

MEDIA RELEASE**Republic Polytechnic launches new diplomas and initiatives in support of Singapore's sustainable development**

The two new diplomas were announced as part of the polytechnic's virtual Open House 2021

SINGAPORE, 7 January 2021 – With the increased national focus on sustainable development and the Government's announcement of [50,000 new and upgraded jobs](#) to be created over the next 10 years, Republic Polytechnic (RP) announced new courses and initiatives with a strong sustainability focus on the first day of its virtual Open House 2021, which runs from January 7 to 9.

From Academic Year 2021, prospective students will be able to enrol into two new full-time, sustainability-focused diplomas in engineering and science at RP: The Diploma in Sustainable Built Environment, and the Diploma in Environmental & Marine Science. RP will also commit to increased sustainable practices for its campus operations that will help to enhance its food waste recycling efficiency.

Mr Yeo Li Pheow, Principal/CEO of Republic Polytechnic, said, "Sustainable development will increasingly be a key enabler and necessary pillar in Singapore's new economy, particularly in the areas of agriculture, construction, food and environmental sustainability and waste management. We expect a strong demand for industry professionals with sustainability-driven skillsets across these sectors.

The Diploma in Sustainable Built Environment and the Diploma in Environmental & Marine Science underscore RP's response to the growing need for a skilled workforce aligned with Singapore's sustainable practices and development going forward. Ultimately, our revamped courses and modules and industry partnerships will equip our students with the latest technical skills and industry knowledge for this [new economy](#).

Republic Polytechnic is also committed to doing its part in reducing waste and promoting a culture of sustainability. We will be ramping up our food waste recycling efforts for our food court operations, so that RP achieves its goal of becoming a zero-food waste campus."

Two new diplomas in engineering and science**Diploma in Sustainable Built Environment (DSBE)**

With a targeted annual intake of 100, the new Diploma in Sustainable Built Environment (DSBE) offered by RP's School of Engineering replaces the Diploma in Green Building Energy Management. While traditional diplomas focus on siloed disciplines, the DSBE provides comprehensive training across the entire built environment industry, covering green building design, building simulation and analysis, and facilities management.

The diploma fuses the latest digital and smart technologies into the curriculum and students can look forward to taking up a range of job roles in the exciting built environment industry upon graduation. They will be equipped with skills in digital design, construction technology,

and smart building technology, and can work towards earning a certification for Building Information Modelling (BIM) software, further expanding their career options.

Graduates can expect to take up various engineering positions such as assistant engineer (mechanical/electrical/sustainable design), BIM modeller, facilities executive and assistant specialist in BIM and digital delivery.

The launch of DSBE is accompanied by the recently-launched Sustainable Built Environment Lab (SBEL) on the RP campus. Located on the rooftop of RP's Industry Centre, which [houses laboratories and learning facilities](#), the 80sqm facility enables students to carry out learning and research activities in green technologies in an outdoor setting. The lab's innovative features also help support industry collaboration projects.

Diploma in Environmental & Marine Science (DEMS)

Offered by RP's School of Applied Science, the new Diploma in Environmental & Marine Science (DEMS) focuses on environmental and food sustainability, giving students the option to specialise in either of these sectors upon graduation. Every year, around 100 students will gain skills in earth and climate science, terrestrial and marine ecology, environmental data analysis, environmental management, sustainability reporting, and circular economy. Two specialisation tracks in Environmental Management and Technology or Aquaculture Technology are offered in the second year, preparing graduates for roles at the forefront of developing sustainable environmental and aquaculture solutions.

Graduates of the diploma can take on careers in the areas of environmental and water services, petrochemicals and semiconductors, fisheries, marine parks and reserves, research institutes, and government agencies.

The School of Applied Science has also partnered local eco-conscious start-up [Crown Coffee](#). Expected outcomes from this partnership include more collaborative and consultancy projects in areas of food waste management, urban farming, and final year project opportunities for students. It will also create attachment opportunities for RP staff, and training and development programmes for Crown Coffee's staff.

