INDIAN MARITIME UNIVERSITY

Guidelines for Structured Shipboard Training Programme and conduct of semester III, IV, and V Examination For DNS Course leading to BSc Applied Nautical Science

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Subject: DNS leading to B.Sc. (Applied Nautical Science) Programme

Guidelines for Structured Shipboard Training Programme and conduct of semester III, IV, and V Examination

1. Preamble:

The DNS leading to B.Sc. AppliedNautical Science programme of the Indian Maritime University (IMU) was created so that a cadet gets the opportunity to earn a university degree (awarded by the IMU, a central government university) while being trained for his trade license (Second Mate - Foreign Going License, awarded by the Director General of Shipping in accordance with the IMO STCW convention as amended in 2010).

This three-year, six semesters, B.Sc. programme includes 12 months of on-shore pre-sea training (Semesters I and II), 18 months of ship board training (Semesters III, IV and V), followed by 4 months of post-sea shore-based training (Semester VI) which is the preparatory course for the 2nd Mates examination conducted by the Director General of Shipping (DGS), at approved institutes. The cadet also has to complete mandatory STCW courses (ROC/ARPA, GMDSS, PSCRB, AFF, MFA, and ECDIS) for his/her Second Mates (FG) licence which takes approximately 2 months.

In the first year of this B.Sc. programme (Semesters I and II), a cadet has to pass the University examinations conducted at the end of each semester (each semester is of six months duration). Only on successfully passing these examinations (Semesters I and II), a cadet is awarded the Diploma in Nautical Science (DNS) and is eligible to proceed for the ship board training.

If a cadet fails in Semester I examination, he/she needs to reappear in this examination at the time of his/her Semester II examination. However if a cadet fails in semester II examination, he/she can reappear only during the next semester examination (after six months) and need to complete additional documentation with his/her pre-sea maritime training institute.

Training to become a certificated officer is a continuous process. Therefore during the 18 months of required on board training, a cadet needs to follow a Structured Shipboard Training Programme or SSTP. The SSTP has been designed so that on successful completion, a cadet is considered proficient in all the competencies required for a 2nd Mate under the IMO STCW convention as amended in 2010.

After completion of 18 months of ship board training, a cadet needs to obtain a SSTP completion certificate. The SSTP completion certificate can be issued only by the same pre sea maritime training institute from where the cadet had completed his DNS course.In case the pre sea maritime training institute is no longer functional procedure as

given in section 5.6 of this document to be followed. The SSTP completion certificate will be issued by the institute only after scrutiny and assessment of the SSTP programme and satisfying its completion criteria. This SSTP completion certificate then needs to be endorsed by the officers designated by the IMU.
On completion of the SSTP, and on fulfilling other criteria as given in this notification, a cadet is eligible to appear in the IMU examination (Semester III, IV, and V examinations of the B.Sc. Applied Nautical Sciences). Credits earned from the SSTP and the marks in this IMU semester III, IV and V Examination, both constitute the final marks of the Semester III, IV, and V.

Candidates passing 2nd Mates (Semester VI) examination successfully and having passed all the five semester examinations of the IMU shall qualify for the award of B.Sc. (Applied Nautical Sciences) degree by the university.
Cadets are required also to complete the mandatory STCW courses for their Second Mate (FG) Certificate of Competency. Cadets are advised to complete these STCW courses as soon as they have the required sea time for these courses.

Career progression of an IMU SSTP cadet can be seen in the following flow chart.

