

AI CERTIFICATION PROGRAMME HANDBOOK

by



AI SINGAPORE

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INTRODUCTION

The AI Certification Programme is a national certification and assessment framework for AI Engineers announced by AI Singapore (AISG) on 29 October 2019. This initiative provides structured learning pathways for Singaporeans to learn about AI and for those who are technically inclined, the opportunity to become AI Certified Engineers in Singapore.

The learning pathways and competency outcomes are mapped to real-world industry needs from AI Singapore's 100E Programme (*100 Experiment*) and IDC-awarded AI Apprenticeship Programme (AIAP)[™].

There are presently four (4) professional certification levels to formally recognize an individual's level of technical competency and experience in AI:

1. AI Certified Engineer Associate (AICE Assoc)
2. AI Certified Engineer Level I (AICE I)
3. AI Certified Engineer Level II (AICE II)
4. AI Certified Engineer Level III (AICE III)

This handbook covers the information, policies, and processes to apply and attain the above levels of professional certification.

ABOUT AI SINGAPORE (AISG)

AISG is Singapore's premier national research and innovation programme office in Artificial Intelligence (AI) funded by the National Research Foundation (NRF) since June 2017, and currently located within the campus of the National University of Singapore (NUS).

Its mission is to harness the scientific and economic potentials of AI technologies to boost Singapore's global competitiveness. It does so by directing AI research and inventions of strategic interests, developing national-level AI systems and building AI engineering talents and capabilities to catalyze industry transformation.

For more information on AI Singapore and its various programmes, please visit www.aisingapore.org

WHAT IS AN AI CERTIFIED ENGINEER?

An AI Certified Engineer (AICE) is an individual that has demonstrated technical competencies that enables the engineer to build AI applications.

Those certified at the basic levels will be job-ready and will be able to use their capabilities to build AI models or applications to address business problems. Those at higher certification levels will have shown experience in leading a team of AI engineers to design, develop and deploy multiple AI projects that unlock and deliver business value.

As the demand for skilled AI Engineers scales exponentially, AICE members are well poised to provide the necessary technical and professional knowledge, skills and competencies to manage AI projects from start to successful completion.

An overview of the AI Certification Pathways is detailed in Figure 1, below:

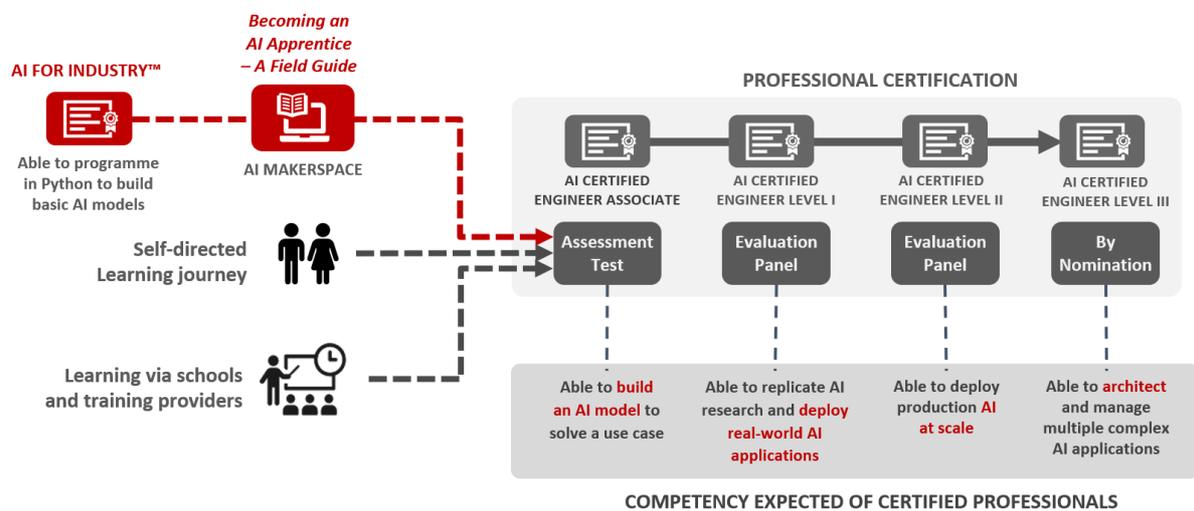


Fig 1. AI Certification Pathways

Certification Levels aligned to Career Profiles

The AI Certified Engineer is a certification designed for all levels of AI professionals:

	Profile	Required Competencies
AI Certified Engineer Associate	Students who are deeply interested in coding /AI/ML, fresh graduates, working professionals who employ data analysis techniques in the course of their work	<ul style="list-style-type: none"> • Python / Programming • SQL • Linear Algebra and Statistics • Exploratory Data Analysis • Artificial Intelligence/Machine Learning • AI Ethics, Biases and Governance
AI Certified Engineer Level I	<p>Working professionals with a minimum of 1 year of working experience in AI-related roles.</p> <p>Individuals at this level are AI specialists in AI project teams in a commercial organization.</p>	<ul style="list-style-type: none"> • Business Needs Analysis • Data Preparation / Feature Engineering • Model Design and Deployment • Statistics and Theoretical Knowledge • Communication • AI Ethics, Biases and Governance
AI Certified Engineer Level II	<p>Working professionals with a minimum of 3 years of working experience in AI-related roles.</p> <p>Individuals at this level are Managers or Senior Managers who are team leads for large scale AI projects in commercial organizations.</p>	<ul style="list-style-type: none"> • AI Implementation Consulting • Model Design and Process Management • Stakeholder Management and Communication • AI Ethics, Biases and Governance

<p>AI Certified Engineer Level III</p>	<p>Mid-Senior level working professionals with a minimum of 6 years of working experience in AI-related roles who lead teams in developing and deploying multiple and large scale, complex AI projects in a commercial organization.</p> <p>Individuals at this level are a manager of managers or higher, and typically head AI/Technology Centres of Excellence or a similar sized, complex functional unit.</p>	<ul style="list-style-type: none"> ● Strategic Orientation ● Influence and Communication ● AI Project Design, Development, Management and Deployment ● IP Management ● Thought Leadership ● AI Ethics, Biases and Governance
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CERTIFICATION LEVELS

1. AI Certified Engineer Associate (AICE Assoc)

An AI Certified Engineer (Associate) is an individual that understands major AI frameworks and cloud infrastructure and is able to apply that knowledge to build an AI model that solves a business problem.

1.1 Required Technical Knowledge and Skills

This certification level is targeted at candidates who do not possess working experience in AI-related roles but have a programming background in Python and able to understand databases and run basic SQL queries. The candidate should also have knowledge and familiarity in software engineering, AI cloud services, data engineering and data management.

1.2 Certification Pathways

a) AISG Pathway

AISG has developed and published a curated learning pathway called “Becoming an AI Apprentice – A Field Guide”. This field guide details a 12 to 18 months intensive roadmap that will help prepare interested candidates to take the technical test and pass the assessment interview to be certified.

The latest version of the Guide is available FREE at AI Makerspace at <https://makerspace.aisingapore.org/2019/11/becoming-an-ai-apprentice-a-field-guide/>

b) Direct Assessment Pathway

Candidates who already possess the required technical knowledge and skills described in 1.1, can apply directly to AISG to take the technical test and pass the assessment interview to be certified.

c) Continuing Education and Training (CET) Pathway

For students or those enrolled in part-time courses, AISG is working with Singapore’s universities, polytechnics and local training providers to align their curriculum and learning outcomes to requirements of the technical test.

For those who are keen to receive structured CET training to acquire the required knowledge and skills, Reluvate Technologies Pte Ltd (www.reluvate.com) is the first accredited AI Certification training partner. AISG will continue to grow the list of accredited training partners.

1.3 Assessment Process

There are two (2) parts to the assessment process:

a) Technical Test

The Technical Test is a five (5) day take-home assessment emailed to a candidate's registered email address. Candidates will have to complete the technical assessment which is issued at 0900 hours on the first day and to be submitted before 2359 hours on the fifth day. Candidates will adhere to all instructions outlined in the technical test document. No late entries to the submission portal will be entertained after the deadline.

AISG will evaluate each candidate's submission based on a set of assessment rubrics and he/she will be notified via the email indicated in his/her application form to attend an assessment interview in person, if it is determined that he/she had passed the technical test.

A reminder email will be sent five (5) working days after the first email to request for confirmation of interview attendance. If there is no reply after two (2) working days from the second (reminder) email, AISG will deem that the candidate has withdrawn from the application.

b) Assessment Interview

Candidates will present and walk-through the submitted codes, as well as be tested on his/her level of technical knowledge, to an assessment panel. The assessment panel will consist of 2 Engineers from AISG. The total duration of the interview will be approximately 30 minutes, and candidates are required to bring their own laptops/computing devices. AISG reserves the right to not proceed with the assessment interview if the candidate fails the technical test.

