

ual:

APPROVED

MSc Data Science and AI for the Creative Industries

Awarding Body	University of the Arts London
College	UAL Institute for Creative Computing
School	University of the Arts London
Programme	Institute of Creative Computing (ICC)
Course AOS Code	CCIMSDSC F01/D01
FHEQ Level	Level 7 Masters
Course Credits	180
Mode	Full Time, Distance Learning
Duration of Course	1 year
Valid From	September 1st 2021
QAA Subject Benchmark	Art and Design
Collaboration	N/A
UAL Subject Classification	Creative computing
JACS Code	None
UCAS Code	N/A
PSRB	N/A
Work placement offered	N/A
Course Entry Requirements	An applicant will normally be considered for admission if they have achieved an educational level equivalent to an honours degree in either the broad fields of:

	<ul style="list-style-type: none"> • Arts and Design • Humanities • a joint computer sciences and arts/humanities degree, or related subject. <p>Educational level may be demonstrated by: Honours degree (named above); Possession of equivalent qualifications in a design-related or creative discipline; Prior experiential learning, the outcome of which can be demonstrated to be equivalent to formal qualifications otherwise required. Your experience is assessed as a learning process and tutors will evaluate that experience for currency, validity, quality and sufficiency; Or a combination of formal qualifications and experiential learning which, taken together, can be demonstrated to be equivalent to formal qualifications otherwise required.</p> <p>Applicants without the required qualifications, but with professional experience may be eligible to gain credit for previous learning and experience through the AP(E)L system.</p> <p>Language requirements: IELTS level 7.0 or above, with at least 6.0 in reading, writing, listening and speaking (please check our main English Language requirements webpage).</p>
Selection Criteria	<p>Sufficient prior knowledge and experience of and/or potential in a specialist subject area to be able to successfully complete the programme of study and have an academic or professional background in a relevant subject for a conversion masters.</p> <p>Aptitude for computing study and logical methods, sometimes tested in an online aptitude test. (this test is required on a per application basis and may not always be required)</p> <p>Also, to show a willingness to work as a team player, good language skills in reading, writing and speaking, the ability to work independently and be self-motivated.</p>

	<p>We welcome non-standard applications from diverse applicants and subject fields and applications that make a strong case for how the course could be applied to the ambitions of the applicant.</p>
Scheduled Learning and Teaching	<p>During your course you will engage with learning and teaching that includes both online and face-to-face modes. The advertised scheduled activity for the course will be delivered through a combination of live, synchronous and asynchronous on-line learning. Scheduled learning and teaching activity may include lectures, seminars, studio and workshop briefings, tutorials, external visits and project briefings.</p>

Awards and Percentage of Scheduled Learning

Year 1

Percentage of Scheduled Learning	16
Awards	Credits
Postgraduate Diploma (Exit Only)	120
Master of Science	180

Course Aims and Outcomes

The Aims and Outcomes of this Course are as follows:

Aim/Outcome	Description
Aim	To enable you to reorient your educational experience to the applied STEM field of Data Science for the Creative Industries.
Aim	To equip you with a range of advanced computational approaches to the exploration of data science questions.
Aim	To equip you with an advanced grounding in data science methods in a creative industries context.
Aim	To develop your critical awareness of data science approaches in a creative industries context with respect to ethics, innovation and value creation.
Aim	To prepare you for professional data science roles in a creative industries context.
Aim	To enable you to identify and explore relevant and novel research questions in the field of Data Science and AI for the Creative Industries
Outcome	Define complex data science problems in a creative industries context.
Outcome	Develop and use advanced experimental software for exploring data science problems.
Outcome	Understand and apply innovative AI and machine learning methods, tools and frameworks.
Outcome	Engage with relevant critical, social, ethical issues and impacts at an advanced level
Outcome	Build experimental tools for the creative industries.
Outcome	Understand and present findings drawn from experimental research data and methods.

Distinctive Features	
1	Conversion Masters: This Master's degree offers BA arts and humanities graduates the opportunity to re-orient their studies to an applied STEM discipline in a creative industries context.
2	Developed with Industry: This Master's degree has been co-designed with our current industry partner WPP the "world's largest advertising company" and this ensures the skills developed on the course are in demand at the highest levels of the creative industry. This also means students gain access to live data science and case study work from WPP.
3	Machine Learning and creative AI research focus: students will benefit from work within the Institute research theme of Creativity Machine Learning and AI and will be exposed to experimental computational approaches to research in this field.
4	CCI PhD and partners student research community: The course engages with creative computing researchers from across London's university sector including our formal research collaboration agreement with Goldsmiths UoL. This means students have access to cross institutional seminars and workshops over the course of their studies with a cross institutional groups of M level and research students.