RP commits to more sustainable campus operations

In keeping with the polytechnic's commitment to sustainable development, RP is also intensifying its efforts to segregate food waste for recycling with appropriate infrastructure and systems already being put in place.

All three food courts on campus are supported by two food waste digestors. In total, the food digestors are able to process up to 200 kilograms of food waste daily, and the institution has been able to recycle two-thirds of its total food waste in 2019.

Food waste is turned into compost and is in turn used for fertiliser. Insights from food waste trends on campus will also be utilised by RP students pursuing relevant full-time diplomas such as DEMS and part-time diplomas such as the Diploma in Applied Science (Environmental Services and Management) to generate innovative solutions for the real world.

Republic Polytechnic Open House 2021 goes virtual

The virtual Republic Polytechnic Open House 2021 is set to feature highlights such as course webinars, engagement with lecturers and current students, admissions talks and vibrant online activities. It includes an exclusive RP 360 virtual experience platform that was launched in conjunction with our first-ever Virtual Open House, from 7 to 9 Jan 2021!

The immersive experience aims to give 'O' and 'N' levels and ITE graduates a peek at RP's vibrant student and academic life on campus, allowing them to see how RP students hone their skills through cutting-edge learning facilities across a diverse range of 37 diploma programmes.

Visit the webpages below and discover why RP is so much more!

<https://openhouse21.rp.edu.sg/>

<https://www.rp.edu.sg/discover/>

**The sites are best viewed on Google Chrome.*

- End -

Media release issued by:

Republic Polytechnic
Office of Corporate Communications
Patrick Seng / Julian Soh
+65 9767 6701 / +65 9018 0719
patrick_seng@rp.edu.sg / julian_soh@rp.edu.sg

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>.

Appendix A

Final-Year Projects and Learning Opportunities for Students

Below are examples of sustainability-themed, final-year projects undertaken by students. Incoming students to the Diploma in Sustainable Built Environment (DSBE) and the Diploma in Environmental & Marine Science (DEMS) can look forward to working on similar real-world projects in collaboration with RP's vast network of industry partners.

Diploma in Sustainable Built Environment (DSBE)

- **International Building Design Competition: ORCHARD D’GEM – first mixed development building featuring aquaponics system**

A joint FYP team comprising eight students received a Merit Award in the International Building Design Competition for their submission titled ORCHARD D’GEM, a building design that features Singapore’s first aquaponics system in a mixed development building.

Fully ideated by the students, they proposed ORCHARD D’GEM, a 21-storey mixed-development building that combines residences, retail, commercial, community and transportation. Comprising a three-level shopping mall, and four 18-storey condominium towers directly above it, this green building hosts a fully integrated eco-system complete with solar panels, rainwater harvesting for non-potable irrigation and a circular aquaponics system that provides fish and vegetables for the community.

- **Paints that keep buildings cool**

This project was initiated in collaboration with green building management consultancy [Climateasia](#), to find out the most effective commercial paints that cool buildings.

Future DSBE final-year students can further investigate the best way to paint buildings (internally or externally) to keep them cool.

- **Cloud-based temperature monitoring system for building materials**

This project involved developing a cloud-based temperature monitoring system to monitor the temperature of different types of building materials. The data collected is hosted on a commercially available cloud website and provides deep insights for potential industry collaborators.

Future DSBE final-year students will be able to further enhance this temperature monitoring system, and carry out more comprehensive performance studies of building materials.

Diploma in Environmental & Marine Science (DEMS)

- **Study on the transport of air pollutants in urban cities**

In this joint research project with DSO National Laboratories (DSO), students investigated the effect of Singapore’s unique tropical weather on the infiltration and exfiltration of environmental pollutants, into and within modern buildings.

Students performed outdoor and indoor dispersion simulations using historical and real-time weather data using weather stations set up in RP. Future final-year students will take part in the trial to monitor the release and transport of non-harmful gases in and out of a building. They will also be involved in hands-on gas sampling and lab tests of collected gas samples.

