JOB DESCRIPTION

Engineer Research Software

ROLE TITLE	Engineer Research Software
SECTION/DIVISION:	eResearch Support, Digital Division
REPORTS TO:	Group Leader Research Software Engineering
DIRECT REPORTS (FTE):	Nil
INDIRECT REPORTS (FTE):	Nil
PRIMARY PURPOSE OF THE ROLE:	Design, develop, and maintain complex research software applications and computational models that support scientific investigation and data analysis. Collaborate closely with research teams to translate scientific problems into robust, efficient, and scalable software solutions, using advanced programming techniques and scientific modelling. Lead the full software development lifecycle, from conceptual design and prototyping through implementation, testing, and refinement, ensuring adherence to organisational standards and best practices. Provide specialist advice on software design, methods, and tools to optimise development processes and software quality. Apply numerical analysis, data science, and scientific modelling expertise to develop and enhance algorithms and computational models that accurately represent real-world phenomena. Evaluate and improve existing models, communicate limitations clearly, and contribute to advancing research capabilities through innovative software solutions.
ACCOUNTABILITIES:	**Software design, SWDN: Level 4** Designs complex software applications, components and modules. Uses appropriate modelling techniques following agreed software design standards, guidelines, patterns and methodology. Creates and communicates multiple design views to balance stakeholders' concerns and to satisfy functional and non-functional requirements. Identifies, evaluates and recommends alternative design options and trade-offs. Models, simulates or prototypes the behaviour of proposed software to enable approval by stakeholders, and effective construction of the software. Verifies software design by constructing and applying appropriate methods. Reviews, verifies and improves own designs against specifications. Leads reviews of others - designs. **Programming/software development, PROG: Level 5** Takes technical responsibility across all stages and iterations of software development. Plans and drives software construction activities. Adopts and adapts appropriate software development methods, tools and techniques. Measures and monitors applications of project/team standards for software construction, including software security. Contributes to the development of organisational policies, standards, and guidelines for software development.

Methods and tools, METL: Level 4
Provides advice and guidance to support the adoption of methods and tools and adherence to policies and standards.

Tailors processes in line with agreed standards and evaluation of methods and tools.

Reviews and improves usage and application of methods and tools.

Specialist advice, TECH: Level 4
Provides detailed and specific advice regarding the application of their specialism to the organisation's planning and operations.

Actively maintains knowledge in one or more identifiable specialisms.

Recognises and identifies the boundaries of their own specialist knowledge.

Where appropriate, collaborates with other specialists to ensure advice given is appropriate to the organisation's needs.

Data science, DATS: Level 4
Investigates the described problem and dataset to assess the usefulness of data science and analytics solutions.

Applies a range of data science techniques and uses specialised programming languages. Understands and applies rules and guidelines specific to the industry, and anticipates risks and other implications of modelling.

Selects, acquires and integrates data for analysis. Develops data hypotheses and methods and evaluates analytics models. Advises on the effectiveness of specific techniques based on project findings and comprehensive research.

Contributes to the development, evaluation, monitoring and deployment of data science solutions.

Numerical analysis, NUAN: Level 4
Creates moderately complex algorithms using a range of mathematical techniques and with sensitivity to the limitations of the techniques.

Uses sophisticated scientific computing and visualisation environments.

Assesses the stability, accuracy and efficiency of algorithms and makes or recommends improvements to them.

Iterates and improves models using feedback from experts as appropriate.

Scientific modelling, SCMO: Level 5
Investigates real-world problems to assess whether existing scientific models provide effective solutions.

Creates new mathematical representations of the underlying science that can be implemented in a computational model. Applies advanced programming techniques to implement scientific models and apply these for problem-solving.

Analyses the functioning of existing computational models to improve accuracy and performance.

Communicates limitations such as uncertainty and systematic errors. Ensures appropriate usage of computational models.