Course Detail

The post-graduate conversion masters ***MSc Data Science and AI for the Creative Industries*** offers BA arts and humanities graduates the opportunity to re-orient their studies to an applied STEM discipline in a creative industries context. Designed in collaboration with the creative industries, this masters delivers applied computer science skills and data science training, introducing functional approaches to AI across multiple use cases.

This course has been developed in response to the Office for Students identifying a need for data science and AI skills in multiple sectors within the UK and internationally. It is anticipated that graduates with these skills will be in high demand. Additionally, the programme seeks to attract diverse learners so as to increase diversity within this high value and growing part of the creative technology economy.

As a student at the UAL Creative Computing Institute you will study in a specialist, research rich environment. The Institute provides dedicated technical resources, access to an Institute-wide lecture programme, and further opportunities to engage with Institute researchers and practitioners through additional events, seminars and workshops. By studying at the UAL Creative Computing Institute, you will join a network of creative researchers excited by the potential of computational technologies.

Course Units

STEM for Creatives (20 Credits)

This unit offers a conversion boot camp for STEM study for arts and humanities graduates including the maths that underpins the data science approaches later in the course. This unit is taught by a STEM academics who have worked in a creative industries setting.

Natural Language Processing for the Creative Industries (20 credits)

This practical class develops key coding skills to support NLP for the creative industries and introduces applied computer science concepts for arts and humanities graduates. Students will use coding languages such Python and JavaScript to develop approaches to text analysis, text generation, chatbots, conversational interfaces for sectors such journalism, data centric marketing, customer insights and services.

Introduction to Data Science (20 credits)

This computing and seminar class uses programming approaches to statistics, structuring

data, analysing data and explores big data approaches to social media analysis including techniques such as topic modelling. This unit also gives a grounding in data ethics, data handling and GDPR.

Artificial Intelligence for Media (20 credits)

This practical class introduces students to practical Artificial Intelligence tools such as Tensorflow and pyTorch in order to do signal processing classification, regression, style transfer, image and video generation and includes exploring techniques such as, deep fakes, GANS, pix-2-pix and others. You will benefit from tuition from senior CCI researchers in this area and our relationships with industrial product teams such as Google Brain.

Data Science in the Creative Industries (20 credits)

This unit is taught in partnership with our current industry partner (WPP) and involves an industry case study of data science approaches to product development and applied approaches to campaign insight, customer interfaces, media analysis and generation.

Personalisation and Machine Learning (20 credits)

This practical class looks at extending your machine learning experience to include the building and testing of recommenders and audience analysis tools. This Python and JavaScript based applied computing experience enables you to build and test systems that specifically test clustering for audience preferences.

Thesis Project (60 credits)

This self-directed unit asks you to build a practical project and write an associated thesis report of 8-10,000 words that documents your technical methods, process of design and development and evaluation.

Learning and Teaching Methods

To enable students to demonstrate achievement against the unit learning outcomes, learning and teaching methods will include:

- Lectures and seminars

- Studio/lab-based practice & masterclasses
- Project work
- Technical Tuition
- Collaborative problem-solving & group work
- Independent Study

Assessment Methods

The assessment strategy for the MSc has been designed in accordance with the QAA expectations of research masters as outlined in section 6 above. It is a strategy that develops threshold research competency in creative computing. Assessment methods include:

- Project portfolio comprising
 - Technical prototypes
 - Presentations
- Essays and reports
- Exams

Reference Points

FHEQ https://www.qaa.ac.uk/docs/qaa/quality-code/qualifications-frameworks.pdf?sfvrsn=170af781_14;

UK Quality Code <https://www.qaa.ac.uk/quality-code>;

Benchmark Statements <https://www.qaa.ac.uk/en/quality-code/subject-benchmark-statements>

Course Diagram

	Term 1										Term 2										Term 3										UAL Summer Period						
Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31-45						
45 Weeks	STEM for Creatives (20 Credits)										S	Introduction to Data Science (20 Credits)										S	Data Science in the Creative Industries (20 Credits)										S	PG Diploma - Exit Point	Thesis Project (60 Credits)		S
	Natural Language Processing for the Creative Industries (20 Credits)										S	Artificial Intelligence for the Media (20 Credits)										S	Personalisation and Machine Learning (20 Credits)										S				
UAL Block 1											UAL Block 2											15 Weeks															

Summative Assessment

Indicative summative assessment weeks are noted in the course diagram. For exact dates please refer to your timetable.

