





#### **National Workshop 4**







# Schedule – Day 1

11.00am - 1.00pm	Session 1: Introduction to Strand 1 - Computers and Society
	Lunch
2.00pm – 4.30pm	Session 2: Computational Thinking



#### Go to www.menti.com and use the code 50 89 79

Mentimeter

# What should be the culture in this group? What expectations do you have from each other?

Open, collaborative, supportive.	Collaboration and sharing. Helpful and supportive.	An open, sharing, collaborative culture. It's not a competition!!
Sharing is caring. Nonjudgmental. No inappropriate questions.	Be non judgemental, share your expertise.	Open Source Share and Share alike! PMA - Positive Mental
Lots of sharing but even more helpful if shared resources could be linked to Learning Objectives of the LCCS spec	Sharing is caring. Regular communication online. A good	and what works.
	atmosphere within the group.	Helpful if we have the answers.
Supporting environment where every mistake leads us a step closer to our ultimate goal of world domination.	Sharing resources/ possible solutions targeted to the	questions.
	specific learning outcomes	An open approach to learning in a collaborative supportive

https://www.mentimeter.com/s/808d13590aee2c126cfb76044464a98b/6904e5f73c08







#### 2019/20 Timeline



Timeline - Round 2 - 6th Year

### **Teachers are the Key**





# **Privileged Place**

# **Bring Different Experiences**



#### National Workshop 3 - Quick Recap

# Curriculum PlanningData Science ArcModelling & SimulationData Analysis IntroductionComputational ThinkingALT2 & 3

**Project Design and Development** 





#### Session 1

#### Introduction to Strand 1 - Computers and Society



#### **Key Messages**



All learning outcomes are interwoven and should be studied concurrently at different stages of the course and should not be studied in a linear order.



LCCS can be effectively mediated through the use of a constructivist pedagogical orientation which will incorporate participatory and enquiry focused teaching and learning activities.



The assessment will afford students the opportunity to generate responses that reveal that the objectives of the LCCS course have been met (see p6 specification).



Digital technologies used in LCCS have the potential to enhance collaboration, learning and reflection, by enabling students to learn more efficiently and to facilitate work that might not otherwise be possible.



#### By the end of this session participants will have ...

- an enhanced awareness of the interwoven nature of the LCCS course (including samples) teaching through the ALTs.
- gained a deeper understanding of Strand 1 Computer and Society including the LOs.
- taken part in a short activity to acquire additional strategies and ideas on teaching and learning this section of the course.
- gained a deeper understanding of how to 'Stimulate a debate' in a classroom using the fourstep process.
- experienced the 'Stimulate a debate' via a group activity and, in doing so, appreciate the benefits of this approach.
- reflected on the how to teach aspects of this section of the course via group activity debrief.



Strand 1: Practices	Strand 2: Core	Strand 3: Computer science
and principles	concepts	in practice
<ul> <li>Computers and society</li> <li>Computational thinking</li> <li>Design and development</li> </ul>	<ul> <li>Abstraction</li> <li>Algorithms</li> <li>Computer systems</li> <li>Data</li> <li>Evaluation/Testing</li> </ul>	<ul> <li>Applied learning task 1 <ul> <li>Interactive information systems</li> </ul> </li> <li>Applied learning task 2 - Analytics</li> <li>Applied learning task 3 <ul> <li>Modelling and simulation</li> </ul> </li> <li>Applied learning task 4 <ul> <li>Embedded systems</li> </ul> </li> </ul>



#### Strand 1: Practices and principles

The overarching practices and principles of computer science are the behaviours and ways of thinking that computer scientists use.

This strand underpins the specification and is fundamental to all learning activities. By becoming familiar with, and fluent in, the practices and principles that underpin good practice, students develop their ability to manage themselves and their learning across the subject.

#### **LCCS Interwoven**

The four applied learning tasks explore the four following contexts:



#### Key to remember:

Explore and teach the LOs through the lens of ALTs.