1.4 Application Process

Candidates will access and complete the application form on AISG's website at <https://www.aisingapore.org/ai-certification/>. Registration is processed in batches on a quarterly basis, and information on the registration start and end dates will be disseminated via the AISG mailing list, our website and social media channels.

Payment is required during the application process in order to fully complete the application. Candidates will receive an email with instructions if their application process is successful.

1.5 Application Fee

The application fee is Singapore Dollars (SGD) 250, excluding the prevailing Goods and Services Tax (GST). There are no refunds if a candidate decides not to take the technical test and/or attend the assessment interview.

1.6 Certificate Validity

Upon fulfilling the certification requirements, AISG will issue an electronic certificate certifying the candidate. Charges apply to requests for a signed hardcopy of the certificate.

The AI Certified Engineer Associate certification is valid for two (2) years from the date of issue. During this period, Certified Engineers can display their credentials on business stationeries and on their online profiles.

Re-certification is required upon expiry for Certified Engineers to continue to display their credentials. Please refer to the section on DISPLAY OF CREDENTIALS and CERTIFICATION RENEWAL for more details.

1.7 Additional Information

All Singapore citizens who attain the AI Certified Engineer Associate status are invited to apply to the full-time nine (9) months AI Apprenticeship Programme (AIAP)[™].

Successful applicants to the Programme will have an opportunity to work on real-world company AI projects alongside experienced mentors. They can also expect to be offered a monthly stipend of between SGD 3,500 to 5,500 during the apprenticeship period.

For more information on AIAP[™], please visit www.aisingapore.org/aiap.

2. AI CERTIFIED ENGINEER LEVEL I (AICE I)

An AI Certified Engineer Level I is an individual who can replicate an AI research paper and deploy AI real-world AI applications.

2.1 Required Technical Competencies and Experience

Candidates will need to have a minimum of one (1) year of working experience in an AI-related role, and must have deployed one AI application with a project value of at least Singapore Dollars (SGD) 250,000 and/or built an AI product that is being used by a commercial customer.

2.2 Certification Pathway

There is only one pathway available to certification – the Direct Assessment Pathway.

2.3 Assessment Process

There are two (2) parts to the assessment process:

a) Technical Report

Candidates have to submit a technical report describing a deployed AI model or an AI product for a real-world commercial project at the point of application.

AISG will evaluate the submission based on a set of assessment rubrics and candidates will be notified via the email that was indicated in the application, to attend an assessment interview in person.

b) Assessment Interview

Candidates will present and walk-through the AI model (or product) in the submitted technical report to an evaluation panel (candidates are required to bring their laptops/computing devices for the walk-through). The assessment panel will consist of the Head of AI, AISG; an AI Engineer from AISG; and current AI Certified Engineers Level I or Level II from the industry.

Candidates will also need to display a sound understanding of the core AI concept used in the project, and in general. The assessment panel will ask questions to assess the candidate's critical thinking and problem-solving abilities. References and applied knowledge to Singapore's Model AI Governance Framework (or other applicable ethics framework) will contribute to the interview score. AISG reserves the right to not proceed with the assessment interview after an assessment of the technical report.

2.4 Application process

Candidates will access and complete the application form on AISG's website at <https://www.aisingapore.org/ai-certification/>. Registration is processed in batches on a quarterly basis, and information on the registration start and end dates will be disseminated via the AISG mailing list, our website and social media channels.

Candidates will need to prepare and submit the following documents:

- a) The technical report
- b) Access to the explained deployed AI model on commercial cloud or on-premise platform (where permissible and/or applicable)
- c) Updated CV

Payment is required during the application process to fully complete the application. Candidates will receive an email with instructions if the application process is successful. There are no refunds if the candidate decides not to attend the assessment interview.

A reminder email will be sent five (5) working days after the first email to request for confirmation of interview attendance. If no response is received after two (2) working days from the second (reminder) email, AISG will deem that the candidate has withdrawn from the application.

2.5 Application Fee

The application fee is Singapore Dollars (SGD) 500, excluding the prevailing Goods and Services Tax (GST), payable during the online application process.

