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Studying for the Jobs of the Future

Electrical Engineering

PRESENTED BY

Dr Yuanyuan Fan | Lecturer

Ms Emily Levy | Learning Support Officer

Agenda

1 Welcome

2 Overview of EIT

3 Job Trends in Electrical Engineering

4 EIT Programs, Unique Delivery Methodology & Student Support

5 Q & A

We are dedicated to ensuring that you receive a world-class education and gain skills that you can immediately implement in the workforce.



World-Class Australia Accredited Education

Our vocational programs and higher education degrees are registered and accredited by the Australian Government. We have programs that are also recognized under three international engineering accords.



Engineering Specialists

EIT is one of the only institutes in the world specializing in Engineering. We deliver professional certificates, diplomas, advanced diplomas, undergraduate and graduate certificates, bachelor's and master's degrees, and a Doctor of Engineering.



Industry Experienced Lecturers

Our lecturers are highly experienced engineers and subject specialists with applied knowledge. The technologies employed by EIT, both online and on-campus, enable us to source our lecturers from a large, global pool of expertise.



Industry Oriented Programs

Our programs are designed by industry experts, ensuring you graduate with cutting-edge skills that are valued by employers. Our program content remains current with rapidly changing technology and industry developments.



Unique Delivery Model

We deliver our programs via a unique methodology that makes use of live and interactive webinars, an international pool of expert lecturers, dedicated learning support officers, and state-of-the-art technologies such as hands-on workshops, remote laboratories, and simulation software.

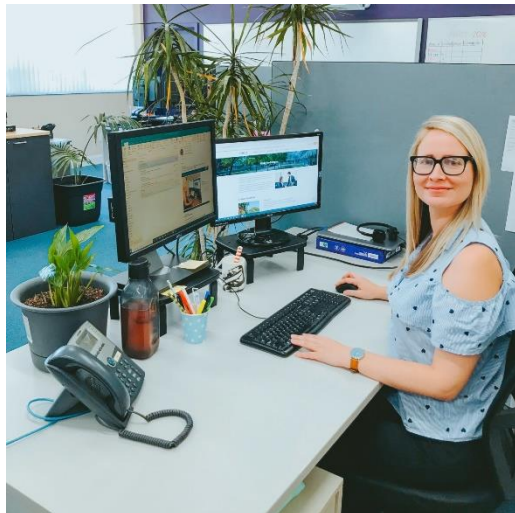


Dr Yuanyuan Fan

EIT Course Coordinator & Electrical Engineering Lecturer

Dr. Fan received her BSc and MEng degrees from North China Electric Power University in electrical engineering in 2010 and 2013, respectively. She received her PhD degree in electrical engineering from Curtin University, Perth, Australia, in 2017.

From 2018 until now, she has been a course coordinator and lecturer at the Engineering Institute of Technology, Perth, Australia. She holds certificates on Python and machine learning. Her research interests include machine learning in education, machine learning in renewable energy and smart grids.



Ms Emily Levy

EIT Learning Support Officer

Ms Levy has worked within the education industry for the past four years, including learning and development experience within industry. She is currently a Learning Support Officer at EIT, looking after students studying their higher education programs.

She is passionate about helping people, and with her outstanding communication skills, provides our students the highest level of encouragement in anticipation of their success.

What is Electrical Engineering?

- › Electrical Engineering has many sub-fields. It encompasses electronic, computer systems, telecommunications, control and electrical power engineering.
- › It is concerned with the way electrical energy is produced and used in homes, the community and industry.
- › Electrical Engineers design and build the systems and machines that generate, transmit, measure, control and use electrical energy essential to modern life.

<https://www.engineersaustralia.org.au/For-Students-And-Educators/Engineering-Careers/What-Is-Engineering>



What is Electrical Engineering?

Electrical Engineers help build:

- › Power plants and new technology for harnessing and distributing power
- › Telecommunications platforms and delivery systems
- › Power and lighting for houses, offices and municipal buildings
- › Electronic components of computers and other tools

*As an Electrical Engineer you will help power the world.
You will work with other engineers to make all the
things modern life requires faster, smaller and better
for the environment.*

<https://www.engineersaustralia.org.au/For-Students-And-Educators/Engineering-Careers/Future-Of-Engineering>