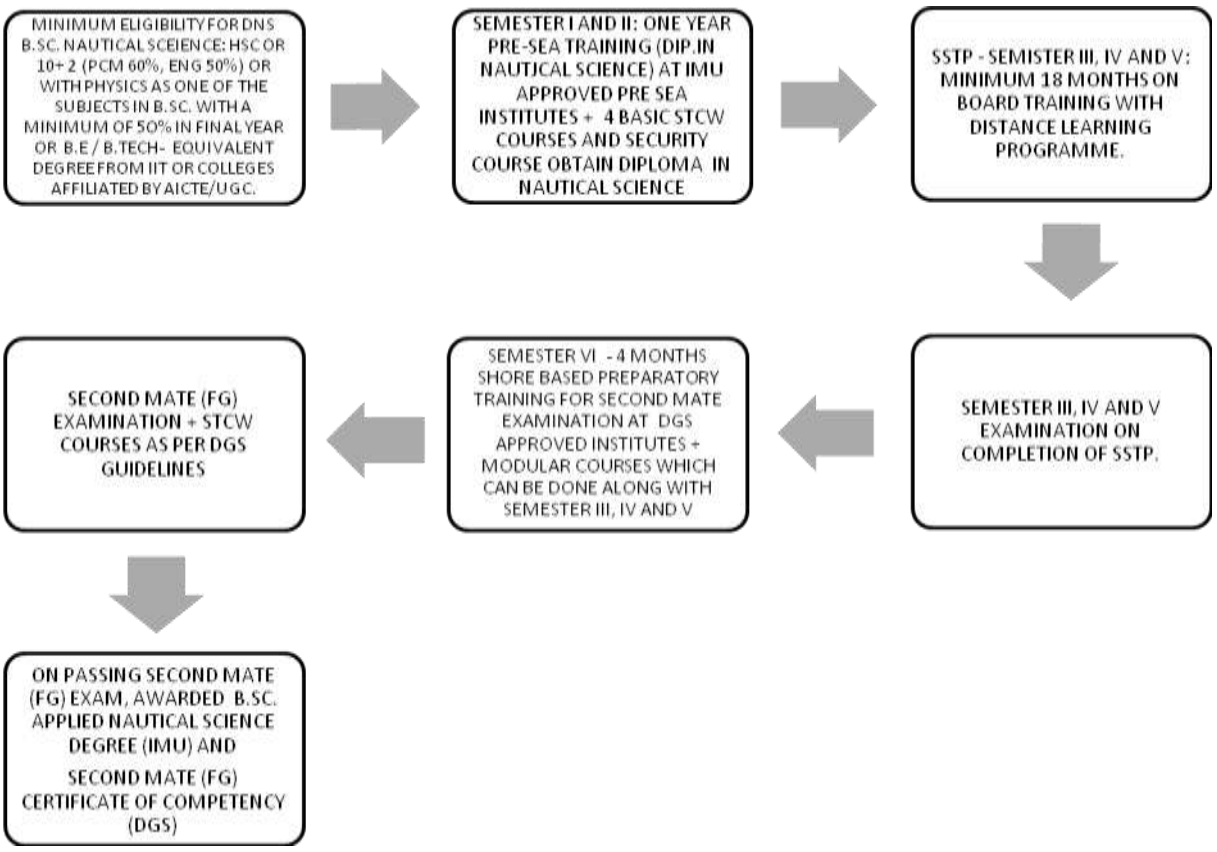

Diagram 1: Career progression of an IMU SSTP cadet is given above

In today's modern shipping scenario, ships schedules have become tighter, turn-around faster and overall efficiency of operations increased, with the result that time and effort devoted towards cadet training has reduced. The SSTP is designed to provide the right training, the right learning and the right assessment processes to turn a young cadet into a competent officer required by the international shipping industry. Therefore success of the

SSTP programme is the necessity of the shipping industry and needs positive participation and contribution by all the stakeholders.

2. Objectives of this circular:

This circular provides guidance to the stake holders, such as deck cadets, pre-sea maritime training institutes, shipping companies, Masters, Shipboard Training Officers (STOs), and Company Training Officers (CTOs) regarding the conduct, completion and management of semesters III, IV and V including the Structured Shipboard Training Programme (SSTP).

This circular is effective 01.08.2015.It shall apply to IMU DNS cadets holding Deck Cadet SSTP Record Book in compliance with the Manila Amendments to STCW issued by IMU / DGS / GlobalMET, from batch commencing August 2013 onwards

3. Completion of the DNS Programme (Semester I and II).

Semester I and II are shore based pre sea training programmes and can be completed at any IMU approved institute. The purpose of semesters I and II is to provide the theoretical foundation and the underpinning knowledge of ship board operations and practices, and thus to prepare a cadet for the ship board training. Semester I and II examinations are conducted by the IMU and the list of subjects and respective credits can be found in Table 5 and 6.
A cadet must pass the semester I and II examinations conducted by the IMU, so that he/ she can appear for the semester III, IV and V examinations. This is applicable for the batches which have commenced after August 2012.

3.1. SSTP - Issue of Training Material - On completion of Semester II

On success full completion of Semester I and II, and on meeting other regulatory criteria, a cadet would be eligible to commence his 18 months of Structured Shipboard Training Programme (SSTP) in the shipping company with which the institute has a tie up.

Before commencing the on board training (on completion of the Semester II) each cadet shall be provided a set of the IMU-DGS approved Structured Shipboard Training Programme (SSTP) material by the pre-sea maritime training institute.

The list of materials given by the institute to the cadets shall include:

3.1.1. IMU DGS approved Deck Cadet Record Book.
3.1.2. IMU DGS approved Activity Work Book
3.1.3. IMU DGS approved Supplementary Work Books
   a) Oil andChemical Tanker
   b) Gas Tanker
3.1.4. Distance Learning Material (DLM)
   a) Semester 3
   b) Semester 4
   c) Semester 5
3.1.5. Project File

3.1.6. Notification (Guidelines for Structured Shipboard Training Programme and conduct of semester III, IV, and V Examination).

3.2. **Security features of the Cadet Record Book:**

The Deck Cadet Record Book, Activity Workbook and Supplementary Work books, issued by IMU,shall have security features such as IMU Watermark on all pages, IMU, DGS and GlobalMET embossed emblem on inner first page; institute embossed stamp and unique serial number the IMU enrolment number of the cadet on the inner first page.

3.3. The pre-sea maritime training institute is to attest the photograph of the candidate affixed on the CRB with an embossed stamp.

3.4. Cadets are advised to join the pre-sea maritime training institute alumni association on completion of semester II. The pre-sea institute shall keep in touch with the cadets through the Alumni association.

4. Instruction for Conduct and Implementation of Structured Shipboard Training Programme (Semester III, IV and V).

4.1. The institute must apply for a CDC (issued by the Shipping Master) during the pre- sea training (Semester I and II). The CDC will be issued to the institute by the Shipping Master's office. CDC will be given to the cadets who have successfully passed Semester I and II.