2.6 Certificate Validity

Upon fulfilling the certification requirements, AISG will issue an electronic certificate certifying the candidate. Charges apply to requests for a signed hardcopy of the certificate.

The AI Certified Engineer Level I certification is valid for three (3) years from the date of issue. During this period, Certified Engineers can display their credentials on business stationeries and their online profiles.

Re-certification is required upon expiry for Certified Engineers to continue to display their credentials. Please refer to the section on DISPLAY OF CREDENTIALS and CERTIFICATION RENEWAL for more details.

2.7 Additional Information

To help Singapore build a sustainable and growing pool of AI talent, Certified Engineers will be invited to be AI Certification Assessors for future batches of AI Certified Engineer Level 1 applicants. The term of service will be 24 months and assessors will be paid an honorarium for each day of service.

3. AI CERTIFIED ENGINEER LEVEL II (AICE II)

An AI Certified Engineer Level II is an individual that can deploy production AI at scale.

3.1 Required Technical Competencies and Experience

Candidates will need to have a minimum of three (3) years of working experience in AI-related roles and should have deployed a commercialized AI application with a project value of at least Singapore Dollars (SGD) 500,000.

3.2 Certification Pathway

There is only one pathway available to certification – the Direct Assessment Pathway.

3.3 Assessment Process

There are two (2) parts to the assessment process:

a) Technical Report

Candidates have to submit a technical report describing a deployed AI model either from a company R&D project, research or framework that was published less than 3 years from the date of application.

AISG will evaluate the submission based on a set of assessment rubrics and will notify applicants via email to attend an assessment interview in person.

A reminder email will be sent five (5) working days after the first email to request for confirmation of interview attendance. If there is no response after two (2) working days from the second (reminder) email, AISG will deem that the candidate has withdrawn from the application.

b) Assessment Interview

Candidates will need to present and walk through the deployed AI model or product in the technical report to an assessment panel (candidates are required to bring their laptops/computing devices for the walk-through). The panel will consist of the Head of AI, AISG; a Senior Engineer from AISG; and current AI Certified Engineers Level II from the industry.

Candidates will need to display a sound understanding of the core AI concepts, in general and those used in the project. The assessment panel will ask questions to assess the candidate's critical thinking and problem solving abilities; references and applied knowledge to Singapore's Model AI Governance Framework (or other applicable ethics framework) will contribute to the interview score. AISG reserves the right to not proceed with the assessment interview after an assessment of the technical report.

3.4 Application Process

Candidates will access and complete the application form on AISG's website at <https://www.aisingapore.org/ai-certification/> Registrations are done in batches on a quarterly basis, and information on the registration start and end dates will be disseminated via the AISG mailing list, our website and social media channels.

Candidates will need to prepare and submit the following documents:

- a) The technical report
- b) Access to the explained deployed AI model on commercial cloud or on-premise platform (where permissible and/or applicable)
- c) Updated CV

Payment will be required during the application process in order to fully complete the submission. Candidates will receive an email with instructions if the application process is successful. There are no refunds if the candidate decides not to attend the assessment interview.

3.5 Application Fee

The application fee is Singapore Dollars (SGD) 800, excluding prevailing Goods and Services Tax (GST), payable during the online application process

3.6 Certificate Validity

Upon fulfilling the certification requirements, AISG will issue an electronic certificate certifying the candidate. Charges apply to requests for a signed hardcopy of the certificate.

The AI Certified Engineer Level II certification is valid for three (3) years from the date of issue. During this period, Certified Engineers can display their credentials on business stationeries and their online profiles.

Re-certification is required upon expiry for Certified Engineers to continue to display their credentials. Please refer to the section on DISPLAY OF CREDENTIALS and CERTIFICATION RENEWAL for more details.

3.7 Additional Information

To help Singapore build a sustainable and growing pool of AI talent, Certified Engineers Level II will be invited to be AI Certification Assessors for future batches of AI Certified Engineer Level I and II applicants. The term of service will be 36 months and assessors will be paid an honorarium for each day of service.

4. AI CERTIFIED ENGINEER LEVEL III (AICE III)

An AI Certified Engineer Level III is an individual who can architect and manage multiple complex AI applications, and is widely regarded by the AI community as being an authority or key opinion leader.

4.1 Required Competencies and Experience

Candidates would typically have more than six (6) years of working experience in AI-related roles and holds a manager of managers' role in a commercial organization, often with a regional or global remit. Candidates would also have demonstrated continued success leading project teams to deploy multiple and complex AI projects throughout their career.