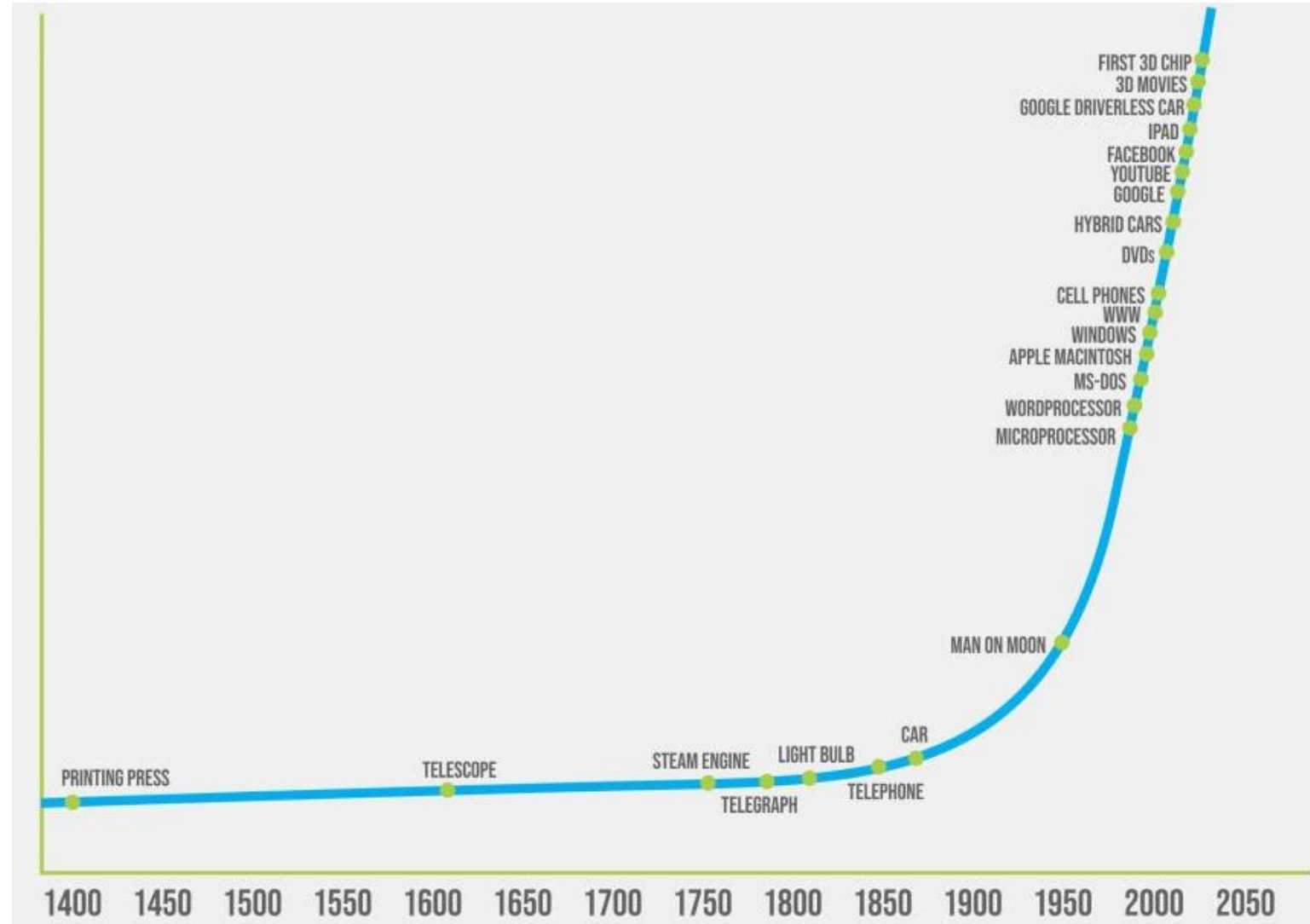
The electrical engineering industry is under a significant paradigm shift. Ambitious research and development departments all around the globe are working towards better ways to obtain, store, and use electrical energy.

<https://skelia.com/>

Global Technological Growth (1400 – Present)

