



# PG DIPLOMA IN COMPUTER VISION



**UCAM**  
UNIVERSIDAD  
CATÓLICA DE MURCIA

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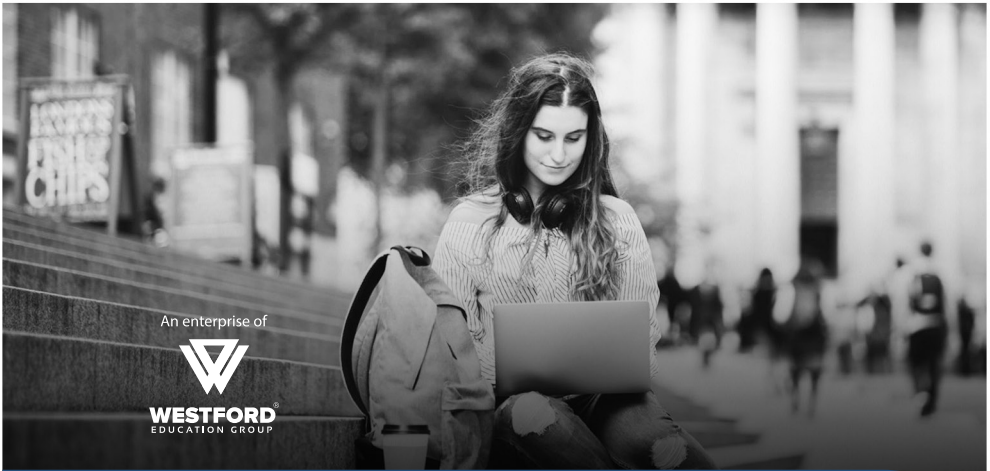
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# ABOUT EXEED ECX



Exeed ECX is a spin-off of Exeed College - a prestigious entity of higher learning and executive education from Westford Education Group. Exeed ECX provides a unique learning method through its satellite centres via blended learning. Exeed ECX, with its world-class academics, has accreditation and partnerships with the world's premium universities and awarding bodies. Plymouth Marjon University is a top-ranked, accredited university in the UK that collaborated with Exeed ECX. Other major universities collaborating with Exeed ECX are Universidad Católica de Murcia (UCAM) in Spain, Acacia University in the USA, and GEX Business School in France. Apart from this, our parent organisation Exeed College has tie-ups with universities across the globe - UCAM (Spain), Liverpool John Moores University (UK) and Carolina University (US) as well as with professional accreditation bodies like Scottish Qualifications Authority (SQA), Chartered Management Institute (CMI), Society for Human Resource Management (SHRM) and Cambridge International Qualification to provide globally recognised qualifications



An enterprise of



ABOUT

# WESTFORD EDUCATION

Westford Education Group (WEG) is a leading provider of accredited international education to aspiring learners across the globe. Headquartered in the UK, WEG is a pioneer in providing various Academic Degrees, Professional Certificates and Diploma courses in association with international accredited and recognized organizations and universities.

The study programs offered at WEG range from Undergraduate to Doctoral level consisting of master's, post graduate diplomas and doctoral degrees. WEG also provides specialized courses such as Doctor of Business Administration, Doctorate in Management, and Master of Business Administration (MBA) to name a few. Our core competence lies in providing higher National diplomas and professional certificate courses encompassing a wide range of domains specific to various industries.



Westford is fast emerging as a reputed brand of global education providers. WEG comprises 9 independent brands, 7 brands of Higher Education, 2 brands of K-12 education, and 1 brand operating in Sports Management.



