*NOTES ABOUT THE USE OF THIS FORM:*

1. *This form is designed to be completed on a computer. Cells in the table below will expand to accommodate any amount of text … but we suggest that you keep the narrative as succinct as possible!*
2. *Please keep the use of formatting to a minimum. Importing formatted text onto a virtual learning platform presents challenges!*
3. *This form assumes that the “unit of learning” is a module. The module, in turn, would be included in a “course” (which is not referred to here). Each module will have a series of components which have been called “units” – they may be called something different in your design (like “weeks”, or “sections”) and you are free to change the terminology.*
4. *In the section about the authors of and contributors to the course, we have provided space for 5 co-authors (or co-contributors). If there were more than six people on the team, please add additional rows to the table.*
5. *Please ensure that you use student-friendly language. So the intended learning outcomes will be framed using the word “you”, and not “the student”. (This may be at odds with what you understand to be “academic” language. The aim, in online and blended learning, is to use language that includes the student to the greatest extent possible.)*
6. *Please note that module-level outcomes should be “overarching” outcomes onto which the unit-level outcomes map. You should have a few (maybe 4) module-level outcomes, and a very few (two or three at the most) unit-level outcomes for each unit.*
7. *The unit-level template should be copied so that there is a copy of the template for EACH unit/week/section. Thus, if there are 15 units/weeks/sections in a module, you will copy the template 14 times and complete each copy for one unit/week/section.*
8. *In the unit-level template, there is a space for a detailed description of student and teacher engagement with the unit. Here we would expect to see a “blow-by-blow” account of how the unit “hangs together”. What happens first? And then? What resources would students need to access for each part of the unit’s work? Where would they find these? Where is collaboration expected to happen? How is it scaffolded? And so on? What happens in class? What happens online? How do these elements build on each other? How long should students spend on each part of the unit?*

*This is NOT a list of things that students (or teachers) do. It is a* ***detailed description*** *of the* ***process****.*

*We have used a generic set of headings in the template. You are free to change the headings to suit the particular unit, but you are* ***not*** *free to ignore any of the required information.*

*Be sure, when completing the unit-level template to contextualise the content … by which we mean that content needs to be grounded in real life – even mathematical equations need to be demonstrably linked to real life! A student needs to know* ***why*** *they are engaging with the content.*

There are 2 templates on the following pages. The **Module-level template**should be completed once, and the **Unit-level template** should be completed in respect of each of the Units (or Sections, or Weeks) in the Module

MODULE-LEVEL TEMPLATE

|  |
| --- |
| **Details of institution that has developed the module** |
| Name of University | Alex Ekwueme Federal University, Ndufu Alike, Ebonyi State |
| Name of institutional contact | Prof Johnny Ogunji |
| Email address of institutional contact | ogunjijo@yahoo.com |

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| **Details of Creative Commons licence** (<https://creativecommons.org/licenses/>) |
| Licence type | Open source |

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| **Details of the authors of/contributors to the course and their role***(You can delete any sections that don’t apply.)* |
| Lead author (+ email address) | **Uzoma Rita Alo (****auzomarita@gmail.com** **)** |
| *Responsible for:* | **Modue Design/Vetting/Quality Assurance** |
| Co-author/co-contributor | **Chinwe Ogunji (nickchidi2005@yahoo.com)** |
| *Responsible for:* | **Module Design/Vetting** |
| Co-author/co-contributor | **Onyinye Anne Nwankwo (annegerald2001@gmail.com)** |
| *Responsible for:* | **Module Design/Vetting** |

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| **Information regarding format of material to upload onto the OER Africa repository** |
| Primary resource (Not PDF) | Open source |
| Will a Moodle common cartridge be uploaded as well? | Not required as our LMS is moodle |

*(A Moodle common cartridge is a .ZIP file of your module – if it is created in Moodle – that can be imported into another university’s Moodle platform.)*

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| **Course details** |
| Module title: | INTRODUCTION TO COMPUTER PROGRAMMING 1 |
| Under- or Post-graduate? | UNDER-GRADUATE | Year of study: | 2 |
| Class contact time (hours): | 2 | Number of credits: | 2 |
| Private/online study hours: | 1 | Number of weeks of study: | 13 |
| Total student learning hours: | 39 | Number of units of study: | 11 |

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| Programme(s) which might include this Module: | B.Sc Mathematics, B.Sc Physics, B.Sc Statistics, B.Sc Chemistry, B.Sc Geology/Geophysics, B.Sc Computer Science/Informatics, B.Eng Mechatronics Engineering, B.Eng Civil Engineering, B.Eng Electrical/Electronics Engineering |
| Pre-requisite student abilities and knowledge: | Introduction to Computers (CSC 101) |
| Pre-requisite (or co-requisite) modules: | None |

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| Aim of the module: | The aim of this module is to enable you become problem solvers with requisite knowledge and skills using computer programming (C or C++) in a dynamic and technologically driven economy. You will explore various problem solving techniques, programming fundamentals and control structures, program design, coding, debugging and documentation. Lastly the tasks/e-tivities will enable adequate hands on and ensure a firm grip of knowledge application in real life problem solving |
| Brief description of module: | The module is designed to impact basic programming knowledge and skills towards real life problem solving and its application using various algorithm development techniques, control structures and program documentations. |

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| Intended learning outcomes: | *At the end of this* ***module****, you will be able to:*1. Describe various problem solving techniques and algorithm techniques
2. Apply various control structures using C or C++ in real life problem solving
3. Demonstrate knowledge C or C++ in application development
4. Develop program documentation reports for software maintainability
 |
| Indicative content: | 1. Introduction to computer Programming and programming language
2. Programming Algorithm Development
3. Programming Fundamentals &programming Control Structures
4. Introduction to C or C++
5. Documenting programmes using techniques of a good programming language style
6. Designing, Coding and Debugging
7. Practical Sessions and Mid Semester Examination
8. Introduction to problem solving methods
9. Practical session, applying some problem solving methods to solve real world problems
10. Working with controls and control properties
11. Object oriented programming (OOP) and writing Codes
 |
| Form of final/summative assessment: | End of Semester examination |

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| **Assessment of module-level learning outcomes** |
| Module-level learning outcome | Module assessment task |
| 1. Describe various problem solving techniques and algorithm techniques
 | Formative and summative assessment  |
| 1. Apply various control structures using C or C++ in real life problem solving
 | Formative and summative assessment |
| 1. Create wealth using skills in C or C++ application development
 | Formative and summative assessment  |
| 1. Develop program documentation reports for software maintainability
 | Formative and summative assessment |

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| **Significant features or elements of module** |
| Integration of concise online documents, short videos and online discussion groups that act as sparks in acquiring needed skills towards real life problem solving, and its application in diverse human areas in a dynamic and ever evolving technologically driven global economy of the 21st century towards being self reliant and wealth creators. This will not only aid in developing and acquiring a firm grip of the needed skills but would also ignite the self confidence in real life problem solving.  |

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| **Student profile in the context of this module:** |
| What is the target group of students who would do this module? | Science based students in Physical Sciences and Engineering |
| What **skills** should a *student* have **already** mastered before starting this Module? | Nil |
| What **prior knowledge** of the subject matter should a *student* have? | Introduction to Computers  |

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| **Non-expert support:** |
| What **skills** and **prior knowledge** of the subject mattershould *facilitators* have **already** mastered before starting to deliver this Module? | Proficiency in Programming especially in C or C++ and its application in real life problem solving |
| What **skills** do *support staff* need in order to support the delivery of this module? | Technical skills in computer Laboratory management. Proficiency in Programming especially in C or C++ and its application in real life problem solving is added advantage |

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| **Quality assurance matters** |
| How will feedback on module be obtained from students? | Classroom/online comment, formative and summative course evaluation after mid semester and end of module assessment and through analysis of periodic structured questionnaire feedback which will be achieved with the collaborative efforts of the quality assurance group |
| How will student feedback be used to improve module? | A critical analysis of students’ feedback would be done, analysed and its results used to improve specific aspects of the module captured in students feedback. This would be communicated to course coordinators and facilitators for corrective and enhancement procedure |
| A certificate, signed by the university’s Head of Quality Assurance, confirming that the module meets the requirements of the PEBL QA rubric is attached. | Yes ☐ No ☐ |

UNIT/WEEK/SECTION-LEVEL TEMPLATE

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| **Unit-level overview** | **Unit/week/section** | **0** |
| Topic name: | Introduction/ Getting Acquainted and Learner Support |
| Aim of the topic: | This week aims at having the facilitators (e-moderators) and you introduce yourselves, get acquainted with each other, , navigate the university’s learning platform and get to know the rules of online learning which are called “Netiquettes” |
| This topic covers: | 1. Information about each other and learner support
2. Introducing yourself on the learning environment
3. Netiquette and its demonstration
4. Other necessary guidelines for online learning
 |
| Intended learning outcomes: | *At the end of this* ***topic****, you will be able to:*1. Identify learner support systems that are available to you
2. Introduce yourself on the learning environment
3. Demonstrate your understanding of Netiquette in an online learning
4. Suggest other necessary rules for an online learning
 |

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| Overview of student activity: | 1. Getting yourself acquainted with the learner support systems that are available
2. Introducing yourself to your fellow students on the forum
3. Writing any five rules you understood from the Netiquette
4. Suggesting other necessary rules that are worth considering in an online learning
 |

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| **Constructive alignment of unit level outcomes with module level outcomes, learning activities and assessment***(Pressing <Tab> at the end of the table will provide additional rows in the table, if required.)* |
| Intended unit learning outcomes: | No of module-level outcome | Activity where students engage with this outcome | Where and how is this outcome assessed? |
| ***At the end of this unit, you will be able to:*** |
| 1. Identify learner support systems that are available to you
 |  | E tivity 0. 1 | The welcome forum |
| 1. Introduce yourself on your learning environment
 |  | E tivity 0.2 | Interactions on the discussion forum |
| 1. Demonstrate your understanding of Netiquette
 |  | E tivity 0.3 | Interactions on the discussion forum |
| 1. Suggest other necessary rules for an online learning
 |  | E tivity 0.4 | Interactions on the discussion forum |

