

## CMI COURSE CURRICULUM COURSE ACTION

**Course Title:** Fundamental Concepts of Programming

**Alpha Number:** ICS 100

**CIP No.** 11.0201

**Type of Action:**

New Course (attach narrative justification for course creation)

Substantive Revision (attach narrative justification for changes, including assessment and/or achievement data and feedback from the advisory committee if relevant)

Select all that apply:

- Change in number of credit hours
- Change in prerequisite
- Substantive change in course content
- Change to SLOs  Other:

Non-substantive Revision

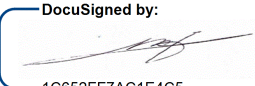
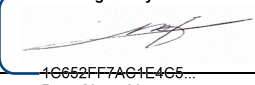
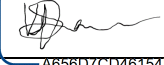

Select all that apply:

- Change in Alpha Number or Title (unless letter abbreviation has not previously been used)
- Edit to course description that does not alter the substance of the course
- Change to recommended texts
- Other

Reinstitution of Archived Course (attach narrative justification for reinstitution, including evidence of demand, evidence of capacity, feedback from the advisory committee if relevant, and commentary that speaks directly to the reasons the course was initially archived)

Reaffirmation of Course (only allowable if course completion rate exceeds ISS, the benchmark has been met for the majority of SLO assessments, and there is no evidence of inequitable levels of achievement across subpopulations; attach evidence)

**Approvals:**

	Name	Signature	Date
<b>Department Chair</b>	Mr. Edward Alfonso	 DocuSigned by: 1C652FF7AC1E4C5...	10/23/2024
<b>Curriculum Committee Chair</b>	Mr. Edward Alfonso	 DocuSigned by: 1C652FF7AC1E4C5...	10/23/2024
<b>Dean</b>	Ms. Vasemaca Savu	 DocuSigned by: A85817C146194E8...	10/22/2024
<b>VPASA</b>	Dr. Elizabeth Switaj	 DocuSigned by: 89BE83BDDC23455...	10/30/2024

## CMI COURSE OUTLINE

**CIP No.** 11.0201

**Version No.** 1

**Alpha Number:** ICS 100

**Course Title:** Fundamental Concepts of Programming

**Course Description:** Introduces fundamental concepts in programming, from binary conversions to variables and data types; and creates programs in C++ by using different control structures: sequential, selection (if-else) and iteration (loops). This course also covers the use of mathematical functions in C++, the order of precedence for arithmetic and logical operators, increment and decrement operators, and cast operators. Furthermore, the concept of encapsulation is also introduced by the use of modular functions.

**Course originally prepared by:** Solomone Pule/Curtis Vila **Department:** STEM **Month/Year:** Aug/2024

**Course mode(s):**  Face to Face (including Zoom)  Hybrid  Distance Education

**Credits calculated by:**  Credit Hour  Clock Hour

**Contact Hours:** 90

Type	No. of Hours	No. of Credits	Maximum No. of Hours Online
Lecture/Seminar/Workshop	45	3	
Clinical			
Practicum			
Lab/Tutorial	45	1	
Fieldwork			
Studio Time			
<b>Total</b>	<b>90</b>	<b>4</b>	

**Purpose(s) of Course:**

Degree Requirement	<u>AS Degree of Computer Science, and Info Tech</u>
Degree Elective	<u>Liberal Arts</u>
General Education	_____
Credit Certification	<u>Level 1 Certificate of IT Support</u>
Developmental	_____
CTE/TVET	_____
ABE/Adult HS	_____

**Distribution Area:**

Humanities	_____
Social Sciences	_____
Mathematics (Credit)	_____
Science	_____

**Prerequisite:** ICS 090

**Student Learning Outcomes:** Upon completion of this course, students will be able to:

1. Identify suitable data types for different data items/objects/values
2. Write a simple program that contains variables and constants of different data types, assignment statements, arithmetic operations, numerical data type conversion, comments for lines of codes with low readability.
3. Utilize different control structures, and different Boolean variables and operators in their programming
4. Test written programs by using different test-cases and input validations
5. Design functions as modules of the divide-and-conquer concept, with different numbers of return values.

**SLO Mapping:**

Prerequisite Course SLO	Linked SLO from this Course	Explanation
ICS 090 SLO (1) Utilize the internet and the worldwide web properly as information tools; (2) Employ different Basic Application Software; (3)Classify Hardware components and illustrate how they interact; (4) Create a diagram of a Communication system and label its components; (5) Identify different network types and topologies; (6)Assess a given scenario and identify whether it concerns the issue of privacy, security, or ethics.	1 - 5	Students will be able to introduce the fundamental concepts of programming skills.

