UNIVERSITY OF AUCKLAND
Waipapa Taumata Rau
NEW ZEALAND

ENGINEERING

FINAL YEAR PROJECT

Display Day 2024

Thursday, 17 October
University of Auckland City Campus
Building 401 & 405, Entry via 20 Symonds Street

Featured Departments:
Civil and Environmental Engineering
Mechanical and Mechatronics Engineering
Chemical and Materials Engineering
Engineering Science and Biomedical Engineering
Electrical, Computer, and Software Engineering

KIA ORA KOUTOU.

It is my pleasure and privilege to welcome you to our 2024 Final Year Project Display Day.

The Final Year Project represents a significant milestone in our Bachelor of Engineering degree. These year-long research projects draw upon the knowledge and expertise that the students have attained during their degree, applied to solve real-world problems. The Final Year Project Display Day is always an exciting time to see engineering theory come to life.

The projects provide an important opportunity for students to realise their capacity and build confidence in their skills as independent learners. We put a strong emphasis on getting our students career-ready once they graduate, so it is great to see the range of industry sponsors who continue to get involved with the projects each year.

I hope you will join us in proudly celebrating everything that our students have achieved this year.

ASSOCIATE PROFESSOR RICHARD CLARKE
Manukura Pūkaha | Dean of Engineering
Waipapa Taumata Rau | University of Auckland

ABOUT

the Final Year Project

The Final Year Project, formerly recognised as the Part IV Research Project, is a compulsory unit of our Bachelor of Engineering (Honours) degree. This involves final year Engineering students spending the bulk of the year — usually in pairs — on a research project supervised by engineering academics. This degree component requires the submission of a research portfolio that includes a final report, a conference presentation, and technical demonstrations. In essence, it assesses a student's ability to utilise their knowledge of both theory and practice.

A variety of topics will be showcased by each department, and in some cases, a student's project may entail solving a real problem proposed by an engineering company. Because these projects are considered as learning experiences to encourage students to tackle problems the same way engineers do in their professional career, we encourage as much industry participation as possible.

We ensure that this is the case by inviting industry professionals each year, not just as sponsors and co-supervisors, but also to review and judge the projects. Prizes are also awarded to outstanding projects of each department.

The practical demo and display/exhibition component of the Final Year Project is what you will be seeing today.

Engineering departments featured at today's event in the order of floor level:

- Civil and Environmental Engineering
- Mechanical and Mechatronics Engineering
- Chemical and Materials Engineering
- Engineering Science and Biomedical Engineering
- Electrical, Computer, and Software Engineering

CIVIL & ENVIRONMENTAL ENGINEERING

Construction Management

PROJECT NO	TITLE	SUPERVISOR	STUDENTS
41	Considerations surrounding the mining of pumice from Māori geothermal landscapes	Nona Taute	Nikita Privalov, Tony Yang
44	Ensuring minimal talent wastage in Lean Project Delivery	Nona Taute	Michael Brake, Luke Cashmore
107	Automated sustainability assessment for infrastructure projects	Hongyu Jin	Xiao Luan, Sze Kin Mak
108	Concession pricing and adjustment for highway public-private partnership (PPP) projects	Hongyu Jin	David Long, William Tang
109	A circularity and resilience assessment framework for infrastructure projects	Hongyu Jin	John Lee, Samuel Lee
222	From damage to risk mitigation: What we can learn from building damage from natural hazards?	Alice Chang-Richards	Simon Rao, Denny Woo
223	Functionality-based loss modelling and downtime estimation	Alice Chang-Richards	Omer Abdelrazig, Chester Gray
224	Establishing a framework evaluating the capacity and capability of construction companies	Alice Chang-Richards	Joseph Mukkada, Janith Premathilaka
225	Exploring the use of machine learning in modelling contractor selection	Alice Chang-Richards	Gabriel Perin Richard, Frank Wu

Environmental

PROJECT NO	TITLE	SUPERVISOR	STUDENTS
1	NZ Roof-collected Rainwater Quality 1	Cody Mankelow	Wendy Ji, Vicky Pan
8	Determinants of indoor air quality in Auckland apartments	Kim Dirks	Ayush Bhandari, Jared Matthias
9	Determinants of indoor noise in Auckland apartments	Kim Dirks	Jude Weerasinghe,Andre Yiu
10	Indoor air quality impacts on classroom health and well-being	Kim Dirks	Joshua Lim, Sun Oh
11	Environmental Forensic - Detecting Unidentified Organic and Inorganic Water Contaminants in Pahurehure Inlet 2	Naresh Singhal	Hirdayjeet Bajwa, Priyanka Kavthekar
12	Stabilisation of contaminated sediments in Pahurehure Inlet 2	Naresh Singhal	Catrina Lin, Bryan Zhu
13	Assessing Free Floating Plant Systems for the Removal of Water Contaminants in Pahurehure Inlet 2	Naresh Singhal	Ivy Ho, Kenny Huang
39	Ka ora te wai, ka ora te whenua: Understanding the water, to facilitate community wellbeing	Tumanako Fa'aui	Janny Latthiwan-Jones, Andrew Lee
40	Understanding Māori community transport patterns for implementation of an electrified road network	Tumanako Fa'aui	Zixi Wang, Zheng Zhou
58	Biculutral biomontoring of waterways in response to natural hazards and climate change	Tumanako Fa'aui	Paul Duran, Alec Yang
103	NZ Roof-collected Rainwater Quality 2	Cody Mankelow	Catherine Borich, Chantelle Potbury
104	Climate change risk to New Zealand's Drinking Water Self Supplies	Cody Mankelow	Yu Chen Pan, Leo Yan
146	Hydrogenotrophic Denitrification - A Low-emission Option for Nitrogen Removal	Wei-Qin Zhuang	Tamzin Aldrin, Malisha Munidasa
147	Assessing Hydrogenotrophic Bacteria in Activated Sludge	Wei-Qin Zhuang	Ellyse Lendrum, Bella Wikaira-South
148	Using Immobilized Bacterial Enzymes in Wastewater Treatment	Wei-Qin Zhuang	Keyu Liu, Shi Qiu
156	*Understanding the influence of risk perception on community actions in response to natural hazards and climate change 1	Sandeeka Mannakkara	Amanda Liang, Yue Liao

PROJECT NO	TITLE	SUPERVISOR	STUDENTS
157	*Understanding the influence of risk perception on community actions in response to natural hazards and climate change 2	Sandeeka Mannakkara	Pranav Balamurali, Brandon Ormsby
159	Auckland Floods Recovery - Are we Building Back Better?	Sandeeka Mannakkara	Ella Fasciana, Thomas Fritzen
160	Perceptions and uptake of AI technologies on Teaching and Learning at UoA	Sandeeka Mannakkara	Alan Huang, Andrew Zhong
235	PFAS Analytical Challenges: Assessing PFAS Loss on Different Types of Laboratory Filters	Lokesh Padhye	Giona Basso, Elvis Lee
236	PFAS Separation and Destruction Technologies: Critical Review	Lokesh Padhye	Dominic Jarecki, Leo Qiu
239	Formation and Transformation Mechanisms of Iodine-Containing Disinfection By-Products during Breakpoint Chlorination	Lokesh Padhye	Vivian Chen, Jier Zhang
254	TiO2 supported ball milled biochar for the efficient removal of metoprolol from aqueous solution	Ajit Sarmah	Jiarong Jing, Daniel Stoddart
255	Preparation of magnetic cabbage leaves biochar by simultaneous activation and magnetization for metoprolol removal from water	Ajit Sarmah	Leon Lobo, Miguel Yap
256	Degradation modelling of pesticides using mathematical models to determine dissipation times for regulatory purposes	Ajit Sarmah	Jazlyn Kim, Ellen Park
257	Removal of selected microplastics from water using specially designed activated biochar and ball-milling	Ajit Sarmah	Xin Tian Chia, Georgia Hillegers
258	Preparation of ultrafine magnetic biochar for pharmaceutical adsorption in water	Ajit Sarmah	Ryan Place, Yibo Sun

Geotechnical

PROJECT NO	TITLE	SUPERVISOR	STUDENTS
48	On the angle of repose of granular materials	Rolando Orense	Leo Chen, Tommy Ong
49	A geotechnical investigation on the stability of sand dunes	Rolando Orense	Damian Pereira, Shukrullah Rezaie
51	Role of seepage patterns in slope stability analysis	Rolando Orense	Bingwen Fang, Shuhan Wang
77	Multi-hazard assessment of national infrastructure networks	Liam Wotherspoon	Nico Austen, Linyun Wong
78	Natural hazards assessment of the national dam stock	Liam Wotherspoon	Nisuli Badana, Alaghi Mathavasivam
79	Field-testing based geotechnical and geologic characterization of the Auckland region	Liam Wotherspoon	Navin Rohan, Sor Taing
80	Development of national flood defence network characteristics using spatial datasets	Liam Wotherspoon	Yaduvira Meffan, Jasmeet Singh
87	Evaluating the effect of tension crack on slope failure under rainfall	Romain Meite	Lampard Liu, Steven ye
88	Evaluating the effect of suction on slope failure under rainfall	Romain Meite	Zekai Wang, Sophia Zeya Zhu
89	Evaluating the global stability of closely spaced buildings founded on sloping ground	Romain Meite	Sam Heyes, Jack Roberts
90	Evaluating the effect of tension cracks on the stability of strip footings on sloping ground	Romain Meite	Aditya Behera, Navim Zanzabil-Molla
98	Residual shear strength of some Auckland clays	Arezoo Rahimi	Tony Liu, Yuanxu Zhou
99	Effect of initial moisture content of soil on shrink-swell test	Arezoo Rahimi	Jason Li, Kevin Wang
100	Heat treatment of expansive clayey soils	Arezoo Rahimi	Arya Bhatt, Ilhan Serif
101	Study of the heat-treated expansive clayey soils as supplementary cementitious material	Arezoo Rahimi	Ethan Gilmore, Tom Riesterer
114	Use of waste materials in geotechnical engineering	Arezoo Rahimi	Jason Rawles, Siana Short
149	Towards linking soil liquefaction potential and hydro-climatic change	Andrew Stolte	Kyumin Kim, Minyeop Kim
150	Geophysical Investigations and Seismic Site Classification in the Auckland Region	Andrew Stolte	Yi Ding, Jeff Kung
151	Geophysical Investigations and Seismic Site Classification in the Hauraki Plains	Andrew Stolte	Ashlee Blaymires, James Killick
152	Geophysical analysis of data recorded on regional and nation-wide seismic instrumentation networks	Andrew Stolte	Jonathan McGlashan, Kathan Panchal