IU000130 : STEM for Creatives

(Mandatory)

Unit Code	IU000130
Unit Title	STEM for Creatives
FHEQ Level	Level 7
Effective From	September 1st 2020
Duration	1
Credits	20
Programme	Institute of Creative Computing (I001) (S)
Unit Introduction	This unit provides core conversation content for STEM study for arts and humanities graduates including approaches underpinning core data science methods which students will come across in later modules. The course will: introduce core science and engineering principles / methods, including experimental philosophy, hypothesis formulation, falsifiability, reproducibility, and validation; contextualise STEM principles within the discipline of computer programming for the Creative Industries through the use of sounds, images, text and interactions; detail and reinforce core principles of Mathematics including sets, trigonometry, calculus, geometry, matrices, and transformations; introduce common algorithms and data structures for representing information relevant to creative industries contexts.
Indicative Content	This unit offers a conversion boot camp for STEM study for arts and humanities graduates including the maths that underpins the data science approaches later in the course. This unit is taught by a STEM academics who have worked in the creative industries including music, film, tv, fashion, advertising and journalism.
Learning & Teaching Methods	<ul style="list-style-type: none"> • Lectures • Seminars • Labs

Learning Outcomes

LO1	Demonstrate an understanding of core science and engineering principles required for the programme (Enquiry, Knowledge, Communication)
LO2	Demonstrate computer programming skills in relation to creative industries contexts (Knowledge, Process, Communication)
LO3	Demonstrate core mathematical skills required for performing computational operations on data (Process, Realisation)
LO4	Demonstrate knowledge of core algorithms and data structures for representing information relevant to creative industries contexts (Process, Realisation)

Unit Assessment Summary

Element – The assessment for this unit is weighted. In element-based assessment, you must achieve at least an E grade in each element, and an aggregate grade of at least D- in the overall unit. Failure (F, or F-), or non-submission in any element defaults to Fail for the unit. Assessment will be against the specified marking criteria.

Elemental	
Assessment Type	Timed Examination
% of total	50
Hand-in Week	Refer to Assignment Brief
Briefing	Refer to Assignment Brief
Feedback	Refer to Assignment Brief
Assessment Description	Element 1: An exam as directed by the unit brief.
Elemental	
Assessment Type	Test
% of total	50
Hand-in Week	Refer to Assignment Brief
Briefing	Refer to Assignment Brief
Feedback	Refer to Assignment Brief
Assessment Description	Element 2: In-class assignments as directed by the unit brief.

Scheduled Learning and Teaching

Details of the total scheduled learning and teaching activity for each unit, can be found on your student portal on SITS, the UAL student records system.

Click on the “scheduled learning and teaching” tab at the top of the home screen when you have logged in using your UAL details.

Reading List

Essential Reading:

David Spiegelhalter

The Art of Statistics: Learning from Data, Pelican Books, 13 Feb 2020

The Python Tutorial

<https://docs.python.org/3/tutorial/index.html>

Further Reading:

Martin Gould, Edward Hurst

Bridging the Gap to University Mathematics, Springer, 30 Jan 2009

Anaconda Documentation

<https://docs.anaconda.com/>

Sheldon Axler

Linear Algebra Done Right (Undergraduate Texts in

Mathematics), Springer, 18 Dec 2014

Periodicals

The ACM Digital Library

<http://dl.acm.org>

The IEEE Explore Digital Library

<https://ieeexplore.ieee.org/Xplore/>

IU000131 : Natural Language Processing for the Creative Industries

(Mandatory)

Unit Code	IU000131
Unit Title	Natural Language Processing for the Creative Industries
FHEQ Level	Level 7
Effective From	September 1st 2020
Duration	1
Credits	20
Programme	Institute of Creative Computing (I001) (S)
Unit Introduction	<p>This practical class develops key coding skills to support NLP for the creative industries and introduces applied computer science concepts for arts and humanities graduates. Students will use coding languages such Python and JavaScript to develop approaches to text analysis, text generation, chatbots, conversational interfaces for sectors such journalism, data centric marketing, customer insights and services. The course will introduce ways in which Natural Language Processing is used in the Creative Industries through a critical exploration of NLP practices and contexts including customer service, customer insights, market awareness, data journalism, and communications. It will also develop student's practical skills in computer programming for natural language processing in a relevant language (e.g. Python / JavaScript).</p> <p>Furthermore, the course helps students develop an understanding of how to create and use chatbots, text analysis systems, text generators, and simple conversational interfaces, whilst also introducing simple and practical techniques including web scraping, web spidering, word counting, keyword extraction, auto-summarisation and lemmatisation. Finally, the course critically introduces ideas</p>

	that are important for developing an understanding of topic modelling, including Semantic Analysis, Dirichlet Allocation, Word Vectors, Sentiment Analysis and other relevant Machine Learning Approaches.
Indicative Content	This practical class develops key coding skills to support NLP for the creative industries and introduces applied computer science concepts for arts and humanities graduates. Students will use coding languages such Python and JavaScript to develop approaches to text analysis, text generation, chatbots, conversational interfaces for sectors such journalism, data centric marketing, customer insights and services.
Learning & Teaching Methods	<ul style="list-style-type: none"> • Lecture • Lab • Seminar

