





National Workshop 3









Session 1	Introduction to Data Analytics and ALT2
11.00 – 11.30	Tea/Coffee
Session 2	ALT2: Project Design and Presentation
13.00 – 14.00	Lunch
Session 3	Curriculum Planning and Assessment Python Demonstrations

Key Messages



Leaving Certificate Computer Science aims to develop and foster the learner's creativity and problem solving, along with their ability to work both independently and collaboratively.

Computing technology presents new ways to address problems and computational thinking is an approach to analyse problems, design, develop and evaluate solutions.

The ALTs provide opportunities for students to develop their theoretical and procedural understanding of the course.

The externally assessed coursework will be based on all learning outcomes, with those of strand 3 being particularly relevant.

Digital technologies can be used to enhance collaboration, learning and reflection.



Recap on National Workshop 2



Main topics...

Computational Thinking

Flower GardenPillars of Computational ThinkingPedagogies suitable for Computational ThinkingNumber System ConversionsProblem SolvingALT4 Embedded SystemsUnplugged ActivitiesTeaching and Learning
Resources for the micro:bitThe Design Process
Resource DevelopmentCurriculum Planning





Session 1

Data Analytics and ALT2

"Data is the new oil"





Mentimeter



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What words do you associate with Data Science/Data Analytics?

URL = www.menti.com

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World Economic Forum Video



https://www.youtube.com/watch?v=eVSfJhssXUA

What's driving the data deluge?







Annual Size of the Global Datasphere



Source: IDC's Data Age 2025 study, sponsored by Seagate, April 2017



Go to www.menti.com and use the code 54 67 97 5

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Assess your own knowledge/skill in relation to the following Data Science terminology

No understanding	Data Analysis	
	Data Science	_ ور
	Data Visualisation	andir
	Data Mining	ersto
	Data Transformation	
	Big Data	llent
	Machine Learning	
	Data Capture	
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Data Science ... Analysis ... Big Data



Data Science is an interdisciplinary field that uses scientific methods, processes, algorithms and systems to extract knowledge and insights from data in various forms, both structured and unstructured, similar to data mining.

Data Analysis is a process of inspecting, cleansing, transforming, and modelling data with the goal of discovering useful information, informing conclusions, and supporting decision-making

Big Data is extremely large data sets that may be analysed computationally to reveal patterns, trends, and associations, especially relating to human behaviour and interactions.

Data mining is the practice of examining large pre-existing databases in order to generate new information.

Machine Learning is a method of data analysis that automates analytical model building. It is a branch of artificial intelligence based on the idea that systems can learn from data, identify patterns and make decisions with minimal human intervention.









Applied Learning Task 2

LCCS Interwoven



The four applied learning tasks explore the four following contexts:



Explore and teach the LOs through the lens of ALTs.



'Students work in teams to carry out four applied learning tasks over the duration of the course.'

'Each of which results in the creation of a real or virtual computational artefact.'

'Where possible, the artefacts should be beneficial to the community and society in general.'



'These artefacts should relate to the students' lives and interests.'

'Examples of computational artefacts include programs, games, web pages, simulations, visualisations, digital animations, robotic systems, and apps.'

ALT2



"Hypothesising, making predictions, examining evidence, recognising patterns and reaching conclusions are at the heart of computer science"

"Students will identify an interdisciplinary topic, develop a hypothesis and utilise existing resources to highlight the salient information and inform future decisions"

> "By identifying, analysing, and deconstructing a problem, students will deepen their understanding of the practices and principles of computer science"

> > LCCS Specification: p22



Hypothesis originates from the Greek work *hupo* (under) and *thesis* (placing). It means an idea made from limited evidence. It is a starting point for further investigation.

ALT2 Learning Outcomes



3.4. Develop algorithms that can find the frequency, mean, median and mode of a data set.

- 3.5. Structure and transform raw data to prepare it for analysis.
- 3.6. Represent data to effectively communicate in a graphical form.
- 3.7. Use algorithms to analyse and interpret data in a way that informs decision-making.





Data Science Arc

OOO Ask Clean Prebare Clean Cl Publish





Figure 3: Overview of a design process





ASK – The Question that starts the journey

PREPARE – Sketch out, think through ideas to organise work.

GET DATA – Collect, enter, reuse or repurpose.

CLEAN – Format, layout, organise.

ANALYSE – Format, layout, organise, sort, filter, summarize, triangulate.

VISUALISE – Format charts, tables, add logos, branding, colours.

REVIEW – Gather feedback, find errors, check interpretations.

PUBLISH – Secure and share within or outside the team.



Data Visualisation

https://informationisbeautiful.net/





https://informationisbeautiful.net/topic/tech-digital/



Data Cleansing

The data set below shows the raw data collected from the result of a 100m school race.

Surname	Gender	Age	Time
Murphy	Μ	17	13,12
Ogene	Μ	16	12.14
Ogene	Μ	16	12.14
Mc Intyre	F.	17	12.87
Lopez	F	-18	14.01
	F	17	1 329
McCarthy	Μ	77	13.65
Ó Brádaigh	f	16	13.09

Problems?



The Data Cycle – an alternative framework





Group Activity / Breakout





Questions to discuss

- 1. What prior knowledge will students have that is relevant to ALT2?
- 2. What may challenge students in dealing with ALT2?
- 3. What approach could you take to introduce ALT2 to your students and support their progress?











Part III

NCCA Resources



Demonstration of Samples







Tea/Coffee



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