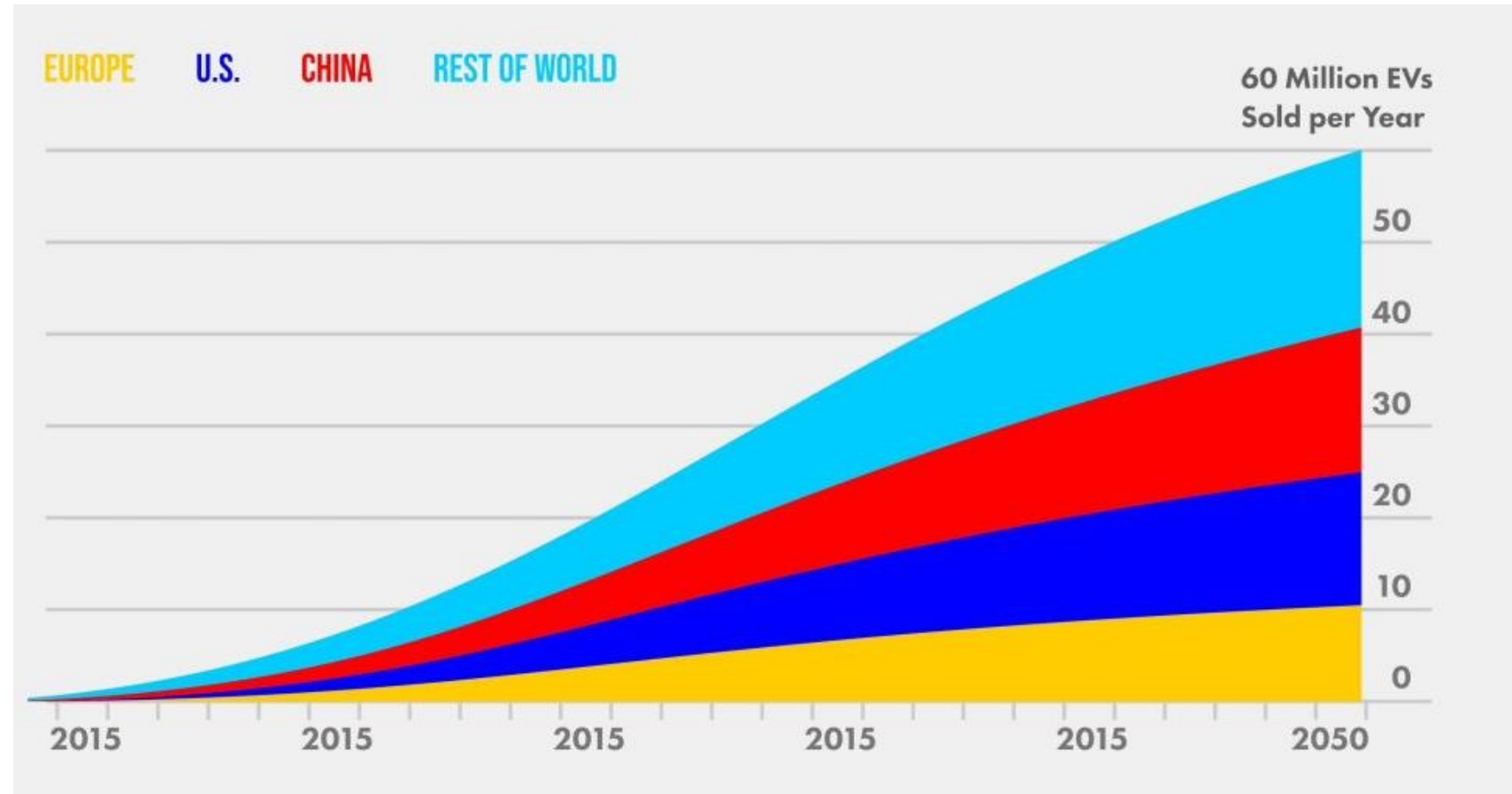
- › Technology is everywhere
- › Specialized roles within the electrical engineering field will be critical
- › People demand faster, smarter, smaller, lighter and cheaper devices
- › One example is smart grids: demand is projected to hit a compound annual growth rate (CAGR) of 16% from 2019 - 2024

<https://engineercalcs.com/will-automation-destroy-future-electrical-engineering-jobs/>



Growing Industries for Electrical Engineers: Electric Cars

- › Battery technology
- › Autonomous vehicle technology
- › Charging stations
- › Car interiors
- › Electric utility improvements



<https://engineercalcs.com/will-automation-destroy-future-electrical-engineering-jobs/>

The Future of Electrical Engineering

In the future, Electrical Engineering will provide:

- › Faster and more efficient wireless charging systems
- › The next generation of solar technology for a greener power system
- › Renewable energy
- › Energy efficiency
- › Robotics
- › Artificial Intelligence
- › Microelectronics
- › Nanotechnology



Job Trends: A Global Outlook

- › Job growth for electrical and electronics engineers is projected to occur largely in professional, scientific, and technical services firms, as more companies are expected to tap the expertise of engineers for projects involving electronic devices and systems.
- › The rapid pace of technological innovation will likely drive demand for electrical and electronics engineers in R&D, an area in which engineering expertise will be needed to design distribution systems related to new technologies.
- › These engineers will play key roles in new developments with solar arrays, semiconductors, and communication technologies.
- › The need to upgrade the nation's power grids will also create demand for electrical engineering services.
- › These engineers may play a role in assisting with the automation of various production processes.