Structural

PROJECT NO	TITLE	SUPERVISOR	STUDENTS
5	Characterising the Expected Seismic Performance of Bridges in the State Highway Network	Lucas Hogan	Lily Danby, Shauntell D'Souza
6	3D printed nodal design of structures	Lucas Hogan	Jay Li, Leo Ren
7	3D Printing of concrete furniture	Lucas Hogan	Elson Peng, Jason Qu
14	Using waste materials to minimise the environmental impact of concrete	Enrique del Rey Castillo	Alex Gordon, Samara Kattan
15	Using seashells and volcanic ash (pumice) for sustainable concrete	Enrique del Rey Castillo	Yingjian Wang, Tian Xia
16	Durability of bridges in Aotearoa New Zealand	Enrique del Rey Castillo	Benjamin Reshef, Dom Solarte-Ramirez
17	Practice-oriented techniques for modelling floor diaphragms strengthened using fibre reinforced composites in frame buildings	Enrique del Rey Castillo	Guanda Li, Zhixin Peng
35	Use of Lateral Torsional Buckling in Portal Frames for Dependable Earthquake Performance	Charles Clifton	Youngmo Koo, Siwon Yun
36	Determining the influence of actual fillet weld profiles on the seismic performance of double sided fillet welds	Charles Clifton	Anthea Chow, Sofia Cradwick
37	Development of teaching tools for demonstrating actions in bolted and moment endplate beam splices	Charles Clifton	Douglas Nadys Goncalves, Anna Millar
38	Design, modelling, fabrication and testing of steel beams	Charles Clifton	Lugman Alsumaidai, Isaac Miller
55	Vibrational analysis for longspan floors	Charlotte Toma	Punya Thapar, Kavinu Undugodage
59	[CDP-MECH] How do experiences during internship programmes shape our engineers? [Priyanka Dhopade]	Charlotte Toma	Avinash Bassan, Jovial Singh Jassowal
61	Practice-oriented techniques for modelling floor diaphragms strengthened using fibre reinforced composites in wall buildings [UG]	Max Stephens	Jess Jiang, June Ye
62	Seismic behaviour of a bridge with different support conditions and unequal slenderness	Nawawi Chouw	Binaypreet Nagra, Ramandeep Singh
63	Seismic behaviour of a bridge with different support conditions under multi-axial excitations	Nawawi Chouw	Brett Tindle, Allen Zheng
64	Interaction between neighbouring buildings in earthquakes	Nawawi Chouw	Drew Kitson, Albie Piddington
65	Investigating factors that influence tsunami loads on structures I: limitations of flume testing [UG]	Max Stephens	Brian Cao, Zachariah Shirley
66	Investigating factors that influence tsunami loads on structures II: effects of shadowing	Charlotte Toma	Andrea Tang, Maria Vaefaga
67	Relationship between a building cluster and ground movements	Nawawi Chouw	Yutong Lin
69	Design, modelling, fabrication and testing of steel beams [UG]	Max Stephens	Harry Glover, Ollie Scott
71	Comparing carbon intensities for seismic hazard zones [UG]	Max Stephens	Jasmyn Jiang, Zhe Wang
73	Effectiveness of base isolation for tall buildings	Alex Shegay	Vincent Chui, Adarsh Koirala
74	Typical structural characteristics of base isolated buildings in New Zealand	Alex Shegay	Tina Chen, Cara Tianlan Wang
76	Use of photogrammetry to evaluate concrete crack size	Alex Shegay	Levi Brinsdon, Richard Luo
81	Design, modelling, fabrication and testing of steel beams	Lucas Hogan	Alysha Donovan, Christina Lieu
83	Determination of specific characteristics of NZ produced LVL using novel test methods	Gary Raftery	Stephanie Okanga, Makana Uele
84	Reinforcement of holes in LVL with screws and assessment of properties	Gary Raftery	William Yan, Davy Zhou
91	Seismic behaviour of rockable skewed bridges including soil-structure interaction	Nawawi Chouw	Jemima Maningas, Jason Ying
92	St Matthew-in-the-city church – Group 1: 3D scanning and modelling (in collaboration with Beca)	Anastasios Giouvanidis	Mohammad Ameen, Edward Kurnia
93	St Matthew-in-the-city church – Group 2: Modelling and seismic strengthening techniques (in collaboration with Beca)	Anastasios Giouvanidis	Haider Aljawahiri, Todd Copley
94	St Matthew-in-the-city church – Group 3: Macro-block analysis (in collaboration with Beca)	Anastasios Giouvanidis	Sione Fifita, Papamama Pokino

PROJECT NO	TITLE	SUPERVISOR	STUDENTS
117	Investigating the influence of soil structure interaction on the seismic response of bridges [UG]	Max Stephens	Terry Krause, Thomas Wood
119	Can you build a concrete cricket bat?	Rick Henry	Thomas Dunphy, Alex McCarthy
120	NZS 3101 effective flange lengths - Are the correct?	Rick Henry	Maxim Kang, Ayush Patel
121	Embodied carbon of concrete flooring systems	Rick Henry	Sophie Bradley, George Wells
133	Comparing seismic design procedures of hospitals between NZ and Chile	Quincy Ma	Benson Ireland, Ryan Tan
134	Implementation plan for a NZ Earthquake Early Warning (EEW) System and lessons from recent events worldwide	Quincy Ma	Hunter Abernethy, Andrew McPherson
137	A skeptical science investigation into earthquake precursors	Quincy Ma	Ken Hu, Andy Shen
144	Durability of Timber bridges in New Zealand	Gary Raftery	Ralika Chhay, Matthew Leask
145	Asset management of Timber bridges in NZ and overseas	Gary Raftery	Xiaoyu Chang, Zhihao Ma
164	Modelling of CLT/steel composite beam behaviour for various connections	Pierre Quenneville	Nick Prasad, Kerry Wu
165	NZ design tool to determine European screw connection resistance in timber	Pierre Quenneville	Nick Teesdale, Alan Zhang
167	Assessment of feasibility of using lime binders and natural fibres in lateral load structural systems in NZ	Pierre Quenneville	Harry Falkiner, Matthew Kightley
189	Hybrid mass timber buildings: Tension-compression braces or ductile Tension-only braces	Ashkan Hashemi	Charlie Cai, Joshua Chong
234	Compression perpendicular-to-grain strength of radiata pine	Pierre Quenneville	Devon Murdoch, Tiree Norman-Bell

Transportation

PROJECT NO	TITLE	SUPERVISOR	STUDENTS
18	First and Last Mile of Public Transport Journeys for Bus Rapid Transit	Subeh Chowdhury	Eshani Mahawedage
19	The Security Experiences and Visions of Rainbow Women and Non-Binary People Who Use Public Transport	Subeh Chowdhury	Minnie Chae, Cindy Huang
32	Cycling in Virtual Reality	Subeh Chowdhury	Nicholas Chua, Jiajun Ye
33	Would you help? Examining the role of bystanders in the event of harassment in public transport journeys	Subeh Chowdhury	Nathaniel Fasitaue, Leander Menezes
34	The evolving nature of transit orientated designs (ToD): A literature review	Subeh Chowdhury	Coleen Contemplo, Nahian Tahiat
57	Optimal Planning of Charging Stations in Rural Bay of Plenty using Census Data	Minh Kieu	Samuel Garth, Su-chya Techathong
182	The evaluation of Accelerated Pavement Testing of Wireless Charging In-Pavement Systems for Electric Vehicles	Doug Wilson	Jiankai Sun, Joseph Yuan
195	An evaluation of the rail freight corridor between Auckland - Hamilton and Tauranga	Doug Wilson	Victor Gan, Tymek Iwanow
197	Evaluating the Carbon footprint of the use of Bituminous products used in Transportation Infrastructure	Doug Wilson	Jamieson Graham, Ned Verrall
207	Investigate the Return on Investment for Climate Adaptation Strategies for Infrastructure (Asset Group A)	Theuns Henning	Eddie Wang, Edward Xu
208	Investigate the Return on Investment for Climate Adaptation Strategies for Infrastructure (Asset Group B)	Theuns Henning	Maxim Barnett, Aidan Skinner
249	Assessing post-disaster operational performance of New Zealand’s Road network	Prakash Ranjitkar	Xinyu Chen, Jason Liu
250	Investigate the impact of autonomous vehicles on road networks under mixed traffic conditions	Prakash Ranjitkar	Don Afable, Vishakhan Bhakhavan
251	UG: Student defined Project: Transportation	Prakash Ranjitkar	Jae Kim, Martin Lim

Water

PROJECT NO	TITLE	SUPERVISOR	STUDENTS
2	Urban Beach Responses to Wave Conditions and Storms in Auckland	Colin Whittaker	Myu Miyamoto, Bernadette Yafar
3	Wave-induced erosion of mudstone cliffs	Colin Whittaker	Ben Batchelor-Cook, Aaryan Trivedi
4	Enhancement of the Coastal Monitoring Report in Hawke's Bay	Colin Whittaker	Jack Anderson, Sarra Ekladios
20	The Worst Place to live in New Zealand [UG]	Conrad Zorn	Jiaqi Bai, Zeyu Xiao
22	Recovery from an Alpine Fault Earthquake [UG]	Conrad Zorn	Stefan Finderup, Zeke Scouller
23	Experimental investigation of gravel barrier breaching at river mouths	Bruce Melville	Jeremie Bayaban, Victor Jing
24	The entrainment and movement mechanism of a smart sediment particle	Bruce Melville	Oliver Britton, Benjamin Jones
25	The hydrodynamic characteristics of the flow field around artificial reefs	Bruce Melville	Tushar Bhowmik, Ankur Chakraborty
26	Sea-bed erosion around off-shore wind turbine foundationss	Bruce Melville	Sasha Barrett-Garnier, Kenny Clarke
27	Investigate the impact of Stormwater on Pahurehure Inlet	Kilisimasi Latu	Jairon Getalado, Kristoff Jean Ramos
28	Investigate if salt marsh can be introduced to the Pahurehure Inlet	Kilisimasi Latu	Ryan Guo, Jun Gi Enoch Han
29	Develop a flood susceptibility model for the Wairoa District	Kilisimasi Latu	Julia Ford, Iisa Salie
30	Investigate the impact of cyclones on water availability in Tonga	Kilisimasi Latu	Ruize Gao, Ziyu Nie
31	Investigate the flood emulator that can be applied to existing 2d models in Auckland	Kilisimasi Latu	Eamen Chan, Leo Zhang
53	The End of 8am Lectures [UG]	Conrad Zorn	Georgia Chambers, Kathy Huang
54	New Zealand is Sinking and Shrinking [UG]	Conrad Zorn	Bencen Sun, Haofan YANG
111	Modelling the impact of pressure management on burst rates in water distribution systems	Kobus van Zyl	Damian Chong, Jim Hsu
212	The role of green space in mitigating urban heat island	Asaad Shamseldin	Josh Clancy, Sila Esekielu
213	UG: Sensitivity analysis of the rain garden performance to evapotranspiration	Asaad Shamseldin	Richard Jocom, Johannah Meer

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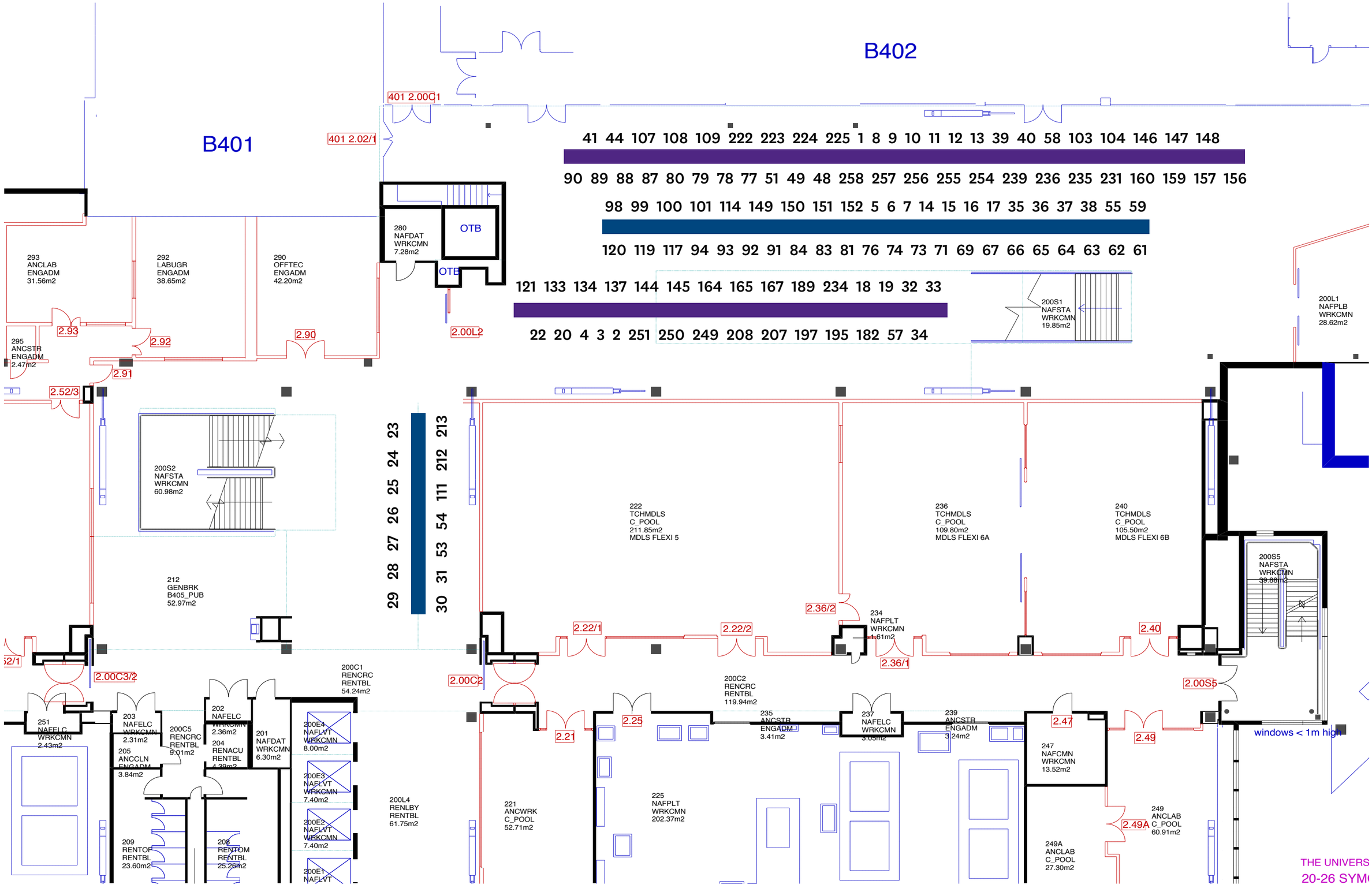