# ABOUT UCAM



**UCAM**  
UNIVERSIDAD CATÓLICA  
DE MURCIA

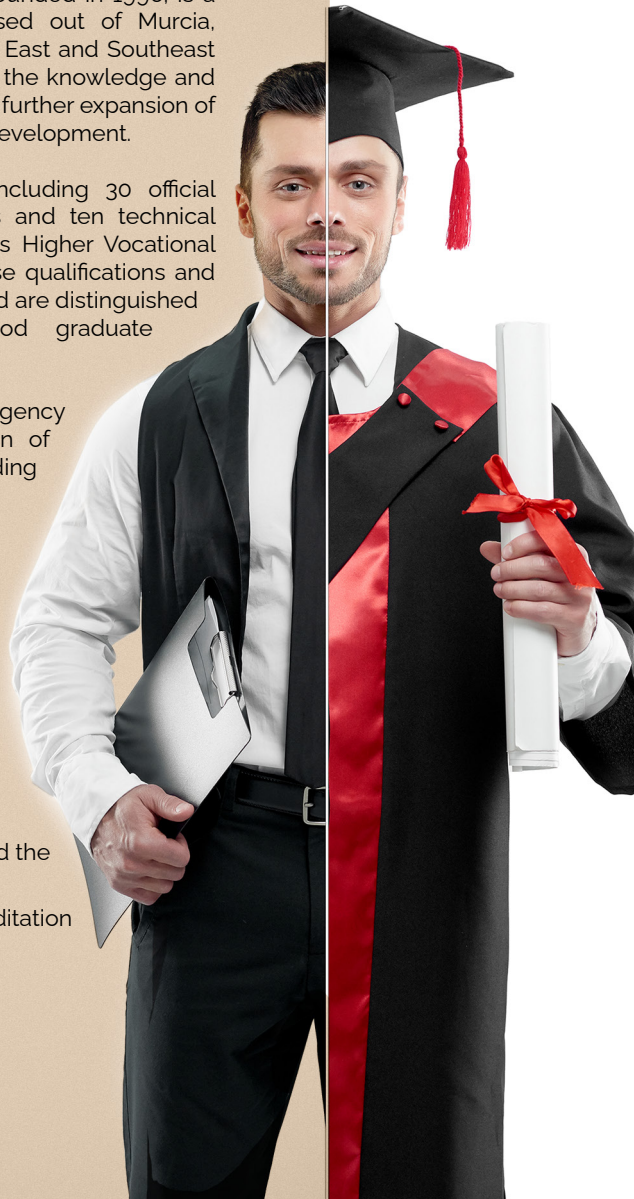
Universidad Católica de Murcia (UCAM), founded in 1996, is a fully-accredited European University based out of Murcia, Spain. With learning centres in the Middle East and Southeast Asia, UCAM aims to provide students with the knowledge and skills to serve society and contribute to the further expansion of human knowledge through research and development.

The university offers various courses, including 30 official bachelor's degrees, 30 master's degrees and ten technical higher education qualifications through its Higher Vocational Training Institute, in addition to its in-house qualifications and language courses. The programmes offered are distinguished in Europe and worldwide, with good graduate employability prospects as well.

UCAM is accredited by ANECA (National Agency for Quality Assessment and Accreditation of Spain) and the Ministry of Education regarding 17 of its undergraduate degrees.

## Key features:

- A fully accredited European University
- Spain's number two private university in academic output and quality
- Recognised by the European Higher Education Area
- Agreements with 167 universities around the world
- First Spanish university to secure accreditation from ANECA
- Four stars in the QS Stars rating system



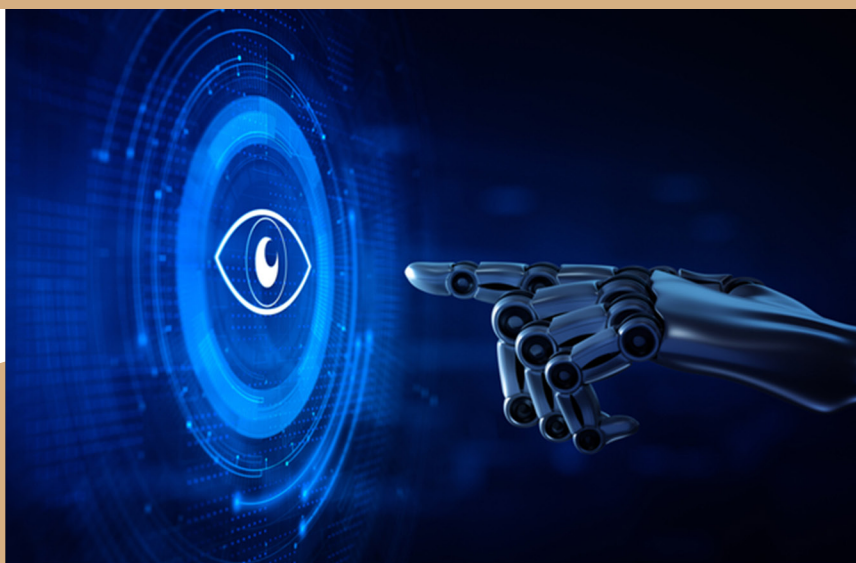
# PROGRAM OVERVIEW

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## PG DIPLOMA IN COMPUTER VISION

