C-CLARKE
INTERNATIONAL INSTITUTE OF DIGITAL SCIENCES

C-CLARKE INTERNATIONAL INSTITUTE OF DIGITAL SCIENCES

Innovating Education for Tomorrow's Leaders

HIGHER DIPLOMA IN ADVANCED AI AND SOFTWARE ENGINEERING

CONTACT DETAILS:

www.c-clarke.com info@c-clarke.com +94 701000000

TABLE OF CONTENTS

WELCOME MESSAGE

Dear Students,

Welcome to C-Clarke International Institute of Digital Sciences!

We are thrilled to have you join us on this exciting journey of learning, innovation, and professional growth with us. At C-Clarke, we are dedicated to providing you with an exceptional education that combines advanced technologies, practical skills, and industry insights to prepare you for a successful career in software landscape.

Our institute is more than just a place to study—it's a community where connections are made, ideas are shared, and futures are shaped. Guided by a team of esteemed lecturers and supported by strong industry partnerships, we are committed to helping you achieve your goals and become leaders who make meaningful contributions both locally and globally.

We encourage you to take full advantage of the resources, opportunities, and support available at C-Clarke. Together, let's build a brighter future for you and our society.

Wishing you great success

Director, Academic Affairs

ABOUT US

C-Clarke International Institute of Digital Sciences is a premier educational institution dedicated to shaping the future of software technology professionals. With a commitment to delivering innovative, industry-relevant education, we enable students to excel in the fast-evolving world of software and digital sciences.

Our programs are precisely designed to provide a strong foundation in advanced technologies, practical skills, and ethical practices, ensuring our students are equipped for success both locally and globally. Backed by a distinguished panel of lecturers and consultants with extensive industry experience, we offer unparalleled opportunities for learning and networking.

At C-Clarke, we prioritize not just education but also the holistic development of our students. By fostering innovation, growth, and lifelong learning, we aim to create a community of future leaders who drive progress, achieve economic independence, and contribute meaningfully to the world..

C-Clarke is not just a place to study; it's a place to connect, grow, and transform your aspirations into reality.

VISION AND MISSION

Vision
To Be acknowledged as the Leader in Education for Digital Sciences, Whilst Inspiring Young Leaders to Achieve Economic Strength and Independence.

Mission
To Provide Innovative Education That Builds Essential Skills for Professional Success Locally and Globally.

CORE VALUES

Innovation
Continuously adhering to the latest global technologies, ensuring our programs stay ahead of industry trends to prepare students for the future.

Integrity
Committed to transparency, honesty, and ethical practices, fostering trust and respect in all our educational endeavors.

Excellence
Striving for the highest standards in education and guiding students to reach their full potential through world-class learning experiences.

Empathy
Building a supportive and compassionate community that understands the personal and professional aspirations of each student, guiding them with care and dedication toward their success.

PANEL OF LECTURERS AND ACADEMIC CONSULTANTS

DR. SOORIYA BANDARA

PhD in Electrical & Electronics Engineering,
NTU Singapore
BSc (Hons) in Electrical and Electronic Engineering
University of Peradeniya

Staff Engineer,
Wireless & Contact Charging Design at **Sivantos Group**
Visiting Lecturer at University of Peradeniya

KUSHANTHA GUNAWARDANA

PhD (Reading)
RMIT University
Cyber/ Computer Forensics and Counter Terrorism
MSc-IT
University of Colombo
MCT, C|EI, C|PENT, LPT, E|CSA, C|EH, C|HFI, E|NSA, C|ND, E|CIH, CCNSP, IRNSS, CISE, MIEEE, MBCS, MCP, MCSA +M, MCSE, HNDIT

Microsoft Cyber Security Architect
Expert International Cybersecurity Trainer & Practitioner
Founder/ CTO - Zecureright Pty Ltd (Australia)

GAYAN GUNAWARDANA

BSc in IT
University of Moratuwa
MBA, Marketing
University Of Belfordshire
Expert in Identity & Access Management
CISSP certified | AWS certified

Founder - onelAM
IAM & Information Security Experts

PANEL OF LECTURERS AND ACADEMIC CONSULTANTS

LIMANTHA MALIKA

BSc (Hons) in
Computer Science & Technology
Uva Wellassa University
MSc in IT
University of Colombo
IsTQB Certified Tester