4.2. The cadet must inform the pre-sea maritime training institute the tentative date of joining prior to boarding each ship and the exact date of joining and date of sign-off after disembarking from each ship. The format for reporting is given in Section 11.

4.3. The Cadet Record Books and the associated documents shall be handled with utmost care, like official documents. It is the responsibility of the cadet for its safe keeping and to ensure that it is kept upto date. He/she will need to take the initiative of obtaining the signatures of the STO and Master by demonstrating his proficiency in that task or activity.

4.4. **On board training:**

4.4.1. The duration of Structured Shipboard Training Programme (SSTP) is 18 months. During this period a cadet needs to complete specific tasks and assignments. The SSTP material provided to the cadet also serves as the evidence of completion of these assignments and tasks.

The SSTP materials help the sponsoring company and other stakeholders to monitor the cadet's progress as they go through their onboard training. It is therefore extremely important for the cadets to keep these materials up to date at all times.

Cadets must ensure that they record all the training sessions they have undertakenand that they have obtained the signatures from the designated officers providing the training.

Cadets are reminded that making correction of any entry in the record book by overwriting, and use of correction fluid (such as white ink) etc. are not allowed.

If a wrong entry has been made it should immediately be struck through with a single line in such a way that the wrong entry is still legible. The struck through wrong entry should be initialed and dated by the cadet. All entries made in these documents must be genuine.

4.4.2. Loss of Cadet Record Book, Activity Work book(s), Project Work file or Watchkeeping Records.
It is advised that the cadet keeps photocopies or scanned copies of all relevant pages of the above documents as a backup so as to provide evidence in case any training material and/or the record book is damaged or lost.

In case of such loss or damage on board, the cadet must inform his STO and the master immediately. It is the responsibility of the cadet to notify his Pre-sea institute and the shipping companyCTO at the earliestand lodge a Police FIR.

Pre sea maritime training institute will keep a record of any such damage or loss of SSTP materials. After verification of facts, the institute will issue new SSTP document to the cadet. Any photocopy of the pages from the damaged or lost material may be endorsed by the pre-sea maritime training institute after proper scrutiny. This will need to be retained by the cadet to be shown to the SSTP officer at the pre-sea institute for the assignment of marks during final completion of SSTP after 18 months sea time.

In case the cadet cannot show any copies of the relevant documents, it will be deemed to be incomplete and he/she will have to complete them again on his next ship.

4.4.3. **Instructions to cadets regarding training, safety and maintaining discipline onboard:**

Safety is of paramount importance. Keep safety as your primary focus whenever any activity is undertaken. Identify the hazards involved, assess the risk and take proper safety precautions when carrying out a task.
Never run but walk fast, always maintain 3-point contact when climbing ladders and stairs. Ensure that the correct personal protective equipment is worn at all times. If you feel safety is compromised at any

time, immediately contact a senior officer.

- Write down what you want to get out of your training on the ship, and create a programme for yourself.
- Make a time management plan to maximise the training.
- Find out in advance what training aids will be available (checklists, books,manuals, videos/DVDs, internet, computer-based learning etc.) and use themwhen you are on the ship.
- Once you are on board, find out where the regulatory publication's (STCW, SOLAS, International Convention for the Prevention of Pollution from Ships [MARPOL]etc.) are.
- Find out who has experience in your chosen area of interest and make a list of questions you could ask them that are not readily available elsewhere.
- Take an interest in everything and use any opportunity to observe or take part in an operation, maintenance and repair.
- Keep your CRB in good condition. It is this document that will be making an impression on the assessor.
- Makes sure that the relevant officers sign off on your tasks weekly, as a minimum.
- Hand your CRB to the STO once a week for inspection
- If you should find it difficult to do a task, go and talk to your STO as soon as possible - he will be able to advise you. It is best not to fall behind with on board training.
- Maintain strict discipline onboard - develop a sense of duty and responsibility towards the work you perform.
  - Wake up early, wash clothes, make the bed, make the room, and maintain spotless cabins/W.C.
  - Wear only uniform or boiler suits when on board the ship and wear civvies only when going ashore
  - Do not have your meals in duty mess or crew mess room. Cadet should have meals in the Officer's Mess Room in Uniform only.
  - Never lie as team spirit and mutual trust are the integral part of on-board culture
  - Maintain the right decorum on board.
  - Maintain strict punctuality.
  - Be a keen learner; keep your eyes and ears open to understand what is happening around you. Clarify your doubts with seniors at appropriate time and be thankful for all that is taught.

Show enthusiasm and initiative; develop the attitude and ability to work hard to complete a difficult task properly and on-time.

4.4.4. **Instructions to cadets regarding upkeep of CRB:**

The Cadet Record Book lists the practical tasks required to be carried out on board. The task list is given in Section 8 of the CRB, in accordance with the STCW convention as amended in 2010.

4.4.5. On receipt of the CRB, the Cadet should complete the information required in **Section 3** (General Information).

4.4.6. **Section 4** of the CRB provides the overview of task progression. The Cadet is responsible for the regular and timely submission of his CRB for inspection and review by the Master, STO and CTO. The task summary record in Section 4.4 should be used for recording the tasks completed in Section 8 and is to be kept updated. Any additional video, computer based training programme and on line training modules should be recorded in Section 4.5 of the CRB.