4.2 Certification Pathway

The AI Certified Engineer Level III is a prestigious certification that is awarded to individuals of stature, and thus is not available for application. The award process is conducted once a year, through nominations by recognized leaders in the AI field, as well as organizational partners of AI Singapore.

Nominated individuals will be invited for a short interview with a Recommendation Panel, which consists of Director, AISG; Head of AI, AISG; Head of Engineering, AISG; and AI Certified Engineers Level III from the industry before confirmation of the award.

4.3 Certificate Validity

Upon fulfilling the certification requirements, AISG will issue an electronic certificate certifying the candidate. The AI Certified Engineer Level III certification will be valid as long as the awardee demonstrates continued support and contribution to the AI certification process and the overall AI ecosystem in Singapore.

During this period, Certified Engineers can display their credentials on business stationeries and on their online profiles. Please refer to the section on DISPLAY OF CREDENTIALS and CERTIFICATION RENEWAL for more details.

4.4 Additional Information

To help Singapore build a sustainable and growing pool of AI talent, Certified Engineers Level III are invited to be an Ambassador for AI Singapore, and/or as Certification Assessors for future batches of AI Certified Engineer Level II applicants, or to be part of the Recommendation Panel for the award of AI Certified Engineer Level III. The term of service will be 36 months and assessors will be paid an honorarium for each day of service.

Below is an overview of the AI Certification Assessment Framework

	AI CERTIFIED ENGINEER ASSOCIATE	AI CERTIFIED ENGINEER LEVEL I	AI CERTIFIED ENGINEER LEVEL II	AI CERTIFIED ENGINEER LEVEL III (BY INVITATION)
Qualification and Recommended Experience	Completed curated learning pathway called “Becoming an AI Apprentice – A Field Guide” or equivalent self-directed learning	At least one (1) year working experience in AI-related roles Deployed at least one AI project with >\$0.25M value or built and deployed an AI product	At least three (3) years working experience in AI-related roles Deployed at least one AI project with >\$0.5M value or equivalent	Six (6) or more years working experience in AI-related roles and is widely regarded by the AI community as being an authority or key opinion leader
Assessment	Pass Technical Test administered by AISG and attend an AISG interview	Submit a Report on a deployed AI model either from commercial project or R&D project, and present to Evaluation Panel	Submit a Report on a deployed AI model either from commercial project or R&D project, and present to Evaluation Panel	Nominated by AISG and/or Industry Peers only
Competency	Able to understand major AI frameworks and cloud infrastructure, and build an AI model to solve a use case	Able to replicate AI research and deploy AI real-world AI applications	Able to deploy production AI at scale	Able to architect and manage multiple complex AI applications.
Management Skills	NA	AI specialists in AI project teams in a commercial organization	Managers or Senior Managers who are team leads for large scale AI projects in commercial organisations	Manager of managers or higher, and typically head AI/Technology Centers of Excellence or a similar sized/complex functional unit
Assessment Fee (excl. GST)	SGD 250	SGD 500	SGD 800	NA
Certificate Validity	Recertify every two (2) years	Recertify every three (3) years	Recertify every three (3) years	Ongoing (T&C applies)

Fig 2. AI Certification Assessment Framework

AI ETHICS

It is important that AI applications be built and used ethically, fairly and responsibly. As an AI engineer, he/she should be aware of these principles and strive to reflect upon the wider impact of their work, and to consistently support the public good in their projects.

The Personal Data Protection Commission (PDPC) of Singapore has a Model AI Governance Framework which provides detailed and readily implementable guidance to private sector organizations to address key ethical and governance issues when deploying AI solutions. More information can be found at <https://www.pdpc.gov.sg/Resources/Model-AI-Gov> .

By explaining how AI systems work, building good data accountability practices, and creating open and transparent communication, the Model Framework aims to promote public understanding and trust in technologies.

In addition, PDPC also released the Implementation and Self-Assessment Guide for Organizations (ISAGO) on 21 January 2020. Intended as a companion guide to the Model Framework, ISAGO aims to help organizations assess the alignment of their AI governance practices with the Model Framework. It also provides an extensive list of useful industry examples and practices to help organizations implement the Model Framework. More information on the ISAGO can be found here at <https://www.pdpc.gov.sg/-/media/Files/PDPC/PDF-Files/Resource-for-Organisation/AI/SGIsago.pdf>

Certified AI Engineers should adhere, in a balanced and sustainable manner, to the guidelines provided by the Model AI Governance Framework (or any other equivalent and recognized AI ethics and governance framework, such as the Ethics Guidelines for Trustworthy AI, Artificial Intelligence: Australia's Ethics Framework, or Social Principles of Human-Centric AI), when developing and deploying AI solutions.