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| Detailed explanation of ALL student and teacher engagement with the unit:***(This should be presented in the order that the activities take place. So if students do work* online *beforecoming to the lecture, that should be shown ahead of what happens in class.******If there is more than one opportunity for face-to-face contact, or more than one online task, there should be a separate section for each instance, and they should be presented in the template in the same order that students encounter them.)******Content*** *– such as lecture material – can EITHER be shown here OR added as* ***clearly identifiable*** *addenda to the document. If you plan to use addenda, you should ensure that these are cross-referenced in this section.)* |
| Module-level outcomes addressed: |
| Week 0 is an orientation week for you. You will identify the available support systems and socialize online with your facilitators and fellow students.  |
| Purpose of the unit/week/section: |
| This Unit is intended to assist you learn how to navigate through the learning management system (LMS) and get acquainted with the learner support systems, know your course facilitators and fellow students and finally familiarize yourself with netiquette (rules for online learning). |
| Over to you: *(a description of the process of the section)* |
| In the course of this week’s lesson, we will be exploring the learner support systems together for familiarization, then you will learn about the netiquette in order to apply it during the online e-tivities and familiarize yourself with other members of your class |
| Pre-topic activity: |  Number of hours | 1/3 of an hour |
| Familiarize yourself with the learning management system |
| Face to face time: *(if applicable)* | Number of hours | 2/3 |
| The course facilitators shall meet with you in the ICT lab to assist you navigate the learning management system without much difficulty. You shall also be presented with a general overview of the course and prospects of blended learning |
| Online activity: | Number of hours | 2/3 |
| What should students do? | E –tivity 0.1Having got yourself familiarized with the learning management system, identify any 3 learner support systems that are available to you. |
| Where do they do it? | E-tivity 0.1 forum for discussion |
| By when should they do it? | By end of the first day of week 0 |
| E-moderator/tutor role |
| E-moderator reads through the learners posts, encouraging the lurkers to be active and providing clarification on the usefulness of the services |
| How are the learning outcomes in this unit assessed? |  Number of hours | 1/3 |
| Through the postings that will be made by students on the platform and their correctness |
| How does this section link to other sections of the module? |
| This section introduces you to the learner support systems which would enhance your learning in the course of this module |

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| Online activity: | Number of hours | 1/3 |
| What should students do? | E –tivity 0.21. Introduce yourself to your colleagues on the discussion board using a brief bio that;
2. Tells other students something about your background
3. Explains why you chose to read a course in the Sciences
4. Describes whom you dream to become after your university education
5. Post your bio on the discussion forum E-tivity 0.2
6. Go through other students posts and comment on at least two bios, proposing possible ways you can be of great help to each other in order to realize those dreams
7. Post your proposal on the discussion forum for e-tivity 0.2
 |
| Where do they do it? | E-tivity 0.2 forum for discussion |
| By when should they do it? | By end of the second day of week 0 |
| E-moderator/tutor role |
| 1. E-moderator guides the students on the learning platform
2. Reads through the learners posts
3. Encourages the lurkers to be active and providing clarification on the usefulness of the services
 |
| How are the learning outcomes in this unit assessed? |  Number of hours | 1/3 |
| Through students’ postings on the platform and their correctness |
| How does this section link to other sections of the module? |
| This section introduces you to the learner support systems which would enhance your learning in the course of this module |
| Online activity: | Number of hours | 1/3 |
| What should students do? | E –tivity 0.31. Read through the Netiquette which is posted on the discussion forum 0.3
2. Summarize any five behaviours that guide an online learning
3. Post your work on the discussion forum 0.3
4. Read through two other colleague’s posts and suggest what might be added to improve their understanding of Netiquette
 |
| Where do they do it? | E-tivity 0.3 forum for discussion |
| By when should they do it? | By end of the third day of week 0 |
| E-moderator/tutor role |
| E-moderator reads through learners posts, encouraging the lurkers to be active and provides clarification on the usefulness of the services |
| How are the learning outcomes in this unit assessed? |  Number of hours |  |
| Through students postings on the platform |
| How does this section link to other sections of the module? |
| This section would be useful in your understanding of the acceptable behaviours in an online learning  |
| Online activity: | Number of hours | 1/3 |
| What should students do? | E –tivity 0.4Read through the Netiquette once again; 1. Suggest few other acceptable behaviour that should govern an online learning but were not captured in the netiquette list
2. Share your suggestion with any classmate of your choice and discuss why you consider those points strongly
3. You might need to strike out any point that lacks merit. Post what ever that is left in your list on the discussion forum 0.4
 |
| Where do they do it? | E-tivity 0.4 forum for discussion |
| By when should they do it? | By end of the fifth day of week 0 |
| E-moderator/tutor role |
| E-moderator encourages lurkers to participate |
| How are the learning outcomes in this unit assessed? |  Number of hours |  |
| Through students postings  |
| How does this section link to other sections of the module? |
| This section introduces you to additional rules for online learning |

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| = Total number of hours | 3 hours |

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| **Some important questions** |
| Which learning resources/ references will scaffold the students’ learning? | The blended module course outline |
| How are students enabled to access the resources? | Links to the relevant Open Educational Resource materials shall be provided for them  |
| Where in this unit are students expected to work collaboratively? | On the e-tivities, commenting on each other’s post |
| How has an inclusive approach been incorporated in this unit? | Students are involved in various activities, get acquainted with each other |
| How will feedback on unit be obtained from students? | Through their post on the discussion forum |
| How will student feedback be used to improve unit? | The feedbacks from their posts shall be utilized by the e-moderator to modify the contents of the units and its e-tivities for improved outcomes |
| At which point(s) will students receive formative feedback on the work they have done in the unit? | By the end of this week’s unit (Unit 0) |

UNIT/WEEK/SECTION-LEVEL TEMPLATE

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| **Unit-level overview** | **Unit/week/section** |  |
| Topic name: | Introduction to Computer Programming and Programming Language |
| Aim of the topic: | This unit aims at introducing you to the types of computer programming, differentiating between system programming and application programming |
| This topic covers: | 1. Definition of computer programming
2. Types of computer programming
3. System Programming and Application Programming
4. Translators (Machine, Assembly and Object oriented Language)
 |
| Intended learning outcomes: | *At the end of this* ***topic****, you will be able to:*1. Define the term “computer programming”
2. Identify the types of computer programming
3. Differentiate between system programming and application programming
4. Choose the most suitable translator for a programming Language
 |

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| Overview of student activity: | You would be provided with a link <https://books.trinket.io/thinkjava/chapter1.html#sec8> to an online article titled “The way of the Program” by Park et al (2020). You will read it to prepare yourself for an engagement with the learning tasks for e-tivity 1.1, 1.2, 1.3 and 1.4 aimed at helping you achieve the intended learning outcomes for topic 1 |

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| **Constructive alignment of unit level outcomes with module level outcomes, learning activities and assessment***(Pressing <Tab> at the end of the table will provide additional rows in the table, if required.)* |
| Intended unit learning outcomes: | No of module-level outcome | Activity where students engage with this outcome | Where and how is this outcome assessed? |
| ***At the end of this unit, you will be able to:*** |
| 1. Summarize the term “Computer Programming” in your own words | 1 | E tivity 1.1 | Brief summary note on the LMS |
| 2. Identify the types of computer programming | 1 | E tivity 1.2 | Multiple choice question on the LMS |
| 3. Differentiate between system programming and application programming | 1 | E tivity 1.3 | Brief summary on the LMS |
| 4.Choose the most suitable translator for a programming language | 1 | E-tivity 1.4 | Take home assignment to be presnted in the class |

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| Detailed explanation of ALL student and teacher engagement with the unit:***(This should be presented in the order that the activities take place. So if students do work* online *beforecoming to the lecture, that should be shown ahead of what happens in class.******If there is more than one opportunity for face-to-face contact, or more than one online task, there should be a separate section for each instance, and they should be presented in the template in the same order that students encounter them.)******Content*** *– such as lecture material – can EITHER be shown here OR added as* ***clearly identifiable*** *addenda to the document. If you plan to use addenda, you should ensure that these are cross-referenced in this section.)* |
| Module-level outcomes addressed: |
| Module –Level Learning outcome 1 |
| Purpose of the unit/week/section: |
| Purpose of this week’s unit is to help you as a programmer to be, appreciate what programming language is in general, understand the features and modalities that make up programming, differentiate between system programming and application programming and be able to choose the most suitable translator for a programming Language |
| Over to you: *(a description of the process of the section)* |
| In this unit, you will work in groups of ten for an oral and video presentation. You will meet with fellow colleagues in the face to face classroom to sharpen your ideas and make presentations on how to achieve your dreams after studying this course. The facilitator (teacher) will introduce to you what “Computer Programming and Programming Language” are. Thereafter, you will Summarize the term “Computer Programming” in your own words, Identify the types of computer programming, differentiate between system programming and application programming and post your work on the designated e tivity platforms at the appropriate time. As a group, you will make and present to your colleagues a short video demonstrating the suitability of the translator you have chosen for a programming language |
| Pre-topic activity: | Number of hours | 1/3 |
| 1. Reflect on your dream of becoming a computer programmer after reading this course.
2. Itemize the things you will need to do in order to achieve this big dream
3. Create a portfolio for this course
4. Post what you have written in your portfolio in readiness for a class presentation
 |
| Face to face time: *(if applicable)* | Number of hours | 1/3 |
| Before going online;1. You will work in groups of ten to analyse the ideas you have put down on what roles you would play in order to realize your dreams of becoming computer programmers.
2. Discuss one specific thing you consider worth doing to help each other in actualizing this dream
 |
| Online activity: | Number of hours | 1/3 |
| What should students do? | E tivity 1.1Read pages 11 -12 of this article <https://alg.manifoldapp.org/system/actioncallout/938a51a2-1c34-4867-b15f-3b24ee27bc4f/attachment/original-e8823f7f6c7fd593a70478f2cbb5b1b3.pdf>titled “Programming Fundamentals” by Park et al (2020). 1. Make a brief summary note of half a page describing what you have understood as computer programming
2. Post what you have written on the discussion platform
3. Read through other students’ posts and see if there are useful ideas which you can adopt to improve your work
4. Review your summary note by adding the new points (if you consider it necessary)
5. Post your final work on the discussion forum

  |
| Where do they do it? | E tivity discussion forum 1.1 |
| By when should they do it? | By the end of first day in week 1  |
| E-moderator/tutor role |
| 1. Stimulate students to read the resource material
2. Summarize the comments for feedbacks
3. Close the discussion forum
 |
| How are the learning outcomes in this unit assessed? | Number of hours | 1/3 |
| The learning outcome will be assessed through their brief summary notes  |
| How does this section link to other sections of the module? |
| This section provides an introduction to the entire module and is linked to its other units  |
|  |  |

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| Online activity: | Number of hours | 1/2 |
| What should students do? | E tivity 1.2 Watch this 10 minutes video <https://www.youtube.com/watch?v=KJgsSFOSQv0> on computer programming language and read pages 11-12 of the article on this link titled “The way of the Program” by Park et al (2020)” <https://books.trinket.io/thinkjava/chapter1.html#sec8> 1. Identify the types of computer programming and give an example of each
2. Post your answers on discussion forum 1.2

