Programme Description

STUDY ABROAD

Name of the programme: Year 3 Computational Engineering

Key information:

Dates: 7 January to 4 April 2025

Duration: 13 weeks (holidays: 15-23 February)

Level: Level 6 (Undergraduate Year 3)

Total number of teaching hours: 155

ECTS: 26

Prerequisites: Completion of Level 5/Undergraduate Year 2 of Engineering studies

Examination Board Date: 20 May 2025*

Resit Exams Dates: 16 to 20 June 2025 (online, apart for Statistics & Probability module, which will take place at ECE campuses in France)*

Resit Examination Board Date: 3 July 2025*

**The forecasted dates of the Examination Boards and the Resit Exams are indicated in your programme description, although they are subject to change based on circumstances*

Programme Lead Name: Maithili Paranjape

Programme Advisor Name, Title and Institution: Fabienne Coudray, Dean of Undergraduate Programmes, ECE Paris

Aims of the Programme:

• This semester of Year 3 Undergraduate Studies in Engineering focuses on equipping students with a strong foundation in computing subjects such as object-oriented programming and artificial intelligence, along with the mathematical concepts of statistics and probability. The objective is to develop robust problem-solving abilities, high-competency, and a professional approach to software development.

• The programme also aims to enhance employability skills by including the interdisciplinary topics for future managers: management theory and leadership as well as written and oral communication.

Programme Benefits:

This programme offers students:

• A distinctive computer-focused curriculum – students engage in experiential, experimental, and collaborative learning using a variety of computer languages and mathematical tools.

• An applied experience – students work on hands-on real life projects developing all the skills needed in problem solving.

• An introduction to management – students obtain fundamental knowledge and abilities in leadership, finance, and entrepreneurship.

• An enhancement of transferrable skills – students learn and experience a wide range of skills that employers are looking for (teamwork, communication, critical reflexion, intellectual curiosity, and organisation).

• A study abroad experience – students develop their autonomy by living in a foreign country

Learning Outcomes:

Knowledge

By the end of this programme, students will have demonstrated:

1. In-depth knowledge of Object-Oriented Programming and recent technologies such as AI.
2. Advanced knowledge of statistics and probability.
3. Core understanding of management theory and public speaking aspects.

Skills

By the end of this programme, students will be able to:

4. Understand progressive computing concepts such as object-oriented programming and artificial intelligence.
5. Apply programming tools for solving a given problem.
6. Demonstrate awareness of emerging technologies in the computing sector.
7. Organise code development to achieve the clarity and transferability of code.
8. Reflect on the interdependence of programming concepts.
9. Evaluate the important factors to consider while speaking in a public domain

Values

By the end of this programme, students will have demonstrated a commitment to:

10. Establish a methodical approach to application development.
11. Adhere to accuracy, efficiency and reliability while deriving solutions.

Programme Structure:

ACADEMIC PROGRAMME *(subject to change)*	**Hours**	**ECTS**
Programming		
OOP Java	48	8
OOP Java Office Hours	4	-
Mathematics		
Statistics & Probability	36	6
Statistics & Probability Support	4	-
Artificial Intelligence		
Artificial Intelligence	36	6
Artificial Intelligence Office Hours	4	-
Management		
Leadership for Effective Management	12	2
Language & Communication		
Advanced Integrated English	12	2
Public Speaking & Key Soft Skills	12	2

Approach to Learning:

The teaching contact hours will vary based on the level of study for each module. In a typical week, contact hours will include small to large group teaching and tutorials. The number of contact hours may vary for each module.

In addition to the teaching hours, students are expected to undertake significant self-directed study every week depending on the requirements of each module. Students are expected to read and watch assigned material (text, articles, podcasts, videos…) independently, attend all classes, workshops and activities in their schedule (unless noted “optional”), actively participate in group discussions, and where appropriate, work in collaboration with their peers for formative and summative assessments.

During the term, students will benefit from our application-driven teaching approach with access to recent teaching tools, using learning techniques such as the flipped classroom, where students will prepare in advance by researching a particular topic or challenge.

Students will be assessed via a range of methods depending on the module. The assessment methods include assignments, exams, group discussions, essays, group projects, presentations, simulations, etc.

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Module Handbook

Module title: OOP Java

Lecturer's name: Maithili Paranjape

Email address: mparanjape@omnesintervenant.com

Contact hours: 48 hrs

Assessment hours: 1.5 hrs midterm exam on computer after week 6: to be invigilated by external invigilators + Final Project to be submitted at the end of the term: Approx. 5 weeks

Independent study hours expected: 96 hrs

ECTS credits: 8

Programme level: 6

Prerequisites: N/A

Aims:

This module introduces the fundamental and advanced object-oriented programming concepts using Java as a programming language. The module focuses on solving real-time problems using core and advanced programming theories. It aims to equip the students with the essential logical and analytical skills required to develop professional applications during their work life.

Learning outcomes:

On successful completion of this module, students will be able to:

Knowledge

1. Apply the core knowledge of procedural and object-oriented programming notions.
2. Develop solutions to real-time problems using a range of programming tools
3. Present in-depth understanding of the reliance and connectivity among the application tiers.

Skills

4. Exhibit the effective use of object-oriented programming tools for application development.
5. Select the appropriate graphical and non-graphical tools while developing the solution to a given problem

6. Reflect on the development of the application and identify the interdependence of the procedures.
7. Evaluate the available software components and recommend the suitable combination of components for a given application.

