing new analytical methods in areas such as nutrients profiling of agri-food products, specialty chemicals and materials analysis with a sustainable focus.

Expanded partnership with Shimadzu

RP and Shimadzu also renewed its partnership today through a memorandum of understanding (MOU) for a further three years. As part of this renewed partnership, Shimadzu will continue to provide training opportunities that encompass collaboration on research projects for RP staff and students, while also providing sponsorships for student scholarships, book prizes and bursaries.

The two organisations have also jointly developed new CET workshops and short courses. Participants of these courses will have access to facilities in the laboratory for their coursework. Learners can apply for programmes in the areas of digitalising laboratory procedure using augmented reality, sample extraction and cloud-based analysis of urban farming produce and functional food. The programmes will be facilitated by trainers from both RP and Shimadzu.

Mr Tetsuya Tanigaki, Managing Director, Shimadzu Asia Pacific said, "It has been in Shimadzu's DNA to support the education landscape, ever since our founding concept began in 1875 with the purpose of manufacturing scientific instruments for educational use. Shimadzu is pleased to partner with Republic Polytechnic to accelerate the digital transformation in laboratories and to train the young scientific talents with Shimadzu's leading-edge technologies. As we always believe, Excellence in Science is not only our motto but a way of life. Through the launch of the RP-Shimadzu STAR Laboratory, I trust that we will work even closer together to redefine laboratory experience and realise our committed goal of continuously developing agri-food innovations and more."

Internship opportunities for students will be made available at Shimadzu for students to participate in a wide range of projects that include gas chromatography, high-performance liquid chromatography and mass spectrometry analysis. These opportunities are designed to help develop and broaden students' capabilities in food science, agritech and chemical laboratory technology.

New PET programmes introduced in the fields of arts, design and media, and tourism

RP is introducing two new programmes in Academic Year 2023 for PET students, namely the **Common Arts, Design and Media Programme (CAP)** and the **Diploma in Tourism Management with Technology (DTMT)**. The launch of these new programmes underscores the institution's commitment in nurturing students to become industry-ready professionals amid a constantly evolving landscape.

The CAP offers students a holistic introduction into the creative industries before narrowing down their area of specialisation. Students will take a cross-disciplinary arts, design and media curriculum in the first year before choosing to specialise in one of the five diplomas offered by the School of Technology for the Arts (STA)[1]. It will also stretch their creativity and imagination through the use of technology, giving them a greater appreciation of the different facets of arts, design and media.

[1] Students can choose from the Diploma in Media Production and Design (DMPD), the Diploma in Sonic Arts (DSA), the Diploma in Arts & Theatre Management (DATM), the Diploma in Design for Games & Gamification (DDGG) and the Diploma in Design for User Experience (DDUX).

With the new DTMT programme, students will be equipped with the skills required to integrate the physical and digital aspects of tourism as the industry continues to reinvent itself. They will learn to create and invigorate tourism experiences, better understand the application of digital technologies in the tourism sector and explore sustainable business practices for the industry at large.

Mr Yeo added, "The issues that society face today are becoming increasingly complex, which necessitates new thinking and competencies to thrive amid this ever-changing environment. As prospective students deliberate on their interests and learning pathways, we believe the two new programmes will give them an edge in the workforce by the time they graduate as industry professionals."

"Students from the Diploma in Tourism Management with Technology programme will be trained to leverage technology in the delivery of bespoke tourism experiences against the evolving tourism landscape, while students taking the Common Arts, Design and Media programme will develop a good grounding and holistic overview of the arts, design and media fields before they proceed to specialise in their chosen disciplines. RP will also place renewed emphasis on affording them opportunities to work alongside industry professionals throughout the curriculum to sharpen their core competencies while putting their knowledge and skills into real-world practice."