Read through any two works that have been posted by your colleagues, bearing in mind “netiquettes”, make a constructive criticism on one of them, post your contribution to the discussion forum 1.2 |
| Where do they do it? | E tivity forum for 1.2 |
| By when should they do it? | By the end of day 2 of week 1 |
| E-moderator/tutor role |
| 1. Stimulate students to watch the video
2. Post comments on other students’ works for constructive feedbacks
3. Close the discussion forum
 |
| How are the learning outcomes in this unit assessed? |  Number of hours | 1/3 |
| Through a Multiple choice question on the LMS |
| How does this section link to other sections of the module? |
| This unit offers you a very good foundation to understand the different units in the module |
| Online activity: | Number of hours | 1/3 |
| What should students do? | E tivity 1.3Watch the 10 minutes video <https://www.youtube.com/watch?v=KJgsSFOSQv0> on computer programming language all over and;1. Differentiate between system programming and application programming in a short essay format
2. Illustrate a variable name, types name and functions name
3. Post your answers to discussion board 2.2
4. Provide positive and constructive feedback on differences between system programming and application programming on your colleagues posts
 |
| Where do they do it? | E tivity forum for 1.3 |
| By when should they do it? | By the end of 3rd day of week 1. |
| E-moderator/tutor role |
| 1. Stimulate students to watch the video and read the article
2. Post comments on other students’ works for constructive feedbacks
3. Close the discussion forum
 |
| How are the learning outcomes in this unit assessed? |  Number of hours | 1/3 |
| Brief summary on the LMS |
| How does this section link to other sections of the module? |
| This section would link you to units 3 and 4 of this module |
| Online activity: | Number of hours | 1/3 |
| What should students do? | E tivity 1.4You are to do the following take-home assignment;1. Choose the most suitable translator for a programming language
2. Make a video presentation to your class in the new week demonstrating the application of your chosen translator
3. Comment on the benefits of a translator that has been chosen by one colleague
4. Post your comments on the discussion forum e tivity 1.4
 |
| Where do they do it? | To be done as a class presentation during the face-to-face classroom meeting for week 2 and post comments on discussion forum 1.4 |
| By when should they do it? | By the end of the 1st day of the week 2 |
| E-moderator/tutor role |
| 1. Encourage all lurkers to participate effectively
2. Post comments on other students’ works for constructive feedbacks
3. Close the discussion forum
 |
| How are the learning outcomes in this unit assessed? |  Number of hours | 1/6 |
| The learning outcome will be assessed as a take home assignment which will be presented in the class |
| How does this section link to other sections of the module? |
| The section is connected to other units of the module through the provision of the basic foundation knowledge in programming language |
| = Total number of hours | 3 hours |

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| **Some important questions** |
| Which learning resources/ references will scaffold the students’ learning? | The resource material link and the video link as well |
| How are students enabled to access the resources? | Through the institutional LMS and the provided links |
| Where in this unit are students expected to work collaboratively? | In the discussion forum for e tivity 1.1, 1.2, 1.3 and 1.4 |
| How has an inclusive approach been incorporated in this unit? | 1. Varied activities for the learners
2. E-moderator prompting the lurkers to do the needful
 |
| How will feedback on unit be obtained from students? | Through online posts on the discussion forum and the take home assignment |
| How will student feedback be used to improve unit? | 1. By using students feedbacks to establish their level of achieving the stated learning objectives
2. By considering other issues raised by students for improvement of the unit
 |
| At which point(s) will students receive formative feedback on the work they have done in the unit? |  By the end of the 1st week |

END OF UNIT/WEEK/SECTION-LEVEL TEMPLATE

UNIT/WEEK/SECTION-LEVEL TEMPLATE

UNIT/WEEK/SECTION-LEVEL TEMPLATE

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| --- | --- | --- |
| **Unit-level overview** | **Unit/week/section** | **2** |
| Topic name: | Programming Algorithm Development |
| Aim of the topic: | The aim of this unit is to develop knowledge base in algorithm writing which is key to successful programming and the steps involved toward problem solving |
| This topic covers: | * Meaning and types of algorithm
* Algorithm design techniques
 |
| Intended learning outcomes: | *At the end of this* ***topic****, you will be able to:*1. Identify the steps in algorithm development
2. Apply various algorithm techniques to problem solving
 |

|  |  |
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| Overview of student activity: | You will be given a 10 minutes short video <http://youtu.be/oa_ZQxlrP6w> on Introduction to Algorithm development .This will give a better understanding to programming algorithm development. The student based on the material answers some e-tivity question. Furthermore, the student identifies his group for the module in which they collaborative develop an algorithm reading the material [Algorithm Flowchart (tutorialspoint.com)](https://www.tutorialspoint.com/basics_of_computer_science/basics_of_computer_science_algorithm_flowchart.htm) on algorithm flowchart and further reflects on how algorithm development affects successful programming in solving real world problems and changing operational processes. |

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| **Constructive alignment of unit level outcomes with module level outcomes, learning activities and assessment***(Pressing <Tab> at the end of the table will provide additional rows in the table, if required.)* |
| Intended unit learning outcomes: | No of module-level outcome | Activity where students engage with this outcome | Where and how is this outcome assessed? |
| ***At the end of this unit, you will be able to:*** |
| 1. Identify the steps in algorithm development
 | 1 | E-tivity 2.1 | The assignment will be done online on the LMS in which the student will watch a video and answer some questions which will be submitted on the LMS |
| 1. Apply various algorithm techniques to problem solving
 | 1 | E-tivity 2.2 | The student in a group will develop an algorithm on a particular real life problem and reading a material on algorithm flowchart noting his contributions to the development. Furthermore, writes down his opinion on how algorithm development affects successful program development  |

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| Detailed explanation of ALL student and teacher engagement with the unit:***(This should be presented in the order that the activities take place. So if students do work* online *before coming to the lecture, that should be shown ahead of what happens in class.******If there is more than one opportunity for face-to-face contact, or more than one online task, there should be a separate section for each instance, and they should be presented in the template in the same order that students encounter them.)******Content*** *– such as lecture material – can EITHER be shown here OR added as* ***clearly identifiable*** *addenda to the document. If you plan to use addenda, you should ensure that these are cross-referenced in this section.)* |
| Module-level outcomes addressed: 1 |
| Apply various algorithm design techniques to problem solving  |
| Purpose of the unit/week/section: |
| The purpose of this activity is to ensure that you develop a firm grip of programming algorithm development and apply same in writing algorithms towards program writing used in problem solving and process changing. |
| Over to you: *(a description of the process of the section)* |
| PART 11. In this week, you will learn basic concepts in algorithm development and understanding. This is divided into two parts.
2. First, you will be given a 10 minutes short video <http://youtu.be/oa_ZQxlrP6w> on Introduction to Algorithm development. Based on the material answers the following questions
3. Outline five steps in problem solving
4. Define a real life problem scenario and create a pseudo code algorithm
5. Develop a flowchart for ii above
6. Make your submission on the LMS

PART 21. The students reads the material [Algorithm Flowchart (tutorialspoint.com)](https://www.tutorialspoint.com/basics_of_computer_science/basics_of_computer_science_algorithm_flowchart.htm) on algorithm flowchart
2. Then identifies his group for the module in order work collaboratively with group members
3. As a group, develop an algorithm
4. Finally, reflects on how algorithm development affects successful programming in solving real world problems and changing operational processes.
5. Notes contribution to group project algorithm and
6. Submits both contributions to group project and reflections on the LMS
 |
| Pre-topic activity:  |  Number of hours | 1/2 |
| 1. Read the material onhttp://sofia.cs.vt.edu/cs1114-ebooklet/chapter4.html
2. Describe the step in algorithm development
3. Reflect on improvement areas in algorithm development as a future programmer
 |
| Face to face time: *(if applicable)* | Number of hours | 1/2 |
| Presentation of group assignment and each student defending contribution to the project development |
| Online activity: | Number of hours | 1/2 |
| What should students do? | E-tivity 4.11. You will be given a 10 minutes short video <http://youtu.be/oa_ZQxlrP6w> on Introduction to Algorithm development. Based on the material answers the following questions
2. Outline five steps in problem solving
3. Define a real life problem scenario and create a pseudo code algorithm
4. Develop a flowchart for ii above
5. Make your submission on the LMS
 |
| Where do they do it? | The student will do it on the Learning management System and post on the e-tivity 2.1  |
| By when should they do it? | The deadline for submission is on Tuesday of the 2th week  |
| E-moderator/tutor role |
| 1. The e-moderator sends reminder for deadline submissions
2. Evaluates student submission and gives general feedback based on general student submissions
3. Encourages student in why algorithm development aids successful programming
 |
| How are the learning outcomes in this unit assessed? |  Number of hours | 1/2 |
| The learning outcomes are assessed through the student e-tivity submission  |
| How does this section link to other sections of the module? |
| This section links to unit 1 |

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| Online activity: | Number of hours | 1/2 |
| What should students do? | E-tivity 2.21. The students reads the material [Algorithm Flowchart (tutorialspoint.com)](https://www.tutorialspoint.com/basics_of_computer_science/basics_of_computer_science_algorithm_flowchart.htm) on algorithm flowchart
2. Identifies his group for the module
3. As a group, develop an algorithm
4. Finally, reflects on how algorithm development affects successful programming in solving real world problems and changing operational processes.
5. Notes contributions to group algorithm development and submit both the contributions to group project and your reflections on the LMS e-tivity 2.2
 |
| Where do they do it? | As a take home group assignment and submit on the Learning management System and submit. Group performance evaluations will be displayed on the discussion board for comments, questions and contributions |
| By when should they do it? | By Friday of the 2th week |
| E-moderator/tutor role |
| The e-moderator evaluates student group assessment and individualized contributions with the reflection and gives appropriate guide and student contributions on the discussion board |
| How are the learning outcomes in this unit assessed? |  Number of hours | 1/2 |
| The learning outcomes are assessed through group submissions and individualized contributions |
| How does this section link to other sections of the module? |
| This section links to unit 1 |

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| = Total number of hours | 3 hours |

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| **Some important questions** |
| Which learning resources/ references will scaffold the students’ learning? | A 10-minutes video and a resource material/reading material link  |
| How are students enabled to access the resources? | Through their institutional LMS with their individual log in details |
| Where in this unit are students expected to work collaboratively? | In the Take Home assignment of e-tivity 2.2 |
| How has an inclusive approach been incorporated in this unit? | 1. Integration of multiple tasks
2. Grouping of students to accomplish a given task as a team
3. E-moderator guide based on student evaluation
 |
| How will feedback on unit be obtained from students? | Through online submissions and group tasks and the discussion board |
| How will student feedback be used to improve unit? | 1. By evaluating student submissions and using result to appraise learning outcomes
2. By feedback from the quality assurance team
 |
| At which point(s) will students receive formative feedback on the work they have done in the unit? | At the end of week 2 |