Values

8. Develop methodical approach to problem solving

Syllabus content:

Weeks	Topic/Knowledge	Skills	LOs
1	Introduction to Java as OOP language	Using programming components	1,2
2	Introduction to classes	Using object-oriented programming concepts	1,2
3	Aggregation	Using object-oriented programming concepts	1,2,4
4	Inheritance	Using object-oriented programming concepts	1,2,4,5,6
5	Abstract classes and interface	Using object-oriented programming concepts	1,2,4,5,6
6	Exception handling	Using object-oriented programming concepts Syndicate object-oriented programming concepts for developing application	2,4,6
7	GUI – JFrame	Use graphical tools for effective use of the application Interdependence of the procedures	3,4,5
8	GUI – JavaFX tools	Use graphical tools for effective use of the application Interdependence of the procedures	3,4,5
9	Revision	Evaluation of available OOP tools	6,7
10	Project Guidelines	Problem solving with a methodical approach, Choosing the appropriate tools for project	7,8
11	Project Guidelines	Problem solving with a methodical approach, Choosing the appropriate tools for project	7,8
12	Project demonstrations	Presentation	

Teaching and Learning Strategies:

Teaching and learning strategies have been designed based on the specific requirements of this module. Each topic will be taught through lecture and lab session. PowerPoint presentations will be used to explain the theory and demonstrate the programs. For complex concepts, code samples are written using the application by discussing various approaches to problem solving.

BoostCamp is to be used as the virtual learning environment, which will provide access to lecture slides, tutorials, and homework. Students will be expected to submit the work on Boostcamp. Following is the structural approach for the module:

- Presentation: The theory of each topic will be explained and demonstrated though the PowerPoint slides. The slides will include examples elaborating on how to use each concept in the programming context.
- Communicative classroom activities: Students will be asked several questions based on the current topic to firm up their understanding. Small programming tasks will also be assigned during the session.
- Tutorials: Each weekly topic will be associated with a range of programming questions. During the tutorials, students are expected to write code for the given questions. Students will be encouraged to communicate with the lecturer and their peers to improve their understanding of the topic.
- Homework: Every week, few questions from the tutorial will be assigned as the homework

Formative and Summative Assessment Strategies:

Formative Assessments:

Formative assessments will primarily consist of weekly tutorials. Each topic in the syllabus is linked to 8-10 programming questions, to enhance the understanding of the topic. Students are expected to attempt writing programs to derive the solution to the problem. At the beginning of the tutorial, the approach to solve the problem, possible choice of programming tools will be discussed. Students will be expected to demonstrate every completed tutorial to the lecturer.

Summative Assessments:

Final Grade distribution

1. **Midterm Examination (50%)**
2. **Final Project (50%)**

Assessment Schedule -Week	Name of assessment	Format of assessment	OELS Invigilation Needed? Y/N	Duration	Contribution to final grade	LOs
7	Midterm Examination (1.5 hrs)	3-4 questions with sub sections. Questions will be based on the syllabus covered until session 6. Students will be expected to write the programs on the computer for the given set of problems.	Y	1.5 hrs	50%	1,2,3,4
13	Final Project	Information System project using database.	N		50%	4,5,6,7,8
Resit Information	Viva based on Java concepts	Oral Exam on MS Teams with 3-4 questions	N	10 mins	100%	ALL

The midterm examination is designed to evaluate the student's ability to apply efficient logic and choose the relevant programming language tools to solve the given problem.

The final project will be grades based on the implementation of requirements specified in the project specifications. Organization of work, application of logic and use of programming tools to enhance the quality of application, dynamicity of the application will be the primary factors to be considered during the evaluation of the submitted work.

Following will be the schedule of summative assessments.

Feedback Strategies:

Following approach will be observed for providing feedback:

1. Verbal feedback: Verbal feedback will be provided every week during the lab sessions. As the students work on the tutorial questions, guidance is provided to resolve the errors, understand the cause of the errors, develop logic development abilities, and adapt professional programming practices. This feedback strategy has been refined over the years to support the students to boost their programming skills as they progress through the semester.
   Students are also encouraged to communicate with their peers during the lab session. Comparing the logical approach, identifying the common mistakes are the supporting activities achieved through communication with peers.
2. Written feedback: Detailed written feedback is given on the midterm exam script for every student. The feedback will explain the logical and syntactical errors. Further

guidance will be given if the student approaches the lecturer with any specific questions about the exam script.

Reading Lists:

Gaddis, T., 2024. *Starting Out With Java: From Control Structures Through Objects.* 8th ed. Pearson College Div.

Kishori Sharan, P. S., 2022. *Learn JavaFX 17.* 2nd ed. Apress.

Schildt, H., 2018. *Java: A Beginner's Guide.* 8th ed. McGraw Hill.

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Module Handbook

Module title: Statistics and Probabilities

Lecturer's name: Veronique Fuller

Lecturer's email address: vfuller@omnesintervenant.com

Contact hours: 36 hours

Assessment hours: 1h30 Midterm, 2h Final Exam, 15min Group Project Presentation

Independent study hours expected: 72 hours

ECTS credits: 6 ECTS

Programme level: Level 6 = Year 3 Undergraduate

Prerequisites: Further Math A-level

Aims:

The unit aims for students to gain various basic concepts and strategic tools used in Data Science and to develop, through a variety of applications, the capacity to interpret and analyze quantitative data.