Despite being in its early stages, this project has the potential to mitigate indoor air pollution, which is often a problem in Singapore due to its geographical position and neighbouring countries.

- **Upcycling of Food Waste for Hydroponics Farming**

In this partnership with [Crown Coffee](#), a retail technology start-up and eco-conscious café that features Singapore's first robotic barista, students successfully developed a fully organic-based nutrient solution from food waste, for hydroponics farming. They successfully turned used coffee beans into organic, liquid nutrients for sustainable hydroponics farming of leafy green vegetables.

The innovation, utilising a thermochemical process known as hydrothermal carbonisation (HTC), caters to the growing local demand for organic food, and also helps solve Singapore's current low recycling rates by closing the loop on food waste. Moving forward, Crown Coffee and the RP team are looking to upscale the production of this organic liquid nutrient.

- **Aquaculture of tropical spiny lobsters**

The high demand for lobsters as seafood has led to increased concerns over the potential overexploitation and decline in capture lobster fisheries. This project explored the feasibility of using black soldier fly larvae in lobster feed to replace fish meal, making lobster aquaculture more sustainable and lower cost.

Current students have successfully incorporated the fly larvae into feed and future student teams will be able to further optimise feed formulations, to help produce lower cost and more sustainable lobster feed.

Appendix B

Diploma factsheets

Diploma in Sustainable Built Environment (DSBE)

<p>Objectives</p>	<p>The Diploma in Sustainable Built Environment (DSBE) is designed to infuse three areas identified by the Construction Industry Transformation Map, namely, Green Buildings, Integrated Digital Delivery (IDD), and Design for Manufacturing and Assembly (DfMA) into its discipline and specialisation modules. This would transform students to take up wide range of job roles in the exciting and future-ready Build Environment (BE) Industry.</p> <p>With the Diploma in Sustainable Built Environment (DSBE), students will acquire in-depth knowledge of Technologies for Integrated Digital Delivery (IDD), Virtual Design and Construction (VDC), Design for Manufacturing and Assembly (DfMA), Environmental Sustainability Design, Green Buildings, Smart Buildings and Smart Facilities Management. Riding on the wave of the digital revolution and rapid urbanisation, students will be trained to extensively use Building Information Modelling (BIM) to model and simulate the performance of buildings and integrate work processes.</p> <p>Students will also gain access to cutting-edge equipment in our joint laboratories supported by leading companies from the industry. One new facility, Republic Polytechnic's Sustainable Built Environment Laboratory (SBEL), has been built with the launch of DSBE. Located on the rooftop of the Republic Polytechnic Industry Centre, this provides an outdoor setting for the laboratory. The laboratory is equipped with numerous innovating green features such as skylight roof structure made with building integrated photovoltaic panels that generate electricity to power the lab's equipment. Students can look forward to lessons and research activities related to green building technologies conducted in this laboratory</p> <p>Intended graduate profile:</p> <p>i. Graduates with a strong foundation in engineering design management, Building Information Modelling (BIM) application, environment management and knowledge and skills in technical drawing.</p> <p>Graduates will be able to apply engineering design concepts using Building Information Modelling (BIM) throughout construction project lifecycle to enhance productivity and ensure effectiveness, safety and economies of scale for manufacturing, assembly and maintenance tasks. Graduates will develop environmental sustainability plans and manage facility operations and maintenance throughout building lifecycle to reduce environmental impact and operational costs efficiently. Graduates will possess skills in drawing 3D models to represent characteristics of a</p>
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	<p>real-world building. They will also adopt Integrated Digital Delivery (IDD) technologies to manage projects and building life-cycle efficiently.</p> <p>ii. Graduates who can apply multi-disciplinary skills and knowledge to solve challenges in the Built Environment Industry</p> <p>Graduates will have a good grounding in multi-disciplinary skills and knowledge in the area of Integrated Digital Delivery (IDD), Virtual Design and Construction (VDC), Building Information Modelling (BIM), Design for Manufacturing and Assembly (DfMA), Environmental Sustainability Design, Green Buildings, Smart Buildings and Smart Facilities Management. With lifelong skills like problem-solving and critical thinking skills, they will be able to solve challenges related to building design, constructions, operation, facilities and asset management etc throughout the building lifecycle.</p> <p>iii. Graduates who are self-driven, ethical, able to communicate and work well in teams.</p> <p>Graduates will be adept in skills like IT, data analysis, critical thinking, and project management in the course of their work. Graduates will embody professional and ethical values, attitudes as well as behaviours, in meeting industry expectations and practices. These include demonstrating effective leadership and communication skills when solving problems as team members in the industry.</p>						
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Duration of Study	<p>3 years</p> <p>Students will need to complete modules equivalent to 120 modular credits.</p>
The Faculty	<p>School of Engineering</p>
Prospects	<p>To champion the next phase of advancement and growth of the Built Environment (BE) industry, the Construction Industry Transformation Map (ITM) was launched in 2017. It aims to build an advanced and integrated sector supported by firms that would provide good job opportunities for Singaporeans. The three key areas identified by the Construction ITM are:</p> <ul style="list-style-type: none"> Green Buildings Integrated Digital Delivery (IDD) Design for Manufacturing and Assembly (DfMA) <p>The Built Environment SkillsFuture Tripartite (BEST) Taskforce was set up in 2017 by the Future Economy Council (FEC) BE Cluster Subcommittee to look into the building of a strong and competent workforce at PMET levels to lead a successful transformation for the BE industry.</p> <p>One of the Taskforce's recommendations is for Institutes of Higher Learning (IHLs) to infuse or enhance their pre-employment training (PET) curriculum.</p> <p>Hence, the birth of a new PET Diploma in Sustainable Built Environment (DSBE) that is designed by infusing all three key ITM areas into its discipline and specialisation modules. This would enable DSBE</p>