<https://myfuture.com/career/electrical-engineers>



The world human population is already more than 7 billion — a number that could exceed 11 billion by 2100, according to projections from the United Nations. This rising populace, coupled with environmental challenges, puts even greater pressure on already strained energy resources.

<https://rh.gatech.edu/features/12-emerging-technologies-may-help-power-future>

Electrical Engineering Career Pathways

EIT offers a range of electrical engineering programs from professional development through to formal qualifications. EIT also offers its higher education programs on-campus in two campuses; *Perth, Western Australia and Melbourne, Victoria.*



Chris Fuller

A graduate of EIT's [52726WA – Advanced Diploma of Applied Electrical Engineering \(Electrical Systems\)](#).

“I chose the Advanced Diploma to gain further engineering skills as an experienced tradesperson working in electricity distribution, metering and power quality. I needed a course that would provide me with the skills and knowledge required to take the next step as an experienced technician requiring a better understanding of electricity distribution networks,”

Oswell Machekano

A graduate of EIT's [52859WA Graduate Certificate in Renewable Energy Technologies](#).

“I chose the course because of my current work situation, and because I see my future lying in the sector,” he explains, “seeing the need to expand my theoretical knowledge and understanding of diverse renewable energy.”



Professional Certificates, Diplomas and Advanced Diplomas

- › Gain credibility in your firm and improve career prospects and income.
- › Enhance competency and skills in a more specific field.

*“to qualify individuals who apply specialized knowledge in a range of contexts to undertake advanced skilled or paraprofessional (not fully qualified) work and as a **pathway for further learning**”*

Professional Certificates

- › Professional Certificate of Competency in Arc Flash
- › Professional Certificate of Competency in Big Data and Analytics in Electricity Grids
- › Professional Certificate of Competency in Circuit Breakers, Switchgear & Power Transformers
- › Professional Certificate of Competency in Electrical Power System Fundamentals for Non-Electrical Engineers
- › Professional Certificate of Competency in Electrical Power System Protection
- › Professional Certificate of Competency in Fundamental E&I Engineering for Oil & Gas Facilities

Find more programs on our website: www.eit.edu.au

Advanced Diplomas

- › 52684WA Advanced Diploma of Electrical and Instrumentation (E&I) Engineering for Oil & Gas Facilities
- › 52726WA Advanced Diploma of Applied Electrical Engineering (Electrical Systems)
- › 52726WA Advanced Diploma of Applied Electrical Engineering (Power Industry)
- › 52727WA Advanced Diploma of Electrical and Instrumentation (E&I) Engineering in Mining
- › 52856WA Advanced Diploma of Illumination Engineering and Lighting Design

Graduate Certificate (VET)

52859WA Graduate Certificate in Renewable Energy Technologies

Undergraduate Certificates

Bachelor of Science Degrees

- › To work as an Electrical Engineer, most countries require you to have a Professional Engineer's License. Professional accreditation body for Australia is Engineers Australia.
- › There are opportunities to work on **public** and **private** infrastructure projects.

Graduate Certificates

Master of Engineering Degrees

- › Electrical Engineers may undertake a Master of Engineering (Electrical Systems) degree in order to increase their chances of becoming a **consultant**, **manager** or **project leader**.

Doctor of Engineering Degree

- › You must provide a **significant** and **original contribution** to knowledge in the context of professional practice.

Year One

Code	Unit Title
MEE501	Power Generation
MEE509	Transmission and Distribution Systems
MEE601	Electric Power System Analysis
MEE510	Power Conversion
MEE602	System Stability Analysis
MXX507	Professional Engineering Management
MEE511	Renewable Energy Systems
MEE512	Power System Safety and Protection

Year Two

Code	Unit Title
MEE505	Substation Design and Automation
MEE603	Power Quality and Mitigation
MXX501/601	Engineering Practice and Key Research Methods
MEE605	Smart Grids
ME700	Project Thesis (taken over 2 terms – equivalent to 4 units)

Job Outcomes: Electrical Engineering

Graduates will be employable as technicians, technologists and professional engineers working in a wide range of manufacturing, industrial, chemical, military, mineral processes, and mining industries. Examples are illustrated below.