All certification candidates who are successful in their assessment will need to complete an online e-learning module on AI ethics and governance before the certificate can be awarded.

APPEALS

Should a candidate wish to initiate an appeal against a certification decision, he/she should submit the appeal in writing, detailing the reason for the appeal, to: ai-cert@aisingapore.org.

Upon receipt of the appeal, and should the case involve the review of the candidate's assessment, an administrative fee will be levied (AICE I: \$250; AICE II: \$400).

Upon receipt of the fee, the appellant will be notified within fourteen (14) working days on a date for a review meeting with an Appeals Review Committee (ARC). The ARC will consist of AI Certified Engineers Levels II and Level III who were not involved in the appellant's original assessment and are not in employment with AISG, and 2 Senior Engineers from AISG.

The ARC will review the merits of the appeal together with the appellant. The results of the appeal will be sent to the appellant within fourteen (14) working days from the date of the review meeting. All decisions made by the ARC will be final.

DISPLAY OF CREDENTIALS

All Certified Engineers will be allowed to display their certification credentials and the AISG AI Certification logo on their business card, email signature and other corporate marketing materials, to showcase their expertise and capabilities as an accomplished AI engineer, subject to the continued maintenance of all elements of the AISG AI certification logo. A complete style guide would be sent to all Certified Engineers upon successful certification.

CERTIFICATION RENEWAL

AI Certified Engineers, with the exception of Level III (AICE III), are required to undergo recertification, to ensure that one's knowledge, skills and experiences remain current. The requirements for recertification for each level is detailed below:

Certification Level	Recertification Period	Required Actions/Documents
AI Certified Engineer Associate	2 years	<ul style="list-style-type: none"> • Same required actions and documents as certification – see “The 4 Certification Levels”, section 1.3 • Complete the online e-learning module on AI Ethics • Recertification Fee: SGD 125 (excl. GST)
AI Certified Engineer Level I	3 years	<ul style="list-style-type: none"> • A technical report with the description of an AI model or AI product from a real-world/commercial/industry AI project that was deployed 3 years or less after the last certification/recertification • Completed record of self-directed learning in relevant AI fields (at least 60hrs), together with accompanying verifiable documentation, where applicable (Recommendations are available on AI Makerspace's ShareAI) • Complete the online e-learning module on AI Ethics • Updated CV • Recertification Fee: SGD 250 (excl. GST)
AI Certified Engineer Level II	3 years	<ul style="list-style-type: none"> • A technical report with the description of an AI model either from a company R&D project, research or framework that was deployed or published 3 years or less from the last certification/recertification • Completed record of self-directed learning in relevant AI fields (at least 60hrs), together with accompanying verifiable documentation, where applicable (recommendations are available on AI Makerspace's ShareAI) • Complete the online e-learning module on AI Ethics • Updated CV • Recertification Fee: SGD 400 (excl. GST)
AI Certified Engineer Level III	Permanent	<ul style="list-style-type: none"> • The AI Certified Engineer Level III certification will be valid as long as the awardee stays in, and continues to contribute to, the AI Certification Process and the building of a flourishing local AI community.

ANNEX A: AI Certification Competency Framework

AI Certified Engineer Associate

Competency	Competency Descriptors/Behaviours
Python/Programming	<ul style="list-style-type: none">● Use Python to develop basic end-to-end data driven AI/ML solutions● Use Python libraries to perform exploratory data analysis and build basic AI/ML models● Write basic SQL queries as part of a simple extract, transform and load pipeline● Demonstrate an awareness of good software engineering practices (writing clean and readable code, etc.) and source code management tools● Communicate and collaborate effectively with other programmers
Linear Algebra and Statistics	<ul style="list-style-type: none">● Perform basic linear algebra operations and generate descriptive statistics● Extract and analyze relationships between multiple variables using statistical measures and graphical plots
Exploratory Data Analysis (EDA)	<ul style="list-style-type: none">● Discover insights from data and synthesize them into a coherent story● Leverage EDA to engineer features and improve the AI model● Effectively communicate analytical findings to stakeholders
Artificial Intelligence (AI)/Machine Learning (ML)	<ul style="list-style-type: none">● Formulate AI/ML solutions that address the AI/ML task● Demonstrate awareness of standard AI/ML workflow● Articulate the benefits of the AI/ML solution and present them to stakeholders