	graduates to acquire broad-based knowledge and skills which are applicable to a wider range of BE job roles and hence reduce the leakage from the BE industry.																
Career Opportunities	<p>DSBE graduates will be well placed to take on various engineering positions in Built Environment Industry such as:</p> <ul style="list-style-type: none"> • Assistant Engineer (Mechanical/Electrical) • Assistant Engineer (Sustainable Design) • BIM Modeller, BIM Coordinator • Facilities Executive • Assistant Specialist in BIM and Digital Delivery 																
Industry Endorsement	<p>The programme is approved by the Ministry of Education. Industry support for the course and qualitative feedback were obtained from the following stakeholders as indicated in Table 1.</p> <p style="text-align: center;">Table 1. Industry Support</p> <table border="1" data-bbox="472 1016 1358 1429"> <thead> <tr> <th>S/N</th> <th>Agency/Company</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Building and Construction Authority (BCA)</td> </tr> <tr> <td>2</td> <td>Singapore Green Building Council (SGBC)</td> </tr> <tr> <td>3</td> <td>Beca Carter Hollings & Ferner (S.E.Asia) Pte Ltd</td> </tr> <tr> <td>4</td> <td>Sodexo Singapore Pte Ltd</td> </tr> <tr> <td>5</td> <td>CPG Facilities Management Pte Ltd</td> </tr> <tr> <td>6</td> <td>ebm-papst SEA Pte. Ltd</td> </tr> <tr> <td>7</td> <td>Workplace Safety and Health Council</td> </tr> </tbody> </table>	S/N	Agency/Company	1	Building and Construction Authority (BCA)	2	Singapore Green Building Council (SGBC)	3	Beca Carter Hollings & Ferner (S.E.Asia) Pte Ltd	4	Sodexo Singapore Pte Ltd	5	CPG Facilities Management Pte Ltd	6	ebm-papst SEA Pte. Ltd	7	Workplace Safety and Health Council
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Contact	<p>Lieu Chee Fui, Programme Chair, DSBE Email: lieu_chee_fui@rp.edu.sg Tel: 66971683</p> <p>Kelvin Loo, Assistant Programme Chair, DSBE Email: kelvin_loo@rp.edu.sg Tel: 66971876</p>																

