**Narrative Justification**

Three years ago, the math transition program was implemented to uplift the placement of PSS students into math credit level. This has led to improvements in the number of High School students placed at the Credit level at our College. Despite this improvement, many students are still placed at Level 1 Developmental Math thereby requiring a longer transition to Credit level math. The STEM Dept, in consulted and came to the recommendation of the phasing out of the developmental math level 01 and instead develop a level 2 Developmental Math course that will recognize the improvement in High Schools' performance in Math and provide extra revisions and better sequencing that will lead to shorter period and improved students' success. This will be similar to the DEVED department where the developmental English level 01 was phased out and the topics assimilated into the level 02 courses.

Further justification and the process that we will follow to integrate the topics in developmental math level 01 into developmental math level 02 for STEM pathway and Non-STEM pathway are as follows:

1. Despite the improvements achieved in getting more High School students from the Public-School Systems placed in Math Credit level, we still have a high percentage of new students placed in developmental math level 01 after the placement test. Many of these students are from private schools and sometimes it's the condition of taking the test that results in their poor performance and not necessarily their inability to do better. We have observed that many of these students do not find the course content of Math 068 challenging and are easily bored and disinterested in the course.
2. During the first week of instruction, we have encouraged students to challenge the Final Exam of the previous Math 068 course after which they are upgraded into the next level (Math 088 or Math 099) through the Credit by Examination process if they pass. Many students who took this path were found to have coped well and passed the higher-level courses.
3. The current STEM pathway requires students to take Math 088 (Beginning Algebra, level 2) and Math 098 (Intermediate Algebra, level 3) before they qualify for credit math courses. However, there's only Math 099 (Fundamentals of Math, level 3) as a developmental class for students taking the Non-STEM Pathway. We have noticed that many of the students taking Math 099 directly usually require basic math knowledge which are not covered by Math 068. We hereby propose the creation of a New course, Math 089, at level 2 that will be based on topics adopted from Math 068 but more intensively focused on the basic mathematics knowledge required of the Non-STEM Math pathway.
4. These changes will result in the elimination of the Level 1 Math (Math 068) resulting in the students starting in level 02 (Math 088 for the STEM Pathway or Math 089 for the Non-STEM Pathway). This will foster an opportunity to create an Accelerated Program for Math 089 and Math 099 as is already available for Math 088 and Math 098.
5. The direction for these courses will be like this

# CMI COURSE CURRICULUM
## COURSE ACTION

**Course Title:** Elementary Statistics          **Alpha Number:** MATH 160          **CIP No.** 27.0501

**Type of Action:**

_____New Course (attach narrative justification for course creation)

___x___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
___x___Change in prerequisite
_____Substantive change in course content
_____Change to SLOs
_____Other:

__x____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
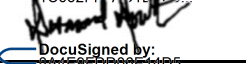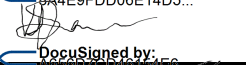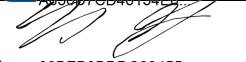_____Change to recommended texts
__x____Other: Change in number of contact hours from 64 to 60

_____ 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 |
|---|---|---|---|
| **Department Chair** | Edward Alfonso | DocuSigned by: | 6/6/2024 |
| **Curriculum Committee Chair** | Desmond Doulatram | DocuSigned by: | 6/5/2024 |
| **Dean** | Vasemaca Savu | DocuSigned by: | 6/5/2024 |
| **VPASA** | Dr. Elizabeth Switaj | DocuSigned by: | 6/10/2024 |

# CMI COURSE OUTLINE

**CIP No.** <u>27.0501</u>                                                 **Version No.** <u>003</u>

<u>MATH 160</u>                                                              <u>Elementary Statistics</u>
**Alpha Number**                                                     **Course Title**
**Previous Alpha Number:**
**Course Description:** Provides conceptual understanding of descriptive and inferential statistics. Emphasis is placed on data collection and presentation, sampling, probability, hypothesis testing and confidence intervals, linear regression and correlation, analysis of variance, and critique of articles with statistical results.

**Course originally prepared by:**  <u>Math/Science Departments</u>       <u>STEM</u>          <u>November/2008</u>
**Most recent revision by:**        <u> Waisiki Baleikorocau </u>       <u>STeM</u>          <u>June/2024</u>

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

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

**Contact Hours:** <u>60</u>

| Type | No. of Hours | No. of Credits | Maximum No. of Hours Online |
|---|---|---|---|
| Lecture/Seminar/Workshop | 60 | 4 | |
| Clinical | | | |
| Practicum | | | |
| Lab | | | |
| Fieldwork | | | |
| Studio Time | | | |
| **Total** | 60 | 4 | |

**Purpose(s) of Course:**  Degree Requirement _____<u>Nursing, Business</u>_____
                           Degree Elective  _____<u>LA</u>_____ _____
                           General Education  _____<u>LA, Nursing, _____</u>_____
                           Credit Certification  _____
                           Developmental  _____
                           CTE/TVET  _____ _
                           ABE/Adult HS  _____ _

**Distribution Area:**   Humanities          _____
                         Social Sciences     _____
                         Mathematics (Credit) _____<u>x</u>_____
                         Science             _____

**Prerequisite:**       <u>Math 90's or Placement in Credit Math</u>
                        <u>Eng 90's or Placement in Credit English</u>

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

1. Collects and categorizes data for statistical analyses.
2. Draw graphs and charts to picture sample data.
3. Calculate probabilities of dependent and independent events.
4. Interpret statistical measures and models.
5. Report results of statistical analyses.

