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| Hibernia College Planning Form |
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**Session Planning Form**

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| Tutor name: | Kevin O’Brien | | | |
| Delivery date: |  | | | |
| Module title:   |  | | --- | |  | | Mathematics for Computing | | | |
| Session title: | Sequences, Series and Induction | | **Session no.** | 7 |
| Prepare | | | | |
| Session study content: | Chapter 7 of study guide (Chapter 2 of Study Guide 2) | | | |
| Essential readings: | This exercise requires a full understanding of material covered in “Sequences, Series and Induction” (Chapter 2 of Book 2) | | | |
| Study aims and learning outcomes: | The quiz/knowledge check questions should focus on determining how well the students succeeded in achieving the study aims and learning outcomes. | | | |
| In this part of the session, students will study the relevant chapter(s) in the University of London study guide and read the essential readings for the chapter(s). When they have completed this, they will complete the end-of-session quiz to see how well they know the session content.  If there are any further readings, resources or web sites that you feel would be useful to students for studying this session, please add them in the next row. | | | | |
| Additional resources | None | None | | |
| Test yourself | Provide multiple-choice questions that test students on the core session content.  Fill in the quiz template at the end of this document with questions and constructive feedback. | | | |
| Evaluate | | | | |
| In this part of the session, students will engage with tasks and activities that will enable them to evaluate and analyse the session content they have studied.  When developing tasks and activities, think about how you intend for the student to achieve each one – this may be through discussing concepts on a forum, contributing to a wiki , conducting some online research, analysing a case study, studying a video, etc.  Discuss your ideas with the Knowledge Officer who will know the full range of options available and advise on which is most appropriate.  Note: You do not need to provide a task for each of the headings below. The task that you provide will depend on the session content and the workload for the student in that session. Select the most appropriate task(s) based on the session content. | | | | |
| Discuss | ~~Provide a question based on the session content that will generate a discussion on the tutor-moderated forum.~~ | | | |
| Solve | Design a problem-solving exercise or worksheet based on the session content that the students will complete. | | | |
| Research | ~~Ask the student to conduct online research into important areas of the session content such as useful examples or further explanation of the content. The findings could then be shared on a forum/wiki/blog.~~ | | | |
| Assess | | | | |
| Note: The activities in this part of the session will be linked to the synchronous online tutorial and the onsite days. The activities for each session will depend on the scheduling of the tutorials and onsites in the module calendar. These activities will be completed over a number of sessions.  Ideally, the activities in this part of the session should link together and be developed over a number of sessions. | | | | |
| Submit | Prepare an activity/task (for example, answering exam questions) for the students and ask them to submit their responses to the tutor prior to an online tutorial or onsite – this submission could then form the basis of the tutorial/onsite discussion.  The activity/task should be based on the content that they have covered in the sessions prior to the online tutorial or onsite. | | | |
| ***Students attempt end of chapter revision questions from the study guide*** | | | |
| Apply your knowledge | In the online tutorial and onsite day, build on the activity/task that students have prepared and submitted. Students could work together in groups to discuss and solve a problem.  A selection of students should be asked to present their submission in each online tutorial or onsite. This would be a different group of students for each tutorials and onsite so every student gets an opportunity to present. | | | |
| ***Not applicable*** | | | |

## Quiz template

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| Session title: | Sequences, Series and Induction | | Session no. | 7 |
| Test yourself:  Each session should have a minimum of 20 questions in total.  What content is tested will depend on the chapter(s) content – some parts may require more questions than others to test the student.  These questions will be used to test students' knowledge and help them to recall the academic content of the chapter(s).  Constructive feedback should be provided for each question to reinforce the learning for the session. | | | | |
| Q 1: A sequence for which the recurrence relation is of the form  *Un+1 = Un + d*,  where d is a constant, is known as an arithmetic progression  a) True b) False | | Q 2: What is the next term in the Fibonacci Sequence?  1,1,2,3,5,8,…  a) 10 c) 12  b) 11 d) 13 | | |
| Feedback:  TRUE | | Feedback:The correct answer is d 13 | | |
| Q 3:  A sequence for which the recurrence relation is of the form  *Un+1 = Un + r*  is known as a geometric progression  a) True  b) False | | Q 4: determine the next term in the geometric progression  ***9,3,1,1/3,1/9***  a) 1/3 c) 1/6  b) 1/27 d) 1/9 | | |
| Feedback:  The correct answer is False. It should be  *Un+1 = rUn* | | Feedback:  The correct answer is b: 1/27 | | |
| Q 5:  The Domino Analogy for the Principle of Induction states that   1. If somebody knocks over domino 1 2. If all the dominoes are arranged correctly   then all the dominoes will fall.  a) True  b) False | | Q 6:  Identify the first four terms in the sequence defined by the recurrence relations,  ***Un+1 = Un + 4***  given that u5 is 25  a) 5,9,13,17,21  b) 11,15,19,23  c) 9,13,17,21  d) 5,10,15,20 | | |
| Feedback: True | | Feedback:The correct answer is c. Answer A has one term too many | | |
| Q7. Identify the fifth term in the sequence defined by the recurrence relation:  *Un+1 = Un +2n*  given that u1 is 1   1. 21 2. The answer is not determinable 3. 11 4. 13 | | Q8. Evaluate the following expression   1. 3 2. n 3. 3n 4. answer Is not determinable | | |
| Feedback: The correct answer is a) 21 | | Feedback: The answer is c) 3n | | |
| Q9. Evaluate the following expression   1. 435 2. The answer is not determinable 3. 900 4. 1395 | | Q 10: The terms of a sequence are defined by a formula  ***Uk = 6k-1***  What value of k gives the value which equals 2999   1. 500 2. The answer is not determinable 3. 450 4. 750 | | |
| Feedback: The correct answer is d: 1395 | | Feedback: The correct answer is a: 500 | | |
| Q 11: The three steps of process, in order, are proof by induction are  1) Base case  2) Induction hypothesis  3) Induction step  a) True  b) False | | Q12.  Evaluate the following series for r = 3    A) 11 B) 20  C) 21 D) 36 | | |
| Feedback: False, these are the right steps, but in the wrong order. | | Feedback: The correct answer is c). 21 | | |
| Q13.  What value of r yields a value of *Sr* of 155    A) 15 B) 10  C) 20 D) 5 | | Q 14: Suppose we have to compute as summation of the form (i.e. the lower bound is m rather than 1).  we would use the following identity   1. Yes 2. No | | |
| Feedback: The correct answer is b 10 | | Feedback : No. The upper limit in the last term is inappropriate for this summation | | |
| Q 15:  State whether the following is true or false    False. It is equal to 2n.  a) True  b) False | | Question 16  State whether the following is true or false    a) True  b) False | | |
| Feedback: False. It is equal to 2n. | | Feedback: False. It is equal to n(n-1)/2  . | | |
| Q 17: State whether the following is true or false     1. TRUE 2. FALSE | | Q 18: State whether the following is true or false     1. TRUE 2. FALSE | | |
| The correct answer is A) True. | | The correct answer is B) False.  There is a value of 1 missing. | | |
| Q 19: Evaluate the summation   1. 2046 2. 63 3. 127 4. not computable | | Q 20: The formula for the sum of the first n square numbers is    Evaluate the following expression:     1. 42925 2. 1275 3. 1625625 4. not computable | | |
| The correct answer is b) 63 | | Feedback: The correct answer is a 42925 | | |