Learning Outcomes	
LO1	Demonstrate a critical understanding of how NLP is used in the Creative Industries across a range of contexts including marketing, customer interaction and content generation (Knowledge, Communication).
LO2	Demonstrate practical skills in computer programming for use in NLP contexts (Process, Realisation)
LO3	Use existing frameworks and examples to create simple computational systems that make use of NLP approaches (Knowledge, Processes, Realisation)
LO4	Demonstrate practical skills in web scraping, web spidering, regular expressions, word counting, keyword extraction, summarisation, stemming and lemmatisation. (Knowledge, Processes, Realisation)
LO5	Demonstrate a critical awareness of techniques relevant to Topic Modelling, including Semantic Analysis, Vectorisation, Sentiment / Toxicity. (Knowledge, Communication)

Unit Assessment Summary
Element – The assessment for this unit is weighted. In element-based assessment, you must achieve at least an E grade in each element, and an aggregate grade of at least D- in the overall unit. Failure (F, or F-), or non-submission in any element defaults to Fail for the unit. Assessment will be against the specified marking criteria.

Elemental	
Assessment Type	Essay
% of total	50
Hand-in Week	Refer to Assignment Brief
Briefing	Refer to Assignment Brief
Feedback	Refer to Assignment Brief
Assessment Description	Element 1: Critical Essay as directed by the unit brief.
Elemental	
Assessment Type	Project Outcome
% of total	50
Hand-in Week	Refer to Assignment Brief
Briefing	Refer to Assignment Brief
Feedback	Refer to Assignment Brief
Assessment Description	Element 2: Mini Project as directed by the unit brief

Scheduled Learning and Teaching

Details of the total scheduled learning and teaching activity for each unit, can be found on your student portal on SITS, the UAL student records system. Click on the “scheduled learning and teaching” tab at the top of the home screen when you have logged in using your UAL details.

Reading List	<p>Essential Reading</p> <p>Bhargav Srinivasa-Desikan</p> <p>Natural Language Processing and Computational Linguistics: A practical guide to text analysis with Python, Gensim, spaCy, and Keras</p>
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29 Jun 2018, Pakt, Birmingham UK

Further Reading

Gensim Core Concepts, Corpora and Vector Spaces, Topics and Transformations, Similarity Queries

https://radimrehurek.com/gensim/auto_examples/index.html

Natural Language Processing with Python, --- Analyzing Text with the Natural Language Toolkit

Steven Bird, Ewan Klein, and Edward Loper

https://www.nltk.org/book_1ed/

Periodicals

The ACM Digital Library

<http://dl.acm.org>

The IEEE Explore Digital Library

<https://ieeexplore.ieee.org/Xplore/>

IU000132 : Introduction to Data Science

(Mandatory)

Unit Code	IU000132
Unit Title	Introduction to Data Science
FHEQ Level	Level 7
Effective From	September 1st 2020
Duration	1
Credits	20
Programme	Institute of Creative Computing (I001) (S)
Unit Introduction	<p>This course uses programming approaches to introduce founding principles of data science to students. These include data gathering, data representation, data structures, and the difference between data and information. The course develops student's understanding of statistical data mining approaches to analysis of structured and unstructured data, including common problems and challenges, such as issues with data distributions, data formats, and data bias. Furthermore, students will develop knowledge and skills in computer programming for gathering, processing and analysing data, including essential algorithms and frameworks. The course also discusses approaches to data analysis such as topic modelling, and common methods for social media analysis. Students are also required to develop a robust understanding of data science ethics, including bias, data protection (e.g. GDPR), data ownership, data storage, data sharing, and ethics processes.</p>
Indicative Content	<p>This computing and seminar class uses programming approaches to statistics, structuring data, analysing data and explores big data approaches to social media analysis including techniques such as topic modelling. This units also gives a grounding in data ethics, data handling and GDPR.</p>
Learning & Teaching Methods	<ul style="list-style-type: none"> • Lecture • Seminar