Learning Outcomes (LOs):

After completion of this module, the student is able to demonstrate the following abilities:

Knowledge:

1. Advanced knowledge of the mathematical definitions of the underlying concepts (sample space, probability measure, discrete/continuous distribution, joint/marginal distributions, random variable, PDF, CDF, Moments)
2. Advanced knowledge of the in-scope common distributions. (Uniform, Bernoulli, Binomial, Poisson, Exponential, Normal)
3. Advanced knowledge of random variables
4. Knowledge of estimation theory based on a frequentist approach

Skills

5. Efficient manipulation of random variables and their associated mathematical objects
6. Ability to derive estimators using different methods
7. Ability to derive confidence intervals
8. Fit a theoretical distribution to given data

9. Knowledge in hypothesis testing for a wide variety of situations

Values

10. Rigor in mathematical reasoning
11. Ability to apply skills to business problems

Syllabus Content:

Sessions	Topic/Knowledge	Skills	LOs
Session 1	Counting and sets Combinations and permutations	Master counting techniques	1
Session 2	Definition of a probability Random experiment and events, Basic concepts, Bayes theorem	Know basic vocabulary definitions	1
Session 3	Counting techniques Combinations and permutations	Master counting techniques	1,2
Session 4	Discrete random variables Uniform, Binomial and Geometric distributions	Know typical distributions	1,2
Session 5	Discrete random variables Expectation and variance	Know typical distributions	3
Session 6	Continuous random variables 1	Know typical distributions	3
Session 7	Normal distribution	Know typical distributions	3
Session 8	Poisson distribution and link to normal and binomial	Know typical distributions	3
Session 9	Continuous random variables 2	Know typical distributions	4
Session 10	Linear combinations of random variables	Basic moment calculations and transfer formula	3
Session 11	Exercices / Applications	Practice acquired knowledge	5
Session 12	Midterm revision	Practice acquired knowledge	1,2,3,5
Session 13	Sampling	Understanding sampling problems	4,6
Session 14	Correlation bi variate data	Solve practical problems	3
Session 15	Regression	Solve practical problems	3
Session 16	Hypothesis testing: continuous variables	Knowledge in hypothesis testing	9
Session 17	Hypothesis testing: discrete variables	Knowledge in hypothesis testing	9
Session 18	Errors in hypothesis testing	Knowledge in hypothesis testing	9

Session 19	Confidence Interval and the t-distribution	Derive confidence intervals	7
Session 20	Testing for differences between populations	Derive confidence intervals	7
Session 21	Chi-squared tests	Fit a theoretical distribution	8
Session 22	Wrap up and Review	All the skills previously highlighted	3-10
Session 23	Project presentations	Applying skills of structuring and organizing presentations	3-10
Session 24	Project presentations	Applying skills of structuring and organizing presentations	3-10

Teaching and Learning Strategies:

This module uses a wide range of teaching and learning strategies to provide a stimulating learning environment that encourages students to take control of their own learning, to engage with a wide range of mathematical knowledge and skills, and to work collaboratively while developing self-awareness. The strategies have been carefully chosen to support students towards learning outcomes and assessments and to cater for diversity across the student body.

Teaching and Learning Strategies include:

- Exercises and Classroom discussions: Exercises will be set in class followed by discussions in pairs.
- Quizzes set on *Kahoot*
- Independent research activities (the final project will require the students to do independent research on a topic or and present their findings in class)

Formative and Summative Assessment Strategies:

Formative Assessments:

The student will have the opportunity to prepare for the in-class assessments: A mock midterm in session 12 to prepare of midterm and mock final exam in session 23 to prepare for the final exam. Several past papers are available on the Moodle page of the module.

In Session 15, the students will be presented with the expectation of the project and the research skills that they will have to use.

Summative Assessments:

Assessment schedule	Name of assessment	Format of assessment	OELS Invigilation Needed? Y/N	Duration if timed assessment	Weighting	LOs
Following Session 12	Midterm exam	Paper 5-6 exercises with sub	Y	90 min	25%	1,2,3,5,6,7

		questions. Questions will be based on the syllabus covered until session 12.				
Following Session 22	Final Exam	MCQ on knowledge + 4-5 exercises with sub questions. Questions will be cover the entire syllabus with a focus on sessions 16 to 23	Y	2h	50%	1 to 10
Session 23 or 24	Group Project	Students will be in group of 3 to 4 and will present a project on a real-life application of inferential stats	N	15 min	25%	1,2,5,6,7
Resit Information	MS Teams	Live oral assessment using a handwriting recognition software: questions on precise and rigorous content knowledge of the entire syllabus + 1-2 exercise on the entire syllabus	N	20 min	100% (replaces the final module grade)	All as far as possible

Feedback Strategies:

Student will receive verbal feedback on activities and exercises done in class. The Students will also receive written feedback after completing their midterm. The comments on their performance will help them review for the final exam.

Students will be encourage to solve exercises in front of the class, receiving oral feedback about their presentation skills.

Upon request, the student will be able to get the breakdown of the grade of their project.

Reading Lists:

Books:

Spiegel, M.R., Schiller, J.J. and R Alu Srinivasan (2013). *Probability and statistics*. New York: Mcgraw-Hill.

Wheelan, C. (2013). *Naked Statistics: Stripping the Dread from the Data*. W. W. Norton & Company.

Prerequisite:

Basic Calculus: at A level Further Math level

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Module Handbook

Module title: Artificial Intelligence

Lecturer's name: Dr John Balasuriya

Email address: lbalasuriya@omnesintervenant.com

Contact hours: 36 hours

Assessment hours: Three AI coding assessments in the PC lab and one project demo. Schedule of assessments can be found in the syllabus content section of this document.

Independent study hours expected: 72 hours (36 hours + 36 hours project R&D)

ECTS credits: 6 ECTS

Programme level: Level 6 = Year 3 Undergraduate

Prerequisites: Basic understanding of mathematics, statistics and programming.

Aims:

This course introduces students to the basics of Artificial Intelligence, gradually moving on to advanced concepts such as Machine Learning and Computer Vision.

During the course we heavily focus on the practical application of Artificial Intelligence, coding solutions to difficult real-world problems in the lab. The course also includes an Artificial Intelligence project where students will build a working AI system to solve a classical AI problem such as face recognition. Matlab will be used as the programming language in this module since Matlab is a compact, easy to learn yet powerful 4th generation language which many of our students have already used prior to this Artificial Intelligence module.