Lead Engineer
Software Quality Assassurance
HCL Technologies

PRASHAN SILVA

Bsc (Hons) in Computer Science
University Of Kelaniya

Tech Lead
CodeGen

SUSHAIN DILISHAN PATHIRAGE

BSc (Hons) in Software Engineering
Cardiff Metropolitan University

Expert in Full Stack Development

Technical Lead
Sysco LABS

PANEL OF LECTURERS AND ACADEMIC CONSULTANTS

DILSHAN ARIYARATHNA

BSc (SP) in Computer Science
University of Kelaniya

Associate Technical Lead Engineer
iCan Lanka

CHAMINDIKA KODITHUWAKKU

Master of Information Technology
University of Colombo
BSc. (Hons) in IT & Management
University of Moratuwa

Senior Software Engineer
CMS

YASHOD PERERA

BSc (Hons) in Information Technology
University of Moratuwa
MSc in Big Data Analytics
University of Robert Gorden

Associate Technical Lead
WSO2

HIGHER DIPLOMA IN ADVANCED AI AND SOFTWARE ENGINEERING

Higher Diploma in Advanced Ai and Software Engineering is a concise, yet intensive, TVEC approved, 24-month program that focuses on foundational technologies and tools essential for any aspiring software developer.

Future with AI

After mastering advanced Python development as your foundation, then we dive deep into the world of Generative AI. You can learn to integrate powerful AI APIs like GPT, Claude, LLaMA, and Perplexity to build your own intelligent tools. You'll also gain knowledge and experience in creating multi-agent AI systems and mastering prompt engineering — the Skill Of communicating effectively With large language models. We help you not onlyjust to understand AI, but also to create with it.

Real-World Benefits:

This program is designed to quickly bring you up to speed with the core competencies required in the software industry. You'll gain hands-on experience in building web applications, managing code through version control, and developing a solid understanding of key programming languages. Graduates are well-prepared to take on entry-level roles in software development or enhance their current skill set.

FULL COURSE SYLLABUS

Module 1: Professional Python Development (Python)

1.1 Introduction to Python & Development Environment
1.2 Python Syntax, Variables & Data Types
1.3 Operators & Expressions
1.4 Control Flow Statements (if, elif, else)
1.5 Looping Structures (for, while)
1.6 Functions & Lambda Expressions
1.7 Core Data Structures (Lists, Tuples, Sets, Dictionaries)
1.8 Advanced Data Structures & Comprehensions
1.9 Object-Oriented Programming — Fundamentals
1.10 Object-Oriented Programming — Advanced Concepts
1.11 Modules & Packages
1.12 Exception Handling & Custom Exceptions
1.13 File Handling & File Operations
1.14 File Handling & File Operations - Day 2
1.15 Regular Expressions (Regex)
1.16 Debugging Techniques & Code Testing

Module 2: Introduction to Web Development (Web)

2.1 Introduction to Web Development & Web Architecture
2.2 HTML5 Fundamentals (Structure & Semantics)
2.3 HTML5 Forms, Media & Best Practices
2.4 CSSS Fundamentals (Selectors, Colors, Units)
2.5 CSS Box Model & Layout Techniques
2.6 CSS Flexbox
2.7 CSS Grid & Responsive Design Principles
2.8 Advanced CSS3 (Animations, Transitions) JavaScript ES6 Fundamentals
2.10 JavaScript Control Flow & Functions
2.11 DOM Manipulation & Events
2.12 JavaScript ES6 Advanced Features
2.13 Ajax Concepts & Asynchronous Programming
2.14 Fetch API & JSON Handling
2.15 Introduction to JavaScript Libraries
2.16 Bootstrap Framework
2.17 Tailwind CSS Framework

Module 3: FastAPI Backend Development

3.1 Introduction to Web APIs & REST Concepts
3.2 FastAPI Framework Introduction
3.3 Building REST APIs with FastAPI
3.4 Request Handling, Path Parameters & Query Parameters
3.5 Data Validation using Pydantic Models
3.6 CRUD API Development with FastAPI
3.7 FastAPI Database Integration (SQLAlchemy)
3.8 API Documentation (Swagger / OpenAPI)
3.9 Authentication & Security Basics (JWT)
3.10 Async Programming in FastAPI

Module 4: Advanced Project Management (PM)

4.1 Project Management Frameworks
4.2 Project Management Methodologies
4.3 Project Initiation & Stakeholder Management
4.4 Project Planning & Work Breakdown Structure (WBS)
4.5 Agile Frameworks (Scrum, Kanban)
4.6 Project Execution, Monitoring & Closure

Module 5: Advanced AI Development (AI)