4.4.7. As soon as possible upon joining each vessel, **Section 5** of the CRB concerning details of Shipboard Safety and Security Familiarization should be completed.

4.4.8. After joining a vessel, it is the responsibility of the cadet to fill in all the ship's particulars in **Section 6** of the CRB as soon as possible.

4.4.9. **Section 8 of the CRB contains the list of competences / tasks** which should be progressively completed. The tasks in the SSTP Record Book are based on main functions (navigation, cargo handling and stowage, controlling the operation of the ship and care for persons on board) in accordance with the STCW convention as amended in 2010 (STCW 2010 Table A-II/1). The competences for Ship Security are also included in the CRB based on STCW (convention as amended in 2010) Table A-VI/6-1.

4.4.10. The SSTP Record Book also addresses tasks for specialized vessels such as Oil and Chemical Tankers, Gas Carriers, Passenger ships, Ro-Ro ships, Ships operating in Polar Waters / Ice conditions, Dynamic positioning vessels and offshore vessels as per STCW requirements. These tasks to be completed only in case the cadet sails on that type of ship.

4.4.11. The designed tasks are directly relevant to the competences required by STCW
convention as amended in 2010 .The aim is for the Cadet to be "considered proficient" in all of these competences by the end of the cadetship period. All the competences designated are based on the practical tasks carried out on board.

4.4.12. The task summary record in Section 4.4 should be used for recording the tasks completed in Section 8 and be kept updated.

4.4.13. The CRB should be submitted by the cadet to the Shipboard Training Officer onjoining the ship and subsequently every week for monitoring progress. CRB should be submitted to the STO once a month for documenting STO's monthly review and thereafter to the Master.

The training programme shall be reviewed by the shipping company personnel periodically when they visit the ship (eg: Auditors, Superintendents) to monitor the progress of the training and by the Cadet Training Officer (CTO) after each tenure on the vessel.

All comments in the CRB should be in reference to cadet's progress in training andcompetence alone. Example can be seen in the CRB in the relevant section (Section 4 of the CRB).

4.4.14. Any additional video, computer based training programme and on line training modules should be recorded in Section 4.5 of the CRB. In case additional pages are required, they may be filled and stapled to this section.

4.4.15. **Bridge Watch keeping:** As per requirement, cadet must complete a minimum of 6 months of bridge watch-keeping (180 watches of 4 hrs each = 720 hours) along with a certified officer.

A cadet shall keep watches with Chief Officer and other navigating officers during passages through all areas of the world with conditions of clear and restricted visibility. A record of all Bridge Watches kept must be maintained as per CRB (Section 9.1).

4.4.16. **Steering:** Each cadet should complete at least a total of 40 hours of steering practice, broken up between open waters, coastal waters, congested waters and pilotage waters.

The cadet must try and complete the required 40 hours of steering on the first ship itself. On each vessel, the Master is to carry out a test and if found proficient, the 'Steering Certificate' to be signed in the CRB (Section 9.6). "Steering by sight without aid of compass" is an essential part of the steering training and it should be practiced diligently so as to be proficient. Proper record of hand steering shall be maintained in section 9.2 of the Cadet Record Book. A precise record should be kept of the Cadet's seagoing service including time spent on steering

4.4.17. **Port watches**: The CRB Section 9.3 contains format for keeping a record of port/cargo watches kept. The record is to be maintained in a separate file. A minimum of 60 port / cargo watches (each of 6 hours duration) must be kept.

4.4.18. **Engine Room Watchkeeping**: A cadet is required to get familiar with the engine room machinery especially work shop activities and arrival/departure procedures.

A cadet is required to keep at least 20 hours of Engine Room Watchkeeping. This should be recorded as per the format given in Section 9.4 of the CRB.

4.4.19. **Deck Cadet Shipboard Activity Workbook**: The CRB is supplemented by a DeckCadet Shipboard Activity Workbook. The purpose of the Activity Work Book is to ensure maintenance of a written record of the relevant tasks carried out onboard.Completion of tasks requiring documented evidence, such as calculations andprocedures which are to be recorded in this Activity Work Book. Additional pages may be used and stapled to the relevant activity task in case the space available for the write-up is insufficient. To assist the cadet in spacing out the activity work, the Activities have been prioritized into those requiring to be done in Phase 1 or 2 or 3. Each phase being of six month duration.

4.4.20. **Deck Cadet Shipboard Activity Work Book-Supplements**: Completion of tasks requiring documented evidence, such as calculations or lists of procedures relating to cargo operations on specialized ships (Oil and Chemical Tankers or Gas Carriers) are to be recorded in these supplements to ensure a written record of the tasks carried out on board. The Work Book/s should be submitted to the Shipboard Training Officer (STO) on joining the ship and subsequently every month for inspection. The Shipboard Training Officer should inspect the Work Book together with the Record Book to check the Cadet's progress.

4.4.21. **Project Work file**: The Cadet is also required to do the project work as provided in Section 10 of the SSTP Record Book.

A Project work file is to be maintained. Projects should be done regularly, so that the requisite numbers are completed every semester. Project file should have an Index.Index should have the serial number, date, topic name, and page numbers.Appendix 3 provides the format of the Index for the Project Workbook. Prior signing off from the ship, STO should sign at the bottom of each index page with date and stamp. Each page of a project should be numbered and each project should be signed, dated and stamped by STO on the last page of the project.

