



NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Faculty of Computing and Informatics

Introduction

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2020 Semester I

Introduction to Computing (ICG11S)





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- What is Computing?
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processes, outputs

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1. Course Description

This course introduces students to programming concepts and techniques required to solve computing related problems. Students will learn how to brainstorm about a given problem, decompose and reduce its complexity and define the modules that form parts of the solution. They will be exposed to how to represent data as a compact bloc of information, define a sequence of instructions as part of the solution, iterate over a subset of those instructions or select a part of it.



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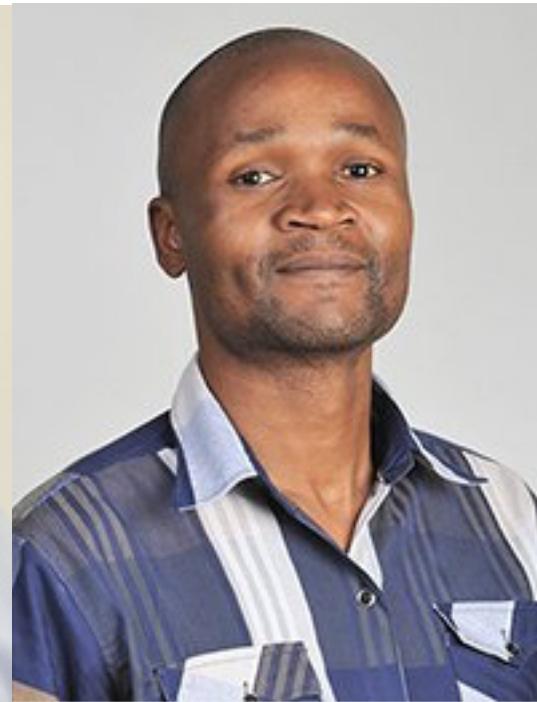
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2. Course Facilitators



Mr Eliazer Mbaeva

Mr Veerabhadram Paduri



Ms Ndinelago Nashandi

Mr Mike Abia

Mr. Steven U. Tjiraso

Mr Simon Muchinenyika



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3. Learning Outcomes

At the end of this course students are expected to:

- Create data representation, define variables & reason about program state;
- Apply abstraction principles in problem solving;
- Decompose a problem into modules, procedures and functions;
- Define programs as a sequence of instructions;
- Use iteration and selection in their programs;
- Represent solutions as diagrams and flowcharts; and
- Apply security good practices into their problem-solving approach



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4. Communication Used

- E-learning (Moodle) is used as the number one communication tool;
 - login to Moodle using your account;
 - search for the course ICG511S;
 - use the one-time self-enrolment key to access the course;
- File server (isnotes) may be used to supplement Moodle;
- Mobile Phone (WhatsApp)



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5. Course Assessment

Assessment	Weight
Test 1	7.5%
Quizzes	10%
Group Assignment	15%
Test 2	7.5%
Examination	60%
Total:	100%

Minimum pass requirement is 50%



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6. Introduction

- what is computing?

(students share their ideas and expectations from the course – 5 minutes)



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7. The Essence of A Computer

- all computers have the following tasks in common:
 - input data;
 - stores data;;
 - processes;
 - outputs.