	• Lab
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Learning Outcomes	
LO1	Demonstrate an understanding of core Data Science principles including data gathering, data representation and data storage, and the relationship between data and information (Enquiry, knowledge)
LO2	Demonstrate an understanding of statistical data mining approaches to analysis of structured and unstructured data, including common problems and challenges (Knowledge, Process, Communication)
LO3	Demonstrate fundamental skills in computer programming for gathering, processing and analysing data, including essential algorithms and frameworks (Process, Realisation)
LO4	Demonstrate an ability to undertake fundamental data analysis using approaches such as topic modelling (Process, Realisation)
LO5	Demonstrate an understanding of and engagement with the ethical requirements for undertaking data science experiments, including the impact of essential legislation such as GDPR, and ethical issues including bias (Communication, Knowledge)

Unit Assessment Summary
Element – The assessment for this unit is weighted. In element-based assessment, you must achieve at least an E grade in each element, and an aggregate grade of at least D- in the overall unit. Failure (F, or F-), or non-submission in any element defaults to Fail for the unit. Assessment will be against the specified marking criteria.

Elemental	
Assessment Type	Test
% of total	50
Hand-in Week	Refer to Assignment Brief
Briefing	Refer to Assignment Brief
Feedback	Refer to Assignment Brief
Assessment Description	Element 1: Practical exam as directed by the unit brief.

Elemental	
Assessment Type	Multiple
% of total	50
Hand-in Week	Refer to Assignment Brief
Briefing	Refer to Assignment Brief
Feedback	Refer to Assignment Brief
Assessment Description	Element 2: In-class assignments as directed by the unit brief.

Scheduled Learning and Teaching

Details of the total scheduled learning and teaching activity for each unit, can be found on your student portal on SITS, the UAL student records system. Click on the “scheduled learning and teaching” tab at the top of the home screen when you have logged in using your UAL details.

Reading List	<p>Essential Reading:</p> <p>Joel Grus</p> <p>Data Science from Scratch: First Principles with Python Paperback, 30 Apr 2019, O'Reilly</p> <p>Further Reading:</p> <p>David Spiegelhalter</p> <p>The Art of Statistics: Learning from Data, Pelican Books, 13 Feb 2020</p> <p>The Python Tutorial https://docs.python.org/3/tutorial/index.html</p>
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Aurelien Geron

Hands-on Machine Learning with Scikit-Learn, Keras, and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems 14 Oct 2019 O'Reilly

Periodicals

The ACM Digital Library

<http://dl.acm.org>

The IEEE Explore Digital Library

<https://ieeexplore.ieee.org/Xplore/>

IU000133 : Artificial Intelligence for Media

(Mandatory)

Unit Code	IU000133
Unit Title	Artificial Intelligence for Media
FHEQ Level	Level 7
Effective From	September 1st 2021
Duration	1
Credits	20
Programme	Institute of Creative Computing (ICC)
Unit Introduction	<p>This advanced unit introduces Machine Learning (ML) approaches, concepts and methods through direct examples, practical problem solving and core technical training for creative applications. It introduces students to practical Artificial Intelligence and Machine Learning tools in order to do signal processing, classification, regression, style transfer, image and video generation, and includes the exploration of techniques relevant sound, image, broadcast, design and journalism. You will benefit from tuition from senior CCI researchers in this area and our relationships with industrial product teams such as Google Brain.</p> <p>The unit explores a specific set of approaches for both interactive and offline Machine Learning using common tools and frameworks such as Tensorflow, Torch, Keras and TFlearn, or equivalent. Fundamental concepts such as classification, clustering and regression are developed through practical problem solving including gesture recognition and tracking, sound and image classification, and text processing. Problems such sequence matching using probabilistic and stochastic processes (MMs, HMMs) are explained explored, as are contemporary ML approaches including basic RNNs/LSTMs, CNNs, GANs SEQ2SEQ, PIX2PIX Word2Vec and other emerging methods.</p>

Indicative Content	This practical class introduces students to practical Artificial Intelligence tools such as Tensorflow and pyTorch in order to do signal processing classification, regression, style transfer, image and video generation and includes exploring techniques such as, deep fakes, GANS, pix-2-pix and others. You will benefit from tuition from senior CCI researchers in this area and our relationships with industrial product teams such as Google Brain.
Learning & Teaching Methods	<ul style="list-style-type: none"> • Workshops • Seminars

Learning Outcomes	
LO1	Understand how to program advanced ML systems, such as Markov chains, Neural Nets and similar systems from scratch in any language. (Knowledge, Realisation)
LO2	Understand and use ML fundamental concepts such as classification and regression in both real and non-real time. (Knowledge, Process, Realisation)
LO3	Create, test and deploy ML systems for problem solving (Gesture, Image, Sound, Video and Graphics) (Knowledge, Realisation)
LO4	Create, test and deploy ML systems for bespoke creative applications such as image, sound, Text generation in advance contexts. (Knowledge, Realisation)

Unit Assessment Summary
Element – The assessment for this unit is weighted. In element-based assessment, you must achieve at least an E grade in each element, and an aggregate grade of at least D- in the overall unit. Failure (F, or F-), or non-submission in any element defaults to Fail for the unit. Assessment will be against the specified marking criteria.