Project work is divided into two broad categories: Generic and Ship-type specific. The generic category has projects which are applicable to any type of ship so that the cadet can complete them on any ship that he joins. The ship type specific projects would be done depending on the type of ship he is on at that time.

Projects concerning Navigation and controlling the operation of the ships and care for persons on board are compulsory for all cadets. The projects are further prioritized into the three semesters. Additional projects are required to be carried out depending upon the ship type-sailed on - for example Container vessels, Bulk carriers, Heavy lift vessels, Car carriers/ Ro-Ro vessels, Forest product carriers and Offshore vessels.

4.4.22. **Cadets are warned that fraudulent practices such as forging**

signature, copying another cadets work book or submitting a project file of another cadet, shall be dealt with severely and could entail those tasks/projects to be redone with a penalty of additional seatime.

4.4.23. In case a cadet needs additional copies of any page of the CRB for record keeping or certification (Example Record of Bridge watchkeeping, Record of steering, Bridge watch keeping certificate, Port watch keeping certificate etc.) he /she is advised to take a photocopy of the relevant page and get it signed (with date) and stamped by the STO.

4.4.24. **Role of the Shipboard Training Officer (STO):**
STO is in-charge of implementing and monitoring the progress of the SSTP. The competencies under Section 8 of Cadet Record Book (CRB) are sub-divided into a number of practical tasks in which the cadet needs to demonstrate his proficiency in performing that task. The STO should sign and date the column “considered proficient” when the cadet has satisfactorily demonstrated his proficiency in performing all the sub-tasks for that competence and they have been all signed off.

The assessment tools used for demonstrating proficiency could be a practical demonstration, an activity performed to the satisfaction of the STO or his designated deputy, oral questioning and/or by completing a project in the Project Work book.

The STO should ensure that the cadets have undergone an induction /familiarization on safety, security and relevant shipboard procedures before they are assigned to shipboard duties.

It is suggested that the STO holds an initial meeting where he will ask the cadets about themselves, their first impressions of life on board, and what they are looking forward to during their experience at sea. This interaction enables the STO to:

- get to know the cadets, their backgrounds and the courses studied ashore
- know the status of tasks completed in CRB,assess their current knowledge to ensure that training starts at the right level
- start to build up a good relationship with the cadets as they may hesitate toask and may not know whether they are allowed to take part in certain tasks,
- encourage cadets to participate in the day-to-day work on board.

The STO should launch the onboard experience in a positive way, by reassuring the cadets that they will be assisted and supported by the senior officers on the ship. Cadets should feel that the STO is their first point of contact on the ship.

The first month on the first ship is the most critical as the cadet is thrown into a total new environment which he / she may have difficulty adjusting to. Positive strokes can motivate and reassure the cadet that he / she will get over the initial blues and to focus on learning the tasks at hand. Negative experiences on the other hand can break the cadet's morale and confidence and lead him / her to a state of despair. Brotherly compassion and guidance will help the cadet to get over this initial transition stage.

While the STO's overall role is to supervise and monitor the cadets' progress, in essence it is far broader than that and includes:

Welcome and initial meeting

- Welcoming and helping new cadets to settle into their new environment
- Assuring them of an interesting and fulfilling learning experience
- Pointing out that if cadets would like to learn about certain equipment or tasks on board they should approach the STO about this.
- Emphasising that the responsibility for the successful outcome of on board training rests with the cadets themselves

Planning

- Learning and understanding the Structured Shipboard Training Programme the
  cadet has to undergo and ensuring that the cadets have planned their training tasks efficiently
- Planning, agreeing and arranging all training session activities with theofficers and crew on board
- Providing useful tips and coaching and helping cadets to organise their duties
- Setting aside periods each week in which cadets can study and complete the written tasks
- Discussing and setting down priorities and opportunities for training on the voyage.
- Deciding what training aids will be needed.
- Providing a list of tips so as to help cadets organise their duties
- Creating weekly and monthly programme of work activities associated with aparticular task
- Informing company's requirements for cadet appraisals

A positive attitude

- Focussing the training programme on the needs of the cadets and not treating them as an extra pair of hands on board
- Giving them encouraging and constructive feedback as they progress along their training programme
- Treating them with respect and patience
- Boosting their confidence

Monitoring progress

- Monitoring cadets' progress during the voyage
- Taking account of the cadets' individual abilities to absorb new information
- Ensuring that cadets are working consistently towards the completion of their onboard project work
- Making sure that the assets available on board ship, such as the accumulated knowledge and experience of serving officers, and the ship itself, are being used to their best advantage
- Taking responsibility for the cadets' schedule on board (including the requirement for hours of rest), and for any discipline that they may require

Review

- Inspecting the cadets' SSTP documents and checking that they have been authenticated by the relevant officers. Sending required SSTP documents to officesashore
- Carrying out appraisals as required. Suggest a weekly review schedule to be set, such that the cadet shows his progress during that week, and completed tasks signed off
- Evaluating the success of the training at the end of each month
- Providing information requested by other stakeholders about cadets' performance on board
- Every quarter, the STO shall :
- Attest and date the Task Summary Record, Section 4.4 in CRB
- Attest and date the completed Projects (as per format provided in Appendix 3).
- Attest and date the Shipboard Training Officer's Monthly Review of the Record Book and Master's Monthly Review of the Record Book

4.4.25. **Role of other officers**

A positive outcome of the SSTP will also depend on how the officers can create a supportive learning environment for the cadets.