- › Electrical system planning, design, and development
- › Power supply, distribution, and transmission
- › Electrical commissioning and power production management
- › Renewable energy
- › Electrical instrumentation and control
- › Electronics research, design, and testing
- › Operations, maintenance, field services, and technical support
- › Electrical project management and business development
- › Radio and television broadcasting
- › Mining
- › Advanced Automation & Robotic Systems
- › Space Defense Systems

EIT has many of their qualifications recognized with Engineers Australia under the three accords: Dublin, Sydney and Washington.



Dr Rodney Jacobs

Dr Jacobs is based in the middle regions of South Africa, and has been involved as an instructor for the EIT group since 2004. His area of expertise includes all aspects of process control (PLC, SCADA, DCS, Loop tuning, as well as multiple facets of electrical engineering).

Jacobs currently does hundreds of e-sessions per year for EIT (sometimes up to five sessions per day, at all times of the day or night), and is active as a consultant to industry. His motto is “find a job you love, and you never work a day in your life”.



Mr Deepak Pais

Deepak started his career within the Zinc mining & smelting industry as Project Engineer in Substation & Distribution Greenfield project. He then worked in a Marine and Logistics firm in the Bahamas as Maintenance and Commissioning Engineer. Following this he worked with Japanese and German automobile firms as Maintenance Engineer for Distribution and Utility related systems. For the last seven years he has been working as a Principal Engineer in the Mains (Standards) team for a leading NSW Electricity Distribution utility.

He has a particular interest in the consistent interpretation and implementation of Greenfield and Brownfield Standards with an emphasis on safety, reliability, economy and whole of life cost analysis.



Indumathi V *MBA, MIEAust CPEng NER PhD Candidate*

Ms Indu started her career in Electronics, Computer and Communication engineering after completing her Diploma studies in Singapore. She has extensive knowledge in the semiconductor industry starting out as a failure analysis specialist in a German MNC.

She subsequently went on to complete her Bachelor of Electrical and Electronic Engineering from the University of Western Australia. After completing her bachelors, she went on to work as a Failure analysis engineer for a MNC, specializing in both destructive and non-destructive methods of failure analysis. She is a passionate STEM advocate and has designed and run STEM open days particularly targeting females into the engineering industry. Ms Indu is currently pursuing her PhD.



Dr Seyed Morteza Alizadeh

Dr Alizadeh is a Lecturer and Unit Coordinator in Electrical and Industrial Automation Engineering. He graduated with a PhD degree from Victoria University in December 2017. He has over 10 years of extensive experience in teaching and research in the university sector.

His research interests deal with the power system analysis and machine learning. Initially, this was applied to the improvement of the performance of Distributed Generation systems using Artificial Intelligence-Based methods. More recently, his research efforts have involved the optimal sizing and siting of wind power plants in distribution networks using novel numerical methods. The results of his research have been published in high ranked journal and conference papers.



Emily Levy | Higher Education LSO
Based in Perth, Western Australia

- › Learning Support Officers (LSOs) are in addition to the academic support (instructors/lecturers).
- › LSOs guide the students from the onboarding process through to graduation.
- › LSOs are the support, encouragement and go-to person for any question relating to a student's studies.
- › One LSO is dedicated to the student for the duration of either a professional certificate or VET program.
- › If a student is studying a degree, they will have a committed LSO for each unit of study.
- › EIT has LSOs based in: *South Africa, Switzerland, Zimbabwe, New Zealand and Australia.*



- › In the majority of our programs students complete practical exercises using a combination of remote and virtual laboratories (including simulation software).
- › In these remote and virtual laboratories students can control physical equipment and sensors equivalent to the traditional university engineering lab.
- › This means that even though you are studying online, you are not missing out on your hands-on, practical experience. For the on-campus students, workshops and work integrated learning via an internship is incorporated into the student journey.
- › Through these hands-on exercises using simulation software, remote laboratories, practical based assignments and interactive discussion groups, students are able to grasp new knowledge and apply it successfully to the real world.
- › **Each hosted engineering software and hardware can be controlled in real time; it's as simple as logging in and selecting an available lab and timeslot!**



Join Dr Yuanyuan Fan to gain a greater insight into smart grids.

During the webinar, Dr Yuanyuan will:

- › Share the vision of smart grids and the role of machine learning in the journey towards smart grids
- › Look at the popular and promising renewable sources and energy storage systems
- › Outline what machine learning can do in advancing modern power systems
- › Describe a couple of case studies

A certificate of participation can be provided to attendees who request it after the live webinar.

Register today:

<https://www.eit.edu.au/event/smart-grids-from-renewable-sources-to-machine-learning/>

Q&A





Engineering Institute of Technology.



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