Elemental	
Assessment Type	Project Outcome
% of total	50
Hand-in Week	Refer to Assignment Brief
Briefing	Refer to Assignment Brief

Feedback	Refer to Assignment Brief
Assessment Description	Element 1: mini project.
Elemental	
Assessment Type	Other
% of total	50
Hand-in Week	Refer to Assignment Brief
Briefing	Refer to Assignment Brief
Feedback	Refer to Assignment Brief
Assessment Description	Element 2: In-class assignments as directed by the unit brief.

Scheduled Learning and Teaching

Details of the total scheduled learning and teaching activity for each unit, can be found on your student portal on SITS, the UAL student records system. Click on the “scheduled learning and teaching” tab at the top of the home screen when you have logged in using your UAL details.

Reading List	Refer to Unit Assignment Brief
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IU000134 : Data Science in the Creative Industries

(Mandatory)

Unit Code	IU000134
Unit Title	Data Science in the Creative Industries
FHEQ Level	Level 7
Effective From	September 1st 2020
Duration	1
Credits	20
Programme	Institute of Creative Computing (I001) (S)
Unit Introduction	<p>This unit is taught in partnership with industry partners from the Creative Industries who make use of Data Science and AI approaches. Partners present industry case studies in data science approaches to product development and applied approaches to campaign insight, customer interfaces, media analysis and generation. The unit informs and develop student's awareness of how and why Machine Learning and AI is used in the Creative Industries. It also introduces key aspects of professional practice for students in terms of client requirements, project briefs, and production outcomes, providing a tangible connection to the creative industries through case studies, discussion and direct contact with professionals. It also serves to provide examples of functioning AI and ML systems that are commonly used by creatives, and that are useful for meeting professional requirements.</p>
Indicative Content	<p>This unit is taught in partnership with industry partners from the Creative Industries who make use of Data Science and AI approaches. Partners present industry case studies in data science approaches to product development and applied approaches to campaign insight, customer interfaces, media analysis and generation. The course provides students with a strong, real-world understanding of how Data Science and AI impacts on the creative industries.</p>
Learning & Teaching Methods	<ul style="list-style-type: none"> • Lecture • Seminar

	• Lab
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Learning Outcomes	
LO1	Understand and critically articulate how and why ML and AI is used in the Creative Industries (Enquiry, Communication)
LO2	Discuss and contextualise briefs, budgets, project management, legal and timing constraints relating to AI and ML projects (Enquiry, Communication)
LO3	Critically evaluate AI and ML systems in common use in the Creative Industries, including potential ethical impacts (Knowledge, Process)
LO4	Propose solutions for potential AI and ML projects that are relevant to the creative industries context (Knowledge, Communication)

Unit Assessment Summary
Element – The assessment for this unit is weighted. In element-based assessment, you must achieve at least an E grade in each element, and an aggregate grade of at least D- in the overall unit. Failure (F, or F-), or non-submission in any element defaults to Fail for the unit. Assessment will be against the specified marking criteria.

Elemental	
Assessment Type	Essay
% of total	50
Hand-in Week	Refer to Assignment Brief
Briefing	Refer to Assignment Brief
Feedback	Refer to Assignment Brief
Assessment Description	Element 1: Essay 1 as directed by the unit brief.
Elemental	
Assessment Type	Essay
% of total	50
Hand-in Week	Refer to Assignment Brief

Briefing	Refer to Assignment Brief
Feedback	Refer to Assignment Brief
Assessment Description	Element 2: Essay 2 as directed by the unit brief.

Scheduled Learning and Teaching

Details of the total scheduled learning and teaching activity for each unit, can be found on your student portal on SITS, the UAL student records system. Click on the “scheduled learning and teaching” tab at the top of the home screen when you have logged in using your UAL details.