MECHANICAL & MECHATRONICS ENGINEERING

Acoustics

PROJECT NO	TITLE	SUPERVISOR	STUDENTS
21	Development of a smart acoustic system to monitor equipment in noisy workshops	Yusuke Hioka	Luke Simpson, Jack Towers
23	The accuracy of acoustic virtual reality for replicating speech perception in real world	Yusuke Hioka	Dhruv Jagmohan, Hong Kit Li
34	Acoustic black hole, does it really work as it sounds?	Vladislav Sorokin	James Alexander, Logan Singleton
44	Ground-board mounted microphone assessment	Michael Kingan	Seongju Kang, Seraph Zhou
63	Thumping good floors: Making homes quieter for good sleep	Andrew Hall	Kate Davenport, Mikki Lucman
65	An invisible acoustic barrier for quiet ventilation windows	Andrew Hall	Manaakiao Hahipene, Kyle Sowry
85	Development of an e-textile based wearable for sonic interaction design	Justine Hui	Chante de Villiers, Gabby Sumner
91	High resolution vibrations can be used to convey audio events	Justine Hui	Matthew Eccleshall, Matthew Liggett
101	BreathSonix: Respiratory sound analysis	Vladislav Sorokin	Shaquille Khan, Mustafa Laxmidhar
114	Auralisation vs reality - How close can we get to the real room?	Andrew Hall	Sophia Axenova, Hannah Hill-Marks

Aero-Fluid-Hydrodynamics

PROJECT NO	TITLE	SUPERVISOR	STUDENTS
6	Aerodynamic optimisation of a state-of-the-art VTOL system	Michael Kingan	Samuel Gordon, Thomas Phillips
14	Innovative modelling of vegetation-fluid interaction	Michael MacDonald	Jordan Rear, Tayla Wong
15	Unveiling the aerodynamics of kites	Michael MacDonald	Ethan Roentgen, Daniel Walker
16	Winds of change: CFD and wind tunnel investigation of abrupt changes in aerodynamic surface roughness	Michael MacDonald	Howard Covich, Achira Nadakandage
27	Evaluating aerodynamic performance: Aircraft with and without fuselage breaches	Rajnish Sharma	Joshua Eaton, Robert Wilson
28	Transient loads on a UAV in turbulent crossflows	Nicholas Kay	Hugh Holroyd, Doug Russ
33	Utilizing tidal flows at aquafarms: Revolutionizing shellfish aquafarming in New Zealand	Vladislav Sorokin	Ben McCosh, James Mercer
35	Powering marine farms with tidal energy	Vladislav Sorokin	Joshua Davidson, Lucas MacMillan
39	Development of an aerodynamic and hydrodynamic model of an IACC yacht for implementation into a VPP program	Stuart Norris	Oliver Rainey, Jackson White
40	Flettner rotors for wind assisted cargo shipping	Stuart Norris	Joel Norman, Peter Ruffell
45	Cyclist aerodynamics	Michael Kingan	Euan Argent, Kai Murase
46	Paddle hydrodynamics	Michael Kingan	James Dolan, Harry McGahan
73	Louvre-incorporating rear wing endplates for UOA Formula SAE car	Nicholas Kay	David Pribis, Vicente Wishart
116	An investigation into the boundary layer over a rolling road in the UOA boundary layer wind tunnel for FSAE aerodynamics validation	Daniel De Mel	Brendan Cooper, Mikayel Dobrovolski

PROJECT NO	TITLE	SUPERVISOR	STUDENTS
126	Breathing mask exhaust fluid dynamics and noise	Rajnish Sharma	Dianne Kristine Omandam, Sophie Pease
127	Development of a CFD framework for the UoA F:SAE team	Priyanka Dhopade	Mitchell Bremner, Alec Cao

Thermodynamics

PROJECT NO	TITLE	SUPERVISOR	STUDENTS
41	Thermal pollution of the Waikato river	Stuart Norris	Emily Blackmore, Aaron Sharpe
42	Improvement of heat transfer correlations in a rectangular cavity	Stuart Norris	Elisha Alexander, Nathan Hartley
43	Satellite mission and hardware design for upper atmosphere sampling	Benjamin Taylor	Shivam Desai, Henissa Tong
51	How do experiences during internships shape our engineers?	Priyanka Dhopade	Jiaxun Han, Eligh Small
52	Powering Tapuwae: Renewable energy systems in northern Hokianga	Priyanka Dhopade	Samuel MacKay
53	Sustainable development in the North Hokianga	Priyanka Dhopade	Tessa Brunton, Sarina Todd

Design and Systems Engineering

PROJECT NO	TITLE	SUPERVISOR	STUDENTS
17	3D Printed sand-casting molds	Olaf Diegel	Sara Renall, Sebastian Webb
19	Nodal designed bicycle	Olaf Diegel	Kaurerewa Koopu, Thomas Spicer
20	Pellet extruder for robot arm 3D printer	Olaf Diegel	Christoph Kim, Joe Kim
49	Mapping the coefficient of friction across an industrial warehouse floor	David Wynn	Andrew Bi, Yiyang Chen
50	Autonomous NPK sampling and mapping of a pasture using a drone	Mark Jeunnette	Cale Morris, Anirudh Rayudu
78	Computational generation of design solutions for Warman design projects	David Wynn	Anthony Wang, Letao Zhao
79	Testing and improving a system for guiding novice designers through machine design projects	David Wynn	Ethan Bush, Josiah Grimmer

Mechanics of Materials and Manufacturing Processes

PROJECT NO	TITLE	SUPERVISOR	STUDENTS
18	Additive manufacturing under N2 environment	Olaf Diegel	Anderson Huang, Nicholas Zhang
80	Improving a model-based approach for combining existing designs to create new ones	David Wynn	Anna Boldeskul, Ashley Myrelle Tolentino
89	Cold plasma jet modified flax fibre reinforced composites manufactured from waste polyethylene	Johan Verbeek	Ryan Gilbertson, Blake Nelson
90	Improving polymer upcycling using plasma modified blends	Johan Verbeek	Kian Manilal, Jackson Smith
92	Using advanced thermo-reversible crosslinks to enhance the mechanical properties of waste polyethylene	Johan Verbeek	Mohammad Mohammad Safar, Kavindu Pallearachchige
95	Improving performance of harakeke flax fibre composites through low-temperature plasma treatment	Tom Allen	Olivia Gordon, Imani Ranasinghe
96	Determining the geometric degradation of 470 dinghy jibs	Tom Allen	Rebecca Hume, Jenny Lo
108	Effects of Plasma Treatment on Manufacture and Mechanical Properties of Microfibrillar Composites	Nam Kyeun Kim	Devnaka Jayakody
110	Completion and improvement of infrared-heating rotational moulding machine	Arcot Somashekar	Phinyhas Ikahihifo, Jiada Jia

PROJECT NO	TITLE	SUPERVISOR	STUDENTS
111	3D printing of a polymer blend for robotic applications	Arcot Somashekar	Mitchell Cooper, Connor Voigt
112	Manufacture and performance evaluation of bio-composite panels	Arcot Somashekar	Michael Adolph, Thomas Buckley

Industry 4.0 Smart Manufacturing Systems

PROJECT NO	TITLE	SUPERVISOR	STUDENTS
57	Deep learning based health monitoring of industrial assets	Jaspreet Dhupia	Nathaniel Coe, Beth Cutler
59	Retrofitting legacy systems for industry 4.0	Xun Xu	Nico Holmes, Luka Katavich
60	Use of cutting force dynamometer for machining optimization	Xun Xu	Isaac Abbott, Jas Brady
61	Crane anti-collision system at New Zealand Steel	Xun Xu	Juaninho Penteado, Jackson Taylor
76	Smart factory optimisation: Production scheduling 3D simulation	Yuqian Lu	Aidan Carey
119	Development of a low-cost solution for job and staff cost tracking suitable for SMEs	Jan Polzer	Monika Gadomski, Emily Koeck
123	QA checks on steel frames using computer vision techniques	Yuqian Lu	Cole Parker, Chi-Hsiang Yang
124	Investigation into dust ingress induced jamming of compressed natural gas fueling nozzles	Yuqian Lu	Ben Bridger, Canny Peng

Dynamics and Control

PROJECT NO	TITLE	SUPERVISOR	STUDENTS
66	Vibration-based rail structural health monitoring	Lihua Tang	James Harold, Lachlan Tate
69	MPC for path tracking a mobile robot in a remote lab	Hazim Namik	Eloise Beattie, Tamsin Holmes
70	Reinforcement learning for accurate navigation on a remote mobile robot	Hazim Namik	Michael Samuel, Yunge Yu
71	Can prompt engineering improve accuracy in engineering education?	Hazim Namik	Hyunwoo Ko, Chun Yiu Lau
93	Traction control system for FSAE car	Jaspreet Dhupia	Isabella Stevens, Megan Tse
94	Digital twin of drivetrain test rig for anomaly detection	Jaspreet Dhupia	Mia Jackson, Joshua Williams
102	Multi-directional nonlinear vibration absorber	Lihua Tang	Marlon Keser, Lochy Naismith
118	Development of a scale testbed for validation of path-tracking control systems for driverless Formula SAE	Daniel De Mel	Corbin Keane, Julio Josef Romero

Biomechatronics

PROJECT NO	TITLE	SUPERVISOR	STUDENTS
5	A chain-driven prosthetic finger	Minas Liarokapis	Trevor Heinemann, Raymond Wallace
7	A systematic review, design, and development of integrated biosystem for cancer research	Maran MM	Aaron Mathew, Johnson Xie
8	A systematic review, design and development of an IoT based sensor network for the prevention of unhealthy home related diseases	Maran MM	Savannah Galvin, Luke Hynds
10	Wearable pressure sensor for gait analysis	Kean Aw	Dimithri Gallage, Sahana Pasupati
81	Exploring tactile spatial acuity through 3D printing	Luke Hallum	Joseph Kaw, Sunny Zhu

PROJECT NO	TITLE	SUPERVISOR	STUDENTS
104	Designing a microcontroller-based LED device to test visual sensitivity to changes in light intensity	Luke Hallum	Renee Parore, Rahul Rajasingh
105	Working towards the detection and characterisation of sleep apnea events using thoracic and abdominal movement signals	Luke Hallum	Aanchal Aravinthan, Natascha Gregory
106	3D printed texture defined form tactile perception tests	Luke Hallum	Cole Smith, Finley Willcox