This can be done by:

- Making each cadet feel valued: This is done by listening to what they have to say and asking for their ideas and thoughts.
- Giving feedback: Praise where appropriate and, if the person has made a mistake, provide constructive feedback about what they should have done instead.
- Being approachable and implementing an 'open door' policy: The cadets will keep their concerns to themselves if they are anxious about speaking to the officers, and this may delay their development.

4.4.26. **Role of the Master**

Master becomes the father figure for a cadet while he is on board, Master provides the vital link between the Shipboard Training Officer and the Company Training Officer/ Pre-sea Maritime Training Institution

ashore; and

- ensures that the cadet is effectively carrying out the training programme. If required he provides the required guidance and takes the corrective actions.
- inspects the training programme at monthly intervals to ensure that the training programme is on schedule and gives comments and suggestions for further improvement.
- ensures that the Summary Record is emailed Quarterly to the CTO.
- signs the certificates listed in the CRB when appropriate, after assessing the cadet.

4.4.27. **Mentoring by the Senior officers:**

A young cadet must gain the technical knowledge and also needs to develop 'Officer Like Qualities' (OLQ) such as:

- Ability - aptitude
- Knowledge - power of comprehension
- Diligence- dedication
- Industriousness -hardworking, does not shun work, willing worker
- Sense of discipline - respect for seniors
- Initiative - optimistic, does not just wait to be told what to do. Seeks work, seeks improvement, seeks perfection
- Leadership - confident and assertiveness in his communication with the crew
- Loyalty - loyal to his fellow colleagues, loyal to the company, exudes a sense of gratitude and purpose

In most cases mentoring by a senior officer can contribute significantly to achieving this goal. As personal qualities such as behaviour, attitude, emotional maturity are critical factors affecting the performance of an officer, the right coaching and mentoring by the senior officers can significantly improve the learning and overall development of a young cadet.

As a mentor the officer can provide the right guidance, motivation and confidence and also share knowledge and experience. A mentorship is a relationship based on mutual trust, professional values, empathy, and responsiveness. The purpose of mentoring is to support and encourage the cadets to manage their own learning in order that they may maximize their potential, develop their skills, and improve their performance and thus facilitating their professional development. A mentor has the understanding of the issues and is a guide who can help the cadets to find the right direction and who can help them to develop solutions. A mentor should help the cadet to boost self-confidence. A mentor should ask questions and challenge, while providing guidance and encouragement. Mentoring allows he mentee to explore new ideas in confidence. Where appropriate, the STO can assign a mentor for a cadet or take on that role himself. In this way training and mentoring can

complement each other.

4.4.28. **Role of the Company Training Officer (CTO)**

CTO is responsible for overall administration of the structured shipboard training programme. He/She :

- issues guidance as required and ensures that all concerned with the training programme play their role.
- monitors the progress of the Cadets through the Quarterly Summary Reports. Checks and comments on the appraisal report sent by the Shipboard Training Officer.
- liaises with the Pre-Sea Training Institute and forwards the Quarterly summary report once received from the ship.

4.4.29. **On sign-off from each ship**

Prior sign off from each ship a cadet shall ensure that following are completed

a. Section 5 and Section 6 of CRB are completed
b. Section 7, 8 and 10 of CRB are appropriately signed, stamped and dated
c. All relevant certificates in Section 9 of CRB are appropriately signed, stamped and dated.
d. Activity Sheets and Project Work of Work completed successfully to be signed and stamped by STO.

5. Continuous Monitoring of SSTP progress during the 18 months onboard training:

Training progression and performance of a cadet shall be monitored by the CTO and the pre sea maritime training institute. If cadet performance is unsatisfactory CTO shall intimate the cadet and the Master with the reasons for the unsatisfactory performance and subsequent improvement required. To facilitate this monitoring process following must be done:

5.1 Every quarter, the cadet shall send either a photocopy by post or a scanned copy by email of the following to the Company Training Officer (CTO) who in turn will pass it to his/ her pre-sea maritime training institute.

5.1.1 Task Summary Chart, with the completed tasks ticked off and signed and attested by the STO.

5.1.2 List of completed Projects, duly signed and attested by the STO (As per format provided in Appendix 3).

5.1.3 Shipboard Training Officer's Monthly Review of the Record Book and Master's Monthly Review of the Record Book duly signed and stamped by the STO.

5.2 The Company Training Officer (CTO) shall monitor the training progress of the cadet. CTO shall liaise with the Master in case the cadet is lagging behind in his / her completion of tasks and activities. CTO shall seek periodic appraisal of the Cadets progress and performance and issue recommendations to the cadet

towards improvements sought in his / her performance.