Computer vision contains a mix of programming, modeling, mathematics and is sometimes difficult to grasp so Airtics has designed this course to give a practical approach of learning computer vision with enough understanding of underlying theory, programming and algorithms to help in building stronger computer vision fundamentals. This course teaches how to create computer vision applications using standard tools such as OpenCV, Keras and TensorFlow. The various concepts taught in this course can be used across several domains from image editing apps to self-driving cars.

Course Duration: **9 Months** | Course Modules: **6 Modules**



# PROGRAM STRUCTURE

## MODULE 1

CREDITS : 20

### BASICS OF PYTHON

#### Basic Python Programming

- Variable & data types
- Conditional statements
- Loops
- Functions

#### Essential Python libraries for data science

- Pandas
- Numpy
- Scikit
- Matplotlib

#### Setting up Python for Machine Learning

### LEARNING OUTCOMES

- **L01** Learn basic concepts of Python
- **L02** Acquire rudimentary skills to write programs in Python
- **L03** Ability to use Python for Data Science & Machine learning
- **L04** Get application-ready with essential Python libraries & tools



## MODULE 2

CREDITS : 20

### MATHEMATICS AND STATISTICS FOR ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

- **Linear algebra**
- **Probability Theory**
- **Statistics**
- **Statistical tools**
  - CSV
  - Excel

## LEARNING OUTCOMES

- **L01** Master the mathematical foundation required for writing programs
- **L02** Learn mathematical and statistical foundations required for AI & ML
- **L03** Acquire mathematical knowledge to build algorithms for data analysing
- **L04** Apply statistical analysis techniques using essential softwares on data sets



## MODULE 3

CREDITS : 20

## PYTHON FOR MACHINE LEARNING

- **Python Programming for AI & ML**
  - Essential Python libraries for data analysis
  - Data storage and manipulation by NumPy
  - Data Visualization using Matplotlib
  - Data Analysis with Pandas
  - Basic introduction to Sci-kit-learn

## LEARNING OUTCOMES

- **L01** Acquire practical skills in data analyzing, handling & visualization using Python tools
- **L02** Perform mathematic operations on a wide range of data using NumPy
- **L03** Operate Pandas to sort through & rearrange data, run analyses, & build data frames
- **L04** Ability to analyze by visualizing data with Matplotlib



# MODULE 4

CREDITS : 20

## INTRODUCTION TO MACHINE LEARNING & ARTIFICIAL INTELLIGENCE

- Introduction to ML & AI
- Supervised Learning
- Unsupervised Learning
- Reinforcement Learning
- Machine Learning Algorithms  
Regression, Classifiers, Clustering
- Machine Learning Task  
Dataset, Data Cleaning, Algorithm Selection, Training & Testing Model

### LEARNING OUTCOMES

- L01 Understand Artificial Intelligence and Machine Learning fundamentals
- L02 Demonstrate a comprehensive knowledge of the nature of the data and techniques used for pre- processing the data for machine learning
- L03 Introduction to major machine learning algorithms like Classifiers (for image, spam, fraud), Regression (stock price, housing price, etc.), Clustering (unsupervised classifiers)
- L04 Demonstrate a deep critical understanding of algorithms and mathematics behind established ML approaches



# SPECIALISATION MODULE 1

CREDITS : 20

## ADVANCED PYTHON FOR COMPUTER VISION

### Core Python for computer vision

- Strings
- Regex

### Machine Learning algorithms

- Regression
- KNN
- SVM

### Computer vision tools

- Keras
- TensorFlow

## LEARNING OUTCOMES

- **L01** Understand the Basic python tools used for Computer Vision
- **L02** Understand image processing python packages to enable them to write scripts for text pre-processing
- **L03** Learn popular machine learning algorithms, Feature Selection, and Mathematical intuition behind it
- **L04** Understand basic concepts and standard tools used in computer vision