END OF UNIT/WEEK/SECTION-LEVEL TEMPLATE

*You should copy sufficient unit templates so that there is one for each unit of your module in the space below.*

UNIT/WEEK/SECTION-LEVEL TEMPLATE

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| **Unit-level overview** | **Unit/week/section** | **3** |
| Topic name: | Introduction to Problem solving |
| Aim of the topic: | The aim of this unit is to develop knowledge base and skills required problem solving and develop the ability to use various problem solving techniques. |
| This topic covers: | * Steps to problem solving
* Types of problem solving methods
* Application of problem solving methods to real life problems
 |
| Intended learning outcomes: | *At the end of this* ***topic****, you will be able to:*1. Demonstrate knowledge of steps and techniques in problem solving
2. Apply problem solving methods to real life problems
 |

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| Overview of student activity: | You will be given a 10 minutes short video <http://youtu.be/bZXDGQSuF9l> on Steps to program solving .This will give a better understanding on the step to solve problem in order not to create another problem. The student based on the material answers some e-tivity question. Reflect on how not getting the problem definition leads to creating another problem. Next, reads the material [UNIT 1 - Introduction to Problem Solving: Problem-solving strategies, Problem identification, - StuDocu](https://www.studocu.com/in/document/pondicherry-university/problem-solving-and-programming/unit-1-introduction-to-problem-solving-problem-solving-strategies-problem-identification/2204992) on Introduction to problem solving. Using an example, list 5 different techniques of problem solving and further reflects on critical thinking skills required for problem solving. Give reasons and note areas of improvement. Post it on the discussion board  |

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| **Constructive alignment of unit level outcomes with module level outcomes, learning activities and assessment***(Pressing <Tab> at the end of the table will provide additional rows in the table, if required.)* |
| Intended unit learning outcomes: | No of module-level outcome | Activity where students engage with this outcome | Where and how is this outcome assessed? |
| ***At the end of this unit, you will be able to:*** |
| 1. Demonstrate knowledge of steps and techniques in problem solving
 | 1 | E-tivity 3.1 | The assignment will be done online on the LMS in which the student will watch a video and answer some questions which will be submitted on the LMS |
| 1. Apply problem solving methods to real life problems
 | 1 | E-tivity 3.2 | The student will read a material and answer some questions and also reflect on critical thinking skill as a programmer noting areas of improvement and submit on the discussion board  |

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| Detailed explanation of ALL student and teacher engagement with the unit:***(This should be presented in the order that the activities take place. So if students do work* online *before coming to the lecture, that should be shown ahead of what happens in class.******If there is more than one opportunity for face-to-face contact, or more than one online task, there should be a separate section for each instance, and they should be presented in the template in the same order that students encounter them.)******Content*** *– such as lecture material – can EITHER be shown here OR added as* ***clearly identifiable*** *addenda to the document. If you plan to use addenda, you should ensure that these are cross-referenced in this section.)* |
| Module-level outcomes addressed: 1 |
| Apply various problem solving techniques to problem solving  |
| Purpose of the unit/week/section: |
| The purpose of this activity is to ensure that you develop a firm grip on problem solving techniques and developing the ability to apply it in real life problem solving. |
| Over to you: *(a description of the process of the section)* |
| PART 11. You will be given a 10 minutes short video <http://youtu.be/bZXDGQSuF9l> on Steps to program solving.
2. The student based on the material answers some e-tivity 3.1 questions.
3. Describe four problem solving techniques you have learnt in this unit
4. List the steps in problem solving you intend to use in any of the techniques
5. Reflect on how this techniques influence problem solving
6. Submit E-tivity 3.1 on the LMS

PART 21. The student reads the material [UNIT 1 - Introduction to Problem Solving: Problem-solving strategies, Problem identification, - StuDocu](https://www.studocu.com/in/document/pondicherry-university/problem-solving-and-programming/unit-1-introduction-to-problem-solving-problem-solving-strategies-problem-identification/2204992) on Introduction to problem solving.
2. Using an example, lists 5 different techniques of problem solving
3. Submits assignment on E-tivity 3.2
4. Further, reflects on critical thinking skills required for problem solving giving reasons and noting areas of improvement.
5. Post it on the discussion board
 |
| Pre-topic activity:  |  Number of hours | 1 |
| 1. Watch the video <https://youtu.be/_vS_b7cJn2A?t=42> on how to solve complex problems
2. Reflect on skills to required for problem solving
3. Reflect on improvement areas in algorithm development as a future programmer
 |
| Face to face time: *(if applicable)* | Number of hours |  |
|  |
| Online activity: | Number of hours | 1/2 |
| What should students do? | E-tivity 3.11. You will be given a 10 minutes short video <http://youtu.be/bZXDGQSuF9l> on Steps to program solving.
2. The student based on the material answers some e-tivity 3.1 questions.
3. Describe four problem solving techniques you have learnt in this unit
4. List the steps in problem solving you intend to use in any of the techniques
5. Reflect on how this techniques influence problem solving
6. Submit on E-tivity 3.1 on the LMS
 |
| Where do they do it? | The student will do it on the Learning management System and post on the e-tivity 3.1 assignment and the reflection on the discussion  |
| By when should they do it? | The deadline for submission is on Tuesday of the 3th week  |
| E-moderator/tutor role |
| 1. The e-moderator sends reminder for deadline submissions
2. Evaluates student submission and gives feedback based on student submission
3. Gives a spark on critical thinking required on the discussion board
 |
| How are the learning outcomes in this unit assessed? |  Number of hours | 1/2 |
| The learning outcomes are assessed through the student e-tivity submission  |
| How does this section link to other sections of the module? |
| This section links to unit 1,2 |

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| Online activity: | Number of hours | 1/2 |
| What should students do? | E-tivity 3.21. The student reads the material [UNIT 1 - Introduction to Problem Solving: Problem-solving strategies, Problem identification, - StuDocu](https://www.studocu.com/in/document/pondicherry-university/problem-solving-and-programming/unit-1-introduction-to-problem-solving-problem-solving-strategies-problem-identification/2204992) on Introduction to problem solving.
2. Using an example, lists 5 different techniques of problem solving
3. Submits assignment on E-tivity 3.2
4. Further, reflects on critical thinking skills required for problem solving giving reasons and noting areas of improvement which is placed on the discussion board
5. Posts on the discussion Board
 |
| Where do they do it? | As a take home group assignment and submit on the Learning management System and submit on the LMS |
| By when should they do it? | By Friday of the 2th week |
| E-moderator/tutor role |
| The e-moderator evaluates student group assessment and individualized contributions with the reflection and gives appropriate guide and student contributions on the discussion board |
| How are the learning outcomes in this unit assessed? |  Number of hours | 1/2 |
| The learning outcomes are assessed through student submission andassignments  |
| How does this section link to other sections of the module? |
| This section links to unit 1,2 |

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| = Total number of hours | 3 hours |

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| **Some important questions** |
| Which learning resources/ references will scaffold the students’ learning? | A 10-minutes video and a resource material/reading material link  |
| How are students enabled to access the resources? | Through their institutional LMS with their individual log in details |
| Where in this unit are students expected to work collaboratively? | In the discussions on the discussion board of e-tivity 3.1 and 3.2 |
| How has an inclusive approach been incorporated in this unit? | 1. Integration of multiple tasks
2. Discussion board sharing of information and brainstorming
3. E-moderator guide based on student evaluation
 |
| How will feedback on unit be obtained from students? | Through online submissions, and e-tivities |
| How will student feedback be used to improve unit? | 1. By evaluating student submissions and using result to appraise learning outcomes
2. By feedback from the quality assurance team
 |
| At which point(s) will students receive formative feedback on the work they have done in the unit? | At the end of week 3 |

END OF UNIT/WEEK/SECTION-LEVEL TEMPLATE

*You should copy sufficient unit templates so that there is one for each unit of your module in the space below.*

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| **Unit-level overview** | **Unit/week/section** | **4** |
| Topic name: | Programming Fundamentals and Control Structures |
| Aim of the topic: | The aim of this unit is to develop knowledge base and skill in basic programming and applying same in solutions to real life problems using a combination of various control structures. You will cover topics such as basic concepts in programming, data types, flow control structures and debugging |
| This topic covers: | * Basic concepts in programming
* Data Types
* Flow Control Structures
* Debugging
 |
| Intended learning outcomes: | *At the end of this* ***topic****, you will be able to:*1. Apply basic programming concepts to real life problem solving
2. Describe various data types
3. Develop programs using various control structures
4. Demonstrate knowledge of C or C++ in debugging
 |

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| Intended unit learning outcomes: | No of module-level outcome | Activity where students engage with this outcome | Where and how is this outcome assessed? |
| ***At the end of this unit, you will be able to:*** |
| 1. Apply basic programming concepts to real life problem solving
 | 1 | E-tivity 4.1 | The assignment will be done online on the LMS in which the student will make a short note of 200 words in explaining some basic concepts in programming and submitted online |
| 1. Describe various data types
 | 2 | E-tivity 4.2 | This learning outcome is done and accessed online by the student taking a quiz on various data types and identifying scenarios when they are used  |
| 1. Develop programs using various control structures
 | 2 | E-tivity 4.3 | This is a take home assignment. This learning outcome will be assessed online through a feedback from the e-moderator. The student will identify a particular real life problem and apply various control structures in program writing which is submitted on the LMS and feedback from e-moderator given in three days.  |
| 1. Demonstrate knowledge of C or C++ in debugging
 | 3 | E-tivity 4.4 | The learning outcome will be accessed online by identifying bugs in a particular given program on the LMS  |

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| Overview of student activity: | You will be given an online preparatory material titled “Computer programming and programming Language” and also watch a six minutes video. Both will avail you a better understanding on basic programming concepts and control structures you will require to write programs towards problem solving. This will prepare you for the tasks ahead to achieve the intended learning outcomes |