**SLO Mapping:**

| Prerequisite Course SLO | Linked SLO from this Course | Explanation |
|---|---|---|
| Math 099: Calculate the mean, median, mode and range of ungrouped data. | 1 | Students have mastered the skills to find the measure of central tendency and measure of dispersion to perform statistical analysis. |
| Math 099: Utilize pictographs, bar graphs, histograms, line graphs and circle graphs. | 2 | Expanding skills on gathering information from graphs to drawing graphs of data. |
| Math 099: Solve word problems involving counting principles and probability of an event. | 3 | Employing skills from counting principles and probability to perform the work on probabilities of dependent and independent events. |
| Math 099: Calculate the mean, median, mode and range of ungrouped data.<br><br>ENG 097: Implement the writing process independently in 3-5 paragraph academic essays and reflections | 4 and 5 | Having mastered the skills in Math 099 and ENG 097, students will be able to interpret the data and explain what it means. |

**Links to Program Learning Outcomes:**

| SLO | Linked PLO | I/P/M | Explanation of Link |
|---|---|---|---|
| 1 | LA Critical Thinking<br>LA Quantitative/Scientific Literacy<br>GE Quantitative Literacy | P | Data analysis is a valuable skills that require critical thinking to interpret, evaluate, and communicate complex information. |
| 2 | LA Quantitative/Scientific Literacy<br>GE Quantitative Literacy | P | Graphs provide visual display of data, facilitate comparison, and can reveal trends and relationships |

| | | | |
|---|---|---|---|
| | | | within the data, modelling and understanding of complex data information. |
| 3 | LA Critical Thinking<br>LA Quantitative/Scientific Literacy<br>GE Quantitative Literacy | P | Provide students information on the likelihood of an event to occur. Students will be able to compute probabilities of events, model random data, interpret the result and make decisions. |
| 4 | LA Critical Thinking<br>LA Quantitative/Scientific Literacy<br>GE Problem Solving<br>GE Quantitative Literacy | P | Understanding statistical measures and models provides more tools in analyzing data to make better decisions. In business, these tools can helps make better decisions such as create better customer service, assessing the value of investment. |
| 5 | LA Quantitative/Scientific Literacy<br>GE Quantitative Literacy | P | Reporting statistical analysis is essential to ensure target audiences can judge the validity of the output. |

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

1. Measure of central tendency
2. Measure of variability and exception
3. Correlation and regression
4. Normal distribution
5. Probability theory
6. Introduction to inferential statistics
7. Statistical significance, p-values, hypothesis testing, and confidence intervals

**Higher Order Thinking Skills: Students in this course will experience:**
__X_ Analyzing the basic elements of an idea, experience, or theory
__X_ Making judgments about the value or soundness of information, arguments, or methods
__X_ Applying theories or concepts to practical problems or in new situations

**Recommended Methods of Instruction**
___X__ Demonstration
___X__ Lecture
___X__ Small group discussion
___X__ Class discussion
___X__ Audio-Visual Aids
_____ Laboratory
___X__ Supervised Practice
_____ Field Trips
___X__ Other: Online learning support system

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

_____ Case Study
_____ Critique of Performance
__X__ Exam/Quiz In-Course
_____ Exam/Quiz Standardized (attach narrative describing development and validation process)
_____ Focus Group
__X__ Group Project
__X__ Individual Project
_____ Observation
_____ Portfolio Review
_____ Presentation
_____ Simulation
_____ Skill Performance
_____ Supervisor Evaluation
_____ Survey
__X__ 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: Allan G. Bluman, Elementary Statistics: A Step by Step Approach, 10th Edition, McGraw-Hill, 2017. ISBN-13: 9781259755330

2. Equipment/Facilities: Calculators (scientific & graphing), computer lab.

3. Materials and Supplies: Whiteboard rulers, Statistical data from EPPSO, Public Information from Banks.

**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*

The course provides higher, quality educational services to ensure student success in their educational pursuits. Throughout the course, students learn to collect, analyze, and communicate data, construct and test hypothesis, solve problems, investigate process that leads to data-based decisions.

**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.*

The elementary statistics course is aligned to the Department's mission by providing students broad statistical competency that will complement their academic program requirements and preparedness for future careers and advanced education.

**Justification for Changes**:

In the changes of the 'ICS 101 – Introduction to Microsoft Office' course has been removed from the list of pre-requisites as it does not provide the necessary skills for statistical work.