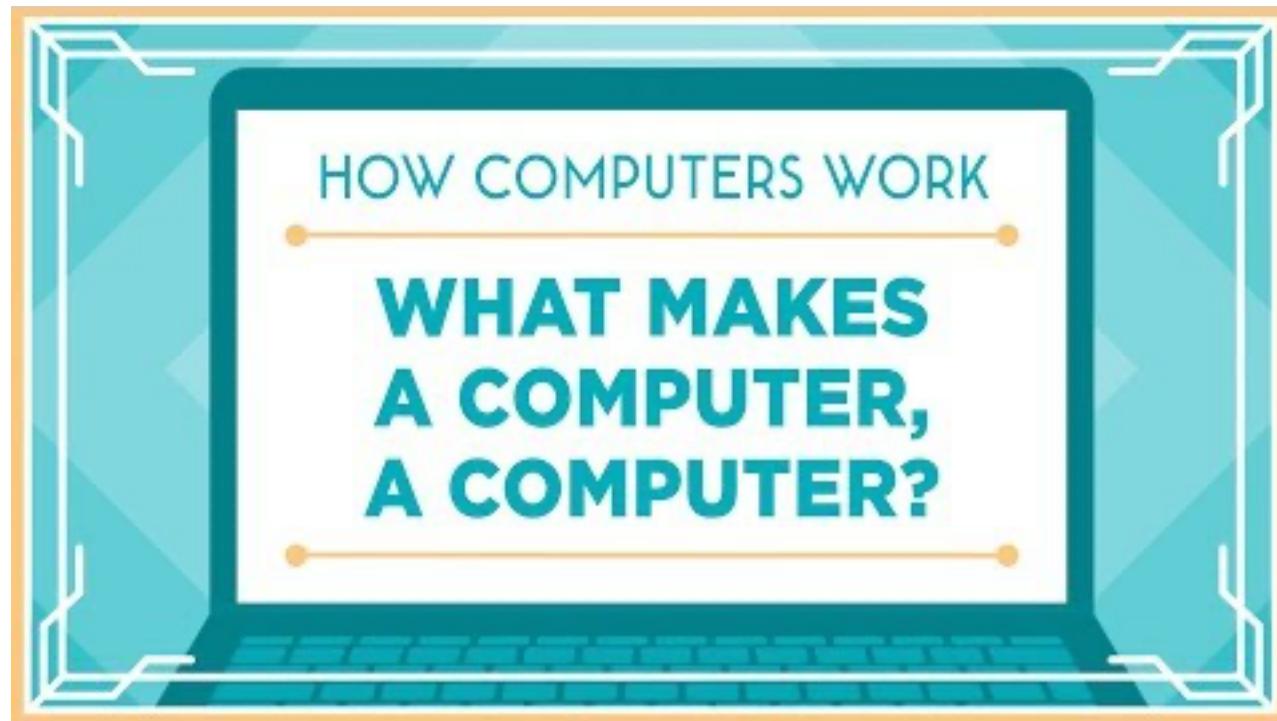




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8. How a Computer Works

- Students watch a 5 minute video from code.org;





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9. Where this course comes in?





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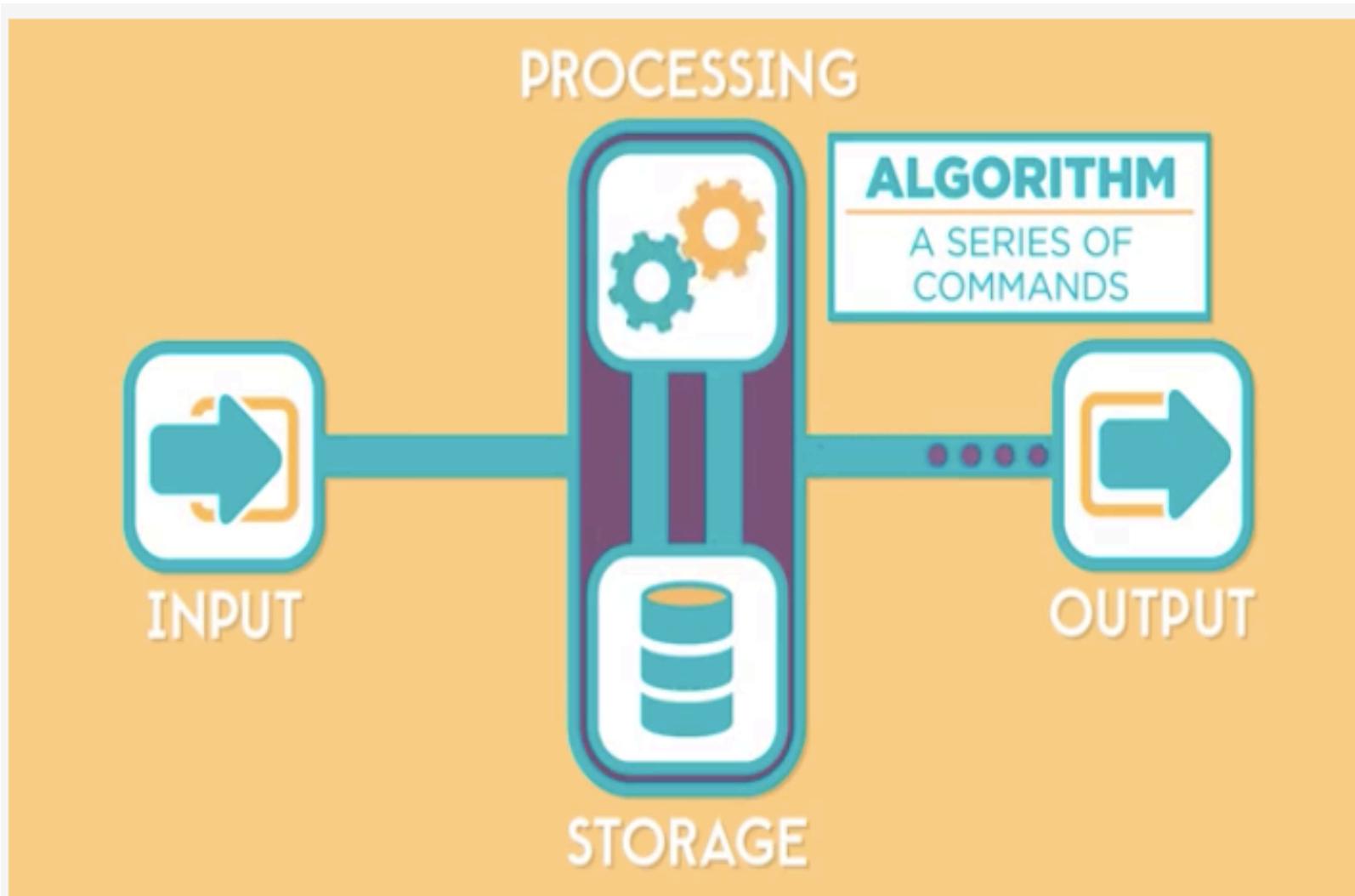
10. ICG511S