Mechatronics

PROJECT NO	TITLE	SUPERVISOR	STUDENTS
9	Frictionless triboelectric generator	Kean Aw	Jade Nguyen, Sid Sheth
11	Flexible graphene sensor for leaf wetness detection	Kean Aw	Zaid Mustafa, Grace Ryan
12	Small-scale wind powered triboelectric nano-generator	Kean Aw	Terence Abdon, George Hart
67	Wearable energy harvesting	Lihua Tang	Marihi Hohepa-Te Huia, Ezekiel Taylor
68	Self-powered condition monitoring	Lihua Tang	Erin McDonald, Rosey Robb
77	Development of a DC offset probe for high power applications	Kean Aw	Hazen Mahon
82	Development of a low-cost aerosol jet printer	Stephen Kavermann	Vijay Nirvaneshwar, Rowan Saini
97	A gimbal system for wireless charging of UAVs	Olaf Diegel	Adam Lee, Halle Townsend
125	Design and development of a sensor to measure humidified carbon dioxide flow	Stephen Kavermann	Boston Blomfield, Louis Brewster

Robotics

PROJECT NO	TITLE	SUPERVISOR	STUDENTS
1	A modular robotic mechanism for discrete rock sample collection on Mars	Minas Liarokapis	Rahul Bhati, Sophia Schulz
2	Robust 6D object pose estimation methods	Minas Liarokapis	Vlad Colpman, Andrew Koh
3	On the feasibility of a robotic seaplane with 3D printed wings	Minas Liarokapis	Isara Nua, Otto Walker
4	Tactile and force/torque sensing for dexterous robots	Minas Liarokapis	Megan Leung, Dylan Sebastian
56	Telerobotic system for ophthalmology	Jaspreet Dhupia	Tane Herbert, Danny Su
72	Developing a robust simulation environment for VEX V5 robots	Hazim Namik	Luke Bao, Ashton Nelson
109	3D real-time object tracking with a cobot driven camera in confined spaces	Jan Polzer	Dominic Mutti, Jade Seo
121	Intuitive human-robot collaborative assembly	Yuqian Lu	Dipesh Patel, Nathan Phu
122	Automated stem assembly and quality checking system	Yuqian Lu	Timothy Marshall, Sam Worn

Drone Technology

PROJECT NO	TITLE	SUPERVISOR	STUDENTS
25	Fully-actuated aerial screwdriving UAV	Karl Stol	Louis Lee, Dulina Senevirathna
26	Collaborative payload positioning	Karl Stol	Jaap Skinner, Connor Williams
29	Variable pitch propellers for coaxial drone rotors	Nicholas Kay	Ruby Chen, Hongyang Zhao

PROJECT NO	TITLE	SUPERVISOR	STUDENTS
30	Horizontally actuated pen drone	Karl Stol	Henry Guo, Elise Oxenham
36	Variable arm angle and control modification for multirotor UAVs	Shahab Kazemi	James Blackhurst, Oliver Reedy
37	Incorporation of a lightweight, low-cost force sensor in the admittance controller for fully-actuated UAVs	Shahab Kazemi	Agustin Soto, Oliver Vannoort

Space Systems

PROJECT NO	TITLE	SUPERVISOR	STUDENTS
43	Satellite mission and hardware design for upper atmosphere sampling	Benjamin Taylor	Shivam Desai, Henissa Tong
47	Deployment of telescopic barrels for spacecraft optical instruments	Guglielmo Aglietti	James Armstrong, Ben Parnell
48	Deployable helicoid antennas for Cubesats	Guglielmo Aglietti	Francois Murrell, Tobias Svoboda
54	Enhancing classical control laws with reinforcement learning	Roberto Armellin	Matthew Flooks, Kenny Yu
55	Learning how to hop between space objects using low-thrust propulsion.	Roberto Armellin	Theo McIntosh, Stephen Ng
62	New Zealand solar sail mission in cislunar space	Roberto Armellin	Carter Grey, Kaliyana Haering
74	Low-thrust trajectory design of interplanetary missions using reinforcement learning and reachability set analysis	Roberto Armellin	Henry Simpson, Benny Welte
75	Cislunar reachability analysis	Roberto Armellin	Ethan Batten, Jean Du Plessis
83	Thermal model of 3U CubeSat	Guglielmo Aglietti	Rhys Parker, Seamus Walsh
117	Strain energy driven deployable spacecraft structures	Guglielmo Aglietti	Daniel Hall, Mark Xu
120	Optimal space debris removal sequences	Roberto Armellin	Mia Kelly, Viet Duc Tran

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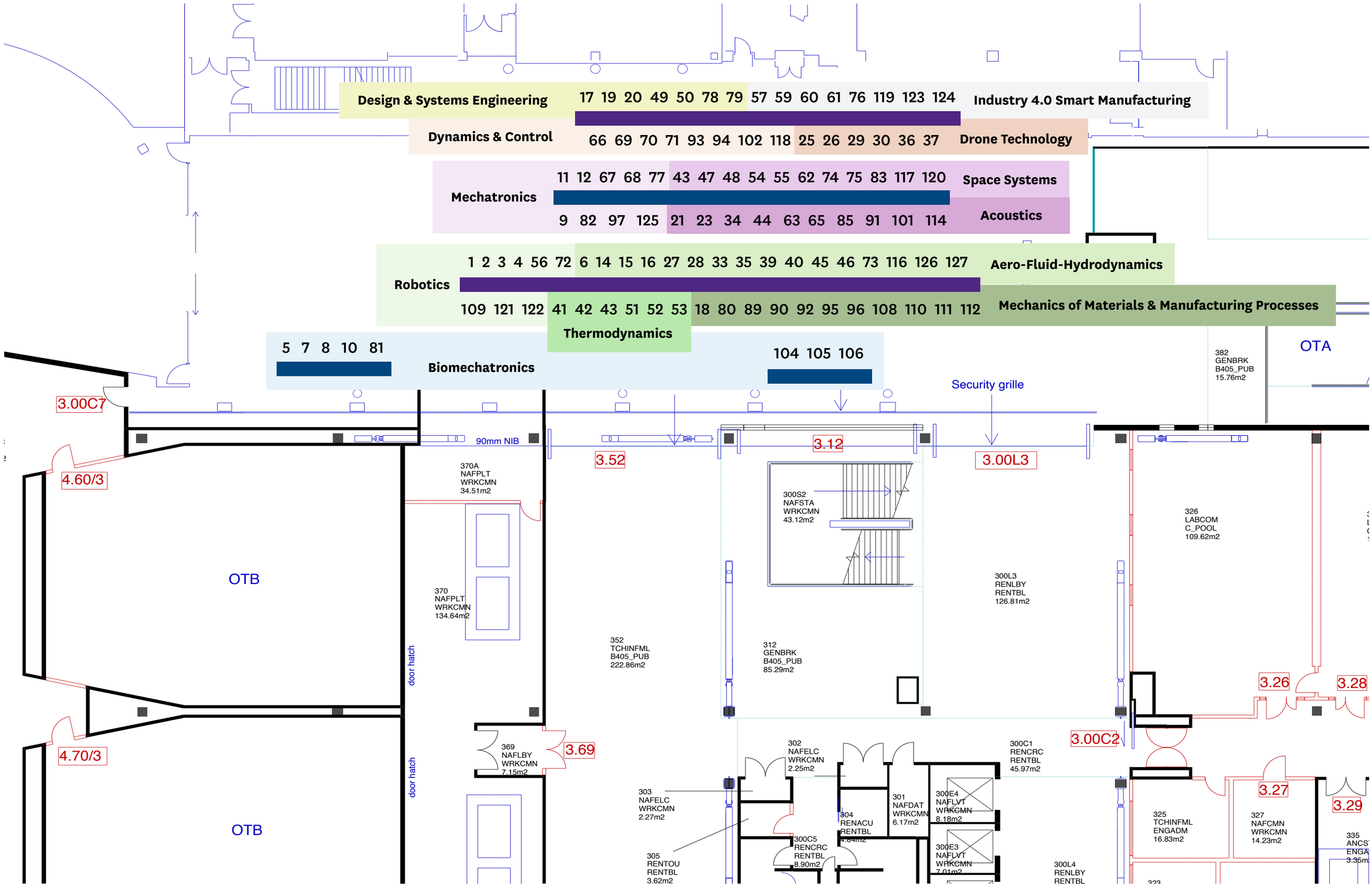

CHEMICAL & MATERIALS ENGINEERING

Energy

PROJECT NO	TITLE	SUPERVISOR	STUDENTS
1	Correlating Temperature with Various Greenhouse Gas Compositions in Heated Closed Systems	Ashton Partridge	Jay Wu
16	Investigation of material degradation of a PEM water electrolyser and energy efficiency loss	Jingjing Liu	Kevin Colita, Caroline Santosa
29	Regeneration of Electrode Materials from Black Mass (Battery Waste)	Peng Cao	Krisha Kumar, Isabel Woodward

Energy, Novel Materials

PROJECT NO	TITLE	SUPERVISOR	STUDENTS
12	Optimising design parameters for metal-air batteries	Shanghai Wei	John Misa, Giovanni Rogers
13	High performance electrode materials for aqueous metal-air batteries	Shanghai Wei	Keshini Amarawardana, Lia Ormsby
33	Biodegradable Piezoelectric Materials via Electrospinning	Jenny Malmstrom	Bree Aiono, Clarissa Lim

Food

PROJECT NO	TITLE	SUPERVISOR	STUDENTS
8	Foreign Bodies Detection in Mince and Juice Using Hyperspectral Imaging	Wei Yu	Jonathan Chong, Kaushiv Parekh
32	Understanding the mechanism of 3D-Ohmic food printing	Meng Wai Woo	Haoyi Li, Raymond Ren

Food, Innovative Processes

PROJECT NO	TITLE	SUPERVISOR	STUDENTS
17	Dealcoholisation of wine with membrane technology	Filicia Wicaksana	Zyean Cutler, Leon Sleith

Health & Well-being

PROJECT NO	TITLE	SUPERVISOR	STUDENTS
18	Osteoarthritis - Understanding the structure of cartilage in relation to its function	Ashvin Thambyah	Jack Clarke, Imesh Mallawaarachchi
21	The microstructural response of cartilage with a defect to mechanical compression	Ashvin Thambyah	Rebecca Amos, Ayasha Faaee
24	Investigating the biomechanical rationale for lumbar spine herniation through computational modelling	Reza Arjmandi, Ashvin Thambyah	Jaewon Choi, Jason Lee

Health & Well-being, Innovative Processes

PROJECT NO	TITLE	SUPERVISOR	STUDENTS
15	Treatment, regeneration and valorisation of spent soda lime carbon dioxide scrubber from anaesthetic machines	Saeid Baroutian	Diezel Bautista, William Chang

Innovative Processes

PROJECT NO	TITLE	SUPERVISOR	STUDENTS
3	Sustainable extraction of lipids from New Zealand green-lipped mussel using switchable green solvents	Kaveh Shahbaz	Alice Chen, Daniela Du
11	Adsorptive Removal of Waste Anaesthetic Gases (WAGs)	Saeid Baroutian	Uralaliyanage Savithi Gunasinghe, Lauren Holroyd
23	Investigating bioreactor operational conditions in an anaerobic chain-elongation bioprocess for upcycling winery waste	Shan Yi	Dhusar Chatterjee, Karl Luigi Guarin
25	Evaluating bacterial conversion of lignocellulosic biomass	Shan Yi	Tiffany Chen, Joseph Sia, Ella Rowe

Innovative Processes, Novel Materials

PROJECT NO	TITLE	SUPERVISOR	STUDENTS
26	Aerogels from sustainable sources for insulation	Mark Jones	James Batten, Cassie Farmilo
27	Biodegradation of sustainable resins used in packaging and adhesives.	Mark Jones	Amir Mahdi, Nancy Zhang
31	Influence of Bio-resin Content on the Mechanical Properties and Compostability of Natural Rubber Latex (NRL) Adhesives	Mark Jones	Rashidah Haneef, Juae Lee

Innovative Processes, Water

PROJECT NO	TITLE	SUPERVISOR	STUDENTS
2	Extraction of micro and nano plastics from water using green solvents	Kaveh Shahbaz	Zara Codyre, Tania Simpson