#### **LCCS Interwoven**









- **S1 Computers and Society**
- **S1** Designing and Developing
- **S1 Computational thinking**

S2 - Computer Systems S2 - Evaluation and Testing



#### **LCCS Interwoven**



- **S1 Computers and Society**
- **S1** Designing and Developing
- **S1 Computational thinking**

- S2 Data
- S2 Abstraction
- **S2** Evaluation and Testing





# The practices and principles are encountered in a context-based approach related to social, professional, and scientific contexts.

The practices and principles of computer science describe the behaviours and ways of thinking that computationally-literate students use to fully engage in a data-rich and interconnected world.

Studying the role of computers in society will enhance students' attitudes towards computer science and make it more meaningful and relevant.

LCCS Specification: p18

#### **Computers & Society**



#### Social and ethical considerations of computing technologies

**Turing machines: The Internet; Machine Learning; Artificial Intelligence** 

**User-Centred Design** 



#### **LCCS Learning Outcomes**

1.11 - discuss the complex relationship between computing technologies and society including issues of ethics

1.12 - compare the positive and negative impacts of computing on culture and society

1.13 - identify important computing developments that have taken place in the last 100 years and consider emerging trends that could shape future computing technologies

1.14 - explain when and what machine learning and AI algorithms might be used in certain contexts

1.15 - consider the quality of the user experience when interacting with computers and list the principles of universal design, including the role of a user interface and the factors that contribute to its usability

1.16 - compare two different user interfaces and identify different design decisions that shape the user experience

1.17 - describe the role that adaptive technology can play in the lives of people with special needs

1.18 - recognise the diverse roles and careers that use computing technologies



MARC

# Warm Up Activity



What strategies could you use to teach this section of the course?







<u>https://www.mentimeter.com/s/6b2839c64bc17a4662eae4ca66844426/9142ebe493c2/edit</u>











## Stimulate a debate – How Computer Science is changing the world

(NCCA Booklet p29).





# 1. Watch a Stimulus Video or read a stimulus piece.



https://www.youtube.com/watch?v=QvyTEx1wyOY&feature=youtu.be



# 2. Prompt questions to provoke class discussion and elicit initial viewpoints



# Six ways in which Computer Science improves the world we live in today

- 1. Solving problems and improving solutions
- 2. Protecting people and organisations
- 3. Furthering education
- 4. Improving communication
- 5. Organising & streamlining philanthropy
- 6. Positively impacting every area of society

#### Rasmussen College



# 3. Divide into research groups to explore the topic from key standpoints



#### For example, No 4. Improving Communication -

- Is Computer Science a net creator or destroyer of jobs in this area?
- How has Computer Science helped to improve our world in this area?
- How has Computer Science contributed to disimproving our world in this area?



# 4. Choose a teaching / facilitation methodology



a. Students first research each topic in research groups of three.

b. Use a Jigsaw Learning Technique to create groups of three comprising one student from three different themes. Each person discusses their research within their new group.

c. Reassemble into original groups.



#### **Recap - The 4 steps:**

1. Watch a Stimulus Video or read a stimulus piece.

2. Prompt questions to provoke class discussion and elicit initial viewpoints.

3. Divide into research groups to explore the topic from key standpoints.

4. Choose a teaching / facilitation methodology.

### Main Group Activity Groups will work together on a -'Stimulate a debate example'





How should we respond as a society to the rapid growth of AI? (NCCA Booklet p34)

How much data, and the kinds of data governments and giant multinationals should be allowed to keep on citizens and consumers? (NCCA Booklet p51)

2 + 5

3 + 6

1 + 4

Positive and negative impact of military innovations on both society and technological developments (NCCA Booklet p19)







#### **Presentation & Debrief**

#### What has challenged your thinking?



Where and how could you make links with other parts of the specification?



#### **Resources for Computer and Society**







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