- Bad News: This course does not teach programming;
- Good News: It gives you the necessary skills that forms the foundation of software development;



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11. Back to the Basics of a Computer





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12. Calculator Example

- A calculator is a computing device. I guess all of you have used a calculator before. YES or NO?



Suppose you want to add two simple numbers and find the total. What do you think are the inputs, processes, and outputs involved?



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13. Identifying Computing Components

- when given a computer problem, it is essential to identify the inputs, processes, and output required.

Example:

A local construction company pays its workers 30N\$ per hour and 35N\$ per hour if it is overtime. Required is a program that takes in both the hours worked by an employee and the overtime hours and then calculates and displays the daily wage.



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14. Sample Solution

Example:

A local construction company pays its workers 30N\$ per hour and 35N\$ per hour if it is overtime. Required is a program that takes in both the hours worked by an employee and the overtime hours and then calculates and displays the daily wage.

<i>inputs</i>	<i>processes</i>	<i>outputs</i>
<i>hours worked</i>	<i>get hoursWorked,</i> <i>overtimeHours</i>	<i>dailyWage</i>
<i>overtime hours</i>	<i>calculate dailyWage</i>	
	<i>display dailyWage</i>	



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15. A Revisit to Sample Solution

Example:

A local construction company pays its workers 30N\$ per hour and 35N\$ per hour if it is overtime. Required is a program that takes in both the hours worked by an employee and the overtime hours and then calculates and displays the daily wage.

Tips:

1. The sentence highlighted yellow gives the problem background as it is setting the context.
2. The sentence in purple gives the requirements of what the program takes in, processes, and outputs.



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16. Tips Continued

Example:

Required is a program that takes in both the hours worked by an employee and the overtime hours and then calculates and displays the daily wage.

Tips:

3. The underlined phrases are inputs and outputs. Usually they are nouns and the description tells you whether it is input or output.
4. Processes are normally indicated by verbs. Would you identify them in the given problem?



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17. Exercise

Imagine you want to withdraw money from an ATM machine.



What are the inputs, processes, and outputs that take place? Represent your solution as given in the example.



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18. Further Study

- code.org
- <http://guyhaas.com/bfoit/itp/itp.html>



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Thank You.