# ANNEX I

## EQUIPMENT CARRYING-CAPACITY

The MHEI shall ensure that all equipment are operational, well-maintained, and in accordance with the carrying-capacity computation presented in below. A sample carrying-capacity tables in Microsoft Excel can be acquired at the Accreditation Division, MARINA STCW Office or you may request it through email at stcw_accre@marina.gov.ph. Moreover, the carrying-capacity formula and Tables 1 and 2, based on Microsoft Excel, are shown below as samples. It should be noted that all MHEIs shall follow the *equipment-to-student* ratio as indicated in "Annex E-5" of the Joint CHED-MARINA Memorandum Circular (JCMMC) 03, series of 2022. It is also imperative to note that the results of the carrying-capacity computation, be it in Microsoft Excel or manual computation, shall be reflected in Form 1 herein attached. This form (Form 1), together with Forms 2 to 4, shall be signed and duly notarized before submission to CHED-OPSD, copy furnished, MARINA STCW Office, not later than two (2) months prior to enrollment. The names of signatories are reflected in Forms 1 to 4 below.

Further, the results of the carrying-capacity computation shall determine the number of enrollees that the school should accept and/or enroll.

**Formula:**

The equipment carrying-capacity is determined by the following steps:

1. Calculate the "*Equipment capacity*" by multiplying the actual number of equipment with the "*Equipment to student ratio.*"

   **(Equipment capacity = Actual number of facilities/equipment x Facility/equipment to student ratio)**

2. Determine the equipment "*Total lab use per week*" by adding the "*Lab hours per week*" of the courses that utilizes the same equipment. For example, the courses that utilizes the Ship's Bridge Simulator are Nav 3, Nav 5, Seam 5, and DW with laboratory hour per week of 3, 3, 3, and 6, respectively. Hence, the equipment *Total lab use per week* is 15 hours.

3. Next is to determine the equipment "*Frequency of utilization*". This can be achieved by dividing the "*Maximum equipment utilization per week*" with the "*Total lab use per week*".

   **(Frequency of utilization = Maximum equipment utilization per week/Total lab use per week)**

4. The carrying-capacity of an equipment is the product of "*Frequency of utilization*" and "*Equipment capacity*".

   **(Equipment carrying-capacity = Frequency of utilization x Facility/equipment capacity)**

5. Please bear in mind that the "Equipment to student ratio", "Laboratory hours per week", and "Maximum equipment utilization per week" are all constants i.e. they are fixed values.

# BACHELOR OF SCIENCE IN MARINE TRANSPORTATION

**Table 1. Carrying-capacity in Microsoft Excel for BSMT.**

| SAMPLE | | | BS in Marine Transportation (3-1 Scheme) SY: _____ Semester: _____ | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name of School:<br>Address:<br>Date of Evaluation:<br>Current Status of School:<br>1. New Applicant ____<br>2. Existing ____<br>3. With phaseout/on appeal ____ | | | Computer Hardware and Software including system and application software | Chart Tables (at least L=1.0m, W=0.7) | Some eqpt. and tools under Seam 1 | | | | Other Equipment required in Seam 1 shall be computed based on the carry-capacity computation and the same shall be reflected in Form 1 herein attached. | Other Equipment required for the semester to be provided | Other Equipment required for the semester to be provided | Other Equipment required for the semester to be provided | Other Equipment required for the semester to be provided | Other Equipment required for the semester to be provided | Other Equipment required for the semester to be provided | Total Number of Hours in 1 Semester @ 16 weeks/Sem. |
| | | | | | Pilot Ladder | Safety Net | Disc Sander | Chipping Hammer | | | | | | | | |
| Actual no. of Equipment | | | 20 | 40 | 1 | 1 | 2 | 50 | X | X | X | X | X | X | X | |
| Equipment-to-Student Ratio | | | 2 | 2 | 20 | 20 | 10 | 2 | | | | | | | | |
| Equipment Capacity (Total no. of students that could avail of the eqpt. based on the ratio) | | | 40 | 80 | 20 | 20 | 20 | 100 | | | | | | | | |
| Yr. Level | Course | Lab Hrs/Wk | | | | | | | | | | | | | | |
| 1st | Nav 1 | 3 | | | | | | | | | | | | | | 48 |
| | Seam 1 | 3 | | | | | | | | | | | | | | 48 |
| | ICT | 2 | | | | | | | | | | | | | | 32 |
| 2nd (Yet to be developed) | | | | | | | | | | | | | | | | - |
| | | | | | | | | | | | | | | | | - |
| 3nd (Yet to be developed) | | | | | | | | | | | | | | | | - |
| | | | | | | | | | | | | | | | | - |
| Total lab use per week | | | 2 | 3 | 3 | 3 | 3 | 3 | | | | | | | | |
| Maximum eqpt. utilization per week[1] | | | 84 | 84 | 84 | 84 | 84 | 84 | | | | | | | | |
| Frequency of utilization (No. of grps or sections) | | | 42 | 28 | 28 | 28 | 28 | 28 | | | | | | | | |
| Carrying Capacity (No. of students) | | | 1680 | 2240 | 560 | 560 | 560 | 2800 | | | | | | | | |

[1] All BSMT equipment shall not exceed the eighty-four (84) hours "*Maximum equipment utilization per week*", i.e. 14 hrs. per day X 6 days. However, the MHEI is not precluded from reducing the 84-hour period and make the necessary adjustments to ensure compliance with their equipment Preventive Maintenance System (PMS) and/or safety policies.