## SPECIALISATION MODULE 2

CREDITS : 20

### MACHINE LEARNING FOR COMPUTER VISION

- **Introduction to Computer Vision**
- **Deep Learning Network Models**
- **Convolutional Neural Networks**
- **Recurrent Neural Networks**
- **Introduction to Keras Model Life-Cycle**
- **Image Data Manipulation using Pillow Python library.**
- **Convert Images to NumPy Arrays and Back**

## LEARNING OUTCOMES

- **L01** Concepts of deep learning to build artificial neural networks and traverse layers of data abstraction and get a solid understanding of deep learning
- **L02** Develop and build fully automated CV algorithms USING YOLO
- **L03** Develop the usage of Deep learning models like CNN and RNN
- **L04** Gain insights about advancements in CV, AI, and Machine Learning techniques

- **Clarifying the terms of the research**
- **Suggesting areas of reading**
- **Apply the knowledge base and abilities taught throughout the course to a real-world scenario**
- **The Problem, Understanding It, and Getting Data**
- **Frame a business issue in a manner that can be solved with AI & ML**
- **Apply Exploratory Data Analysis and Modeling**
- **Identify the methodology or algorithm that will handle the proposed challenge**
- **Reviewing the proposed methodology**
- **Establishing a research timetable, including initial dates for further meetings between the student and supervisor**
- **Advising students about appropriate standards & conventions concerning the assessment.**
- **Providing means of contact in addition to tutorials**
- **Educate learners to research and write their results and thoughts correctly, clearly, logically, and to a high-professional degree**

## LEARNING OUTCOMES

- **L01** Conduct independent research and development within the context of an AI & ML project
- **L02** Produce detailed documentation to a standard expected of a professional in the field of AI & ML
- **L03** Communicate technical information clearly and succinctly to a broad, non-specialist audience
- **L04** Apply knowledge of research principles and methods to plan and execute a research based industry project with a high level of personal autonomy and accountability





# TRAINING KEY FEATURES



144 hours of live instructor-led training



3 industry based projects, 6 assignments



24/7 support and LMS Access



Hands on experience with latest tools & applied projects



Live engagement classes by seasoned academics and professionals



Internship/Projects



Flexible timing for working professionals



EMI option

## ELIGIBILITY

Students seeking admission to the course may have to fulfill the following criteria/requirement.

- Bachelor's Degree from a recognized University
- Proficiency in the English language

## PREREQUISITES

Due to its involvement in modern Machine Learning algorithms with math and programming, candidate having knowledge with linear algebra, probability and calculus could be a plus.

# TOOLS/FRAMEWORKS/ LIBRARIES

- Scripting Tools : Python, MySQL
- Tools /Libraries : Pandas, NumPy, Seaborn, Matplotlib, Scikit, Tensorflow, OpenCV, Keras, Scikit Image
- IDE Shell : Jupyter Notebook
- Database Integrations : REST API
- Data Science Environment : Anaconda
- Automated Machine Learning Models : Supervised, Unsupervised



## APPLICATION & USE CASES



Transportation



Banking



Agriculture



Health Care



Manufacturing



Forecasting



Education



Retail

# CAPSTONE PROJECTS

## Showcase your capability with the real-world projects

### Bring Your Own Project

Learn to solve a problem that you/your organization is facing using Computer Vision

OR

### Choose From Curated Capstone Projects



FACE DETECTION  
& IDENTIFICATION



MEDICAL IMAGE  
CLASSIFICATION



OBJECT DETECTION  
FOR BLOOD CELLS

# INTERNSHIP/PROJECTS

Exeed ECX provides internships in the respective field for a period of 4-5 months to all eligible and able students.

## INTERNSHIP/PROJECTS INCLUDES:

- Mentoring by software developers
- Live workshops on projects
- Internship certificate
- Candidate's evaluation



After successfully completing the learning modules, eligible students would move on to internships

# PLACEMENT SUPPORT

Exeed ECX's high level of instruction has attracted an increasing number of companies, and the placement scene is expanding. Candidates who excel in internship will be eligible for placement at top MNC's that work with Exeed ECX.

- Deliver five proof-of- concept a month
- JD based Support training
- We will have our partner companies review the POCs
- Placement in MNC

# CERTIFICATION

International  
Certification by

**UCAM - Spain**



**UCAM**  
UNIVERSIDAD  
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**UCAM**  
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CATÓLICA DE MURCIA



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