5.3 During the SSTP period, once in midterm i.e. between 6-12 months, the cadet shall have a mid-term review done by the Pre-sea Training institute. He/she shall either visit the Pre-sea institute with all documents as mentioned below or send them by courier tothe pre sea institute.After completion of 18 months seatime the cadet shall personally visit the pre-sea maritime training institute for SSTP Clearance and carry the following documents:

5.3.1 Deck Cadet Record Book
5.3.2 Activity Work Book
5.3.3 Supplementary Work Book depending on the tanker ship type served on, if applicable.
5.3.4 Project Work File
5.3.5 Watchkeeping logs and certificates

5.4 Prior to visiting or sending the documents to the pre sea institute , the cadet shall confirm that he/ she has completed, pertaining to the semester finished, at least

5.4.1 80% of the training tasks (Section 8 of CRB),
5.4.2 80% of the activities from Activity Work Book.
5.4.3 80% of the activities from Supplementary Work Book (where applicable).
5.4.4 100% of Projects for the ship types sailed on as listed in CRB (Section 10 of the CRB)

5.5 In case of closing down of the institute from where the cadet has done his Pre Sea Training, the cadet will have to approach the designated IMU campus who will conduct the mid-term review and final assessment of the cadets performance and will issue the SSTP certificate.

5.6 Mid-term Review by the Pre-sea Training Institute

The Pre-sea maritime training institute is to carry out an appropriate assessment, of the training progress made by the cadet during the 6 to 12 months that the cadet has spent on board. The Record books and associated documentation shall be thoroughly reviewed and the knowledge gained assessed through interview either face to face or on skype or similar web application. Please note visit to institute is optional.

The Mid-term Review is to guide the cadet on where he/she has lagged behind and what improvements and course corrections the cadet needs to make, so that his training is back on track and can complete the SSTP fully within the remaining seatime. The Pre-Sea Training Institute shall provide the cadet a Mid-term Review Report in the format given in Appendix 5.

6. Eligibility criteria for Semester III, IV and V examination and requirements for successful completion of the overall Structured Shipboard Training Programme (SSTP)

To be eligible to appear in the IMU semester III, IV and V examinations, the following should be completed:

6.1. Completed 18 months of Seatime. For calculating seatime, the day of joining and sign off will not be counted.

6.2. Pass status of previous semester examination results (semester I and II) can be obtained from the pre-sea institute and from the IMU.

6.3. Cadet Record Book (CRB) including additional task for special vessels if the cadet serves in any of the given type of special vessels during any phase, completed in all respects. At least 80% of the tasks must be completed (Task summary sheet from CRB duly filled in and showing at least 80% of tasks completed and found proficient by the STO).

6.4. Bridge watch keeping certificate (Section 9.5 of CRB) must be signed by the Master, certifying a minimum 6 months of Bridge watch keeping (each day's bridge watchkeeping is counted as of 4 hours, thus 6 months or 180 days of bridge watch is equivalent to 720 hours). Section 9.1 of CRB prescribes the format for the record of such watches.

6.5. Cargo and Port Watch keeping certificate should be duly signed and stamped by the master, certifying as to a minimum of 60 cargo watches (each Port watch is of 6 hours duration) have been kept (Section 9.7 of CRB).

6.6. Record stating that a minimum of 20 hours of Engine room watches has been kept/work has been done in the E/R. This needs to be duly signed and stamped by the chief engineer (Section 9.8 of CRB).

6.7. Steering certificate from the Master, certifying proficiency in steering and a minimum of 40 hours of steering practice as prescribed in Section 9.2 and 9.6 of CRB.

6.8. A self-attested copy of the Consolidated Seatime certificate from the company for 18 months sea service.(Format attached, Appendix 2). The Original shall be kept for giving to MMD.

6.9. **Ship Type specific tasks and Task Exemption:**
The cadet should demonstrate at least 80% tasks have been completed for the ship types sailed on. These ship types are given in CRB Section 8.5 to 8.13. It is expected that all the type specific tasks for the particular ship type can be completed in a period of 6 months. If a cadet serves less than 6 months on a ship type mentioned in Section 8.5 to 8.13, then pro-rata percentage of task completion may be accepted.

6.10. **Project Work**: Projects are listed in Section 10 of the CRB and are of two types -

Generic and ship type specific.

Generic type project list is provided in Section 10.1 and Section 10.2 of the CRB. They are further split into First Phase, Second Phase and Third Phase. First, Second and Third Phase projects are to be completed in Semester III, IV and V respectively. A cadet needs to complete all generic projects (100%).

Ship type specific projects are listed in Section 10.3 to Section 10.10 of the CRB. He/she also needs to complete all projects (100%) for the types of ships sailed on. If a cadet serves less than 6 months on a ship type mentioned in Section 10.3 to 10.10, then pro-rata percentage of project completion may be accepted.

A project file needs to be maintained. The project file to have an Index listing out the Projects done along with the STO's signature and stamp in the bottom of the index page, prior sign off from each ship. (format attached, Appendix 3).

6.11. **Deck Cadet Activity Work Book:**

- In addition to the tasks and Projects listed in Section 10 of the CRB, the cadet will require completing the DECK CADET ACTIVITY WORK BOOK. This activity work book is common to all ship types.
- In addition to the above there are three supplements to the activity book which the cadet will have to complete on those types of ships. They are:
  a) DECK CADET ACTIVITY WORK BOOK: Oil and Chemical Tanker
  b) DECK CADET ACTIVITY WORK BOOK: Gas Carriers.
  At least 80% activities to be completed on board from both the Activity Workbook and the tanker supplement (if sailed on the particular type of tanker vessel)

6.12. **Responsibilities of the Pre-sea Maritime Training institute** for the conduct and successful completion of the Semester III, IV and V :
The pre-sea maritime training institute plays the role of a mentor, teacher, assessor, as well as facilitator enabling a cadet to complete the SSTP programme successfully.

