

## Module specification

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<b>Module Code</b>	COM767
<b>Module Title</b>	Computer Vision and NLP
<b>Level</b>	7
<b>Credit value</b>	20
<b>Faculty</b>	FACE
<b>HECoS Code</b>	100961
<b>Cost Code</b>	GACP
<b>Pre-requisite module</b>	None

### Programmes in which module to be offered

<b>Programme title</b>	<b>Core/Optional/Standalone</b>
MSc Artificial Intelligence	Core

### Breakdown of module hours

Learning and teaching hours	10 hrs
Placement tutor support hours	0 hrs
Supervised learning hours e.g. practical classes, workshops	11 hrs
Project supervision hours	0 hrs
<b>Active learning and teaching hours total</b>	<b>21 hrs</b>
Placement hours	0 hrs
Guided independent study hours	179 hrs
<b>Module duration (Total hours)</b>	<b>200 hrs</b>

### Module aims

This module aims to develop a deep understanding of advanced techniques in Natural Language Processing (NLP) and Computer Vision (CV) without revisiting general AI or machine learning fundamentals. Building on basic knowledge of machine learning, students will focus on state-of-the-art models and practices for processing textual and visual data. The module emphasizes practical skills in designing, implementing, and evaluating NLP and CV solutions using widely accessible frameworks. Through hands-on portfolio work and critical analysis, students will learn to solve real-world language and vision tasks and to critically assess the performance and implications of the techniques used. The overall aim is to equip students with the skills to be capable of applying and innovating with advanced NLP and CV methods in research or industry contexts.



## Module Learning Outcomes

At the end of this module, students will be able to:

1	Critically evaluate and compare advanced NLP and CV techniques, assessing their suitability for real-world applications.
2	Design and implement NLP workflows using preprocessing, embeddings, and neural architectures for diverse language tasks.
3	Conduct and evaluate experimental studies of NLP and CV models using appropriate performance metrics.
4	Interpret and synthesise experimental results, critically reflecting on strengths and limitations while communicating findings effectively.

## Assessment

Indicative Assessment Tasks:

This module is assessed entirely through a portfolio that integrates both practical work and critical reflection within the domains of Computer Vision (CV) and Natural Language Processing (NLP). Students will complete a series of tasks demonstrating the application of relevant techniques, frameworks, and models introduced in the module. These may include implementing and evaluating NLP and CV solutions such as text classification, sentiment analysis, image recognition, or object detection, depending on the chosen focus areas.

The portfolio should provide evidence of technical implementation, evaluation, and analysis of results, including justification of methodological choices and consideration of improvements. Overall, it assesses the student's ability to apply CV and NLP concepts effectively, critically evaluate performance, and communicate insights with clarity and depth.

Portfolio assessments may comprise multiple pieces of work that collectively demonstrate a student's knowledge and skills developed throughout the module. These may take the form of one or two substantial tasks, or a series of smaller tasks, typically ranging from one to eight across the duration of the module.

Assessment number	Learning Outcomes to be met	Type of assessment	Duration/Word Count	Weighting (%)	Alternative assessment, if applicable
1	1, 2, 3,4	Portfolio	5000 Words or Equivalent	100%	N/A

## Derogations

N/A



## Learning and Teaching Strategies

In line with the Active Learning Framework, this module will be blended digitally with both a VLE and online community. Content will be available for students to access synchronously and asynchronously and may indicatively include first and third-party tutorials and videos, supporting files, online activities any additional content that supports their learning. As this module progresses, the strategies will change to best support a diverse learning environment. For each week, a topic will be started with tutor-led demonstrations, and practical-based sessions will be given to ensure that the students get to practice what they have been taught in relevant concepts. Sessions will be intertwined between instructional explanation and practical depending on the specific indicated syllabus necessities.

## Welsh Elements

This module is designed to support Welsh-speaking students in line with the Welsh Language Standards. While the primary delivery will be in English, students will have the opportunity to submit assessments, including coursework and projects, in Welsh if preferred. Relevant module materials, such as reading lists, key texts, and guidance, will be available bilingually upon request, ensuring accessibility for all students. Additionally, where possible, guest speakers, case studies, or examples may include references to the Welsh business context, especially in areas such as data use in local industries and Welsh public sector organisations.

The department encourages students to develop bilingual digital skills by incorporating Welsh-language datasets, tools, and resources where appropriate, offering an inclusive learning environment. We also support the development of bilingual visualisation techniques, enabling students to create digital outputs that reflect the Welsh language, should they wish to do so.

## Indicative Syllabus Outline

### Natural Language Processing

- Text preprocessing and tokenization
- Word embeddings
- Sequence modelling
- Transformers and self-attention
- Text classification, sentiment analysis, Named Entity Recognition (NER)

### Computer Vision

- Image preprocessing and augmentation
- Convolutional Neural Networks
- Object detection
- Image segmentation



- Image classification and transfer learning

Tools and Frameworks

Applications and Case Studies

## Indicative Bibliography

Please note the essential reads and other indicative reading are subject to annual review and update.

### Essential Reads:

There are no essential texts; the module will use relevant online reference material.

### Other indicative reading:

Jurafsky, D. & Martin, J.H., 2023. *Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics, and Speech Recognition*. 3rd ed. London: Pearson

Bird, S., Klein, E. & Loper, E., 2009. *Natural Language Processing with Python*. Sebastopol, CA: O'Reilly Media.

Goldberg, Y., 2017. *Neural Network Methods for Natural Language Processing*. San Rafael, CA: Morgan & Claypool.

## Administrative Information

For office use only	
Initial approval date	29 <sup>th</sup> January 2026
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