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| Detailed explanation of ALL student and teacher engagement with the unit:***(This should be presented in the order that the activities take place. So if students do work* online *before coming to the lecture, that should be shown ahead of what happens in class.******If there is more than one opportunity for face-to-face contact, or more than one online task, there should be a separate section for each instance, and they should be presented in the template in the same order that students encounter them.)******Content*** *– such as lecture material – can EITHER be shown here OR added as* ***clearly identifiable*** *addenda to the document. If you plan to use addenda, you should ensure that these are cross-referenced in this section.)* |
| Module-level outcomes addressed: 2,4 |
| Develop programs using various control structures in problem solving and appropriately generate a documentation report  |
| Purpose of the unit/week/section: |
| The purpose of this activity is to ensure that you will develop a firm grip of basic programming concepts, develop skills required to determine the suitability in combining various control structures in real life problem solving and application development towards problem solving and being self reliant. |
| Over to you: *(a description of the process of the section)* |
| 1. In this week, you will learn basic concepts in programming, various data types, control structures and how to identify bugs in programming. This section is in five parts
2. First, you will be provided with an online <https://books.trinket.io/thinkjava/chapter7.html> and [C++ Loop Types (tutorialspoint.com)](https://www.tutorialspoint.com/cplusplus/cpp_loop_types.htm) to read.
3. Reflect on it and summarize in your words the basic programming concepts needed in problem solving
4. Secondly, you will attempt an online quiz on basic programming concepts and control structures on the Learning management system. At the end of the quiz, submit your answers.
5. Thirdly, as a take home assignment, you will identify a particular real life problem and apply the knowledge acquired in the week to write a program in solving that particular real life problem using a combination of various control structures. In three days, you will submit the assignment in order to receive feedback from the e-moderator
6. Given a particular program written in C or C++ on the LMS, identify bugs and debug by correctly rewriting them.
7. Lastly, reflect on how these skills will help your career as a programmer in future and submit on the discussion board
 |
| Pre-topic activity:  |  Number of hours | 1/4 |
| 1. Watch this ten minutes video on programming concepts on <https://www.youtube.com/watch?v=pQKPUD4_6gA>
2. Summarize basic programming concepts and reflect on how it can be used in problem solving
 |
| Face to face time: *(if applicable)* | Number of hours |  |
|  |
| Online activity: | Number of hours | 1/4 |
| What should students do? | E-tivity 4.11. Read the material <https://books.trinket.io/thinkjava/chapter7.html>, [C++ Loop Types (tutorialspoint.com)](https://www.tutorialspoint.com/cplusplus/cpp_loop_types.htm) and make a summary note of not more than 200 words explaining the basic concept in programming used in problem solving
2. Post your summary note on the discussion forum
3. Read through other submissions and note gray areas/omissions in your previous submission
4. Review you submission and resubmit highlighting areas of your review
 |
| Where do they do it? | The student will do it on the Learning management System and post on the e-tivity 4.1 discussion board |
| By when should they do it? | The deadline for submission is on Tuesday of the 4th week  |
| E-moderator/tutor role |
| 1. The e-moderator sends reminder for deadline submissions
2. Gives a general feedback based on student submissions
3. Finally sends specific feedback to the student based on submission which is given within 3 days after submission deadline.
 |
| How are the learning outcomes in this unit assessed? |  Number of hours | 1/2 |
| The learning outcomes are assessed through the individualized summary notes with the feedback  |
| How does this section link to other sections of the module? |
| This section links to unit 1,2,3 |

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| Online activity: | Number of hours | 1/2 |
| What should students do? | E-tivity 4.21. You will do an online multiple choice [quiz.](MODULE%20UNIT%204%20QUIZ.docx)
2. Afterwards, you will submit your quiz on the LMS
 |
| Where do they do it? | The student will do it on the Learning management System and submit. Performance assessment will be displayed |
| By when should they do it? | By Wednesday of the 4th week |
| E-moderator/tutor role |
| The e-moderator evaluates student assessment performance and gives appropriate guide. |
| How are the learning outcomes in this unit assessed? |  Number of hours | 1/2 |
| The learning outcomes are assessed through the multi choice quiz  |
| How does this section link to other sections of the module? |
| This section links to unit 1,2,3 |
|  |
| Online activity: | Number of hours | 3/4 |
| What should students do? | E-tivity 4.31. You will be batched in groups of 5
2. You will do a take home assignment in which each group will identify a particular real life problem
3. Apply the knowledge acquired in the week to write a program in solving that particular real life problem using a combination of various control structures.
4. In three days, your group leader will submit the assignment and feedback will be received from the e-moderator
 |
| Where do they do it? | At an agreed private study time of each group and submitted on the Learning management System( LMS) e-tivity 4.3  |
| By when should they do it? | The deadline for submission is on Thursday of the 4th week |
| E-moderator/tutor role |
| 1. The e-moderator evaluates each submission
2. Gives a feedback on student group submission within 3 days of the submission deadline.
3. Makes general comments/guide on the discussion board based on group assessment
 |
| How are the learning outcomes in this unit assessed? |  Number of hours | 1/2 |
| The learning outcomes are assessed through student group program writing in problem solving using acquired knowledge  |
| How does this section link to other sections of the module? |
| This section links to unit 1,2,3 |
|  |
| Online activity: | Number of hours | 1/4 |
| What should students do? | Etivity 4.41. Carefully study the given program
2. Demonstrate your knowledge of C++ by identifying bugs
3. List out the identified bugs
4. Post the identified bugs on the discussion board
 |
| Where do they do it? | The student will do it on the Learning management System on E-tivity 4.4 and post on the discussion board for critique |
| By when should they do it? | The deadline for submission is on Friday of the 4th week |
| E-moderator/tutor role |
| 1. The e-moderator at the background evaluates the student submission
2. Gives feedback based on student submission
3. Makes general guide and clarifications based on student submission
4. Gives link for further reading for more understanding and clarification.
 |
| How are the learning outcomes in this unit assessed? |  Number of hours | 1/2 |
| The learning outcomes are assessed through the student ability to demonstrate knowledge of C++ to identify bugs |
| How does this section link to other sections of the module? |
| This section links to unit 1,2,3 |

|  |  |
| --- | --- |
| = Total number of hours | 3 hours |

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| **Some important questions** |
| Which learning resources/ references will scaffold the students’ learning? | A 6-minutes video and a resource material/reading material link  |
| How are students enabled to access the resources? | Through their institutional LMS with their individual log in details |
| Where in this unit are students expected to work collaboratively? | In the Take Home assignment of e-tivity 4.3 |
| How has an inclusive approach been incorporated in this unit? | 1. Integration of multiple tasks
2. Grouping of students to accomplish a given task as a team
3. E-moderator guide based on student evaluation
 |
| How will feedback on unit be obtained from students? | Through online submissions and group tasks and the discussion board |
| How will student feedback be used to improve unit? | 1. By evaluating student submissions and using result to appraise learning outcomes
2. By feedback from the quality assurance team
 |
| At which point(s) will students receive formative feedback on the work they have done in the unit? | At the end of week 4 |

END OF UNIT/WEEK/SECTION-LEVEL TEMPLATE

*You should copy sufficient unit templates so that there is one for each unit of your module in the space below.*

UNIT/WEEK/SECTION-LEVEL TEMPLATE

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| --- | --- | --- |
| **Unit-level overview** | **Unit/week/section** | **5** |
| Topic name: | Introduction to C or C++ |
| Aim of the topic: | To introduce students to coding environments  |
| This topic covers: | * The coding environment
* Variable declaration and IDE
 |
| Intended learning outcomes: | *At the end of this* ***topic****, you will be able to:*1. Launch a C or C++ in a coding environment
2. Generate executable codes in C or C++ coding environment
3. Combine variable declarations in problem solving
 |

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| --- | --- |
| Overview of student activity: | Through an online session, you will engage in activities that provide the requisite knowledge for launching a coding environment  |

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| **Constructive alignment of unit level outcomes with module level outcomes, learning activities and assessment***(Pressing <Tab> at the end of the table will provide additional rows in the table, if required.)* |
| Intended unit learning outcomes: | No of module-level outcome | Activity where students engage with this outcome | Where and how is this outcome assessed? |
| ***At the end of this unit, you will be able to:*** |
| 1. Design a coding environment
 | 2 | Develop a coding environment | The students shall be assessed online on their ability to Illustrate a model coding environment |
| 1. Analyse the integrated development environment ( IDE) in C or C++ environment
 | 3 | Appraise the ID in C or C++ environment | The step by step Justification of C or C++ environment as an appropriate coding environment shall be assessed through the class discussion forum online |
| 1. Declare a variable for a new coding environment
 | 2 | Construct a new variable identifier | An online assessment of how the students can combine their own variables to create a new coding environment  |

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| Detailed explanation of ALL student and teacher engagement with the unit:***(This should be presented in the order that the activities take place. So if students do work* online *beforecoming to the lecture, that should be shown ahead of what happens in class.******If there is more than one opportunity for face-to-face contact, or more than one online task, there should be a separate section for each instance, and they should be presented in the template in the same order that students encounter them.)******Content*** *– such as lecture material – can EITHER be shown here OR added as* ***clearly identifiable*** *addenda to the document. If you plan to use addenda, you should ensure that these are cross-referenced in this section.)* |
| Module-level outcomes addressed: 1 |
| Describe various problem solving techniques and algorithm design techniques |
| Purpose of the unit/week/section: |
| To develop the requisite skills for launching a coding environment |
| Over to you: *(a description of the process of the section)* |
| An inclusive online session for each of the discussion group on the step by step processes of developing a coding environment |
| Pre-topic activity: |  Number of hours | 1hr |
| The students shall preview some online videos on launching a coding environment |
| Face to face time: *(if applicable)* | Number of hours |  |
| N/A |
| Online activity: | Number of hours | 11/2 hrs |
| What should students do? | 1. You shall summarise the responses from the questions discussed by each group
2. Your group shall contribute in responding to the following questions:
3. What is coding?
4. Why is it important in programming?
5. Describe the processes involved in launching a coding environment
6. What factors contribute to generating executable codes
7. Can the C or C++ be said to be a profitable environment in coding?Why
 |
| Where do they do it? | These activities shall be done within the virtual learning environment accessible to each student |
| By when should they do it? | While the discussions go on during the online lecture, the summary of each student shall be sent to facilitators before the end of the day of the lecture(Wednesday ) |
| E-moderator/tutor role |
| The facilitator corrects the wrongly presented ideas by the discussants .  |
| How are the learning outcomes in this unit assessed? |  Number of hours | 1/2 hrs |
| The learning outcomes are assessed through the students ability to respond during the class question and answer sessions, illustrations on coding environment and summary by students. |
| How does this section link to other sections of the module? |
| This section enhances students problem solving skills in programming which is one of the aim of the module  |

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| = Total number of hours | 3hrs |