Learning outcomes:

On successful completion of this module, students will be able to:

Knowledge

1. Acquire the foundational knowledge of Artificial Intelligence theories necessary to develop solutions to classical AI problems.
2. Gain the theoretical understanding of Computer Vision and Image Processing theory, algorithms and approaches required to independently code solutions to real-world problems.
3. Develop a deep understanding of Machine Learning theories and approaches to critically select and implement them in solving real-world problems.

4. Develop an in-depth understanding of Artificial Intelligence theories and methods required to build a system capable of solving complex real-world AI problems, such as face recognition.

Skills

5. Use a 4th generation programming language to develop solutions to Artificial Intelligence problems.

Values

6. Appreciate the enormous impact of Artificial Intelligence on the future of humanity

Syllabus content:

Sessions	Area	Topic/Knowledge	LOs
Session 1	Introduction to AI	Introduction and Philosophy	1, 5, 6
Session 2	Introduction to AI	Basic Concepts	1, 5, 6
Session 3	Introduction to AI	Programming Basics	1, 5, 6
Session 4	Introduction to AI	History of AI	1, 5, 6
Session 5	Introduction to AI	Modern Areas of AI	1, 5, 6
Session 6	Computer Vision	Introduction	2, 5, 6
Session 7	Computer Vision	Image Processing	2, 5, 6
Session 8 (B06 PC lab)	Assessment / Computer Vision	Image Processing	1, 5
Session 9	Computer Vision	Registration	2, 5, 6
Session 10	Computer Vision	Registration	2, 5, 6
Session 11	Computer Vision	Convolutions	2, 5, 6
Session 12	Computer Vision	Fourier Transform & Robotics	2, 5, 6
Session 13 (B06 PC lab)	Assessment / Machine Learning	Introduction	2, 5
Session 14 (B06 PC lab)	Assessment / Machine Learning	Introduction	2, 5
Session 15	Machine Learning	Dimensionality Reduction	3, 4, 5, 6
Session 16	Machine Learning	Principal Component Analysis	3, 4, 5, 6
Session 17	Machine Learning	Principal Component Analysis	3, 4, 5, 6
Session 18	Machine Learning	Independent Component Analysis and Clustering	3, 4, 5, 6
Session 19	Machine Learning	Deep Learning	3, 4, 5, 6
Session 20	Machine Learning	Deep Learning	3, 4, 5, 6
Session 21 (B06 PC lab)	Assessment / AI Project	Project Specification	3, 4, 5
Session 22	Machine Learning	Deep Learning	3, 4, 5, 6
Session 23 (Room 204)	AI Project	Project Demo	3, 4, 5, 6
Session 24 (Room 204)	AI Project	Project Demo	3, 4, 5, 6
Office Hours	AI Project	AI Project	3, 4, 5, 6

Office hours are provided to supervise students in their AI project. During these sessions the students will be helped by discussing and comparing different approaches to the AI project and helping debug code.

Teaching and Learning Strategies:

A practical hands-on teaching and learning strategy has been adopted in this Artificial Intelligence module. Since this module is for engineering students, rather than only learning Artificial Intelligence theory and having written assessments on paper, we focus on getting the students to implement AI theory to solve real-world problems as soon as possible. All evaluations are AI coding assessments, where students implement the theory they've learnt to solve real problems.

All lectures are conducted in a PC lab. Immediately after a new Artificial Intelligence topic is introduced and explained, the students will implement working systems using this new AI approach. Most often students will be coding AI solutions just minutes after learning new AI theory so we enhance their understanding of theory with immediate active hands-on application.

Lecture slides that are projected on a screen will be used to explain the AI theory. Students then implement this theory by independently coding algorithms to solve problems. During these practical exercises, students are provided with peer and lecturer feedback and support to help everyone achieve working AI solutions. The lecturer may finally code and demonstrates solutions while sharing their screen on the projector to help weaker students who were not able to independently solve a problem. The lecturer's solution is often presented in stages to encourage students to work independently as much as possible.

For complex problems, occasional code samples are shared with students. Moodle is used as the virtual learning environment to provide access to this code as well as the lecture slides and data sets.

Following is the structural pedagogical approach taken for teaching Artificial Intelligence concepts in this module:

- Presentation: AI theory and background will be explained in lecture slides. Working AI solutions may be demonstrated to the students by the lecturer sharing their screen using the Impero system.
- Practical exercises: Students immediately apply AI theory to solve a given problem by coding solutions. Students are encouraged to become increasingly independent when implementing solutions to these exercises, but are supported by peers and the lecturer.
- Homework: After each lecture students are given homework to review and complete code they implemented during the lecture and potentially also expand on their learning.

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Formative and Summative Assessment Strategies:

Formative Assessments:

Formative assessments consist of practical exercises conducted during lectures. Students independently code solutions to these problems, with occasional help and feedback from peers and the lecturer. Each AI lecture will contain approximately six formative assessments. Students demonstrate their solutions to each other and the lecturer for verbal feedback. The lecturer finally codes a working solution to help any students who were not able to independently create a working solution.

Summative Assessments:

This module covers different areas of Artificial Intelligence as indicated in Learning Outcomes 1-6. Each of these Learning Outcomes is individually tested with a separate AI coding assessment so students are not completely overwhelmed with completely different AI theories and algorithms. Students will need to critically evaluate different approaches, select the appropriate method and implement this as MATLAB code during the assessment to process the provided data and solve an AI problem.

In addition to the coding assessments, the students are divided into pairs to complete an AI project during this course. The project tends to be a classical AI problem such as face recognition and the students are free to use any AI theoretical approach to solve the problem. Projects are objectively evaluated during an AI Project Demo at the end of this course. The evaluation consists of calculating the recognition rate of each system and studying the performance characteristics of the system.

Marking Scheme:

Marks are provided to the students out of 20, complying with the French grading system used at their home schools. As a general guidance, the following marking scheme is used to grade the students' AI coding assessments:

Missing function or script descriptions and input/output descriptions	-2/20
Submitted code has exceptions or does not execute correctly	-8/20
Other individual assessment specific bugs in submitted code causing an error in the computed output.	-10/20

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List of summative assessments.