Novel Materials

PROJECT NO	TITLE	SUPERVISOR	STUDENTS
5	Novel carbon additions to carbide composites to mitigate inflight decarburisation in thermal spray coating	Steven Matthews	Alan Almeida, Mia Taylor
6	Investigation of the fundamental wear characteristics of industrial steels using pin on disc testing	Steven Matthews	Dominic Passau, Lily Wei
7	FeCr as an alternative to Co as a metallic binder in carbide composite systems	Steven Matthews	Andy Chow, Ezra Latif
9	High Performance Lithium Metal Battery for Aerospace Applications	Wei Gao	Muhammad Razeen Izzat Mohd Zainudin, Krishan Parekh
10	Sustainable Materials for Collector Bars: Recycled Alloy Evaluation	Wei Gao	James de Beer
28	Simulation of Defect formation during metal 3D printing	Peng Cao	Ewan Lee, John Zijlstra

Novel Materials, Water

PROJECT NO	TITLE	SUPERVISOR	STUDENTS
14	Phosphorus Recovery: A Solid Waste Reutilization Method	Wei Yu	Briana Curtis, Aidan Merrick

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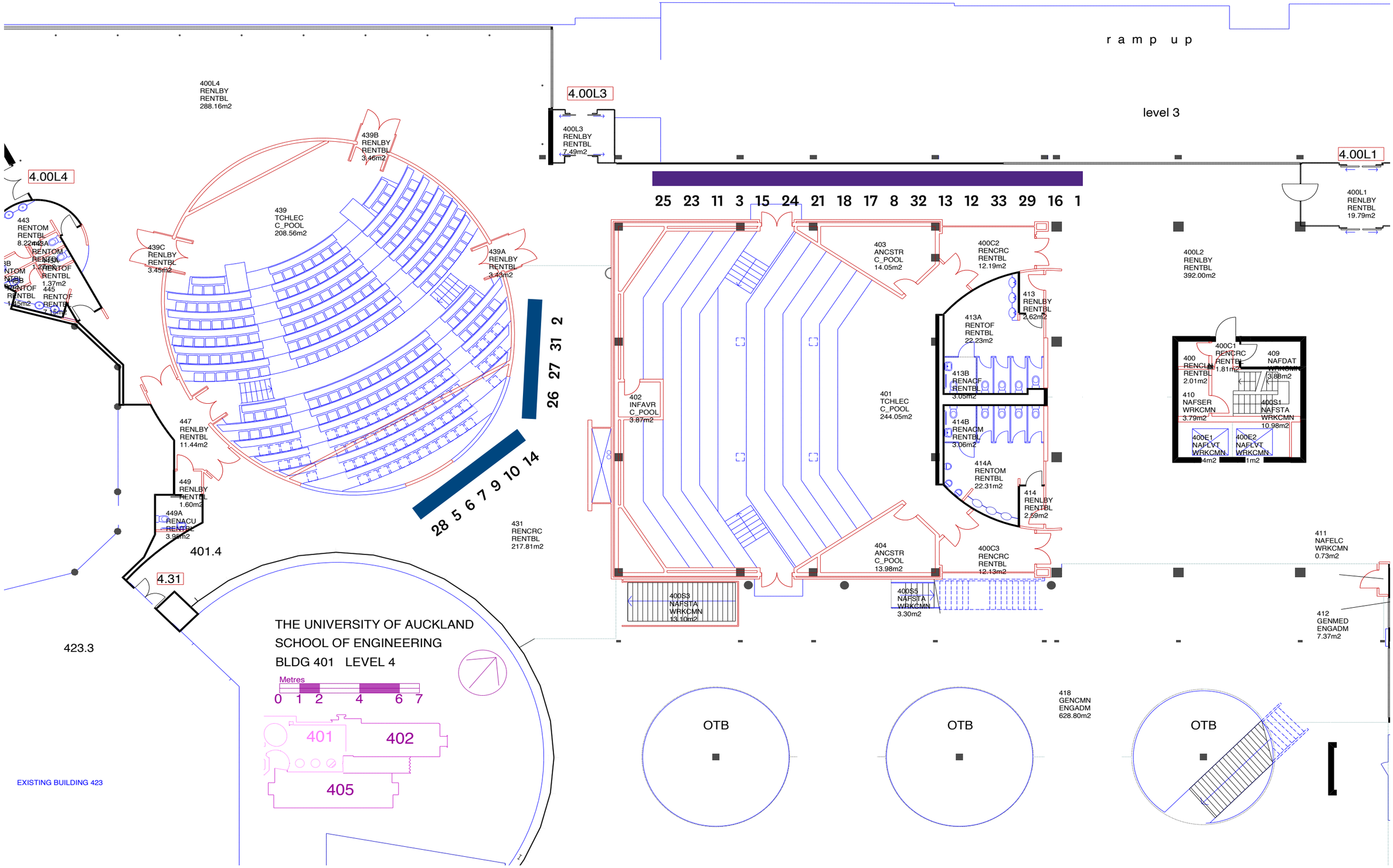

ENGINEERING SCIENCE & BIOMEDICAL ENGINEERING

PROJECT NO	TITLE	SUPERVISOR	CO-SUPERVISOR	STUDENTS
1	Spherical harmony	Poul Nielsen	Alex Dixon	Angela Guo (aguo921), Edmund Lu (elu777)
2	Wearable sensors to assess and monitor knee function following anterior cruciate ligament (ACL) injury	Thor Besier	Andreas Kempa-Liehr	Faith Han (fhan836), Vibhava Leelaratna (vlee669)
3	A sauna for heart muscle	Andrew Taberner		Ben Hutchison (bhut886), Pranisha Prasad (ppra318)
4	Blood sampling from the invisible fingerprint	Andrew Taberner		Eva Collier (ecol742), Tyler Petry (tpet771)
5	Augmented Reality Rehabilitation for Post-Stroke Spatial Neglect	Alan Wang		Promise Akindeju (pki308), India Green (igre915)
8	Harmonization of Brain MRI Scans Across Multiple Sites Using Machine/Deep Learning	Alan Wang		Corbet Anderson (cand936), Roshan Naik (rnai354)
9	Development of Stroke Rehabilitation Clinical Record Intelligent Management System	Alan Wang		Phillip Dong (pdon699), Alex Xie (zxie089)
10	Integrating functional assessment into pre-operative planning for hip replacement surgery	Thor Besier	Vickie Shim	Michael Bebelman (mbeb435), Josh Plummer (jplu752)
12	3D printed tracheas to study airflow obstruction	Vinod Suresh	Ho-Fung Chan	Ashlene Khoo (akho035), Sally Short (ssho175)
13	Design and Manufacture of CFRP Wheel Shells	Maedeh Amirpour		Sven Jansen-Snip (sjan581), Ishan Rama (iram275)
14	Innovating Mobility: Custom Prosthetic Insoles with 3D Printing Technology	Maedeh Amirpour		Natalia Clarke (ncla111), Bernice Yeo (byeo499)
16	Hawkeye – monitoring young animals and their growth characteristics	Jagir Hussan	Alex Dixon	Phoebe Donaldson (pdon238), Oscar Radonich (orad363)
18	Using Artificial Neural Networks to Predict Communication within Real Brain Cell Networks	Charles Unsworth		Geoffrey Chang (gcha446), Daniel Yang (zyan552)
23	Light touch for robots	Poul Nielsen	Alex Dixon	Anya Pearce (apea919), Eric Shen (eshe141)
25	Driving line optimization	Andy Philpott	Cameron Walker	Tanish Bhatt (tbha814), Liam Mobbs (lmob546)
26	Investigating Super Resolution	Ru Nicholson	Oliver Maclaren	Ashleen Lau (alau317), Natalie Lau (slau340)
27	SDDP versus JADE	Andy Philpott	Andrea Raith	Jacky Jin (jjin305), Bryce Lim (blim425)
28	Scraping Growth Hormone Data for patients from PDFs	Cameron Walker	Andreas Kempa-Liehr	Minji Lee (mlee563), Chris Zeng (czen620)
31	Growing Real Brain Cells on Silicon Chip	Charles Unsworth		Connor Sutton (csut974)
32	Development of survey protocols for coastal zones using drones	Cameron Walker	Michael O'Sullivan	Anna Sluyter (aslu085), Martin Wright (mwri469)
33	Robotic Gripper for the Soft and Delicate	Iain Anderson	Massi Hesam	Yangzhe Li (yil916), Jimmy Pen (vpen128)
34	Modelling CO_2 sequestration in geothermal systems using coupled wellbore-reservoir simulations	Ryan Tonkin	Michael Gravatt	Aryan Karan (akar444), Abigail Swanepoel (aswa148)
37	Simulation Modelling for Emergency Departments	Michael O'Sullivan	Cameron Walker	Alexandre Fargier (afar353), Mackenzie Rhodes (mrho451)
43	Micro-structural characteristics of the placenta in a healthy pregnancy	Alys Clark		Florencia Gonzalez (fgon854), Ianne Parado (ipar468)
44	Measuring Motion Sickness using Biosignals in Virtual Reality	Mark Billinghurst		Qinxue Feng (qfen985), Yan Liu (yilu789)
45	Empathic Touch for Mixed Reality Agents	Mark Billinghurst	Iain Anderson	Chengen Dai (cdai940), Jennifer Lu (mlu694)
49	Beating heart disease - non-contact imaging for cardiovascular disease	Prashanna Khwaounjoo	Alex Dixon	Michael Oborn (mobo987), Eric Ou (eou887)

PROJECT NO	TITLE	SUPERVISOR	CO-SUPERVISOR	STUDENTS
50	[CDP-ECSE] PkW Shareholder Matching and Visualisation	Andrew Mason		Sophie Lee (else861)
52	Equity in Surgery Scheduling	Thomas Adams	Cameron Walker	Brodie Dye (bdye239), Perrie Macdonald (pmac178)
53	Groundfish Survey Design	Thomas Adams	Cameron Walker	Gary Kessell (gkes799), Dana Smith (dsmi864)
54	A real-time GPS for the gut	Recep Avci	Leo Cheng	Reaah Kim (rkim752), Donny Weng (dwen400)
55	Spooky shoulders - an exploration of phantom and algorithm design for shoulder system identification	Bryan Ruddy		Mathijs Fijma (mfij336)
59	Computational modelling of diabetic heart cells: what's making it fail?	Kenneth Tran	June-Chiew Han	Simran Chandradevan (schb832), Angel Lai (alai402)
60	Non-Destructive Quality Control of Lithium-Ion Batteries Using Scanning Acoustic Microscopy and Machine Learning	Andreas Kempa-Liehr		Dominic Donahue (ddon335), Minghao Li (mli177)
61	Parallel solvers for dissipative solitons in reaction-diffusion systems of one-activator-two-inhibitor type	Andreas Kempa-Liehr		Dharva Jani (djan862), Gurjas Sekhon (gsek473)
62	Quantifying anatomical changes in the rodent femur following spinal cord injury	Salvador Lopez	Julie Choisne	Logan Maass (lmaa979), Cohen Radich (crad420)
64	Why won't my model run?! Analysing and improving geothermal simulation models using machine learning	Oliver Maclaren	John OSullivan	Griffin Aldrin (gald275), Raymond Zhang (rzha174)
65	What are these cells doing?! A deep learning approach to high-throughput image analysis	Oliver Maclaren	Laura Domigan	Ayaan Saiyad (asai688), Mihnea Vlad (mvla025)
69	Evaluating Heuristics and Improved MIPs for Plant Scheduling for Fonterra	Andrew Mason		Thong Chea (tche206), Mark Pham (dpha730)
71	Using Analytics, Optimisation and Data to model the borrowing of Te Reo Māori words into English	Andrew Mason		Ben Ritchie (brit994), Louis Sinclair (lsin307)
73	Generative AI for 3D echo - image quality verification and enhancement	Martyn Nash	Edward Ferdian	Theo Lim (jlim865), Phillip Wu (pwu233)
74	Novel soft robotic actuator systems	Bryan Ruddy		Maxten Sampson (msam289), Flynn Yeatman-Biggs (fyea100)
75	Generative AI for 3D echo - verifying usefulness of quantity and quality of synthetic data in improving image segmentation	Martyn Nash	Edward Ferdian	Richard Cheng (rche140), Peter Wang (wpet568)
76	Quantifying breast shape, volume, and composition	Thiranja Babarenda Gamage	Martyn Nash	Anna Fu (afu254), Ray Zhang (yzhb683)
77	Mitigation of coastal wave impact damage through flexible protection systems	Mark Battley		Alyssa Olsen (aols711), Jordan Smith (jsmi945)
79	Towards more sustainable freight transport in NZ	Andrea Raith		Hassan Al Bazzaz (halb505), Edison Huang (ehua369)
80	Cyclist network analysis	Andrea Raith		Wensu Kuang (wkua622), Freddie Ma (zma721)
81	Beyond the try line - predicting how the brain changes after head impact	Vickie Shim	Justin Fernandez	Christina Leong (cleo451), Jacob Mathew (jmat310)
82	How does vaping affect the lungs: testing a benchtop chamber for cell culture experiments	Vinod Suresh	Kelly Burrowes	Neha Ashok (nash105), Tarun Muralidhar (tmur293)
83	Inferring the detailed history of a geothermal field using sparse data and machine learning	Michael Gravatt	Andreas Kempa-Liehr	Daniel Clark (dcla189), Michael Terekhin (mter153)
84	Quantitative MRI -retrospective research data quality assessment	Eryn Kwon	Maedeh Amirpour	Hazel Burgess (hbur399), Megan Thomas (mtho993)