**Links to Program Learning Outcomes:**

SLO	Linked PLO	I/P/M	Explanation of Link
1	<b>PLO 4: Word Problems:</b> When solving word problems, demonstrate the ability to (i) understand the conditions, (ii) formulate a plan appropriate to the conditions, (iii) execute the plan, and (iv) logically examine the solution.	P	A solution must have data of specified types
2		P	Design a simple solution with basic programming features
3		P	Using of Boolean logic in decision-making within a solution
4		P	Testing a solution
5		P	Using functional modules in a solution

**Course Content:** Students in this course will be able to understand:

1. Data Types, Variables & Constants
2. Algorithm & Problem-Solving
3. I/O Streams and Control Structures:
4. Boolean variables and operators
5. Errors, Testing and Debugging
6. Functions of Programming

**Higher Order Thinking Skills:** Students in this course will experience:

- Analyzing the basic elements of an idea, experience, or theory
- Making judgments about the value or soundness of information, arguments, or methods
- Applying theories or concepts to practical problems or in new situations

**Recommended Methods of Instruction**

- Demonstration
- Lecture
- Small group discussion
- Class discussion
- Audio-Visual Aids
- Labs/Tutorials
- Supervised Practice
- Field Trips
- Other:

**Recommended Assessment Tool Type(s):**

- Case Study
- Critique of Performance
- Exam/Quiz In-Course
- Exam/Quiz Standardized (attach narrative describing development and validation process)
- Focus Group
- Group Project
- Individual Project
- Observation
- Portfolio Review
- Presentation
- Simulation
- Skill Performance
- Supervisor Evaluation
- Survey
- Written Assignment

**Required Forms of Regular and Substantive Interaction for Hybrid or Distance Education Courses (Select at Least Two):**

- Direct instruction through:
  - Live video lectures
  - Live audio-only lectures
  - Live text chats
  - Assessing or providing feedback on a student's coursework
- Providing information or responding to questions about the content of a course or competency through:
  - Live video discussions
  - Live audio-only discussions
  - Live text chats
  - Asynchronous message boards or text chats
- Facilitating a group discussion regarding the content of a course or competency through:
  - Live video discussions
  - Live audio-only discussions
  - Live text chats
  - Asynchronous message boards or text chats
- Other, specify:

Note: for distance education courses, if only two are selected, both must occur within the course on a weekly basis. If more than two are selected, the instructor may choose which two are used during each week.

**Equipment and Materials:**

**1. Recommended texts:**

- a. Horstmann C. S. (2012). *C++ for Everyone*. Wiley. ISBN-13: 978-0470927137

**2. Equipment/Facilities:**

- a. Computer lab with Internet access

**3. Materials and Supplies:**

- a. SOFTWARE: Dev C++ 5.0 (Open Source C/C++ IDE for Windows)
- b. PRINTING SUPPLIES: Printer/Copier/Scanner, Bond Paper, Stapler

**Connection to College Mission:**

The College of the Marshall Islands will provide our community with access to quality, higher and further educational services, prioritize student success through engagement in relevant Academic, Career and Technical Education, and be a center for the study of Marshallese Culture. It will also provide intellectual resources and facilitate research specific to the needs of the nation. *EC approved 4th Nov, 2020. BOR approved 1st December, 2020*

This course connects to the College Mission by providing access to quality, higher and further educational services in Computer Science as a foundation for Computer Programming; prioritizing student success through engagement in relevant Academic and Career Education. It upholds the values of being skillful and knowledgeable in Problem-Solving, Critical Think and Computing Science, confirming the importance of seeking knowledge and being inquisitive in how to give instructions to computer devices.

### **Connection to Department Mission:**

The mission of the Science, Technology, and Mathematics (STeM) Department is to provide science, technology and mathematics courses to support academic programs and prepare students seeking careers in marine science or an advanced education in a STeM discipline. *Approved by CC on March 5, 2018. Approved by IEC on March 14, 2018.*

- Opens the door to higher levels of problem-solving and coding.
- Support ICT & Computing programs and prepare students seeking careers or an advanced education in Computer Science (CS) and Information Technology (IT) as branches of the STEM Department.

### **Narrative Justification for Course Creation:**

#### **Unlocking the World of Coding**

In the rapidly evolving landscape of technology, programming has emerged as a critical skill that empowers individuals to shape the digital world. The creation of a "Fundamental Concepts of Programming" course is vital in unlocking the world of coding and empowering individuals with the skills needed to thrive in the digital era. By embracing the digital transformation, fostering critical thinking and problem-solving skills, empowering innovation and entrepreneurship, enabling collaboration and teamwork, and nurturing digital literacy and adaptability, this course will equip learners with the foundational knowledge and skills necessary to navigate the world of programming and make a meaningful impact in the digital age.

CC Approved: July 31, 2024