END OF UNIT/WEEK/SECTION-LEVEL TEMPLATE

UNIT/WEEK/SECTION-LEVEL TEMPLATE

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| **Unit-level overview** | **Unit/week/section** | **7** |
| Topic name: |  Designing and Coding, Debugging  |
| Aim of the topic: | This unit aims at equipping you with skills to demonstrate designing and coding in a programming, demonstrate debugging and identify the differences between the three terminologies in computer programming |
| This topic covers: | 1. Overview of coding
2. Types of design
3. Classes of error
4. Debugging strategies
 |
| Intended learning outcomes: | *At the end of this* ***topic****, you will be able to:*1. State the main ideas in coding
2. Identify the different types of design
3. Examine the classes of error in programming
4. Demonstrate how designing and coding can be applied to solve problem in a real life situation
 |

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| Overview of student activity: | 1. You will watch this video on “Coding and Debugging ” <https://www.coursera.org/lecture/3d-modeling-rhinoscript/debugging-lesson-RWc3h>
2. You will also read chapter 1.7, 1.8 and 1.9 of the book on this link <https://books.trinket.io/thinkjava/chapter1.html#sec8>
3. They will prepare you to engage with the learning tasks for e-tivity 7.1, 7.2, 7.3 and 7.4 aimed at helping you achieve the intended learning outcomes for topic 7.
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| **Constructive alignment of unit level outcomes with module level outcomes, learning activities and assessment***(Pressing <Tab> at the end of the table will provide additional rows in the table, if required.)* |
| Intended unit learning outcomes: | No of module-level outcome | Activity where students engage with this outcome | Where and how is this outcome assessed? |
| ***At the end of this unit, you will be able to:*** |
| 1. State the main ideas in coding
 | 3 | E tivity 7.1 | Short summary note on the LMS |
| 1. Identify the different types of design
 | 3 | E tivity 7.2 | Multiple choice test on LMS |
| 1. Examine the classes of error in programming
 | 3 | E tivity 7.3 | Short essay note on LMS |
| 1. Demonstrate how coding can be applied to solve problems in a real life situation
 | 3 | E tivity 7.4 | A video clip posted on LMS |

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| Detailed explanation of ALL student and teacher engagement with the unit:***(This should be presented in the order that the activities take place. So if students do work* online *beforecoming to the lecture, that should be shown ahead of what happens in class.******If there is more than one opportunity for face-to-face contact, or more than one online task, there should be a separate section for each instance, and they should be presented in the template in the same order that students encounter them.)******Content*** *– such as lecture material – can EITHER be shown here OR added as* ***clearly identifiable*** *addenda to the document. If you plan to use addenda, you should ensure that these are cross-referenced in this section.)* |
| Module-level outcomes addressed: 3 |
| To develop knowledge base of applying C or C++ in application development |
| Purpose of the unit/week/section: |
| Purpose of this week’s unit is to introduce you to the act of designing, Coding and Debugging in computer programming. This will enable you to write and design computer programmes, write programming codes that can be used to solve real life problems and write programmes to debug bugs.  |
| Over to you: *(a description of the process of the section)* |
| In this unit, You will meet with the facilitator in the face-to-face classroom for an introduction of the unit. You will be taken through the meaning and act of designing and coding in computer programming as well as debugging, the various types of programming design, classes of programming error and different debugging strategies you can deploy in order to become an effective programmer  |
| Pre-topic activity: |  Number of hours | 1/6 |
| It has always been said about computers that “what you key into it is what it brings out for you” in other words, garbage in garbage out (GIGO).Reflect on this statement and somewhat belief about the computer. In groups of ten students each, give an interpretation to above statement using two strong illustrations, post your comments on the discussion forum for e tivity 7.0. Read through one post that has been made by a colleague and mention why you think that his/her interpretation is correct. Post your comments on the e tivity platform for 7.0 |
| Face to face time: *(if applicable)* | Number of hours | 1/3 |
| This section shall come before the e tivities. The facilitator would meet with you in the class to;1. Explain the main ideas in coding, what coding entails and illustrations on how to generate programming codes
2. Identify the different types of design
3. Examine the classes of error in programming
4. Make a practical demonstrate of how designing and coding can be applied to solve problems in a real life situation
 |
| Online activity: | Number of hours | 1/3 |
| What should students do? | E tivity 7.1Watch this video on “Coding and Debugging ” <https://www.coursera.org/lecture/3d-modeling-rhinoscript/debugging-lesson-RWc3h> and read pages 17 and 18 of <https://alg.manifoldapp.org/system/actioncallout/938a51a2-1c34-4867-b15f-3b24ee27bc4f/attachment/original-e8823f7f6c7fd593a70478f2cbb5b1b3.pdf> titled “Programming Fundamentals”. Then;1. Use information gathered from the given video to explain your understanding of the main ideas in coding of a computer programme.
2. Post your work on the discussion forum for e tivity 7.1
3. Read through your colleague’s post and see if there are new ides in it that could be added to improve your work
4. Modify your work with the new ideas and post your final write up on the discussion forum for e tivity 7.1
 |
| Where do they do it? | Short summary note on the LMS |
| By when should they do it? | By end of 1st day in week 7 |
| E-moderator/tutor role |
| 1. E-moderator monitors the activities on the platform
2. Encourages everyone to revise his/her work
3. Closes the discussion forum
 |
| How are the learning outcomes in this unit assessed? |  Number of hours | 1/3 |
| Learning outcomes shall be addressed through a short summary note  |
| How does this section link to other sections of the module? |
| This section is linked to the other units of the module but especially the unit on introduction to problem solving methods |

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| Online activity: | Number of hours | 1/3 |
| What should students do? | E tivity 7.2With details and information you have acquired from the reading material and video; complete the multiple choice question (quiz) on the discussion forum for e tivity 7.2  |
| Where do they do it? | On the discussion forum for e-tivity 7.2 |
| By when should they do it? | By the end of 2nd day of week 7 |
| E-moderator/tutor role |
| 1. Opens the discussion forum for e tivity 7.2
2. Gives additional explanation on what are expected of the students
3. Grades and provides feedback on the forum
4. Closes the discussion board
 |
| How are the learning outcomes in this unit assessed? |  Number of hours | 1/6 |
| Through a multiple choice test |
| How does this section link to other sections of the module? |
| This section offers a foundation for understanding of c and c ++ programmes  |

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| Online activity: | Number of hours | 1/3 |
| What should students do? | E tivity 7.3Based on the information you have from the link and resource material; 1. Examine the classes of error in programming
2. Post your summary notes on e-tivity forum for 7.3
3. Read other people’s post and provide a constructive feedback that would improve their works
4. Be mindful of netiquette and ensure you abide by it
 |
| Where do they do it? | On the discussion forum for e tivity 7.3 |
| By when should they do it? | By the end of the 3rd day of week 7 |
| E-moderator/tutor role |
| 1. Summarize the threads
2. Provide feedback on the learning progress
3. Stimulate further learning and generation of new ideas
4. Close the discussion forum
 |
| How are the learning outcomes in this unit assessed? |  Number of hours | 1/3 |
| The learning process will be assessed through a Short essay  |
| How does this section link to other sections of the module? |
| This section has a link with other sections through the basic knowledge it offers the students for a better understanding of how to solve real life problems as programmers |
| Online activity: | Number of hours | 1/3 |
| What should students do? |  E tivity 7.41. Reflect on the information you gathered from the link and reading material
2. In groups of ten, make a video clip demonstrating how coding can be applied to solve problem in a real life situation
3. Post your video on the discussion forum for e tivity 7.4
4. Watch any two videos which have been made by your colleagues
5. Comment on the strength and weaknesses of the demonstration in one of the videos
6. Post your observation on the discussion forum for e tivity 7.4
 |
| Where do they do it? | A video clip posted on LMS |
| By when should they do it? | By the end of 5th day of week 7 |
| E-moderator/tutor role |
| 1. Provide feedback on the following students posts
2. Stimulate further learning and generation of new ideas
3. Close the discussion forum
 |
| How are the learning outcomes in this unit assessed? |  Number of hours | 1/3 |
| They shall be addressed through a video clip which they will make by themselves and post on LMS |
| How does this section link to other sections of the module? |
| The completion of this unit will introduce them to real situations where the knowledge and skills acquired could be applied effectively |
| = Total number of hours | 3hours |

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| **Some important questions** |
| Which learning resources/ references will scaffold the students’ learning? | The resource material link and the video link as well |
| How are students enabled to access the resources? | Through the institutional LMS and the provided links |
| Where in this unit are students expected to work collaboratively? | In the discussion forum for e tivity 7.1, 7.2, 7.3 and 7.4 |
| How has an inclusive approach been incorporated in this unit? | The students would be involved in different activities which would enhance inclusiveness |
| How will feedback on unit be obtained from students? | Through online posts on the discussion forum  |
| How will student feedback be used to improve unit? | Students feedbacks shall be reflected upon for use in enhancing the unit  |
| At which point(s) will students receive formative feedback on the work they have done in the unit? | By the end of week 7 |

UNIT/WEEK/SECTION-LEVEL TEMPLATE

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| **Unit-level overview** | **Unit/week/section** | **8** |
| Topic name: | Practical session and Mid-semester exam |
| Aim of the topic: | This section aims at availing you a wide range of opportunity to demonstrate what you have learnt in the past few weeks. You will demonstrate your skills in writing a computer command and variables that are executable.Afterwards, you shall participate in the mid-semester quiz which shall be graded |
| This topic covers: | 1. Practical session
2. Mid-semester quiz
 |
| Intended learning outcomes: | *At the end of this* ***topic****, you will be able to:*1. Demonstrate your understanding of the topics covered so far through practical sessions
2. Participate in a mid-semester quiz
 |

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| Overview of student activity: | You will be involved in some hands –on – activities this week specifically on writing programmes that are executable  |

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| **Constructive alignment of unit level outcomes with module level outcomes, learning activities and assessment***(Pressing <Tab> at the end of the table will provide additional rows in the table, if required.)* |
| Intended unit learning outcomes: | No of module-level outcome | Activity where students engage with this outcome | Where and how is this outcome assessed? |
| ***At the end of this unit, you will be able to:*** |
| 1. Work collaboratively in groups to demonstrate your understanding of the topics covered so far
 | 2 & 3 | E tivity 8.1 | Practical presentations on the LMS |
| 1. Participate in a mid semester quiz
 | 2 & 3 | Face to face mid-semester quiz | Combination of multiple choice questions and short essay questions in the class |