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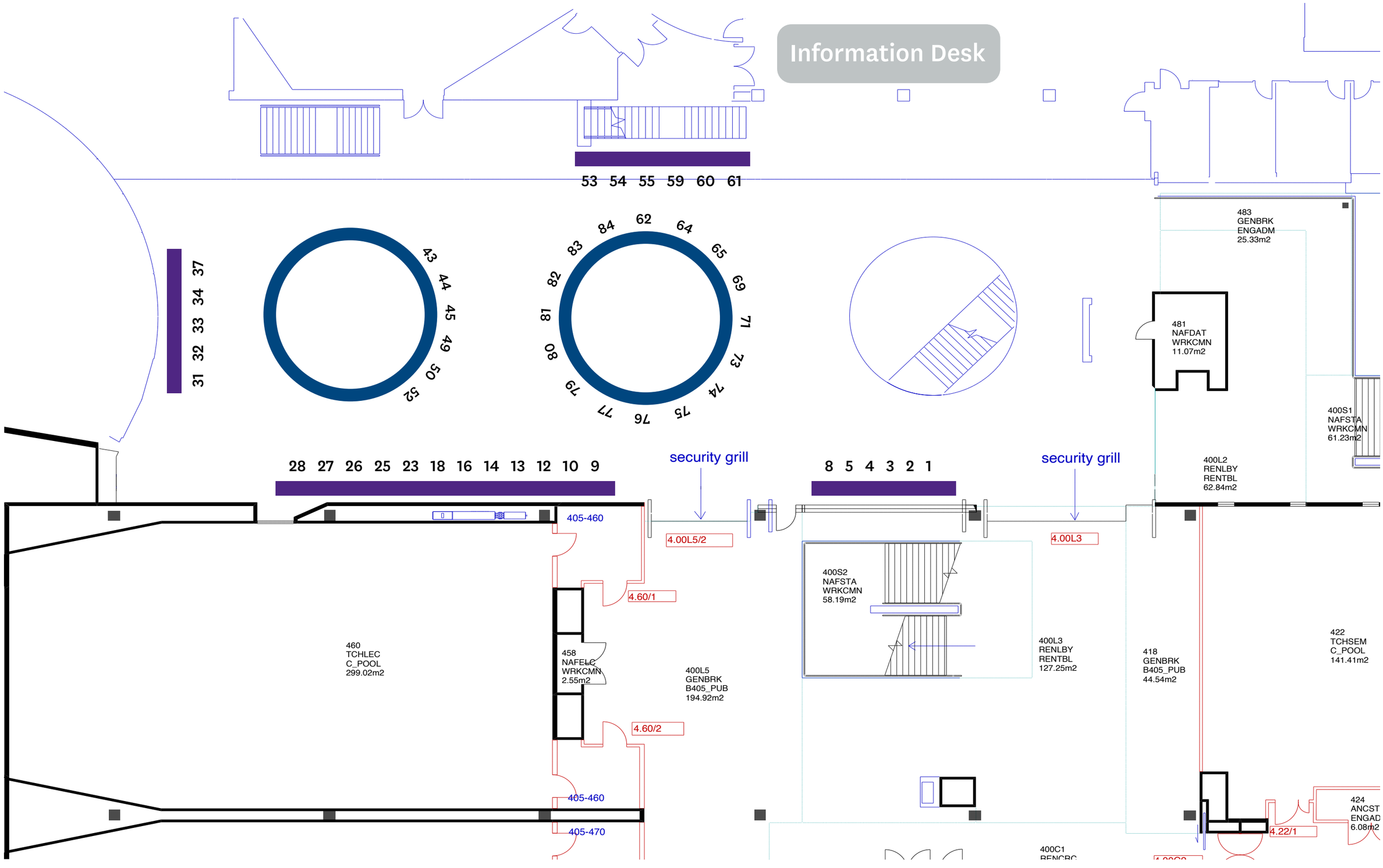


ELECTRICAL, COMPUTER, & SOFTWARE ENGINEERING

AI & Machine learning - 1

PROJECT NO	TITLE	STUDENTS	LAB
5	Generative AI models for the inverse problem of electrocardiography	Aaron Guo, Josh Jeffers	Embedded Systems (405.760, Lab)
11	AI Plays Pokémon - can AI become the very best like no one ever was	Samuel Boasman, PK Wadsworth	Control Systems (405.722, Lab)
28	Developing Novel Backpropagation-free Deep Neural Network	James Gong, Bruce Li	Control Systems (405.722, Lab)
73	Identifying intruders on scooters entering carparks	Vinayak Joshi, Adwait Mane	MDLS (405-569)
77	Can GPTs revolutionize forecasting the hospitalization burden caused by respiratory diseases?	Alex Kim, Joao Madelino	MDLS (405-569)
137	MoodAI: Objective mood state assessment using digital biomarkers	David Su	Radio Systems (405.736, Lab)

AI & Machine learning - 2

PROJECT NO	TITLE	STUDENTS	LAB
6	AI for sentiment analysis of financial text and its application to trading	Hugo Mills, Ben Zhou	Embedded Systems (405.760, Lab)
35	Building a Machine Learning Model to Optimise the Varying of Financial Trading Model Parameters and Maximise Financial Trading Profitability	Oliver Mitchell, Rivah Somerville	Embedded Systems (405.760, Lab)
91	Poison is Not Traceless: Fully-Agnostic Detection of Poisoning Attacks	Eugene Chua, Clemen Sun	MDLS (405-559)
95	Connecting Adversarial Learning and Applicability Domain in Cheminformatics	Lee Violet Ong, Emily Zou	MDLS (405-559)
98	Streamlining adversarial machine learning on Memento	Emma Wang, Lina Yuan	MDLS (405-559)
125	Improving Search-Based Test Generation with Large Language Models	Janith Hettiarachchi, Robert Sefaj	HASEL (405.662, Lab)

Control Systems

PROJECT NO	TITLE	STUDENTS	LAB
48	Intelligent Controllers for Wind Energy Systems	Henry Kim, Wade Park	Power Systems (405.628, Lab)
57	A deterministic networking platform using Google bittide	Allan Chien, Daniel Martinez	Control Systems (405.722, Lab)
82	Improved filtering for Non-Invasive Blood-Glucose detection	Puja Nory, Hira Saleem	Control Systems (405.722, Lab)
117	Beehive CO2 Monitoring	Shaaran Elango, Brian Wei	Control Systems (405.722, Lab)
118	Machine learning applied to behavioural markers in beehives	Jiajun Luo, Lauren Parker	Control Systems (405.722, Lab)

Embedded Systems - 1

PROJECT NO	TITLE	STUDENTS	LAB
33	Acceleration of Capsule Networks on Heterogeneous Adaptive Platforms	Jerome Jose, Nicholas Wolf	Embedded Systems (405.760, Lab)
56	Automating clinical trials using NLP and synchronous programming	Harsheel Singh, Peter Yin	Control Systems (405.722, Lab)
62	IPT and CV enabled UAV for inaccessible urban gardens	Marianne Healey, Jack Sutcliffe	Power Electronics (405.614, Lab)

PROJECT NO	TITLE	STUDENTS	LAB
63	Web-Based Device Management Application for Robotics and IoT	Jolin Chen, Frank Situ	Robotics (405.652, Lab)
88	ReactiveNiOS - an execution platform for concurrent programming of real-time software systems	Kaidi Ginns, Peter Stenersen	Embedded Systems (405.760, Lab)
101	Improving the vision system for disease detection	Nicholas Tjong, Ray Xiao	Robotics (405.652, Lab)

Embedded Systems - 2

PROJECT NO	TITLE	STUDENTS	LAB
26	Physical coding blocks for robotics and software education	Victoria Jones, Matthew Taylor	Control Systems (405.722, Lab)
34	Energy Efficient Machine Learning Solutions on Adaptive Platforms	Heath Grant, Caleb Yang	Embedded Systems (405.760, Lab)
41	Reconfigurable Hardware Accelerator for Energy-Efficient AI	Uma Surendranath, Dulanya Withana	Embedded Systems (405.760, Lab)
43	Soft-Core based Multi-Processor System for Multi-Tasking Applications	Belal Hatem, Caleb Wong	Embedded Systems (405.760, Lab)
66	Optimising Machine Learning Models	James Beazley, Penelope Goertzen	Embedded Systems (405.760, Lab)
83	A pick-and-place for rapid prototyping	James Bao, Sam Skinner	Control Systems (405.722, Lab)

Games & Education Aids - 1

PROJECT NO	TITLE	STUDENTS	LAB
3	How Can We Use Board Games to Teach Robot Ethics?	Ammaar Marzook, Khaled Shaik	Radio Systems (405.736, Lab)
14	Draw a software engineer. Investigating the engineering gender gap	Lia Arroyo, Michelle Lie	HASEL (405.662, Lab)
15	An Automated Assessment Grader using ChatGPT	Matthew Stevens, Caleb Wei	Radio Systems (405.736, Lab)
90	Tangible AR for Data Structure Teaching	Sophia Creak, Logan Head	MDLS (405-559)
103	RythmWalker – A Mobile AR Rhythm Game for Promoting Physical Activity	Yizheng Xing, Yuqi Xing	MDLS (405-559)
131	STEM: Computing and Electronics Education for High School Classrooms	Harrison Bound, Elijah Kahuroa-Stainton	Green Electronics (405.712, Lab)

Games & Education Aids - 2

PROJECT NO	TITLE	STUDENTS	LAB
18	Online platform to enhance student CV work experience and project sections	Ruth Gao, Lucy Zhu	MDLS (405-569)
72	VR and psychophysiological monitoring to develop resilience in Health and Safety training	Joon Young Baik, Luke Kim	Green Electronics (405.712, Lab)
104	AR/VR Perceptual Training	Luca Eastwood, Tristan Mona	MDLS (405-559)
107	VR Bicycle Safety Perception And Training	Leander Legaspi, Connor Stevens	MDLS (405-559)
111	AR Piano Tutor	Dan Chae, Jeremy Ting	MDLS (405-559)
133	Compressive Sensing Illustrated (CSI): A Visual Educational Aid for Learning Compressive Sensing Concepts	Sree Bommineni, Jesse Stayte	Control Systems (405.722, Lab)

Green Energy Technologies

PROJECT NO	TITLE	STUDENTS	LAB
8	Photovoltaic MPPT and MPC control of Hybrid Energy Storage System in Microgrid System	Harry Li, Aamir Mohmand	Power Systems (405.628, Lab)

PROJECT NO	TITLE	STUDENTS	LAB
50	Daylight control in indoor lighting systems	Vance Andrews, Owen McGrath	Radio Systems (405.736, Lab)
51	Emergency lighting for low visibility spaces	Soleil de Bruto, Lanishka Varatharajan	Radio Systems (405.736, Lab)
97	Grid-supporting and Grid-forming Microgrids	Xin yang Han, Alex Won	Power Systems (405.628, Lab)
130	Supercapacitor energy management for energy harvesting systems	Tawan Sangprong, Ri Yoo	Green Electronics (405.712, Lab)