Republic Polytechnic Open House 2023

The launch of the STAR Lab is part of RP's Open House 2023, which is held from 5 to 7 January 2023 at its Woodlands campus. Fresh O-Level, N-Level and ITE graduates seeking higher education opportunities are welcome to visit RP to find out more about RP's full-time diploma programmes in Applied Science, Engineering, Management and Communication, Events and Hospitality, Infocomm, Sports, Health & Leisure, and Technology for the Arts. Event highlights include. More details on RP Open House 2023 can be found at http://www.rp.edu.sg

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About Republic Polytechnic

The first educational institution in Singapore to leverage the Problem-based Learning approach for all its diploma programmes, Republic Polytechnic (RP) has seven schools and one academic centre offering 37 full-time diplomas in Applied Science, Engineering, Management and Communication, Hospitality, Infocomm, Sports, Health & Leisure, and Technology for the Arts.

RP is committed to nurturing professionals with strong problem-solving capabilities through an innovative and entrepreneurial learning environment, based on a holistic and industry-relevant curriculum. RP's Academy for Continuing Education also offers a comprehensive suite of lifelong learning programmes to provide adult learners with skills upgrading opportunities. For more information, visit http://www.rp.edu.sg.

About Shimadzu (Asia Pacific)

Shimadzu Asia Pacific (SAP) is a subsidiary of Shimadzu Corporation, which was founded in Kyoto, Japan in 1875. Established in 1989 in Singapore as a regional headquarter, SAP offers sales and marketing services, application development, technical support, and research and development capabilities. Since then, the fast-paced growth of the business has seen the opening of subsidiaries in India, Malaysia, and the Philippines. Currently, SAP's network of distributors covers 14 countries, including Bangladesh, Brunei, Cambodia, India, Indonesia, Malaysia, Myanmar, Nepal, Pakistan, Philippines, Singapore, Sri Lanka, Thailand, and Vietnam. For more information, visit https://www.shimadzu.com.sg.

APPENDIX

REPUBLIC POLYTECHNIC – SHIDMAZU STAR LABORATORY
FACTSHEET

Republic Polytechnic's (RP) new Sustainable Technology & Analytical Research Laboratory (STAR Lab) is a collaboration with Japanese precision instruments and medical equipment manufacturer Shimadzu (Asia Pacific). The 3,000 square-foot RP-Shimadzu STAR Lab is equipped with Laboratory 4.0 features and will support RP's focus in the study of agri-food, nutraceuticals, sustainable materials and specialty chemicals.

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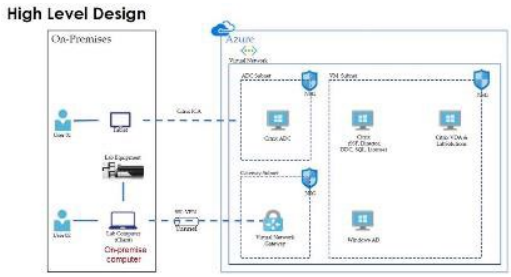
S/N	Facility Name	Information / Facts
1.	**Cloud System** 	LabSolutions CS Network solution hosted in Cloud environment is a virtual platform that connects the analytical and control Analytical instruments and hosts all the analysis data. in a centralised, secured location. The analytical instruments include high performance liquid chromatography HPLC), gas chromatography, (GC), Gas Chromatography Mass Spectrometry (GC-MS) and Triple Quadrupole LC-MS/MS. It allows users to perform real-time control and monitor analytical instruments remotely and manage analysis data securely. Once the chemical analysis is completed, the data from respective instruments will be automatically registered to LabSolutions Database. To further apply processing conditions for data study and reports, users will login to the software with individual accounts either remotely or on-premises using secured virtual private network (VPN) and software as a service (SaaS) based Citrix platform. The Cloud system and LabSolutions software access are secured with VPN tunnel that establishes the connectivity between Virtual Server (hosted on cloud), on-premise Computers (linked to the instruments) and client devices (PC, tablets and mobiles). All data is encrypted to prevent unauthorised access.
2.	**High Performance Liquid Chromatography (HPLC)**	HPLC is a separation technique commonly used to identify and quantify non-volatile and semi-volatile compounds. The separation of compounds is determined by sample and stationary-phase interactions as well as by sample and mobile phase interactions. The separated compounds are then detected at the exit of the column, and the output data is known as a chromatogram.