# BACHELOR OF SCIENCE IN MARINE ENGINEERING

**Table 2. Carrying-capacity in Microsoft Excel for BSMarE.**

| SAMPLE | | | BS in Marine Engineering (3-1 Scheme) SY: _____ Semester: _____ | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name of School:<br>Address:<br>Date of Evaluation:<br>Current Status of School:<br>1. New Applicant ____<br>2. Existing ____<br>3. With phaseout/on appeal ____ | | | Computer Hardware and Software | Electrical and Electronic Test Instruments | | | | | | Drawing Table | Other Equipment required for the semester to be provided | Other Equipment required for the semester to be provided | Other Equipment required for the semester to be provided | Other Equipment required for the semester to be provided | Other Equipment required for the semester to be provided | Other Equipment required for the semester to be provided | Total Number of Hours in 1 Semester @ 16 weeks/Sem. |
| | | | | Multitester (Analogue) | Multitester (Digital) | Clamp-on Ammeter (Analogue) | Clamp-on Ammeter (Digital) | Insulation Resistance Tester | Logic Tester | | | | | | | | |
| **Actual no. of Equipment** | | | 20 | 50 | 40 | 30 | 20 | X | X | 40 | X | X | X | X | X | X | |
| **Equipment-to-Student Ratio** | | | 4 | 2 | 2 | 2 | 2 | | | 1 | | | | | | | |
| **Equipment Capacity** (Total no. of students that could avail of the eqpt. based on the ratio) | | | 80 | 100 | 80 | 60 | 40 | | | 40 | | | | | | | |
| **Yr. Level** | **Course** | **Lab Hrs/Wk** | | | | | | | | | | | | | | | |
| 1st | Electro 1 | 3 | | | | | | | | | | | | | | | 48 |
| | Mdraw | 3 | | | | | | | | | | | | | | | 48 |
| | ICT | 2 | | | | | | | | | | | | | | | 32 |
| 2nd (Yet to be developed) | | | | | | | | | | | | | | | | | - |
| | | | | | | | | | | | | | | | | | - |
| 3nd (Yet to be developed) | | | | | | | | | | | | | | | | | - |
| | | | | | | | | | | | | | | | | | - |
| **Total lab use per week** | | | 2 | 3 | 3 | 3 | 3 | 0 | 0 | 3 | | | | | | | |
| **Maximum eqpt. utilization per week**[2] | | | 84 | 84 | 84 | 84 | 84 | 84 | 84 | 84 | | | | | | | |
| **Frequency of utilization** (No. of groups or sections) | | | 42 | 28 | 28 | 28 | 28 | ##### | ##### | 28 | | | | | | | |
| **Carrying Capacity (No. of students)** | | | 3360 | 2800 | 2240 | 1680 | 1120 | ##### | ##### | 1120 | | | | | | | |

[2] All BSMarE equipment shall not exceed the eighty-four (84) hours "*Maximum equipment utilization per week*" except for the "***Electric Arc Welding***" and "***Gas Welding***" machines, which shall be limited to only **forty-eight (48) hours** to avoid impairment of the equipment. However, the MHEI is not precluded from reducing further the "*Maximum equipment utilization per week*" to ensure compliance with their equipment Preventive Maintenance System (PMS) and/or safety policies.

To maximize the utilization of equipment/tools and no student/s are left idle during laboratory exercises, it is imperative that students are clustered into groups. Each group is assigned with an activity different from the others but related to the topic. After the allocated time has been expended, the "groups" have move to the next activity until all activities are covered. However, the instructor shall ensure that no activity is a prerequisite to any of the other activities. An example of student groups vis-à-vis the activities per period is shown in **Table 3**.

Note: Ensure that the number of students per group is appropriate to the practical exercise or activity and the same must be reflected in the Practical Exercise Sheets for verification.

