

# Data Science in Reliability

## Scalable Record Processing and Extraction

Are you frustrated NOT knowing your mean time between failure? Is it difficult knowing if your continuous improvement programs are working? Do you know if your maintenance strategy is effective? **Join this course to scale up your maintenance knowledge and capability.**



Reliability engineering techniques and technologies are evolving quickly. To keep up with opportunities in data science, technical language processing, predictive maintenance and more, you need access to the best: Master.

Most reliability approaches today are slow, tedious, not reproducible and lack standardisation. This makes it difficult to scale across a plant or organisation; so most plans only focus on a few critical assets. Be at the front of the opportunity in using data science techniques to **automate how crucial data is captured**, and open up your

entire plant and organisation to **data-driven reliability engineering**.

This program is focused on providing the toolkit for applying data science and technical language processing techniques to reliability measures for all assets and to develop, validate and optimise maintenance strategies and value.

### Who is it for?

Maintenance Managers, Reliability Engineers. You don't have to be a coding master... Need to understand your data.

**CORE Skills Master** presents a collection of specialised programs, where resources and energy professionals learn directly from industry leaders, practitioners and academics. Certified and recognised by your organisation.



### CORE Skills Master Learning Principles

- **Industry-led learning** (we use real and current industrial examples)
- **Capstone driven** (learn by doing, bring your real-world challenges)
- **Cohort based with live mentoring** (everything is better in a group with live feedback)

Understanding the principles of Natural Language Processing (NLP/TLP) pipelines, the potential, the challenges and how it can improve your maintenance strategy.

Automate reliability measure estimation (e.g. MTBF) from maintenance records at scale utilising Technical Language Processing approaches.

Automate knowledge extraction from maintenance records to gain insight into task execution and asset behaviour.

Understand how data quality is affecting your maintenance strategy.

Apply these techniques to your Capstone Project to deliver measurable value.

How well is your maintenance strategy performing or why it is not. Are you doing the right task at the right time?

## WHY THIS PROGRAM?

- Led by UWA Prof Melinda Hodkiewicz and Tyler Bikaun.
- As a reliability professional, **increase your capability by learning the latest data science tools and techniques in NLP/TLP and how it can directly improve your maintenance strategy.**
- **Deliver a high-value project to the business.** Bring your reliability challenge to solve.

## WHO IS IT FOR?

- Reliability Engineers, Maintenance Managers and Planners.
- Anyone responsible for driving reliable outcomes at industrial sites.



- Mentorship & momentum - Weekly live (online) sessions with the Master and weeks of support during the program.
- Power of peers - Learn with others in a cohort based approach. Have fun and hold each other accountable.
- Immediate feedback - Bring your industrial reliability challenges to work on, get feedback, and solve.
- Access to private repositories with templates and examples of state-of-art TLP and NLP applications.
- Preloaded content to accelerate at your pace.

## PROGRAM OUTLINE

This CORE Skills Data Science in Reliability Master takes place over **6 weeks with 6 half-day learning** including Q&A, mid-way practice and apply sandbox half day, [ongoing conversation - slack] and **1:1 (pre-booked) mentoring sessions each week** (1 block on Tue & 1 block after 1-5 Wed starting 17 July for 6 weeks).

<b>CORE Skills Data Science in Reliability Master Program</b>	<b>Preliminary Day</b>	<ul style="list-style-type: none"> <li>• We support your setup and access, with workstations ready to go</li> </ul>
<b>Introduction: Why &amp; How Data Science is changing reliability engineering</b>	<b>Week 1</b>	<ul style="list-style-type: none"> <li>• Going from raw data to automated data collection</li> <li>• Scenario: How to apply it to 10,000+ maintenance records</li> </ul>
<b>Scaling Reliability Estimates</b>	<b>Week 2</b>	<ul style="list-style-type: none"> <li>• Identify end-of-life events</li> <li>• Automate reliability measure calculation</li> </ul>
<b>Technical Information Extraction</b>	<b>Week 3</b>	<ul style="list-style-type: none"> <li>• Automate knowledge extraction from maintenance records</li> </ul>
<b>Technical Information Extraction (Hands-on)</b>	<b>Week 4</b>	<ul style="list-style-type: none"> <li>• Demonstration of Knowledge Graph</li> <li>• Guided collaborative annotation session on your data</li> </ul>
<b>Bring your Capstone Project / Demonstration of Mastery</b>	<b>Week 5</b>	<ul style="list-style-type: none"> <li>• Collaborative annotation and data clean up on exemplar and your data.</li> </ul>
<b>Mentoring Wrap Up</b>	<b>Week 6</b>	<ul style="list-style-type: none"> <li>• Feedback and Next Steps</li> </ul>

- PREREQUISITE**
- Good base understanding of the principles of reliability engineering (ie. Weibull analysis, maintenance planning,...).
  - Basic understanding of Python so you can implement these solutions.
  - Install and setup the course technology requirements.
  - Capstone - Bring your own maintenance record data! SAP IW39.