Assessment schedule (lecture number)	Name of assessment	Format of assessment	OELS Invigilation Needed?	Duration	Weighting	LOs
8	Introduction to Artificial Intelligence	Individual coding assessment in PC lab	N	~40 minutes	25%	1, 5
13-14	Computer Vision	Individual coding assessment in PC lab	N	~40 minutes	25%	2, 5
21	Machine Learning	Individual coding assessment in PC lab	N	~40 minutes	25%	3,4,5
23-24	AI Project	Demonstration (in pairs) of working system	N	~15 minutes	25%	3,4,5
Resit (1 hour on Teams, all students together)		Individual online (MS Teams) AI Project demo with a higher recognition rate requirements	N	1 hour	100%	3,4,5

Feedback Strategies:

The following approach is utilized for providing feedback:

1. Verbal feedback: Verbal feedback is continually provided by peers and the lecturer during the six formative assessments in each AI lecture conducted in this module. Lecturer guidance is provided to optimise and debug code, understand AI theory, improve problem solving skills and develop good programming practices. Students thereby improve in their ability to independently solve AI problems as they progress through the semester.

2. Written feedback: Text feedback of the errors in a student's assessment code are provided in real-time during the assessment itself by the Matlab programming environment. Students are referred to the marking scheme to understand their marks. After each summative assessments is graded, communal written feedback on the theoretical, algorithmic and syntax errors found in coding assessments are posted in lecture slides on Boostcamp.

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Reading Lists:

Russell, S. J. & Norvig, P. (2020) *Artificial Intelligence: A Modern Approach.* New Jersey: Prentice Hall

Mackay, D. J. C. (2003) *Information Theory, Inference and Learning Algorithms.* Cambridge: Cambridge University Press

Hofstadter, D. (1999) *Godel, Escher, Bach: An Eternal Golden Braid.* New York: Basic Books

Ballard D. H. & Brown, C. M. (1982). *Computer Vision.* New Jersey: Prentice Hall.

Gonzalez, R. C. & Woods, R. E. (2008). *Digital Image Processing.* New Jersey: Prentice Hall

Mitchell, T. M. (1997) *Machine Learning.* New York: McGraw Hill

Manning, C. & Schutze, H. (1999) *Foundations of Statistical Natural Language Processing.* Cambridge, MA: MIT Press

Van Rijsbergen, C. J. (1975) *Information Retrieval.* Oxford: Butterworth-Heinemann

Prerequisites:

1. Basic understanding of matrix operations, algebra, statistics and probability (Mandatory)
2. Basic ability to code in any computer programming language (Mandatory)
3. Interest in Artificial Intelligence and general awareness of the impact of AI (Recommended)

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Module Handbook

Module title: Leadership for Effective Management
Lecturer's name: Dr. Kit Barton
Email address: kbarton@omnesintervenant.com
Contact hours: 13,5
Assessment hours: 1.5 hours in Session 8
Independent study hours expected: 24 hours
ECTS credits: 2 ECTS
Programme level: Level 6
Prerequisites: None

Aims:

What makes a leader in a managerial context and am I one? Leadership is the process of influencing other people to achieve organizational management goals. Management theory and leadership studies is the growing body of knowledge that seeks to understand how that influence operates within organisations. In this module, you will learn and critique the most current and more advanced leadership models and theories, identifying the positive and negative aspects of each, and comparing them to synthesise solutions in complex scenarios. Through case studies, we see how these leadership models function in practice, both historically and in the contemporary environment, within all types of organisations, including the business and the public sector. In addition, you will expand the scope and depth of your knowledge, by practicing your own advanced personal leadership skills, determining what works best for you and what might enhance your future employability. Through highly challenging and complex collaborative exercises with other students, using the classroom as a laboratory to test and practice the ideas and techniques, you will develop your own awareness of your preferred leadership styles and improve your decision-making to an advanced degree.

Learning Outcomes (LOs):

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

1. Collaborate and build in-class networks to solve complex organisational and managerial challenges in challenging settings, while enhancing personal professional development with foucs on employability

2. Critique and synthesize advanced theories, concepts and facts from management theory and leadership studies relevant to organizational tasks and challenges

Syllabus Content:

Sessions	Topic/Knowledge	Skills	LOs
Session 1	Introduction to Management Theory & Traditional Leadership	Communication, listening skills, and reading skills	1&2
Session 2	Trait Theory of Leadership	Utilizing digital resources	1
Session 3	Behavioural Theory – Task Orientation	Collaboration & networking skills	1&2
Session 4	Consultancy Simulation Practice	Collaboration & networking skills	1&2
Session 5	Behavioural Theory – Social Orientation	Communication & listening skills	1
Session 6	Contingency/Situational Approach	Conceptual & critical thinking skills	1
Session 7	Sources of Power	Collaboration & networking skills	1&2
Session 8 (+ Session 9 if necessary)	Consultancy Simulation Assessment	Collaboration & networking skills	1&2

Teaching and Learning Strategies:

This module uses lectures, workshops, guided learning, and discussion groups to generate a stimulating learning environment that encourages students to take control of their own learning, to engage with a wide range of knowledge and skills, and to work collaboratively while developing self-awareness. The strategies have been carefully chosen to support students towards learning outcomes and assessments and to cater for diversity across the student body.

Teaching and Learning Strategies include:

- Classroom discussions
- In-class research activities
- Role plays and simulations
- Reflective exercises
- Group work for problem-based scenarios

Formative and Summative Assessment Strategies:

Formative Assessments:

Consultancy Practice Exercise: Students will be placed into teams and asked to critique and synthesize relevant management and leadership models from the class to assigned case

studies. These teams will be required to collaborate, networking to find solutions to complex case studies and challenges set by the lecturer. The solutions will require successful synthesis of ideas and frameworks discussed in the module. Students will receive feedback from other students and from the lecturer in class.