Reading List	<p>Essential Reading</p> <p>Aurelien Geron</p> <p>Hands-on Machine Learning with Scikit-Learn, Keras, and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems 14 Oct 2019 O'Reilly</p> <p>Further Reading</p> <p>Francois Chollet</p> <p>Deep Learning with Python. 30 Nov 2017, Manning</p> <p>http://karpathy.github.io/2015/05/21/rnn-effectiveness/ Whittaker, M. Crawford, K. et al. (2018). AI Now Report. https://ainowinstitute.org/AI_Now_2018_Report.pdf</p> <p>http://karpathy.github.io/2015/05/21/rnn-effectiveness/</p> <p>Periodicals</p> <p>The ACM Digital Library</p> <p>http://dl.acm.org</p> <p>The IEEE Explore Digital Library</p> <p>https://ieeexplore.ieee.org/Xplore/</p>
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Web Ref:

Fiebrink, R, Machine Learning for Musicians and Artists

<https://www.kadenze.com/courses/machine-learning-for-musicians-and-artists/info>

<http://www.wekinator.org>

<http://www.rapidmixapi.com>

<http://ainowinstitute.org>

IU000135 : Personalisation and Machine Learning (Mandatory)

Unit Code	IU000135
Unit Title	Personalisation and Machine Learning
FHEQ Level	Level 7
Effective From	September 1st 2020
Duration	1
Credits	20
Programme	Institute of Creative Computing (I001) (S)
Unit Introduction	<p>This practical class look at extending your machine learning experience to include the building and testing of recommenders and audience analysis tools. Through the use of relevant industry standard languages (e.g. Python, JavaScript), this applied computing experience enables you to build and deploy systems that specifically test clustering for audience preferences.</p> <p>The course introduces core concepts in information retrieval including feature representations, feature extraction, datasets of features, similarity and distance metrics in multidimensional space, search and ranking. Students will learn common programming approaches to the design of recommender systems, including Content-Based filtering and Collaborative Filtering, explore audience profiling and audience types via data-driven methods such as clustering and regression, and examine the impact of interdisciplinary approaches to data science via psychological constructs such as the Five Factor Model (FFM).</p>
Indicative Content	<p>This practical class look at extending your machine learning experience to include the building and testing of recommenders and audience analysis tools. Through the use of relevant industry standard languages (e.g. Python, JavaScript), this applied computing experience enables you to build and deploy systems that specifically test clustering for audience preferences.</p>

Learning & Teaching Methods	<ul style="list-style-type: none"> • Lecture • Lab
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Learning Outcomes	
LO1	Demonstrate a critical understanding of core concepts in information retrieval (knowledge, process)
LO2	Demonstrate practical knowledge and skills relating to the design and implementation of recommender systems (knowledge, realisation)
LO3	Demonstrate knowledge and awareness of the use of audience profiling techniques, and audience type theory (knowledge, process)
LO4	Demonstrate an understanding of how psychological models, such as the five factor model, can impact on contemporary recommender systems (knowledge)

Unit Assessment Summary
Element – The assessment for this unit is weighted. In element-based assessment, you must achieve at least an E grade in each element, and an aggregate grade of at least D- in the overall unit. Failure (F, or F-), or non-submission in any element defaults to Fail for the unit. Assessment will be against the specified marking criteria.

Elemental	
Assessment Type	Multiple
% of total	50
Hand-in Week	Refer to Assignment Brief
Briefing	Refer to Assignment Brief
Feedback	Refer to Assignment Brief
Assessment Description	Element 1: In-class assignments as directed by the unit brief.
Elemental	
Assessment Type	Project Outcome
% of total	50
Hand-in Week	Refer to Assignment Brief

Briefing	Refer to Assignment Brief
Feedback	Refer to Assignment Brief
Assessment Description	Element 2: Mini Project as directed by the unit brief.

Scheduled Learning and Teaching

Details of the total scheduled learning and teaching activity for each unit, can be found on your student portal on SITS, the UAL student records system. Click on the “scheduled learning and teaching” tab at the top of the home screen when you have logged in using your UAL details.

Reading List	<p>Essential Reading</p> <p>Frank Kane</p> <p>Building Recommender Systems with Machine Learning and AI</p> <p>September 2018, Packt Publishing</p> <p>Aurelien Geron</p> <p>Hands-on Machine Learning with Scikit-Learn, Keras, and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems 14 Oct 2019 O'Reilly</p> <p>Further Reading</p> <p>Francois Chollet</p> <p>Deep Learning with Python. 30 Nov 2017, Manning</p> <p>Whittaker, M. Crawford, K. et al. (2018). AI Now Report. https://ainowinstitute.org/AI Now 2018 Report.pdf http://karpathy.github.io/2015/05/21/rnn-effectiveness/</p> <p>Periodicals</p>
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The ACM Digital Library

<http://dl.acm.org>

The IEEE Explore Digital Library

<https://ieeexplore.ieee.org/Xplore/>

IU000136 : Thesis Project

(Mandatory)

