****

|  |
| --- |
|  |
| Hibernia College Planning Form |
|  |
|  |

**Session Planning Form**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tutor name: | Kevin O’Brien | | | |
| Delivery date: |  | | | |
| Module title:   |  | | --- | |  | | Mathematics for Computing | | | |
| Session title: | Functions | | **Session no.** | 4 |
| Prepare | | | | |
| Session study content: | Chapter 4 of study guide | | | |
| Essential readings: | This exercise requires a full understanding of material covered in “Functions” (Chapter 4 of Book 1) | | | |
| 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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Session title: | Functions | | Session no. | 4 |
| 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: Consider the following functions f(x) and g(x).   * f(x) = x2 Domain {..,-3,-2,-1,0,1,2,3,..} * g(x) = x2 Domain {0,1,2,3,..}   Are the functions f(x) and g(x) equal?  a) Yes b) No | | Q 2: For the function f(x) = 3x-1, what is the range of the range, given that the domain is {1,2,3}  a) {4,10,16} b) {2,8,14} c) {2,5,8}  d) {2,5,8,11,14} | | |
| Feedback:  No. For functions to be equal they must have the same domain. | | Feedback: The correct answer is c) | | |
| Q 3:   Is f(x) = a function?  a) Yes b) No | | Q 4: f(x) =|x-4|+3  State the value of f(-4). a) 11 c) 5 b) 3 d) 7 | | |
| Feedback:  No. A function must be singled values. The square root operation yields two distinct values (one positive, and one negative) | | Feedback: The correct answer is a) 11. | | |
| Q 5:  What conditions must be satisfied for a function to have an inverse. The function must be   1. One-to-one only 2. Onto only 3. One-to-one and Onto 4. Neither Onto nor One-to-One | | Q 6:  If f(x) is a function for which the rule is f(x) = 9/8 - x, where x is real, the rule for the inverse function f-1(x) is: a) f -1(x) = 8/9 + x b) f -1(x) = -8/x + 9  c) f -1(x) = 8/9 + x d) f -1(x) = 9/8 - x | | |
| Feedback: The correct answer is c) . The function must be “One-to-one” and “Onto” | | Feedback: The correct answer is d) | | |
| Which of the following functions is not one-to-one?   1. f(x) = 9 - x2, x ≥0 2. f(x) = 1/x2 - 9 3. f(x) = 1 - 9x 4. f(x) = 3/x | | Q8. The range of the function with rule f(x) = |x - 4| + 3 is:   1. (4, ∞) 2. [3, ∞) 3. (4, ∞) 4. (-1, ∞) | | |
| Feedback: The correct answer is b) | | Feedback: The correct answer is c. | | |
| Q9. Which of the following expressions is equivalent to log2(x) + log2(y)  a) log2(xy) c) logx(y)  b) log2(x/y) d) log2(x+y) | | Q 10: Evaluate the following expression  ⌊-π ⌋+ ⌈-4*.3*⌉  a) 7.44  b) -8  c) 0  d) -1.3 | | |
| Feedback: The correct answer is a). | | Feedback: The correct answer is b)  ⌊-π ⌋+ ⌈-4*.3*⌉ = (-4) + (-4) = -8 | | |
| Q 11: Evaluate the following expression  |-2| + ⌊-2*.3*⌋.  a) 1  b) 5  c) 0  d) -1 | | Q12. Which of the following terms best describes the following expression  f(x) = 1-x3  a) Quintic function  b) Cubic function  c) Quadratic function  d) None of the above | | |
| Feedback: The correct answer is d)  |-2| + ⌊-2*.3*⌋ = 2 -3 =-1 | | Feedback: The correct answer is b). It is a cubic function | | |
| Q13. Which of the following terms best describes the following expression  f(x) = 2 + x - x-2  a) Linear function  b) Cubic function  c) Quintic function  d) None of the above | | Q 14: Evaluate the following expression  Log2(0.125)   1. 3 2. -3 3. -1/3 4. Not computable | | |
| Feedback: The correct answer is d). It is none of the above | | Feedback: The correct answer is b) i.e. -3 | | |
| Q 15: Evaluate the following expression  Log2(0)   1. -1 2. 1 3. 0 4. Not computable | | Q 16: Evaluate the following expression  Log2(1)   1. 2 2. 1 3. 0 4. Not computable | | |
| Feedback: The correct answer is d. It is not computable | | Feedback: The correct answer is c) i.e. 0  . | | |
| Q 17: For the following function, determine the ancestor of 12  f(x) = 2x+6  a) 30  b) 1  c) 0  d) 2 | | Q 18: For the following function, determine the image of 12  f(x) = 2x-5  a) 19  b) 8.5  c) 25  d) 27 | | |
| The correct answer is b. f(1) = 2(1)+6 =12 | | The correct answer is a. f(12) = 2(12)-5 =19 | | |
| Q 19: “O-notation” is used to compare the capability of algorithms.  a) True  b) False | | Q 20: Which of the following expressions is equivalent to this expression  (e2)4  a) e6 c) e8  b) e16  d) e0.5 | | |
| Feedback: True | | Feedback: The correct answer is c. (e2)4 = e8 | | |