Summative Assessments:

Consultancy Simulation Assessment: Students are required to simulate the activities of consultancy group. Placed into a team, students are required to critique and synthesize theories, concepts and facts from the module in relation to a chosen target business or company. The students will collaborate in choosing a specific business or organization as a target. Role-playing as management consultants and recognizing how consultancy relates to their future employment, they will create a PowerPoint presentation to enhance their 10 minute presentation of a leadership analysis of their chosen target. They will be evaluated on their ability to diagnosis the current leadership strategy of the target and to provide recommendations for improvement. Part of the assignment (70%) is based on the team's performance and the other part of the assignment is an individual written assignment (30%). The OELS marking critieria for Oral Presentations will be utilized for the in-class presentation and the OELS marking criteria for Presentations will be used for the invidual written assignment.

Assessment schedule	Name of assessment	Format of assessment	OELS Invigilation Needed?	Contribution to final grade	LOs
Session 4	Consultancy Practice Exercise	10 minute simulation	N	Formative Assessment	1 & 2
Session 8	Consultancy Simulation	15 minute simulation + individual written assignment – reflective peer assessment (in-class)	N	100% (Shared assessment 70%+Individual written assignment 30%)	1 & 2
Resit Information	Individual Reflection	Recorded Video (5 minutes) and Individual Written Statement	N	100% (replaces the final module grade)	1 & 2

Feedback Strategies:

Consultancy Practice Exercise: Students will receive oral & written feedback from the lecturer and from their peers immediately after their presentation. The written feedback will be delivered through a pre-prepared 'Consultancy Exercise Feedback Sheet'

Consultancy Simulation: Students will receive oral feedback from the lecturer immediately after the consultancy simulation. Written feedback on the Individual written assignment will be provided to students directly.

Resit:

Students who fail the summative assessment will be offered a resit opportunity where they may submit a 10 minute recorded video of them completing individually a Consultancy Simulation assessment (as described above). They will accompany this with an Individual Written Statement (as described above).

Reading Lists:

- *Carnegie, Dale. How to Win Friends and Influence People. London, Vermilion, 2019.*
- *Northouse, P. (2019). Leadership: Theory and practice. 8th ed. Sage Publications.*
- *Samet, Elizabeth D. Leadership : Essential Writings by Our Greatest Thinkers. New York, W. W. Norton, 2017.*
- *Taylor, Frederick Winslow. The Principles of Scientific Management. Charleston, Sc, Createspace, 1911.*

Prerequisite:

None

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Module Handbook

Module title: Advanced Integrated English

Lecturer's name: Iain Wark

Email: iwark@omnesintervenant.com

Contact hours: 12 hours

Assessment Hours: Students are expected to spend a minimum of ten (10) hours on their final assessment.

Independent study hours expected: 24 hours

ECTS credits: 2 ECTS

Programme Level: Level 6 = Year 3 Undergraduate

Aims:

This module aims to introduce students to, and reinforce their familiarity and confidence with, English which is used by native speakers on a day-to-day basis. The students will learn to be able to recognise various forms of 'confusing' English which are in common usage by native speakers, and to have the confidence and ability to define and utilise them in their own use of the language, be that written or spoken. Students will come to realise the prevalence of these forms of language and that if they want their English to become truly fluent, they will need to be comfortable with them. This will contribute to their future employability should they choose to work in an area where intimate knowledge of English is required.

Learning Outcomes (LOs):

Knowledge

By the end of this module, students will have demonstrated:

1) A desire to identify, explain and discuss various types of language (complete expressions; vocabulary; wordplay) which are commonly used by native speakers in all areas of life.

Skills

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

2) Correctly identify, define, analyse, and synthesise such language from authentic sources.

Values

By the end of this module, students will have demonstrated a commitment to:

3) Remembering and confidently using such language in their day-to-day lives, and to continue to recognise and use other examples of such language they may encounter after finishing the course.

Syllabus Content:

In this section, outline the daily/weekly and content (knowledge and skills) that students will engage with in workshops and private reading:

Sessions	Topic/Knowledge	Skills	LOs
Session 1	Introduction to English idioms. What are they, and how and why are they used?	Critical thinking skills. Assimilation of language.	1
Session 2	Continuation of English idioms with a specific focus on animal idioms. The use of this language in context.	Critical thinking skills. Assimilation of language.	1,3
Session 3	Introduction to British newspapers. What are the different types of newspapers and how do they differ in their content and use of language?	Critical thinking and reading skills. Identifying formatted and lexical differences.	1,2
Session 4	Looking more closely at various forms of language commonly used in British tabloid newspapers with use of specific, authentic examples.	Analysis of language from cultural viewpoints. Critical thinking and reading.	1,2,3
Session 5	Introduction to phrasal verbs; their importance in English and the problems they can cause for non-native speakers.	Grammatical skills. Critical thinking.	1,3
Session 6	Continuation of phrasal verbs. The use of phrasal verbs in context.	Critical thinking skills	1,2,3
Session 7	Portmanteau / blended words. The prevalence and use of these with native speakers.	Critical thinking skills.	1,2,3

Session 8	Countability and plural nouns. The difficulty and confusion experienced by non-native speakers in this area.	Grammatical skills. Critical thinking and analysis.	1,3

Teaching and Learning Strategies:

This module uses a wide range of teaching and learning strategies to provide a stimulating learning environment that encourages students to take control of their own learning, to engage with a wide range of knowledge and skills, and to work collaboratively while developing self-awareness. The strategies have been carefully chosen to support students towards learning outcomes and assessments and to cater for diversity across the student body.