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| Detailed explanation of ALL student and teacher engagement with the unit:***(This should be presented in the order that the activities take place. So if students do work* online *beforecoming to the lecture, that should be shown ahead of what happens in class.******If there is more than one opportunity for face-to-face contact, or more than one online task, there should be a separate section for each instance, and they should be presented in the template in the same order that students encounter them.)******Content*** *– such as lecture material – can EITHER be shown here OR added as* ***clearly identifiable*** *addenda to the document. If you plan to use addenda, you should ensure that these are cross-referenced in this section.)* |
| Module-level outcomes addressed: |
| Unit addresses module level 2 and 3 |
| Purpose of the unit/week/section: |
| This section is more of a practical section. You would be giving the opportunity to demonstrate the act of writing executable programmes and codes which can be used to solve problems around you. Participating in the practical section will enhance your programming skills. Afterwards, you shall participate in the mid-semester quiz which shall be graded to contribute to your final semester grade  |
| Over to you: *(a description of the process of the section)* |
| In this unit, You will work in your normal groups to demonstrate some programming skills you have acquired in computer programming. You will design some C or C++ programmes and codes which could be used by you or someone else. You would also demonstrate some programming errors which you have been taught |
| Pre-topic activity: |  Number of hours | 1/2 |
| Reflect on the topics you have covered this past six weeks. Identify the topics that can be demonstrated in a practical session |
| Face to face time: *(if applicable)* | Number of hours | 1 |
| You wil participate in the mid semester quiz which shall be covering the different topics you have learnt so far |
| Online activity: | Number of hours | 1 |
| What should students do? | E tivity 8.1Having reflected on the topics you have been introduced to from week one till this week ;1. Frame two world problems
2. Work collaboratively in your groups to write executable programmes that would be used to solve those problems
3. Post the programmes you have developed on the discussion platform for e tivity 8.1 for colleagues’ critiques
4. Use the feedbacks you received to improve your programme
5. Save the document in your portfolio
 |
| Where do they do it? | On e tivity 8.1 platform |
| By when should they do it? | By the end of 3rd day of week 8 |
| E-moderator/tutor role |
| 1. E-moderator monitors the students submissions on the forum
2. Provides feedback on the students posts
3. Closes the discussion forum
 |
| How are the learning outcomes in this unit assessed? |  Number of hours | 1/2 |
| Through the posts of the students in the practical session |
| How does this section link to other sections of the module? |
| This section links to other units of the module having provided knowledge on how to create programmes  |

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| = Total number of hours | 3 hours |
| **Some important questions** |
| Which learning resources/ references will scaffold the students’ learning? | All the previous resource materials and links to videos  |
| How are students enabled to access the resources? | Through the institutional LMS  |
| Where in this unit are students expected to work collaboratively? | In the discussion forum for e tivity 8.1 |
| How has an inclusive approach been incorporated in this unit? | The students would work together in their groups to write executable programmes |
| How will feedback on unit be obtained from students? | Through online posts on the discussion forum  |
| How will student feedback be used to improve unit? | Students feedbacks shall be reflected upon for use in enhancing the unit  |
| At which point(s) will students receive formative feedback on the work they have done in the unit? | By the end of week 8 |

UNIT/WEEK/SECTION-LEVEL TEMPLATE

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| **Unit-level overview** | **Unit/week/section** | **9** |
| Topic name: | Practical session, applying some problem solving methods to solve real world problems |
| Aim of the topic: | The aim of the unit is to demonstrate and apply knowledge of C or C++ in real life problem solving in the coding environment using various problem solving methods, control structures and appropriate documenting same.  |
| This topic covers: | * A description of the coding environment
* Application of problem solving methods, control structures, debugging and documentation in program writing
 |
| Intended learning outcomes: | *At the end of this* ***topic****, you will be able to:*1. Demonstrate Knowledge of C or C++ in program writing and problem solving
2. Apply acquired skills in the coding environment to generate problem solution
3. Apply knowledge of C or C++ in debugging
4. Generate program documentation report
 |

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| Overview of student activity: | Watch a six minutes video on how to think like a programmer on <https://www.youtube,com/watch?v=rWM> and based on the video watched, answer some question that will be provided for you and submit on the LMS. This will prepare you to work collaboratively in writing program codes, using your knowledge of C ++ to identify bugs. Finally, you will reflect on steps you can take to become a problem solver |

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| **Constructive alignment of unit level outcomes with module level outcomes, learning activities and assessment***(Pressing <Tab> at the end of the table will provide additional rows in the table, if required.)* |
| Intended unit learning outcomes: | No of module-level outcome | Activity where students engage with this outcome | Where and how is this outcome assessed? |
| ***At the end of this unit, you will be able to:*** |
| 1. Demonstrate knowledge of C or C++ in program writing and problem solving  | 1 | E-tivity 9.1 | This is done face to face in the laboratory and the outcome is accessed by the ability of the student answer some question and reflect on program writing skills. |
| 2. Apply acquired skill in the coding environment to generate problem solution | 2 | E-tivity 9.2 | This is done face to face in the laboratory and the outcome accessed by the program group representation structure of the student in the coding environment |
| 3.Apply knowledge of C or C++ in debugging  | 2 | E-tivity 9.3 | This is done face to face and the outcome accessed by the ability of the student to identify why a program written cannot generate result. Identify bugs |
| 1. Generate program documentation report
 | 4 | E-tivity 9.4 | Read a material and make a summary note which is submitted on the LMS  |

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| Detailed explanation of ALL student and teacher engagement with the unit:***(This should be presented in the order that the activities take place. So if students do work* online *before coming to the lecture, that should be shown ahead of what happens in class.******If there is more than one opportunity for face-to-face contact, or more than one online task, there should be a separate section for each instance, and they should be presented in the template in the same order that students encounter them.)******Content*** *– such as lecture material – can EITHER be shown here OR added as* ***clearly identifiable*** *addenda to the document. If you plan to use addenda, you should ensure that these are cross-referenced in this section.)* |
| Module-level outcomes addressed: 1,2,3,4 |
| Applying various problem solving techniques, programming concepts, control structures to problem solving and appropriately documenting same for software maintainability |
| Purpose of the unit/week/section: |
| The purpose of unit/section is to ensure application and demonstration of C or C++ knowledge in real life problem solving and appropriate documentation of the processes as a record for software maintenance. Applying this will make you employable with the developed skill that makes one think like a programmer |
| Over to you: *(a description of the process of the section)* |
| In the unit, you will demonstrate your understanding of real life problem solving. The unit is divided into partsPART 11. Watch a six minutes video on how to think like a programmer on <https://www.youtube,com/watch?v=rWM>
2. Based on the video you watched answer some question and submit on the LMS
3. Reflect on steps you can take to be a problem solver
4. Make a short post based on your reflections on the LMS

PART 2: The next thing is that you work as a group in performing a task, contributing to the successful development of the task. Run the program on C++ coding environment and submit result on the LMS1. You will identify your groups for the module
2. Work as a group and develop program codes in C++ coding environment
3. Run the program and generate appropriate result
4. Submit the program codes and result online
5. Reflect on the process towards doing the group assignment and suggest areas you need to improve as a programmer
6. Post this on the discussion board

PART 3: To demonstrate your knowledge of C++, you will be given a program to identify bugs and correctly debug the programPART 4: Read the material here and make a short note of 100 words why program documentation is important and post on the discussion board.  |
| Pre-topic activity: |  Number of hours |  |
| Reflect on how programming is being used in transforming the world an how you can also think like a programmer |
| Face to face time: *(if applicable)* | Number of hours |  |
| As a group, write a program in C++ to solve a real life problem using acquired knowledge in C++ |
| Online activity: | Number of hours |  |
| What should students do? | E-tivity 9.11. Watch a six minutes video on how to think like a programmer on <https://www.youtube,com/watch?v=rWM>
2. Based on the video you watched answer some questions and submit on the LMS
3. Reflect on steps you can take to be a problem solver
4. Make a short post based on your reflections on the LMS
 |
| Where do they do it? | On the LMS |
| By when should they do it? | By the end of the 2nd day in week 9 |
| E-moderator/tutor role |
| 1. Appraises the student submissions and gives appropriate feedback and guide
2. Motivates the students on submissions of their reflections and redirect thoughts
 |
| How are the learning outcomes in this unit assessed? |  Number of hours |  |
| Learning outcomes will be assessed through student answers to questions and reflection posts on the LMS |
| How does this section link to other sections of the module? |
| 1,2,3,4,5,6,7,8 |

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| Online activity: | Number of hours | 1 |
| What should students do? | E-tivity 9.21. You will identify your groups for the module
2. Work as a group and develop program codes in C++ coding environment on a particular real life problem
3. Run the program on the Integrated development Environment and generate appropriate result
4. Submit the program codes and program result online
5. Reflect on the process towards doing the group assignment and suggest areas you need to improve as a programmer
6. Post this on the discussion board
 |
| Where do they do it? | In the computer laboratory |
| By when should they do it? | By the end of the 4th day in week 9 |
| E-moderator/tutor role |
| Give appropriate guidance on areas of improvements based on student post |
| How are the learning outcomes in this unit assessed? |  Number of hours |  |
| Learning outcomes are accessed by the student ability to run the program codes and generate results |
| How does this section link to other sections of the module? 1,2,3,4,5,6,7,8 |

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| Online activity: | Number of hours |  |
| What should students do? | E-tivity 9.31. you will be given a program to identify bugs
2. Appropriately debug the program
3. Make a list of the bugs and post your findings on the LMS
 |
| Where do they do it? | On the LMS |
| By when should they do it? | By Friday of the 9th week |
| E-moderator/tutor role |
| Monitor the correctness of identified bugs and give appropriate corrections  |
| How are the learning outcomes in this unit assessed? |  Number of hours |  |
| Appraisals on knowledge base in identifying bugs in a program |
| How does this section link to other sections of the module? 1,2,3,4,5,6,7,8 |

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| Online activity: | Number of hours |  |
| What should students do? | E-tivity 9.41. Read the material here, post a short summary note of 200 word why program documentation is important
2. Submit on the LMS
3. Reflect on the impact and challenges that could be encountered without good program documentation
4. Post this reflection on the discussion board
 |
| Where do they do it? | On the LMS |
| By when should they do it? | By Friday of the 9th week |
| E-moderator/tutor role |
| Monitor the correctness of identified and give appropriate corrections  |
| How are the learning outcomes in this unit assessed? |  Number of hours |  |
| 1. Appraises the short summary notes and gives appropriate corrections
2. Initiates student engagements and discussions on the impact and challenges of program documentation
 |
| How does this section link to other sections of the module? 1,2,3,4,5,6,7,8 |

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| = Total number of hours |  |

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| **Some important questions** |
| Which learning resources/ references will scaffold the students’ learning? | The link to resource material and video link |
| How are students enabled to access the resources? | Through the institutional LMS and the links |
| Where in this unit are students expected to work collaboratively? | E-tivity 9.2. Etivity 9.4 |
| How has an inclusive approach been incorporated in this unit? |  The multiple tasks and group discussions would facilitate inclusiveness |
| How will feedback on unit be obtained from students? | Feedback from online submissions and posts on the discussion board |
| How will student feedback be used to improve unit? | The feedback from student submissions and from quality assurance team will be used to enhance the unit |
| At which point(s) will students receive formative feedback on the work they have done in the unit? | By the end of the 9th week |