Human Computer Interactions - 1

PROJECT NO	TITLE	STUDENTS	LAB
2	How Can Developers Collaboratively Work on Program Code?	Justin Ang, Mitchell Wong	Radio Systems (405.736, Lab)
67	Enhancing Music Generation Through Data Augmentation Techniques	Eric Jiang, Kevin Jin	Embedded Systems (405.760, Lab)
78	Virtual reality installation to study embodiment	Liam Gerritsen, Benjamin Kelly-Young	MDLS (405-559)
79	Intelligent body tracking and agent in Virtual reality to study embodiment	Amanda Huang, Jason Xavier	MDLS (405-559)
96	Investigating Autobiographical Memory Retrieval and Emotion Induction in Virtual Reality	Samhar Aeron, Rebecca Hunt	Radio Systems (405.736, Lab)
112	Universal Smart Home Interface: Custom Gesture Control in Augmented Reality	Tony Gao, Shiqing Guan	Embedded Systems (405.760, Lab)

Human Computer Interactions - 2

PROJECT NO	TITLE	STUDENTS	LAB
49	Digitalization of 'The Gift Box' Tool	Michael Hardy, Ben Martin	MDLS (405-569)
74	Visual LegalRuleML editor with auto-completion	Leander D'Souza, Trevor Po	MDLS (405-569)
80	Mixed reality and electronic prototyping installation to study embodiment	Avinaash Krishnan	MDLS (405-559)
121	The confluence and navigation of disconnected repositories of building information	Samuel Cordner, Dylan Heron	MDLS (405-559)
53	AI-Enabled Chatbot for Mental and Wellbeing Care	Amanda Lao, Zhuozhi Ou	MDLS (405-569)
54	AI-Enabled Virtual Assistant for Aged Care	Wenxi Kang, Ruoyu Zhang	MDLS (405-569)

Image & Voice Processing - 1

PROJECT NO	TITLE	STUDENTS	LAB
27	Employing Artificial Intelligence and Remote Sensing Technologies for Early Detection and Response	Farin Ali, Tuan Le	Control Systems (405.722, Lab)
46	A Neural Speaker Diarization System for Doctors	Steven Li, Adi Shenoy	HASEL (405.662, Lab)
71	Image Motion Elimination for Aquaculture Vision	Tyler Kim, Luke McCallum	Radio Systems (405.736, Lab)
76	Computer Vision Support for Reinforcement Learning Overtaking Maneuvering of a Formula SAE CAR	Tony Lu, Raymond Luo	Radio Systems (405.736, Lab)
100	3D scanner	Manav Lal, Josef Santos	Radio Systems (405.736, Lab)

Image & Voice Processing - 2

PROJECT NO	TITLE	STUDENTS	LAB
42	Application-Specific Processor for Computer Vision	Bailey Clague, Ian Kuik	Embedded Systems (405.760, Lab)

PROJECT NO	TITLE	STUDENTS	LAB
45	Pallet Detection with Machine Learning: From synthetic data to the real world	Yechan Kim, Henri Mueller	Robotics (405.652, Lab)
110	mmWave based human activity recognition	Yang Qian, Katie Zhou	Embedded Systems (405.760, Lab)
127	Decoding Discourse: Advancing Fairness in Speech Technology	Dhruv Joshi, Aaron Rodrigues	Control Systems (405.722, Lab)
134	Behaviour Analysis using Computer Vision for Training Accelerator-based Ear Tags	Jason Perng, Sadat Taseen	Robotics (405.652, Lab)

Intelligent Systems & Industrial Informatics

PROJECT NO	TITLE	STUDENTS	LAB
60	Blockchain-Enhanced Roaming Contracts: Integrating Smart Contracts for Mobile Networks Operators Service Optimization	Kiko Ilievski, Sharjil Kazi	Radio Systems (405.736, Lab)
86	Designing Dynamically Reconfigurable Factory Automation Systems	Yiming Li, Ruizhe Wang	Embedded Systems (405.760, Lab)
87	Novel uses of Digital Twin technology in Industrial Automation Systems	Alex Hope, Anna Shimizu	Embedded Systems (405.760, Lab)
99	Enhancing Manufacturing Quality with AI-Powered Vision Systems	Qi Qin, Kylyn Wu	Robotics (405.652, Lab)
109	A digital twin for Lake Waikare using distributed wireless sensors	Ken Tsao, Samuel Ward	Embedded Systems (405.760, Lab)

Parallel & Cloud Computing

PROJECT NO	TITLE	STUDENTS	LAB
7	Can HLS effectively target several small devices (FPGAs) for use in satellites?	Dylan Chamberlain, Franklin O'Sullivan	Embedded Systems (405.760, Lab)
21	Investigating improvements of acceleration structures in offline pathtracers	Jack Freeth, Zane Larking	Embedded Systems (405.760, Lab)
105	Sustainable computing of machine learning and data science jobs	Stephen Brooks, Samuel Hu	Embedded Systems (405.760, Lab)
106	Column generation algorithm for task scheduling in parallel systems	Jake Bowden, Sergei Ogai	Control Systems (405.722, Lab)

Power Electronics & Electronics Systems

PROJECT NO	TITLE	STUDENTS	LAB
12	CDP-Mechanical Eng-Development of a DC current offset probe for high power applications	Kyja McCabe	Green Electronics (405.712, Lab)
31	Sensorless Control of BLDC motors under impulse loading conditions	Aaron Beintken, Ethan Kyle	Power Electronics (405.614, Lab)
68	Improved Cell Balancing Techniques that Co-operate with Regenerative Energy Recovery Systems for Electric Race Cars	Simon Alexander, Andy Woo	Green Electronics (405.712, Lab)
122	Wireless charging of real-time tracking devices for healthcare applications	Qiansong Luo, Aihui Zou	Power Electronics (405.614, Lab)
123	Contactless power supply and control of wheel hub motors	Frank Chen, Johnson Lu	Power Electronics (405.614, Lab)

Power Systems

PROJECT NO	TITLE	STUDENTS	LAB
16	DC Protection Schemes based Improvement of Reliability of HVDC Systems	James Davison, Lucas Gray	Power Systems (405.628, Lab)
93	Improving resilience of distribution networks against high-impact-low probability events using artificial intelligence	Khaled Hasaniah, Keith Van Oosterom	Power Systems (405.628, Lab)
102	Fault Induced Delayed Voltage Recovery in Active Electricity Distribution Networks	Leon Digges, Pas Mudannayaka	Power Systems (405.628, Lab)

PROJECT NO	TITLE	STUDENTS	LAB
113	Enhancing Cybersecurity in Digital Substations: An Investigation into the Practical Application of Intrusion Detection Systems	Sukhleen Kaur, Kenny Cheuk Fung Lam	Power Systems (405.628, Lab)
126	Electricity Smart Meter Data Applications using Big Data analytics and ANN	Tianchang Feng, Ang Li	Power Systems (405.628, Lab)

Radio Systems

PROJECT NO	TITLE	STUDENTS	LAB
38	Broadband Horn Antennas for Anechoic Chamber Measurements	Josh Williamson, Kian Zadeh	Radio Systems (405.736, Lab)
39	High-Performance Metasurface Waveguides	Arthur Christanand, Kristopher Doria	Radio Systems (405.736, Lab)
108	Drone-based wireless sensor network with battery-less sensors	Mingyu Fan, Helen Huang	Embedded Systems (405.760, Lab)

Robotics

PROJECT NO	TITLE	STUDENTS	LAB
9	Reinforcement Learning based control of an Autonomous Formula SAE Car	Kyla Lee, Futian Zhou	Robotics (405.652, Lab)
10	Reinforcement Learning Based Control for Robotic Grasping and Manipulation with a Robot Hand	Benny Del Rosario, Josh Meyer	Robotics (405.652, Lab)
44	ML classification of plant pathogens from image data	Parambir Singh, Maryam Zehra	Control Systems (405.722, Lab)
61	Plant monitoring system to estimate harvesting timing	Do Jun Kwon, Kim Zuo	Robotics (405.652, Lab)
64	Dynamic Facial Expression Generation for Head Robots with Adaptive Style Control	Isaac Lee, Samuel Yoo	Robotics (405.652, Lab)
65	Enhancing Human Motion Generation with Flexible Style Control	James Gai, Xinhuiqiang Xu	Robotics (405.652, Lab)

Signal Processing

PROJECT NO	TITLE	STUDENTS	LAB
32	Exploring thermal haptic feedback on conveying emotion in film scores	Benson Cho, Rishi Shukla	Control Systems (405.722, Lab)
37	Investigating speech intelligibility inequity in our learning spaces.	Woo Jin Lee, Ariel Wang	Control Systems (405.722, Lab)
47	Power Quality Assessment in Smart Grid using Machine Learning Techniques	Ganesh Mahesh, Harry Wigley	Control Systems (405.722, Lab)
52	Transmitting audio via light	Viktor Neshikj, Oliver Wright	Radio Systems (405.736, Lab)
128	Anomaly detection for IoT-based time series	Joshua Morley, Ryan Yoon	Embedded Systems (405.760, Lab)

Smart Phone & Tablet Applications

PROJECT NO	TITLE	STUDENTS	LAB
1	How Can Physiological Data Support the Self-Management of Stress?	Janna Rutor, Michelle Wang	Radio Systems (405.736, Lab)
24	Providing patients suffering from cancer or other terminal illnesses with easy to digest information	Andrew Lam	MDLS (405-569)
55	Enhanced Indoor Activity Tracking with Risk Management	Johnny Shen, Cheryl Yu	MDLS (405-569)
69	Analysis of news sources to provide localized disaster information	Grant Liu, Wen Jie See	MDLS (405-569)
70	Presentation of disaster news information to different kinds of users	Vishva Dave, Aditya Sohani	MDLS (405-569)
132	Mood Colours - Colours for treating anxiety and depression	Jeffery Cao, Justin Huang	Green Electronics (405.712, Lab)

Software Development Tools and Processes - 1

PROJECT NO	TITLE	STUDENTS	LAB
4	How Do Spatial Code Editors Help Programmers Understand Code?	Matthew Wai, Jason Yang	Radio Systems (405.736, Lab)
17	Can AI help detect biases affecting the reliability of Open Source documentation?	Jessica Lowe, Samuel Ou	HASEL (405.662, Lab)
58	Stress Monitoring and Quantification through Digital Biomarkers	Timothy Looi, Dhruvkanth Puli	Control Systems (405.722, Lab)
59	Investigating inclusion of software engineering tools and practices	Atharva Arankalle, Amisha Singh	HASEL (405.662, Lab)
75	Translating tables of information into a logical representation	Shiangbo Chang, Manjot Mann	MDLS (405-569)
115	Towards a Framework to Improve and Validate Source Code generated by Large Language Models	Dylan Bradshaw, Ravin Ravi	HASEL (405.662, Lab)

Software Development Tools and Processes - 2

PROJECT NO	TITLE	STUDENTS	LAB
84	Examining the impact of criticism in software code review	Tisha Naicker, Tanishq Ranjith	HASEL (405.662, Lab)
94	Emotion Dashboard Application	Daniel Eir, Jacky Zhou	MDLS (405-559)
114	Testing Common Software Vulnerability Patches	Xin Yang Liu, Kyle Lowe	HASEL (405.662, Lab)
116	Towards Automated Behaviour-Driven Development	Guryash Matharu, Naren Rohan	HASEL (405.662, Lab)
124	Automated Ontology Learning with Large Language Models	Jasper Lai, Henry Wang	HASEL (405.662, Lab)
135	Automatic Testing of StackOverflow.com Code Snippets	Tudor Zagreanu	HASEL (405.662, Lab)