Diploma in Environmental & Marine Science (DEMS)

Objectives	<p>The Diploma in Environmental & Marine Science (DEMS) was formed following the merger of the Diploma in Environmental Science (DENV) and Diploma in Marine Science and Aquaculture (DMAC). It aims to provide a broad-based curriculum offering specialisation tracks across these two areas, to better prepare students with the necessary skillsets to address evolving challenges in the environmental and marine science sectors. Examples of topics covered in the programme include earth and climate science, terrestrial and marine ecology, data analysis, environmental management, sustainability reporting and circular economy. Students will also gain essential knowledge and skills to help them conserve and manage complex ecosystems through interactions with terrestrial and aquatic wildlife during external field trips and visits to RP rain garden and aquaculture research facility, Aquaria.</p> <p>Intended graduate profile:</p> <ol style="list-style-type: none"> <li data-bbox="467 898 1390 1200"> <p>i. Graduates with a strong foundation in environmental and marine science, and knowledge and skills in data analysis and laboratory work.</p> <p>Graduates will be able to engage in environmental and marine science research. Graduates will demonstrate laboratory skills and knowledge of planning and designing experiments. They will also possess knowledge of technological advances in environmental and marine science-related industries to contribute in the areas of R&D, environmental testing and data analysis.</p> <li data-bbox="467 1234 1390 1570"> <p>ii. Graduates who can develop new ideas with a multi-disciplinary mind-set for better ways to solve challenges in environmental and marine science, as well as create technology improvements and breakthroughs.</p> <p>Graduates will be able to apply scientific principles, knowledge and skills in the areas of environmental management and operations, aquaculture management and conservation. They will be familiar with the principles of sustainable development and be adaptable in applying them to solve challenges related to climate change in the abovementioned sectors.</p> <li data-bbox="467 1603 1390 1872"> <p>iii. Graduates who are self-driven, ethical, able to communicate and work well in teams.</p> <p>Graduates will be adept in skills like IT, data analysis, critical thinking, and project management in the course of their work. Graduates will embody professional and ethical values, attitudes as well as behaviours, in meeting industry expectations and practices. These include demonstrating effective leadership and communication skills when solving problems as team members in the industry.</p>
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Duration of Study	<p>3 years</p> <p>Students will need to complete modules equivalent to 120 modular credits.</p>						
The Faculty	<p>School of Applied Science</p>						
Prospects	<p>Areas of national interest that the proposed diploma can support will be in food security and environmental sustainability. In the first quarter of 2019, Environment and Water Resources Minister Masagos Zulkifli announced that the Singapore Food Agency (SFA) had set a target to produce 30% of Singapore's nutritional needs by 2030 (30 by 30 vision). To achieve this, the related agri-industry which includes</p>						

	<p>aquaculture, will need to raise its productivity, be involved in more R&D work and strengthen climate resilience amid resource constraints. These can be accomplished with the development of local talent. The ministry also mentioned that SFA will be engaging the various institutes of higher learning to develop relevant programmes. This target will help to contribute towards the country's sustainability journey which is in line with the Sustainable Singapore Blueprint 2015.</p> <p>The blueprint was launched with the vision for a Livable and Endearing Home, a Vibrant and Sustainable City, and an Active and Gracious Community. There are 5 key focus areas and the targets set for 2030 clearly highlight the country's ambition in practising sustainable development. In the National Day Rally 2019, one of the key highlights mentioned in PM Lee's speech was Preparing Singapore for Climate Change. Reducing greenhouse gas emissions and increasing energy efficiency to meet our 2030 climate pledge, as well as becoming a climate-resilient Singapore and a hub of circular economic models are all part of the plan for a sustainable future. The new diploma can support this whole-of-nation effort.</p> <p>According to the World Employment and Social Outlook, 18 million more jobs will be created from achieving the Paris Agreement 2°C goal; 6 million more jobs will result from embracing the circular economy. As we transit into the Green Economy, new and emerging occupations will include solar energy technicians, eco-designers, biofuels technicians, field assistants in environmental impact assessments and organic farmers.</p> <p>With a choice of two specialisation tracks – Aquaculture Technology and Environmental Management and Technology, DEMS will train our students/graduates to be future-ready in these sectors and be equipped to take on the 50,000 'new and upgraded' jobs to be created over the next 10 years amid the sustainable development push. This includes skilled jobs in the aquaculture industry, as well as training of food hygiene officers. Minister of Sustainability and the Environment (MSE), Ms Grace Fu, in a Channel NewsAsia article dated 27 August 2020 said that plans are put in place to develop "a pipeline of talent" to support sustainability in Singapore.</p>
Career Opportunities	<p>DEMS graduates can look forward to enriching careers in environmental, water services, petrochemical and semiconductor sectors, fisheries, oceanariums, wildlife and marine parks and reserves, research institutes, and government agencies, in roles such as the following:</p> <ul style="list-style-type: none"> • Conservation and Outreach Executive • Environmental Control and Environmental Service Officer