		Applications of the HPLC include the following: • Analysis of sugar and carbohydrate • Analysis of amino acids • Vitamins profiling in fruits and vegetables samples • Herbicides and pesticides analysis • Size distribution of polymers
3.	**Gas Chromatography (GC)** 	GC is a separation technique used to identify and quantify volatile and semi-volatile samples. The mixture of compounds in the sample are separated primarily based on the differences in boiling points of analytes. The separated compounds are detected at the exit of the column, and the output data is known as a chromatogram. Applications of the GC include the following which can be simplified by Shimadzu's Analytical Intelligence: • Total fat and fatty acids • Flavours and Fragrance • Pollutants such as formaldehyde, carbon monoxide, benzene, Dichlorodiphenyltrichloroethane (DDT) etc. • Aliphatic and aromatic petroleum hydrocarbons • Assay of drugs
4.	**Gas Chromatography Mass Spectrometry (GCMS)** 	GCMS couples the ability of gas chromatography to separate a chemical mixture, and mass spectrometry's ability to identify its components. Mass spectrometry is used to obtain information such as molecular weight, molecular formula and structure of analytes. It measures the mass-to-charge ratio (m/z) of ions. The results are typically presented as a mass spectrum. Applications of the GCMS include the following which can be accelerated by Shimadzu's Ultra-Fast Mass Spectrometry (UFMS) technology: • Petrochemical & hydrocarbons analysis • Geochemical research • Forensic (arson, explosives, drugs & unknown) • Pesticides analysis, food safety and quality • Pharmaceutical and drug analysis • Food and fragrance • Clinical toxicology

5.	**Triple Quadrupole LC-MS/MS System** 	Liquid Chromatography-mass spectrometry (LC-MS) combines the physical separation of liquid chromatography with the mass analysis capabilities of mass spectrometry. Mass spectrometry is used to obtain information such as molecular weight, molecular formula and structure of analytes. It measures the mass-to-charge ratio (m/z) of ions. The results are typically presented as a mass spectrum. Applications of the triple quadrupole LC-MS/MS system include the following which can be more robust by Shimadzu's UFMS and/or Analytical Intelligence: • Drug analysis • Blood and urine Analysis • Water and soil Analysis • Organic pollutant • Pesticide residues • Food additives and sweeteners • Veterinary drugs • Antibody drugs • Protein and glycan analysis • Phospholipids • Chiral drugs analysis • Bioanalysis • Textile testing • Industrial discharge
6.	**Ultraviolet (UV)-Visible Spectrophotometer** 	Ultraviolet-visible spectrophotometers uses a light source to illuminate a sample with light across the UV rays to the visible wavelength range (typically 190 to 800 nm). The instruments then measure the light absorbed, transmitted or reflected by the sample in comparison to a reference or blank sample at each wavelength. This property is influenced by the sample composition, potentially providing information on identity and concentration of sample. Applications of the UV-Visible Spectrophotometer include the following: • Concentration and purity of DNA and RNA • Chlortetracycline and benzocaine in pharmaceutical products • Caffeine for legal limit in beverages, anthocyanin for quality control in wine • Kinetic and monitoring studies of textile dyes • Protein Assay • Absorbance of haemoglobin in cancer research

7.	**Rotatory Evaporator** 	A rotary evaporator is a device used to efficiently remove solvents from samples by evaporation. It distills volatile solution by heating and increasing surface area for distillation. The rotary evaporator is usually connected from a vacuum pump to create vacuum and thus decreases the solution's boiling point.