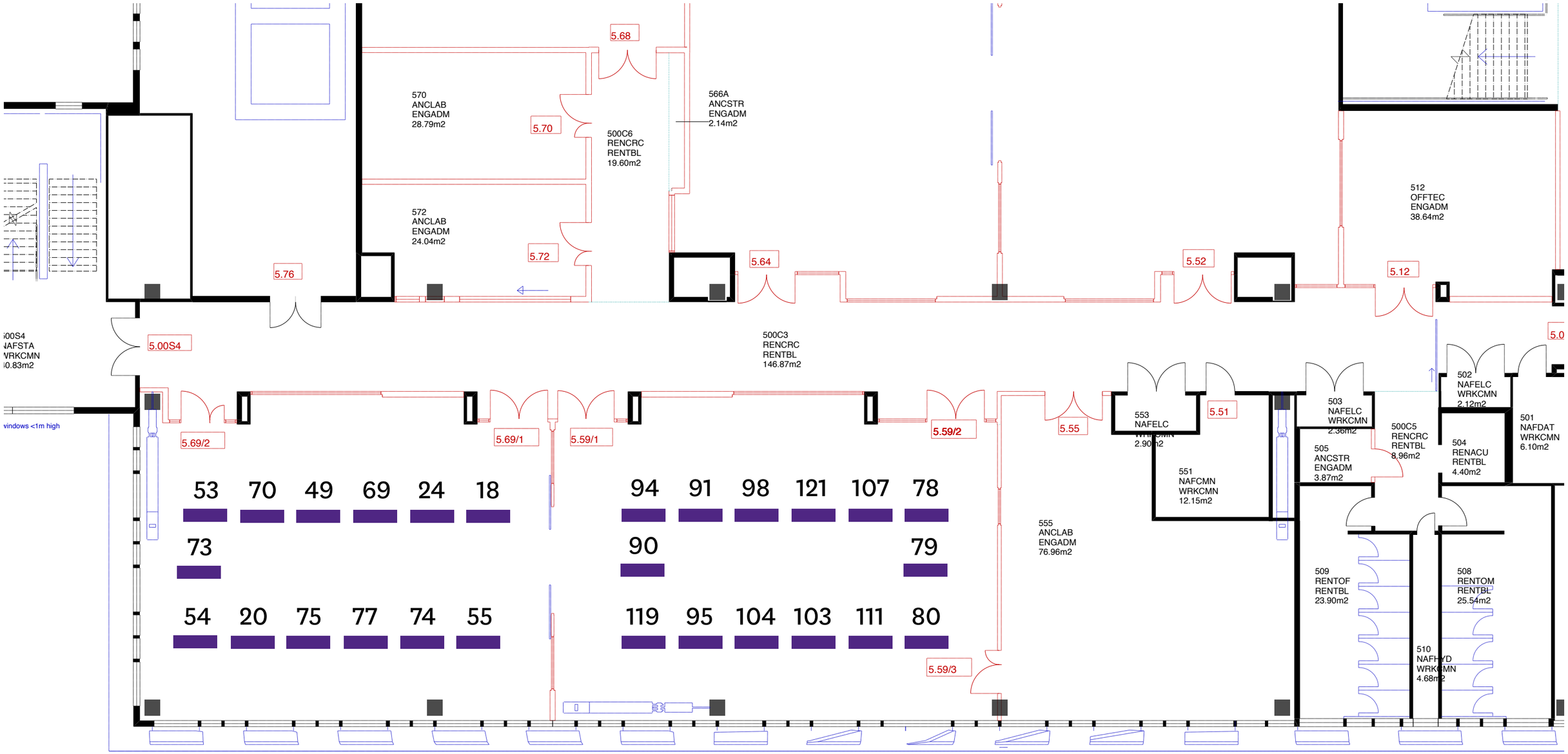
Web tools and Application

PROJECT NO	TITLE	STUDENTS	LAB
20	Web application tool for technical interview preparation	Niraj Patil, Jacob Tan	MDLS (405-569)
25	CDP – CIVIL ENGINEERING - Understanding the factors behind EV adoption in rural NZ communities	Jordan Cooke, Jace Ye	HASEL (405.662, Lab)
36	Exploration of Digital equity within Auckland	Gurjot Bhullar, Kai Hirafune	Control Systems (405.722, Lab)
119	Bias in Large Language Models	Nathan Bell, Troy Murdoch	MDLS (405-559)
120	[CDP-ENGSCI] PkW Shareholder Matching and Visualisation	Dana Seong	Control Systems (405.722, Lab)
136	A Smart Inventory Management System with Asset Tracking	Devesh Duptala, Young Min Kim	Green Electronics (405.712, Lab)

Wireless Power Technologies

PROJECT NO	TITLE	STUDENTS	LAB
13	Development of a Transformer-Rectifier Flux Pump for Superconducting Magnets	Oscar Kippenberger, Jacob Mander	Green Electronics (405.712, Lab)
19	Investigation of laser powered drone integration techniques	Ziqi Jin, Han Zhi	Power Electronics (405.614, Lab)
22	Development of low power three-phase IPT system	Simon Holland, Jan Koeglberger	Power Electronics (405.614, Lab)
23	Investigating wireless synchronisation in a bipolar pad WPT system to be used for EV charging	Shaorong Liu, Andrew Sknar	Power Electronics (405.614, Lab)
129	High power Inductor design for an IPT Inverter	Fraser McDowell, Finnian Montgomery	Power Electronics (405.614, Lab)

ECSE:
B405. LEVEL 5
MDLS 559 & 569



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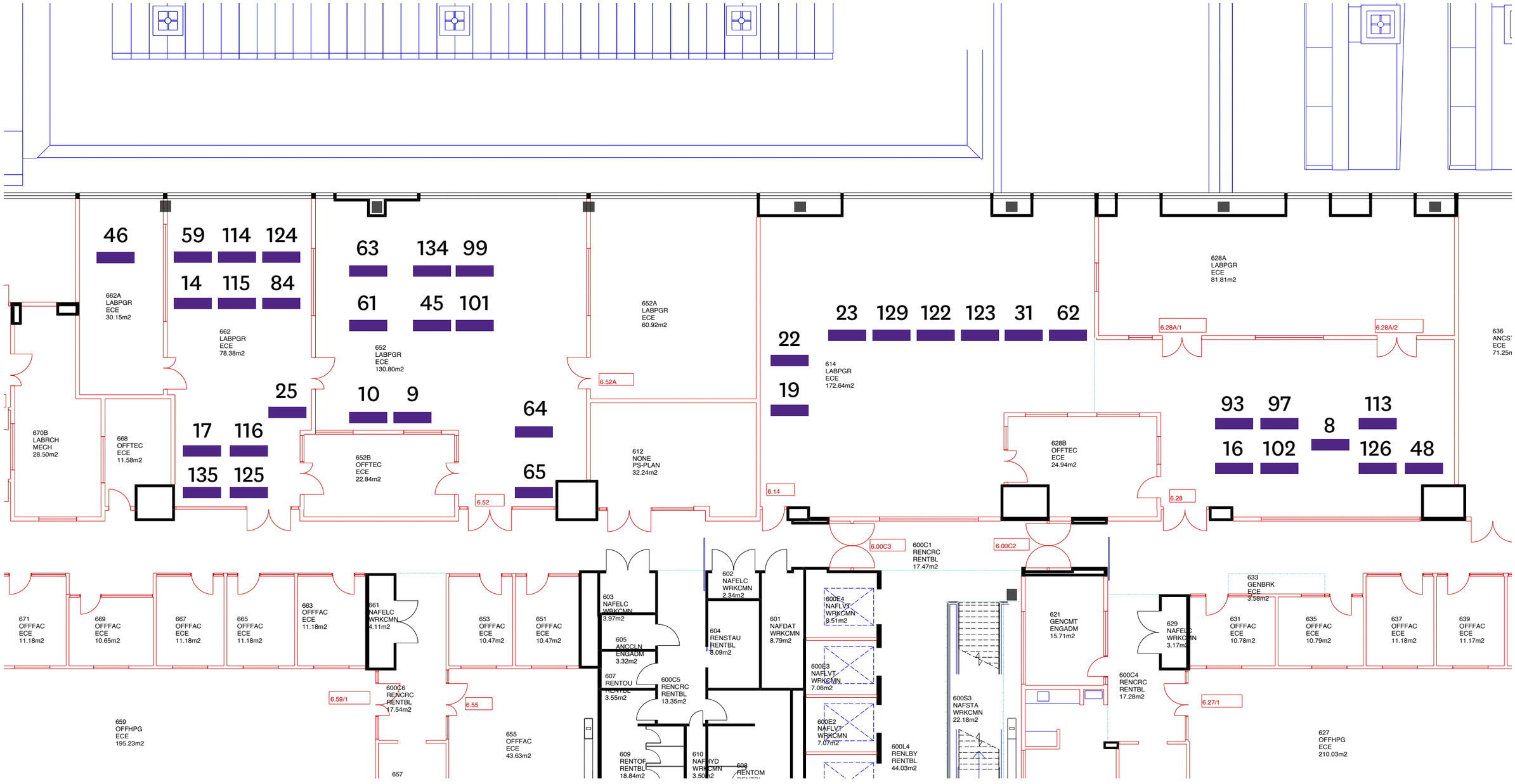
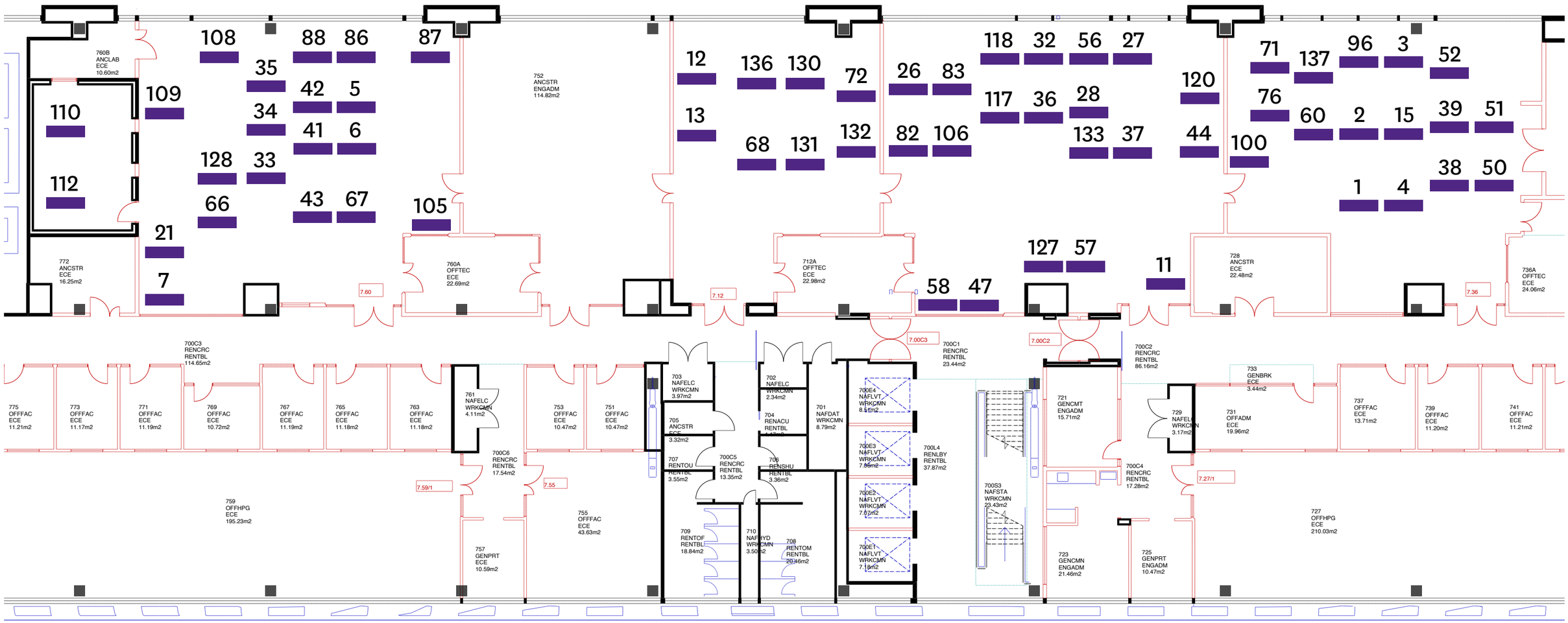
B405. LEVEL 6
614, 628, 652, 662, 662A



ECSE:
B405. LEVEL 7
712, 722, 736, 760, & 760C



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