5.1 Introduction to Artificial Intelligence & AI Ecosystem
5.2 Mathematics for AI – Linear Algebra
5.3 Mathematics for AI - Probability & Statistics
5.4 Data Handling & Data Collection
5.5 Data Cleaning, Preprocessing & Feature Engineering
5.6 Introduction to AI APIs & Frameworks
5.7 Machine Learning Fundamentals
5.8 Regression Algorithms
5.9 Classification Algorithms
5.10 Model Evaluation & Performance Metrics
5.11 Introduction to Deep Learning
5.12 Neural Networks & Backpropagation
5.13 Deep Learningwith AI APIs
5.14 Convolutional Neural Networks (CNNs)
5.15 Natural Language Processing (NLP) – Fundamentals
5.16 NLP Applications
5.17 Real-World AI Applications & Case Studies
5.18 Ethics in AI & Responsible AI
5.19 AI Deployment Concepts
5.20 AI DevOps & MLOps

Module 6: QA, Testing & Automation (QA)

6.1 Fundamentals of Software Testing & QA
6.2 Types of Testing & Test Case Design
6.3 Bug Reporting, Test Plans & Documentation
6.4 Manual Testing Techniques
6.5 Introduction to Test Automation Tools
6.6 Automation Frameworks & Best Practice

Module 7: Prompt Engineering (Prompt)

7.1 Introduction to Large Language Models (LLMs)
7.2 Capabilities, Limitations & use Cases of LLMs
7.3 Introduction to Prompt Engineering
7.4 Prompt Structure & Components
7.5 Zero-Shot Prompting Techniques
7.6 Few-Shot Prompting Techniques
7.7 Chain-of-Thought & Advanced Prompting Strategies
7.8 Improving Reliability, Consistency & Prompt Optimization

Module 8: LLM Engineering (LLM)

8.1 Introduction to LLM Engineering & Ecosystem
8.2 Overview of Open-Source vs Proprietary LLMs
8.3 GPT, Claude, LLaMA & Mistral Model Families
8.4 LLM Architecture Basics (Transformer Overview)
8.5 LLM Inference Concepts
8.6 LLM Inference with APIs
8.7 Local LLM Inference using Ollama
8.8 Prompt Engineering vs Fine-Tuning
8.9 Fine-Tuning Concepts & Use Cases
8.10 Parameter-Efficient Fine-Tuning (LoRA, PEET)
8.11 Introduction to Retrieval-Augmented Generation (RAG)
8.12 RAG Architecture & Workflow
8.13 Vector Databases & Embeddings
8.14 Document Ingestion & Chunking Strategies
8.15 LangChain Fundamentals
8.16 LangChain Chains, Tools & Memory
8.17 LlamaIndex Fundamentals & Data Connectors
8.18 Custom Tool Integration & Function Calling
8.19 Building AI Agents with Tools & Memory
8.20 Autonomous Agent Architectures & Workflows
8.21 Guardrails & Safety in LLM Applications

Module 9: Introduction to Java Programming (JAVA)

9.1 Introduction to Java & JVM Architecture
9.2 Java Compilation Process & Interpreter
9.3 Java Program Structure & Syntax Basics
9.4 Variables, Data Types & Type Casting
9.5 Operators & Expressions
9.6 Control Flow Statements (if, switch)
9.7 Looping Constructs (for, while, do-while)
9.8 Methods & Basic Program Design
9.9 Introduction to Data Structures (Arrays)
9.10 Basic Algorithms & Complexity Concepts

Module 10: OOP & Design Patterns (OOP)

10.1 Object-Oriented Programming Concepts in Java
10.2 Encapsulation and Abstraction
10.3 Inheritance and Polymorphism
10.4 Introduction to Design Patterns

Module 11: Advanced Java Development (Advanced Java)

11.1 Java Threads & Concurrency Basics
11.2 Synchronization & Thread Safety in Java
11.3 Exception Handling & File Handling
11.4 Lambda Expressions & Modern Java Features

Module 12: Database Management Systems (Integrated with JAVA)

12 .1 Database Models & Architecture
12.2 Relational Database Concepts
12 .3 SQL Fundamentals
12.4 Advanced SQL & Performance Optimization
12 .5 NoSQL Databases
12.6 Database Design, Security & Administration

Module 13: Comprehensive React Training (React)

13. I Introduction to React & Component-Based Architecture
13.2 JSX and Rendering Elements
13.3 Event Handling & Forms in React
13.4 Routing & Navigation (React Router)
13.5 React Lifecycle & Side Effects
13.6 State Management in React
13.7 React Hooks (useState, useEffect, custom hooks)
13.8 Advanced React Patterns (Functional Components & HOCs)

Module 14: Spring & Spring Cloud (Spring)

14.1 Introduction to Spring Framework & Core Concepts
14.2 Dependency Injection & Inversion of Control (IoC)
14.3 Spring Configuration (XML, Java Config, Annotations)
14.4 Building RESTful Web Services with Spring Boot
14.5 REST API Design & HTTP Methods
14.6 Exception Handling & Validation in Spring Boot
14.7 Spring Data JPA Fundamentals
14.8 Database Integration & ORM with JPA/Hibernate
14.9 Spring Boot Secu rity Fundamentals
14.10 Authentication & Authorization (JWT / Basic Security)
14.11 Introduction to Microservices Architecture
14.12 Microservices with Spring Boot & Spring Cloud