Unit Code	IU000136
Unit Title	Thesis Project
FHEQ Level	Level 7
Effective From	September 1st 2020
Duration	1
Credits	60
Programme	Institute of Creative Computing (I001) (S)
Unit Introduction	<p>This MSc final thesis project allows students to engage in the exploration of a self-directed, real-world creative-industries relevant research project, guided through academic supervision and industry expertise where appropriate. Students will work towards the creation of a substantial piece of academic writing that details their specific practical and/or creative engagement relevant to data science and AI in the creative industries. Projects can include the development and presentation of fully functioning creative software, such as websites, interactive systems, virtual reality experiences, algorithms for carrying out audio and visual signal processing, and any relevant area of data science and AI in creative industries contexts.</p> <p>Students will submit a draft academic paper and a creative presentation of research, alongside any software and/or creative outcomes developed as part of their research. A mixture of practical, applied and creative approaches to exploring research questions will be formally welcomed and encouraged.</p>
Indicative Content	Students carry out a self-directed research project to demonstrate the ability to apply knowledge and skills attained through their

	<p>engagement with the programme. Students must identify, critically define, and appropriately interrogate known real-world research questions and problems in data science and AI relevant to creative industries contexts.</p> <p>Students will undertake a recognised path to delivering research as follows:</p> <ul style="list-style-type: none"> • Identify current and relevant research questions and/or problems • Appropriately contextualise research using evidence from existing academic research and industry outcomes • Select and define appropriate qualitative and quantitative methods for interrogating their questions • Conduct an appropriate ethical review of their research plan in line with relevant ethics policies and requirements • Carry out experimental research, including through practical development of software and/or creative outputs • Present results appropriately, including through the use of software (including bespoke software), survey analysis, raw data, graphs, visualisations, tables and charts where relevant and informative. • Critically evaluate their findings through appropriately detailed interrogation and analysis based on experimental and/or historical evidence. • Present a report with appropriate formatting and complete referencing in line with that required for academic publication (for example by the ACM). • Present their work to an audience of peers
<p>Learning & Teaching Methods</p>	<ul style="list-style-type: none"> • Tutorials • Seminars • Presentations

Learning Outcomes	
LO1	Conduct self-directed project work using data science and AI approaches in a creative industries context. (Enquiry, Process, Realisation)
LO2	Author credible text on relevant research questions for relevant audiences in AI and Data Science, e.g. ACM, iee (Enquiry, Realisation)
LO3	Demonstrate a robust approach to research methods, design and ethics in data science and AI for creative computing. (Enquiry, Knowledge, Process)

Unit Assessment Summary
Element – The assessment for this unit is weighted. In element-based assessment, you must achieve at least an E grade in each element, and an aggregate grade of at least D- in the overall unit. Failure (F, or F-), or non-submission in any element defaults to Fail for the unit. Assessment will be against the specified marking criteria.

Elemental	
Assessment Type	Thesis
% of total	70
Hand-in Week	Refer to Assignment Brief
Briefing	Refer to Assignment Brief
Feedback	Refer to Assignment Brief
Assessment Description	Element 1: Thesis of at least 7000 words as directed by the unit brief.
Elemental	
Assessment Type	Presentation
% of total	30
Hand-in Week	Refer to Assignment Brief
Briefing	Refer to Assignment Brief
Feedback	Refer to Assignment Brief
Assessment	Element 2: Project Presentation as directed by the unit

Description	brief.
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Scheduled Learning and Teaching

Details of the total scheduled learning and teaching activity for each unit, can be found on your student portal on SITS, the UAL student records system. Click on the “scheduled learning and teaching” tab at the top of the home screen when you have logged in using your UAL details.

Reading List	<p>Essential Reading</p> <p>Collins, H. (2010) Creative Research: The Theory and Practice of Research for the Creative Industries. AVA Publishing.</p> <p>Kara, H. (2015) Creative Research Methods in the Social Sciences: A Practical Guide. Policy Press.</p> <p>Plattner, H., Meinel, C. and Leifer, L. (2017) Design Thinking Research: Making Distinctions: Collaboration versus Cooperation. Springer.</p> <p>Further Reading</p> <p>Bateman, J., Wildfeuer, J. and Hiippala, T. (2017) Multimodality: Foundations, Research and Analysis – A Problem-Oriented Introduction. Walter de Gruyter GmbH & Co KG.</p> <p>Jones, J. and Hirsu, L. (2019) Rhetorical Machines: Writing, Code, and Computational Ethics. University of Alabama Press.</p> <p>Robson, C. (2011) Real World Research 3e. John Wiley & Sons.</p> <p>Silva, E.A., Healey, P., Harris, N. and Broeck, P.V. den (2014) The Routledge Handbook of Planning Research Methods. Routledge.</p>
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