AI Certified Engineer Level I

Competency	Competency Descriptors/Behaviours
Business Needs Analysis	<ul style="list-style-type: none"> ● Evaluate business needs and recommend AI techniques as viable solutions
Data Preparation / Feature Engineering	<ul style="list-style-type: none"> ● Conduct EDA - uncover underlying structure of data, extract important variables and detect potential data cleanliness and integrity issues ● Optimize the data pre-processing pipeline and set-up/improve back end systems to streamline infrastructure ● Engineer useful modelling features and implement appropriate data versioning mechanisms
Model Design and Deployment	<ul style="list-style-type: none"> ● Design, build, tune and debug AI models for business use cases ● Design and build automated deployments for AI models with retraining loop, ensuring versioning and reproducibility of built models ● Continually fine-tune models and have functions built in to automatically retrain on new data ● Deploy AI models on infrastructure (including cloud) with robust front end and an optimized back end architecture ● Understand AI research papers and adapt them to apply to new or similar business use cases
Statistics and Theoretical Knowledge	<ul style="list-style-type: none"> ● Scope and explain the statistical framework underpinning the model(s) being developed
Communication	<ul style="list-style-type: none"> ● Express technical concepts underpinning findings/results to lay audience/non-technical stakeholders in a clear and concise manner to secure buy-in
AI Ethics, Biases and Governance	<ul style="list-style-type: none"> ● Ensure models that are developed follow the guidelines provided by the Model AI Governance Framework (PDPC) and/or other applicable ethics frameworks, where relevant

AI Certified Engineer Level II

Competency	Competency Descriptors/Behaviours
AI Implementation Consulting	<ul style="list-style-type: none"> ● Understand business needs and processes, scope viable use cases and design suitable AI solutions that balance the need for accuracy, cost, explainability and timeliness ● Perform commercial due diligence to determine the best use of resources
Solution Design and Process Management	<ul style="list-style-type: none"> ● Develop an integrated end-to-end AI solution that emphasizes human-centred design
Management and Communication	<ul style="list-style-type: none"> ● Guide and manage a team in the design, development and deployment of large scale AI models ● Communicate and collaborate effectively within cross functional teams ● Showcase system design that highlights business value to senior level stakeholders/customers
AI Ethics, Biases and Governance	<ul style="list-style-type: none"> ● Create design principles that ensures the responsible and ethical use of AI in deployed platforms

AI Certified Engineer Level III

Competency	Competency Descriptors/Behaviours
Strategic Orientation	<ul style="list-style-type: none"> ● Design, implement and evaluate business strategies that are underpinned by AI ● Lead the organizational Data Analytics/AI Centre of Excellence ● Partner Senior Leadership to apply AI to the overall organizational strategy
Influence and Communication	<ul style="list-style-type: none"> ● Effectively communicate the business value of AI across business units and functions ● Articulate a compelling vision and manage organizational change brought about by AI and technology ● Possess deep understanding of technology and business, and be able to bridge both in strategy and execution for different stakeholders
AI Development and Management	<ul style="list-style-type: none"> ● Architect and manage multiple yet complex AI applications across a large commercial organization ● Design/establish internal policies on periodic model tuning to cater to changes to business needs
Manage intellectual property (IP) strategies, processes and procedures	<ul style="list-style-type: none"> ● Identify potential IP commercialization opportunities for developed AI solutions and/or models ● Liaise with external vendors on preparation and finalization of IP applications ● Ensure organization's compliance to IP legislation and guidelines

Competency	Competency Descriptors/Behaviours
Thought Leadership	<ul style="list-style-type: none"> ● Evangelize the positive impact of Data/AI on business within the their organization as well as to external stakeholders/partners in Commerce, the Government and Education ● Effectively lead AI/ML Communities-of-Practice for AI professionals ● Mentor aspiring AI/ML professionals to create a viable pipeline of AI talent ● Constantly keeps abreast of the latest developments in AI
AI Ethics, Biases and Governance	<ul style="list-style-type: none"> ● Design organizational policies to ensure the responsible and ethical use of AI in deployed platforms