	<ul style="list-style-type: none"> • Laboratory Technologist • Operations Technician / Executive • Environmental Health and Safety Technician • Parks Officer • Aquarist • Aquatic Facility Manager • Aquaculture Technologist 																							
Industry Endorsement	<p>The programme is approved by the Ministry of Education. Industry support for the course and qualitative feedback were obtained from the following stakeholders as indicated in Table 1.</p> <p>Table 1. Engaged Stakeholder Groups for Curriculum Review</p> <table border="1" data-bbox="596 900 1262 2045"> <thead> <tr> <th>Stakeholder Groups</th> <th>Agency/Company</th> </tr> </thead> <tbody> <tr> <td rowspan="3">Government Agencies</td> <td>National Environment Agency (NEA)</td> </tr> <tr> <td>National Parks Board (NParks)</td> </tr> <tr> <td>Public Utilities Board (PUB)</td> </tr> <tr> <td rowspan="2">Workplace, Health and Safety</td> <td>Enerpac Tool Group c/o Actuant Operations Singapore Pte Ltd</td> </tr> <tr> <td>800 Super</td> </tr> <tr> <td rowspan="3">Aquaculture</td> <td>Apollo</td> </tr> <tr> <td>Oceanus</td> </tr> <tr> <td>Trapia</td> </tr> <tr> <td>Semi-conductor industries</td> <td>Micron Semiconductor Asia Operations</td> </tr> <tr> <td rowspan="2">Testing Laboratories</td> <td>Eurofins Mechem Pte Ltd</td> </tr> <tr> <td>SETSCO Services Pte Ltd</td> </tr> <tr> <td rowspan="4">Others</td> <td>Singapore Environment Council (SEC)</td> </tr> <tr> <td>Temasek Life Sciences Laboratory (TLL)</td> </tr> <tr> <td>Singapore Agro-Food Enterprises Federation Limited (SAFEF)</td> </tr> <tr> <td>Wildlife Reserves Singapore (WRS)</td> </tr> </tbody> </table>	Stakeholder Groups	Agency/Company	Government Agencies	National Environment Agency (NEA)	National Parks Board (NParks)	Public Utilities Board (PUB)	Workplace, Health and Safety	Enerpac Tool Group c/o Actuant Operations Singapore Pte Ltd	800 Super	Aquaculture	Apollo	Oceanus	Trapia	Semi-conductor industries	Micron Semiconductor Asia Operations	Testing Laboratories	Eurofins Mechem Pte Ltd	SETSCO Services Pte Ltd	Others	Singapore Environment Council (SEC)	Temasek Life Sciences Laboratory (TLL)	Singapore Agro-Food Enterprises Federation Limited (SAFEF)	Wildlife Reserves Singapore (WRS)
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			Resorts World Sentosa (RWS)	
Contact	Laura Yap, Programme Chair, DEMS Email: laura_yap@rp.edu.sg Tel: 66971906 Junainah Badron, Assistant Programme Chair, DEMS Email: junainah_badron@rp.edu.sg Tel: 66971738			