KEY RELATIONSHIPS:	Internal Academic researchers and Principal Investigators across a range of disciplines Research software engineers and IT technical teams Digital Strategy and Partnering teams Data scientists, analysts, and statisticians IT Infrastructure teams Research and eResearch support staff External Partner universities and research institutions External software and tool vendors Open-source and academic software communities National and international research collaborations or consortia Funding bodies and granting agencies (as required for reporting or technical input)
QUALIFICATIONS AND EXPERIENCE:	Essential Masters degree in relevant discipline with a significant computational component Considerable experience in software development within research, academic, or scientific environments Demonstrated experience applying scientific computing, numerical methods, or modelling techniques to solve complex problems Experience collaborating with researchers or multidisciplinary teams on technical projects Strong analytical and problem-solving abilities, with the capacity to explain technical concepts to non-technical audiences Preferred PhD in a relevant discipline with a significant computational component Familiarity with best practices in research software engineering, including version control, testing, documentation, and code review Experience contributing to or maintaining open-source research software Understanding of research data management, including FAIR and CARE principles and reproducible research practices Experience with high-performance computing (HPC), GPU computing, or cloud-based research infrastructure Experience working with secure research software environments Experience implementing or optimising scientific models in high-performance computing environments Experience using containerisation and scalable computing platforms for research
TECHNICAL SKILLS AND KNOWLEDGE:	Essential Proven proficiency with programming languages commonly used in research software (e.g., Python, R, C/C++, Fortran, Julia) Understanding of software design principles, including the ability to model, prototype, or simulate systems Knowledge of data science workflows, including data integration, statistical analysis, and visualisation Applied understanding of numerical analysis and mathematical modelling techniques Skilled in using version control systems and collaborative development tools Ability to develop reproducible, well-documented code for long-term research sustainability Proficient in supporting and integrating research software tools and environments into workflows Preferred Knowledge of scientific modelling practices and the ability to adapt them for performance in HPC environments Familiarity with parallel or distributed computing frameworks Familiarity with GPU development frameworks – CUDA, OpenCL, ROCm Familiarity with software testing, continuous integration, and automated deployment tools Understanding of research computing infrastructure, open science principles, and FAIR/CARE data standards

	Knowledge of containerisation tools and their application in research computing environments
SPECIAL REQUIREMENTS:	At the University, we are required to be compliant with the Public Records Act 2005 and Privacy Act 2020. Staff are expected to participate in available training to understand these requirements and effectively manage information accordingly.
DIRECT BUDGET ACCOUNTABILITY:	Nil
MĀORI STRATEGIC FRAMEWORK:	Act in a manner consistent with the principles and implications, as well as the University's commitment to the Treaty as articulated in the Māori Strategic Framework.
PACIFIC STRATEGIC FRAMEWORK:	Act in a manner consistent with the strategies and goals contained in the University's Pacific Strategic Framework, role-modelling and promoting Pacific values, equity and diversity principles and cultural safety practices.
HEALTH AND SAFETY:	Act and work in a manner compliant with current health and safety at work legislation and University procedures, frameworks and guidelines. Role model safe behaviour and practices, share the responsibility to prevent harm and contribute to a safe campus and work environment, including raising workplace health and safety concerns for self, students, visitors and other staff.
SUSTAINABILITY:	Act in a manner consistent with the University's sustainability commitments; role-modelling sustainable practices, with a particular emphasis on minimising the environmental impact of day-to-day activities.

SKILLS FRAMEWORK FOR THE INFORMATION AGE (SFIA)

Engineer Research Software

Role Type: Engineer

SFIA Levels of responsibility

Autonomy	5	Influence	4	Complexity	5	Business Skills	5	Knowledge	5

SFIA Skills Profile

Category	Subcategory	Skill	Code	L1	L2	L3	L4	L5	L6	L7
Development and implementation	Systems development	Software design	SWDN				■			
Development and implementation	Systems development	Programming/software development	PROG					■		
Strategy and architecture	Advice and guidance	Methods and tools	METL				■			
Strategy and architecture	Advice and guidance	Specialist advice	TECH				■			
Development and implementation	Data and analytics	Data science	DATS				■			
Development and implementation	Computational science	Numerical analysis	NUAN				■			
Development and implementation	Computational science	Scientific modelling	SCMO					■		

https://help.sfia.nz/hc/en-nz/sections/4407230514201-Levels-of-responsibility

https://sfia-online.org/en/sfia-8/sfia-views/full-framework-view?path=/glance