Teaching and Learning Strategies include:

- Classroom discussions
- Frequent use of question and answer (with students actively encouraged to question both the teacher and each other)
- In-class research activities
- Independent research activities
- Practice exercises related to language introduced in-session
- Use of authentic materials to enhance student learning and understanding

Formative and Summative Assessment Strategies:

Formative Assessments:

Students will be given frequent practice exercises (in almost every session) to use and reinforce the language which has been introduced. They are encouraged to collaborate when appropriate.

Constant and consistent feedback will be given by the teacher as they monitor the students during the completion of these exercises.

Answers to these formative assessment exercises will be given in class by the students themselves, with everyone contributing in order to make as inclusive an experience as possible. Students who may be less confident with their ability in English will be assured that their contribution is as valid as anyone else's.

Summative Assessments:

Students will produce an individual piece of analytical work, using authentic materials i.e., British tabloid newspapers. They will be expected to produce an essay which identifies and analyses the various forms of language studied throughout the module by buying and studying an actual British tabloid newspaper. Students will be actively encouraged to bring their

newspapers to the teacher to ensure that they have chosen appropriate stories / articles for analysis and that they are not incorrectly identifying or analysing language. Students will have approximately four weeks to complete the assignment.

The grading of this work will be determined by the correctness of the language analysis presented, which will in turn show a student's understanding of the various forms of language and word play which have been presented throughout the module. The work is also expected to be of a level of English which is the highest any particular student can produce***, without the aid of translation software or any AI related software***.

Grading criteria are as follows:

0 – 9.9 FAIL The student failed to produce work of sufficient quality. This may be for one or more reasons, such as: not doing what was asked, work being of insufficient length, omission of one or more key components, plagiarism, not submitting work, obvious use of AI software.

10 – 11.9 – LOW PASS The student produced work which was of sufficient quality to pass, but was not done to a high standard. Work achieving a grade in this band will typically include various mistakes such as: analysing language incorrectly, frequent misidentification of language, incorrect use of grammar so as to possibly impede understanding and meaning, missing what is deemed to be obvious language from source material, having an impersonal or overly short conclusion to the work.

12 – 13.9 - MEDIUM PASS The student produced work which was of sufficient quality to pass but which still contained some of the errors detailed in the above band. There will, however, be analysis which is correct and the conclusion to the work will be of a more personal nature.

14 – 15.9 MEDIUM HIGH PASS – The student produced work of good quality. However, some of the errors detailed above may still be present, only to a lesser degree. An assignment achieving this band will also be judged more closely on language which is missed in the analysis. The conclusion will be detailed, thoughtful, and personal with reference to language presented in the analysis.

16+ HIGH PASS - The student produced work of very good quality. There will be few to none of the errors detailed above. The work will analyse all (or nearly all) of the appropriate language available in the chosen source material. There will be few grammar, punctuation, or lexical errors evident. The conclusion will be detailed, thoughtful, and personal and will closely refer back to the chosen language presented in the analysis.

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Assessment schedule	Name of assessment	Format of assessment	OELS invigilation needed?	Duration if exam	Contribution to final grade	LOs
Essay will be set in session 4	Final Essay	The essay, as detailed above, will assess the students' ability to identify and analyse the various language forms studied from session 1. The essay will be a minimum of 1000 words, and will be submitted on Boostcamp.	N	N/A	80%	1,2,3
	Participation	Refers to taking an active part in class, but also to following rules regarding use of technology, decorum, lateness etc.	N	N/A	20%	
Resit Information		Online. Boostcamp Quiz. The quiz will test students on the specific language which was studied in class across all areas (idioms, phrasal verbs, portmanteau words, puns / wordplay). The questions in the quiz will be randomised so no two students will see the same set.	N	30 mins	100% (This will replace the final, failing module grade).	All, as far as possible.

Feedback Strategies:

Students will receive daily feedback in classroom activities from the tutor and their peers. Feedback for the final, summative assessment will be given in a short, written form (around 100 words) on Boostcamp after all essays from students in a certain group have been read and graded by the teacher. This feedback will generally be received by students no more than three weeks after the final essay has been submitted.

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Reading Lists:

Booth, T., and Ben Ffrancon Davies (2021). *English for Everyone: English Phrasal Verbs.* London: DK.

Conboy, M. (2006). *Tabloid Britain: Constructing a Community through Language*. London; New York: Routledge.

OTUK (Online Teachers UK). (2018). *A-Z of English Idioms: 150 Most Common Expressions*. Available at: https://onlineteachersuk.com/english-idioms/.

Oxford International English Schools. (2019). *British slang words & phrases | Oxford International English*. Available at: https://www.oxfordinternationalenglish.com/dictionary-of british-slang/.

Writer, J.G.S. (n.d.). *100 Portmanteau Examples of Creative Combined Words*. examples.yourdictionary.com. Available at: https://examples.yourdictionary.com/100-portmanteau-examples-of-creative-combined-words.html/

Prerequisite:

There are no prerequisites as such, but it is expected that students will have a certain level of proficiency with the English language. It is understood that not every student in a given group will have the same level of ability or confidence in English.

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Module Handbook

Module title: Public Speaking & Key Soft Skills
Lecturer's name: Zacchary Falconer-Barfield
Email Address: zfalconer-barfield@omnesintervenant.com
Contact hours: 12 hours
Assessment Hours: 1.5 hours – Individual Presentations
Independent study hours expected: 24 hours
ECTS credits: 2 ECTS
Programme level: Level 6 = Year 3 Undergraduate
Prerequisites: Basic Understanding of Presentations

Aims:

This module aims to develop key concepts & essential skills of public speaking and presentations and embolden the students with the skills to design and produce advanced speeches and presentations. The students will learn to formulate their abilities to speaking in public, especially using English as a mode of oral communication, and therefore be able to become critically effective public speakers and presenters. This will enable them to deploy these abilities to advance their future employability and how they engage with various business stakeholders and the wider audiences, validating their abilities as a global citizen in an ethical manner.