Module 15: Comprehensive Angular Training (Angular)

15.1 Introduction to Angular & Architecture
15.2 Components, Templates & Data Binding
15.3 Directives & Pipes
15.4 Services & Dependency Injection
15.5 Routing & Navigation
15.6 HTTP Client & Observables (RxJS)
15.7 State Management & Advanced RxJS Concepts
15.8 Testing & Debugging in Angular

Module 16: Version Control (GIT)

16.1 Introduction to Version Control & Git Basics
16.2 Git Workflow, Branching, Merging & GitHub Collaboration

Module 17: AWS Cloud & DevOps (AWS)

17.1 AWS Introduction, IAM & Core Services
17.2 Com ute, Stora e, Serverless & DevOps on AWS

Module 18: Flutter App Development (Flutter)

18.1 Introduction to Flutter & Cross-Platform Development
18.2 Dart Programming Fundamentals
18.3 Flutter Project Structure & Widgets
18.4 Layouts, Navigation & IJI Design
18.5 State Management in Flutter
18.6 Forms, Validation & User Input
18.7 Networking & API Integration
18.8 Local Data Storage & Persistence

Module 19: Software Design & Architecture

19.1 Architectural Foundations
19.2 Networking & Traffic Management
19.3 Scalability & Performance Strategies
19.4 Database Design & Sharding
19.5 Communication Patterns
19.6 Distributed Consistency & Consensus
19.7 Resiliency & Fault Tolerance
19.8 Observability & Maintenance

Module 20: Individual Research Project

- 360 Research hours
- Comprehensive research document with working prototype or product

Module 21: Enterprise App Development (Capstone Project)

- Develop a production-grade enterprise application

LIFETIME LEARNING SUPPORT

We provide:

- Access to updated course materials.
- Regular webinars on industry trends.
- A dedicated alumni network.

ADMISSION PROCESS

» Visit our website and fill out the application form.
» Submit necessary documents.
» Attend an interview or placement test.
» Confirm your admission and begin your journey.

COURSE FEES AND PAYMENT OPTIONS

Bank Account Details for Payments

COMMERCIAL BANK

Account Name: C-Clarke International Institute of Digital Sciences
Bank: Commercial Bank **Bank Code:** 7056
Branch: Moratuwa Branch **Code:** 59
Account Type: Current Account
Account Number: 1000874493

PAN ASIA BANK

Account Name: C-Clarke International Institute of Digital Sciences
Bank: Pan Asia Bank **Bank Code:** 7311
Branch: Moratuwa Branch **Code:** 024
Account Type: Current Account
Account Number: 102411001581

Please Note:

- **All completed payments are non-refundable**
- We encourage all students to reach out for guidance to ensure a smooth payment process.

Important Instructions

- When making the payment, please include your NIC number on the deposit slip or in the remarks section for online transfers.
- If you require specific payment instructions, contact your Student Counsellor before proceeding:
- Hotline: 070 1000000

HIGHER DIPLOMA IN ADVANCED AI AND SOFTWARE ENGINEERING

Course Fee: 300,000 LKR
Special Offer: 50,000 LKR Off For One-Time Payments
- One-Time Fee: 250,000 LKR

Duration : 24 Months

- **12 Months Installment Plan**
- 0% Interest on VISA, MasterCard & American Express Credit Cards

VISA MasterCard AMERICAN EXPRESS

"STEP INTO
Future AI Development with
Advanced AI & Software Engineering
Program"

REFUND POLICY

At C-Clarke International Institute of Digital Sciences, we maintain a strict **NO-REFUND POLICY** for all completed payments. Once a payment is made, it is considered final and non-refundable.

We strongly encourage all prospective students to review the program details, schedules, and payment terms carefully before proceeding with the payment. For any clarifications, our student counselors are available to assist you prior to confirming your enrollment.

This policy ensures the smooth operation of our programs and the continued delivery of high-quality education to all enrolled students.

CONTACT INFORMATION

Address	:	517 1/1 Galle Road, Rawatawatta, Moratuwa.
Phone	:	0701 000 000 (Call/WhatsApp)
Email	:	info@c-clarke.com
Website	:	www.c-clarke.com
Linked In	:	https://www.linkedin.com/company/c-clarke
Facebook	:	http://www.facebook.com/cclarkecampus
Instagram	:	http://www.instagram.com/cclarkecampus