END OF UNIT/WEEK/SECTION-LEVEL TEMPLATE

*You should copy sufficient unit templates so that there is one for each unit of your module in the space below.*

UNIT/WEEK/SECTION-LEVEL TEMPLATE

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| **Unit-level overview** | **Unit/week/section** | **10** |
| Topic name: | Working with Controls & Control Properties |
| Aim of the topic: | The aim of this unit is to impact requisite knowledge and skill on how and when to use appropriate control in programming in order to achieve requires result of a logic flow. You will cover topics such as control flow types, control flow type usage, sequential, selection and repetition control flow  |
| This topic covers: | * control flow types
* control flow type usage
* sequential, selection and repetition control flow
 |
| Intended learning outcomes: | *At the end of this* ***topic****, you will be able to:*1. Differentiate between control structures
2. Demonstrate an understanding of working with controls in different application scenario
 |

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| Overview of student activity: | Watch a 6 minutes video <https://www.youtube,com/watch?v=rWM> on how to think like a programmer. Based on the video do a multi choice questions on the LMS. In 30 minutes read the loop structure of C++ in <https://www.tutorialspoint.com/cplusplus/cpp_loop_types.htm>. As a take home assignment, write an algorithm and a programs using various controls  |

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| **Constructive alignment of unit level outcomes with module level outcomes, learning activities and assessment***(Pressing <Tab> at the end of the table will provide additional rows in the table, if required.)* |
| Intended unit learning outcomes: | No of module-level outcome | Activity where students engage with this outcome | Where and how is this outcome assessed? |
| ***At the end of this unit, you will be able to:*** |
| 1. Differentiate between various controls
 | 2 | E-tivity 10.1 | On the LMS by taking multi choice questions |
| 1. Demonstrate understanding of working with controls in different application scenario
 | 3,4 | E-tivity 10.2 | On the LMS by assignment submission |

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| Detailed explanation of ALL student and teacher engagement with the unit:***(This should be presented in the order that the activities take place. So if students do work* online *before coming to the lecture, that should be shown ahead of what happens in class.******If there is more than one opportunity for face-to-face contact, or more than one online task, there should be a separate section for each instance, and they should be presented in the template in the same order that students encounter them.)******Content*** *– such as lecture material – can EITHER be shown here OR added as* ***clearly identifiable*** *addenda to the document. If you plan to use addenda, you should ensure that these are cross-referenced in this section.)* |
| Module-level outcomes addressed: 2,3,4 |
| By applying various control structures and demonstrating understanding of C++ program writing used in problem solving and this requires appropriate program documentation |
| Purpose of the unit/week/section: |
| This unit is to enable the programmer to develop various applications through program writing that changes the world. This unit sharpens the skills required to think as a programmer and become a problem solver |
| Over to you: *(a description of the process of the section)* |
| Watch a 6 minutes video <https://www.youtube,com/watch?v=rWM> on how to think like a programmer. Based on the video reflect on the steps to develop your skills as a programmer. Post your reflection on the LMS. Then In 30 minutes read the loop structure of C++ on this link, <https://www.tutorialspoint.com/cplusplus/cpp_loop_types.htm>. Take a quiz here. Finally, as a take home assignment, write an algorithm and a programs using various controls. submit the assignment on the discussion forum |
| Pre-topic activity: |  Number of hours | 1/2 |
|  Read the material on creating arrays on [Arrays | Think Java | Trinket](https://books.trinket.io/thinkjava/chapter8.html) |
| Face to face time: *(if applicable)* | Number of hours | 1/2 |
| To Run developed programs to generate program result |
| Online activity:  | Number of hours | 1/4 |
| What should students do? | E-tivity !0.11. Watch a 6 minutes video <https://www.youtube,com/watch?v=rWM> on how to think like a programmer.
2. Based on the video reflect on the steps to develop your skills as a programmer.
3. Identify the areas to improve as a programmer
4. Post your reflection and improvement areas on the discussion board of the LMS for comments and contributions
 |
| Where do they do it? | On the institutional LMS |
| By when should they do it? |  By Tuesday of the 10th week |
| E-moderator/tutor role |
| Evaluate and give directions on the student reflections and areas of improvement |
| How are the learning outcomes in this unit assessed? |  Number of hours | 1/2 |
| By posts made on the discussion board on skills  |
| How does this section link to other sections of the module? |
| 1,2,3,4,5,6,7,8,9 |

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| Online activity:  | Number of hours | 11/4 |
| What should students do? | E-tivity !0.21. In 30 minutes read the loop structure of C++ in <https://www.tutorialspoint.com/cplusplus/cpp_loop_types.htm>.
2. Demonstrate your understanding of C++ by taking a [quiz here](MODULE%20UNIT%2010%20%20QUIZ.docx).
3. Identify your group in the module
4. Finally, as a take home assignment, write an algorithm and a program using various controls. submit the assignment on the discussion forum
 |
| Where do they do it? | On the institutional LMS |
| By when should they do it? |  By Friday of the 10th week |
| E-moderator/tutor role |
| Evaluates the knowledge understanding from quiz and take home assignment and gives appropriate guidance towards skills development |
| How are the learning outcomes in this unit assessed? |  Number of hours | 1/2 |
| Feedback from the quiz and take home assignment |
| How does this section link to other sections of the module? |
| 1,2,3,4,5,6,7,8,9 |
| = Total number of hours | 3hrs |

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| **Some important questions** |
| Which learning resources/ references will scaffold the students’ learning? | The resource material link and video |
| How are students enabled to access the resources? | Through the institutional LMS |
| Where in this unit are students expected to work collaboratively? |  In the group activity of E-tivity 10.2 |
| How has an inclusive approach been incorporated in this unit? | Through the multiple tasks and quiz and discussions integrated to enhance inclusiveness |
| How will feedback on unit be obtained from students? | From online posts, quiz, take home assignments and feedbacks from the quality assurance team |
| How will student feedback be used to improve unit? | The feedbacks will help in modification of specific unit areas geared towards improvements |
| At which point(s) will students receive formative feedback on the work they have done in the unit? | At the end of the week |

END OF UNIT/WEEK/SECTION-LEVEL TEMPLATE

*You should copy sufficient unit templates so that there is one for each unit of your module in the space below.*

UNIT/WEEK/SECTION-LEVEL TEMPLATE

|  |  |  |
| --- | --- | --- |
| **Unit-level overview** | **Unit/week/section** | **11** |
| Topic name: | Object oriented programming (OOP) |
| Aim of the topic: | To demonstrate requisite knowledge for developing writing codes and object oriented programming |
| This topic covers: | * Basic concepts of OOP
* Classes, methods and Access specifiers
* Constructors and destructors
* Inheritance
 |
| Intended learning outcomes: | *At the end of this* ***topic****, you will be able to:*1. Explain basic concepts of OOP
2. Classify the methods, classes and Access specifiers
3. Develop a customized writing code
 |

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| --- | --- |
| Overview of student activity: | You will be provided with resources to read in order to acquire more knowledge on in identifying classes of objects and methods in programming |

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| **Constructive alignment of unit level outcomes with module level outcomes, learning activities and assessment***(Pressing <Tab> at the end of the table will provide additional rows in the table, if required.)* |
| Intended unit learning outcomes: | No of module-level outcome | Activity where students engage with this outcome | Where and how is this outcome assessed? |
| ***At the end of this unit, you will be able to:*** |
| 1. Define basic concepts of OOP
 | 1 | Match these basic concepts with the appropriate functions:InheritanceDestructorsAccess specifiersWriting code | Online five minutes presentation on what , how and why the OOP functions are necessary in Programming  |
| 1. Distinguish between the various classes and methods of Access specifier
 | 1 | Identify the methods and classes of each Access specifier | Face to face group discussions on the classes and methods,Principles of object oriented programmingProperties of the principles of OOP |
| 1. Evaluate the given writing code
 | 4 | Propose a new writing code |  Each student illustrates a new writing code during the online segment of the class  |

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| Detailed explanation of ALL student and teacher engagement with the unit:***(This should be presented in the order that the activities take place. So if students do work* online *before coming to the lecture, that should be shown ahead of what happens in class.******If there is more than one opportunity for face-to-face contact, or more than one online task, there should be a separate section for each instance, and they should be presented in the template in the same order that students encounter them.)******Content*** *– such as lecture material – can EITHER be shown here OR added as* ***clearly identifiable*** *addenda to the document. If you plan to use addenda, you should ensure that these are cross-referenced in this section.)* |
| Module-level outcomes addressed: 4 |
| Produce program documentation reports for software maintainability |
| Purpose of the unit/week/section: |
|  This week’s lesson aims to impact the requisite knowledge for developing writing codes for object oriented programming |
| Over to you: *(a description of the process of the section)* |
| Applying blended approach to skill development activities on code writing and OOP |
| Pre-topic activity: |  Number of hours | 1/2hr |
| The facilitator raises her voice to welcome everyone. She initiates a debate on documenting wrong codes by asking: Must we develop writing codes in Programming?  |
| Face to face time: *(if applicable)* | Number of hours | 1 1/2hrs |
| The facilitator moves on to explain that developing writing codes impacts critical thinking, problem solving and creativity skills in us. She asks them to pick their papers and formulate any writing code of their choiceThe students are asked to take a second look at it to note if they are convinced they have written an acceptable codeThe facilitator moves on to explain basic concepts associated with OOP such as inheritance, constructors, basic principles and properties, methods ,classes and Access specifiersThe question and answer segment to show the student level of comprehension |
| Online activity: | Number of hours |  |
| What should students do? | 1. Rewrite your developed codes on the VLE for everyone to see
2. Compare your code with any two of your choice and modify it
3. Match functions with access specifiers, methods and classes.
4. Your group will give a five minutes online presentation to summarize the lesson
 |
| Where do they do it? | On the LMS for e tivity 11.1 forum |
| By when should they do it? |  Friday 4pm of the 11th week |
| E-moderator/tutor role |
| The moderator moves round the class in the face to face session to check the notes and codes formulated by students  |
| How are the learning outcomes in this unit assessed? |  Number of hours | 1 hr |
| Online summary writing and presentation |
| How does this section link to other sections of the module? |
| This section shall help build the students confidence for a hands -on-skill activity in formulating writing codes This aligns with the module aim nos 2.3 and 4  |

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| = Total number of hours | 3hrs |