Learning Outcomes (LOs):

Upon successful completion of this module the students will be able to –

1. Critically evaluate their soft skills & synthesizing the advanced knowledge & skills
2. Critically apply a wide range of delivery skills such as vocal performance; body language; storytelling and visual aides to impact the audience and deeply enhance the presentation
3. Perform an advanced prepared speech, that shows depth & breadth of skills & Knowledge

Syllabus Content:

In this section, outline the daily/weekly and content (knowledge and skills) that students will engage with in workshops and private reading:

Sessions	Topic/Knowledge	Skills	LOs
1	Introduction to Essential Soft Skills: Goals & Benefits of Public Speaking & the core 5 Soft Skills; Evaluate the power of Communication and how in delivers impact.	Developing the essential principles of the 5 Core Soft Skills	1,3
2	Communication - 1st Pillar - The Body: Developing Non-Verbal Communication, how our mind processes it & Using it in Speeches	Developing & Demonstrate Body Lang & it's increased Impact on Communication	2
3	Communication – 2nd & 3rd Pillar: Voice & Words Developing the use of words and critically evaluate a speech	Developing & demonstrating the power of voice and emotion and the power of words and critically evaluating a speech	2
4	Creativity – Developing the idea of creativity & storytelling & how to develop it as a soft skill.	Develop & demonstrate the understanding of creativity as a commercial and presentation context	1.2
5	Embracing the Camera – Working in developing Skills for the Modern video world	Develop & create their ability to work with cameras for presentations	1,3
6	Relationships & Leadership – Developing the understanding or how relationships work and how to become an effect leader.	Develop & demonstrate the understanding of relationship building and leadership in an interpersonal context	1,2
7	Planning/Organisation – How to develop planning & organizational skills –	Develop and demonstrate the understanding of how to organize	1.2.3
8	Teamwork, Creativity & Leadership: The Lego Game and Evaluation	Developing and critically evaluating how to work in a team & apply leadership skills.	1,2,3

Teaching and Learning Strategies:

This module uses a wide range of teaching and learning strategies to provide a stimulating learning environment that encourages students to take control of their own learning, to engage with a wide range of knowledge and skills, and to work collaboratively while developing self-awareness. The strategies have been carefully chosen to support students towards learning outcomes and assessments and to cater for diversity across the student body.

Teaching and Learning Strategies include:

- Classroom discussions
- In-class research activities
- Role plays and simulations
- Practice exercises for speaking & presentations
- Interactive Exercises
- Games that highlight learning outcomes

Formative and Summative Assessment Strategies:

Formative Assessments:

The students will be given opportunities mostly as individuals but occasionally in groups to speak, present and perform exercises in almost every class. This will give the opportunity for individual and group feedback.

There will be also opportunity for class discussions about the essential elements during the classes

Students will also be encouraged to submit an outline of their final presentation for some constructive feedback.

Summative Assessments:

The students will be expected to demonstrate achievement of their Learning Outcomes by ongoing efforts in class and by a summatively assessed final presentation.

Participation and Engagement: The Students will be assessed on their ability to contribute and perform the in-class exercises. As their will be several role-plays and active speech-based exercises to aide in their development. Each exercise will be graded and an average score given at the end. Assessment criteria is based in the OELS critieria found on Boostcamp.

Final Presentation: A 4 minute speech **without visual aids.** It will be delivered in front of the class. It will demonstrate the student's ability to develop an advanced prepared speech and synthesize their wide range of skills to engage with an audience. This will be assessed by the lecturer's criteria which can be found under the course on Boostcamp.

Assessment schedule	Name of assessment	Format of assessment	OELS Invigilator Needed Y/N	Duration	Weighting	LOs

Ongoing after session 1	Participation & Engagement	Students will be assessed on their ability to contribute and perform their exercises.	N	N/A	40%	1,2
Exam Class	Final Presentation	4 min In Person Speech without visual aids	N	4 min per student	60%	2,3
Resit	Resit	5min recorded Video Presentation about on of the Key Soft Skills discussed in the Course	N	5 min per student	100% - replacing existing grade	1,2,3

Feedback Strategies:

The students will be given verbal feedback as individuals, in groups and as a class depending on the task and situation involved. There will be opportunity for peer feedback as well.

The Final Assessment the student will be given individual verbal feedback on their presentation, and written feedback within 3 weeks if they request it.

Reading Lists:

Recommended Reading –

Anderson, C. (2018). *TED talks : the official TED guide to public speaking*. London Nicholas Brealey Publishing.

Berne, E. (2001). *What do you say after you say hello? : the psychology of human destinyn*. London: Corgi Books.

Carnegie, D. (2017). *How to develop self-confidence & influence people by public speaking*. New York: Gallery Books, An Imprint Of Simon & Schuster, Inc.

Carnegie, D. (2018). *How To Win Friends And Influence People.* Toronto: Harpercollins Canada.

Ekman, P. (2004). *Emotions revealed : understanding faces and feelings*. London: Weidenfeld & Nicolson, An Imprint Of Orion Books.

Gleitman, H., Fridlund, A.J. and Reisberg, D. (2000). *Basic psychology*. New York W.W. Norton.

Lopata, A. and Roper, P. (2011). *-- And Death Came Third! : The Definitive Guide To Networking And Speaking In Public*. St Albans: Ecademy.

Nihill, D. (2016). *Do You Talk Funny?.* Benbella Books, Inc.

Sharp, D. (1987). *Personality types : Jung's model of typology*. Toronto, Canada: Inner City Books.

Ted.com. (2019). *TED: Ideas worth spreading*. [online] Available at: http://TED.com.

Students will be expected to have watched the top 3 TED.com speeches

Prerequisite:

Some basic understanding of Public Speaking