**Table 3. Distribution of group of students in various practical exercises or activities.**

| ACTIVITIES | PERIODS | | | | |
|---|---|---|---|---|---|
| | 1th Period | 2nd Period | 3rd Period | 4th Period | 5th Period |
| Activity No. 1 | Group 1 | Group 2 | Group 3 | Group 4 | Group 5 |
| Activity No. 2 | Group 5 | Group 1 | Group 2 | Group 3 | Group 4 |
| Activity No. 3 | Group 4 | Group 5 | Group 1 | Group 2 | Group 3 |
| Activity No. 4 | Group 3 | Group 4 | Group 5 | Group 1 | Group 2 |
| Activity No. 5 | Group 2 | Group 3 | Group 4 | Group 5 | Group 1 |

Legend:
Group 1:
Group 2:
Group 3:
Group 4:
Group 5:

# FORMS

All MHEIs shall submit a duly notarized forms, i.e. **Forms 1** to **4**, based on the carrying-capacity computations explained above. These forms have to be signed by those who prepared it, validated it i.e. the Department Head, and approved it i.e. by the Dean, respectively. These documents shall then be submitted to the CHED-OPSD, copy furnished Accreditation Division, MARINA STCW Office, at least two (2) months prior to the date of enrollment. Any changes in equipment features, condition, and/or quantity has to be communicated to the Accreditation Division, MARINA STCW Office, so appropriate changes will be made in the SAM-IS.

Moreover, MHEIs shall ensure that all equipment listed in **Form 1** are operational and available. Any inconsistency found therein shall be construed as violation of this circular.

**Form 1. List of Equipment**

Republic of the Philippines
OFFICE OF THE PRESIDENT
**COMMISSION ON HIGHER EDUCATION**

Department of Transportation
**MARITIME INDUSTRY AUTHORITY**

**Name of HEI:**

**Address:**

**Program offered:**

**Academic Year/Semester:**

| No. | List of Equipment | Quantity Acquired by MHEI | Maximum number of student intake based on carrying-capacity computation | Remarks |
|---|---|---|---|---|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |

| | | | | |
|---|---|---|---|---|
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |
| 9 | | | | |
| 10 | | | | |
| 11 | | | | |
| 12 | | | | |
| 13 | | | | |
| 14 | | | | |
| 15 | | | | |
| 16 | | | | |

Note: Ensure that all equipment listed in **Form 1** are all operational and available upon verification.

Prepared by:

_____
Name/Position/Date

Validated by:

_____
Name of Department Head/Date

Approved by:

_____
Name of Dean/Date

**Form 2**

_____

*(Name of MHEI)*

**Bachelor of Science in Marine Transportation/Engineering**

## EQUIPMENT UTILIZATION PLAN

_____

(Name of Equipment)

**_____ Semester, Academic Year _____**

| Time | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|---|---|---|---|---|---|---|
| | • *Course Code/Title*<br>• *Instructor/Assessor Name*<br>• *Class/Section No.*<br>• *Group No.*<br>• *Practical Exercise No./Title/ Duration* | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

Prepared by:

_____

Name/Position/Date

Validated by:

_____

Name of Department Head/Date

Approved by:

_____

Name of Dean/Date

**Form 3**

_____

*(Name of MHEI)*

**Bachelor of Science in Marine Transportation/Engineering**
**Summary of Practical Exercises and Assessments**

_____

(Course Code and Title)

**_____ Semester, Academic Year _____**

| Term/Period | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Week 1 | Week 2 | Week 3 | Week 4 | Week 5 | Week 6 | Week 7 | Week 8 | Week 9 |
| Practical Exercise No./Title | | | | | | | | | |
| Duration | | | | | | | | | |

| Term/Period | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Week 10 | Week 11 | Week 12 | Week 13 | Week 14 | Week 15 | Week 16 | Week 17 | Week 18 |
| Practical Exercise No./Title | | | | | | | | | |
| Duration | | | | | | | | | |

Note: Indicate the weeks covered in each term/period within the semester, including the schedule of practical assessment.

Prepared by:

_____
Name/Position/Date

Validated by:

_____
Name of Department Head/Date

Approved by:

_____
Name of Dean/Date

**Form 4**

_____

*(Name of MHEI)*

**Bachelor of Science in Marine Transportation/Engineering**

**WEEKLY CLASS SCHEDULE**

_____

(Section/Year Level)

**_____ Semester, Academic Year _____**

| Time | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|---|---|---|---|---|---|---|
| | *Lecture:*<br>• *Topic/s to be discussed*<br>• *Students' Learning Activity/ies*<br>*Laboratory/Practical Exercise:*<br>• *Practical Exercise No./Title*<br>• *No. of groups formed*<br>• *Practical exercise duration per group*<br>• *Activities of students/groups not assigned to execute/perform the practical exercise during the period* | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

Prepared by:

_____

Name/Position/Date

Validated by:

_____

Name of Department Head/Date

Approved by:

_____

Name of Dean/Date

Note: In order to determine the correct carrying-capacity, the HEI must comply Forms 1 to 4 for the current semester and in all year levels e.g. 1st, 2nd, and 3rd year, except for the on board training (3-1 scheme). For the 2-1-1 scheme, the same shall be complied except for 3rd year level where students are undergoing their on-board training.