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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: | Systems of Linear Equations and Matrices | | **Session no.** | 10 |
| Prepare | | | | |
| Session study content: | Chapter 5 of study guide 2. | | | |
| Essential readings: | This exercise requires a full understanding of material covered in “Systems of Linear Equations and Matrices” (Chapter 5 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: | Systems of Linear Equations and Matrices | Session no. | 10 |
| 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. | | | |

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| Question 1  Consider the following expression:  ***3 + 4x + 3x2 = 10***  Is this a linear equation?  A) Yes  B) No | Question 2  If A and B are matrices of the same size then  ***A - B = B - A***  A) TRUE  B) FALSE |
| Feedback: Correct Answer: No. It is not a linear equation. | Feedback: The correct answer is FALSE. |
| Question 3  Suppose both m and n are positive integers.  An ***m x n*** matrix is a rectangular array of real numbers with m columns and n rows.  A) TRUE  B) FALSE | Question 4  Suppose A is a ***3x3*** matrix. Consider the following mathematical expression  ***AY=A***   1. Y is the identity matrix 2. Y is a ***3 x 3*** matrix 3. Y does not exist, and no solution exists 4. AY is a ***3 x 3*** matrix   Select one of the following:   1. Only Statements are correct 2. Only Statement 1 and 4 are correct 3. Statements 1,2 and 4 are correct 4. Only statement 3 is correct |
| Feedback: The correct answer is FALSE.  The matrix has m rows and n columns. | Feedback: The correct answer is C) Statements 1,2 and 4 are correct. |
| Question 5  The identity matrix contains the values “1” in each cell on every row and column.  A)TRUE  B) FALSE | Question 6  The augmented matrix for matrix of coefficients A and the solution vector b is the *(m+1)* x *n* matrix ***(A:b)***  A)TRUE  B) FALSE |
| Feedback: The correct answer is False. The ones only appear on the diagonal cells, not on each cell. | Feedback: The correct Answer is False. The correct dimensions are ***m* x *(n+1)*** |
| Question 7  ***B*** and ***C*** are ***2x2*** matrices. The following statement is always true?  ***B*x*C = C*x*B***  A)TRUE  B) FALSE | Question 8  Let M be an ***mxn*** matrix. Then an entry of M is said to be a leading entry if it is the first non-zero in some row.  A)TRUE  B) FALSE |
| Feedback : The correct answer is False  BxC is almost always different to CxB | Feedback: The correct answer is True  See definition 5.5 on page 78 of volume 2. |
| Question 9  What are elements of the top row of ***C2***?    A) 4,1  B) 4,-1  C) 4, 0  D) 4,-6 | Question 10  Consider the matrices B and C, given as      What are the dimensions of the matrix ***B x C*** ?   1. 2 x2 2. 2 x 3 3. 3 x 2 4. ***B x C*** can not be computed |
| Feedback: Correct Answer is option B 4, -1 | Feedback: Correct Answer is option B 2 rows x 3 Columns |
| Question 11  Consider the matrices A and B.      It is not possible to compute ***A x B***, because the dimensions of the both matrices are incompatible.   1. True 2. False | Question 12  What is the outcome of the matrix addition ***A+B***? |
| Correct answer: False. It is possible to compute ***AxB***. | Correct answer D |
| Question 13:  For a matrix to be in reduced echelon form, all rows which consist entirely of zeros are located at the bottom rows   1. TRUE 2. FALSE | Question 14:  For a matrix to be in reduced echelon form, all leading entries are equal to zero   1. TRUE 2. FALSE |
| Feedback: The correct answer is TRUE | Feedback: The correct answer is False  They are equal to one. |
| Question 15:  Suppose a matrix is in reduced echelon form.  If a column contains a leading entry then all entries in that column below the leading entry are one.   1. TRUE 2. FALSE | Question 16:  Suppose a matrix is in reduced echelon form.  In any two consecutive non-zero rows, the leading entry in the upper row occurs to the left of the leading entry in the lower row.  A) TRUE  B) FALSE |
| Feedback: The correct answer is False  They are equal to zero. | Feedback: The correct answer is TRUE see the top of page 79. |
| Question 17  There are three operations that may be performed on the rows of augmented matrices.  The interchanging of two columns is one of these operations.   1. TRUE 2. FALSE | Question 18  When performing row operations on the rows of augmented matrices.  The subtraction of one row from another is one of these operations.   1. TRUE 2. FALSE |
| Feedback: Correct Answer: FALSE. One can interchange rows, but not columns. | Feedback: Correct Answer: TRUE |
| Question 19  When performing Gaussian elimination, a unique solution to a system of equations is found using ***Forward Substitution***.  A) TRUE  B) FALSE | Question 20  Consider the system of linear equations.  ***1x + 1y + 2z = 9***  ***1y + 2z = 6***  ***1z = 2***   1. x= 2, y=2, z=2 2. x=3, y=2, z=2 3. x=2, y=3, z=2 4. No unique solution exists. |
| Feedback: False – you would use Back Substitution | The correct answer is B |