The primary responsibilities include but not limited to:

a. Ensuring that each cadet gets at least 18 months of on board training opportunity.
b. Each cadet is provided with the SSTP materials as listed in Section 3.1 of this circular.
c. Regularly monitor the progress of learning and training of the Cadet during Semester III, IV and V which include assessment of SSTP materials (such as CRB tasks, projects, activity work book) and Mid-term review and debriefing (which include written and oral assessment) when a cadet visits the institute or sends his documents to the pre sea training institute in between his 18 months of on board training.

d. To co-ordinate with IMU and DGS as required by various circular /notices issued by the IMU and DGS.
e. In case of reported loss or damage to either of the CRB, Activity books and supplements of Activity workbook by the Master or the Cadet, the institute shall keep a record of the loss and on verification of facts issue a new SSTP document to the cadet. In case the cadet is in a position to provide photocopy/ scanned copies of his lost document, the same shall be endorsed by the institute after scrutiny. The loss of record book and the subsequent re-issue of a new book must be reported to IMU with the unique book number issued.
f. Assessment of the SSTP work at Final stage after completion of requisite 18 months seatime and the issuance of SSTP certificate.
g. To upload marks of internal assessment of SSTP on the IMU website as required.
h. To facilitate the application process of a cadet for the Semester III, IV and V examinations which includes collection of fees, consolidating application forms and fees and submission of all documents and fees to the IMU.
i. Notification of internal and external assessments marks to the cadet.
j. Providing the necessary support, guidance as mentor to the cadets.
k. To send a list of cadet's name with the unique number on their CRB, which should be the IMU Enrolment number.

7. Assessment of SSTP by the Pre-sea institute

7.1. SSTP-Internal Marks

The marks for the SSTP assignments/tasks for T1 301, T1 401 and T1 501 shall be forwarded to IMU by the pre sea maritime training institute on completion of the cadet's seatime. Institutes to use the format given in Appendix 6 for forwarding the above internal marks.

7.2. Pre-sea maritime training institute is responsible for assessing SSTP materials such as CRB tasks, CRB projects and SSTP activity workbooks. The assessment criteria are given in para 7.4, 7.5, 7.6

7.3. **Guidance on writing a Project.**

Project work complements learning and reflects understanding of the task. Allwriting should be relevant to the task and should completely answer all the sub tasks.

Writing should be original and related to the ship the cadet is on. It should not be just a collection or copy of original documents or any other literature. Where necessary relevant pictures, data, diagrams, tables can be used. However a project consisting mostly copy of other documents (such as an instruction manuals) is not substitute of an original work and is not acceptable. When using such additional materials, appropriate references should be used. When writing a project attention also should be given on the presentation. Using headings, sub-headings, numbering headings or subheadings, underlining main points

highlights understanding and improve readability.
Cadets are advised to pay attention to the assessment rubric. This rubric provides details of how the work will be assessed. Thus paying attention to the rubric will help in writing a better project.

7.4. **Rubric for the project works as listed in Section 10 of the CRB**

The rubric provided below shall be used when assessing the project work listed in Section 10 of the CRB. Assessor can use the appropriate mix of assessment techniques such as assessing written project work and oral questioning of the cadet.

Rubric to be used for assessment of each Project work as listed in Section 10 of CRB.				
Criteria	**Weightage**	**Less than 60%**	**60% to 80%**	**80% to 100%**
Relevance of the project content to the ship type sailed on and relevance to the question/task	20%	Irrelevant or partly relevant subject matter.	At least 70% of the work has relevance.	More than 85% of the work has relevance.
Appropriate reference material used	15%	None / Wrong reference to regulatory publications, best industry practices guidelines, or standard literature.	At least 70% of the work is based on references to regulatory publications, best industry practices guidelines, or standard literature and ship's manuals and plans.	At least 85% of the work is based on references to regulatory publications; best industry practices guidelines, or standard literature. Proper citation and reference list provided.
Logical Structure	15%	Random, incoherent points reflect no understanding of the subject. Data picked up from various disjointed sources.	Reasonable structuring of the task, reflecting understanding of critical/ salient points of the task and logical progression of description/ project work.	Exceptionally well structured task reflecting complete understanding of task and its critical elements.
Project completely answers the	10%	Less than 70% of the task is answered.	At least 70% of the task is answered.	More than 85% of the task is answered.

Rubric to be used for assessment of each Project work as listed in Section 10 of CRB.				
Criteria	**Weightage**	**Less than 60%**	**60% to 80%**	**80% to 100%**
task				
Reflects the underlying aims and objectives of the task and expresses thorough understanding of the subject.	30%	No understanding of the underlying aims and objectives.	Reasonable understanding of the underlying aims and objectives.	Very good understanding of the underlying aims and objectives.
Presentation	10%	Inappropriate sheets used, untidy and shabbily done task reflecting sloppiness. Diagrams, handwriting not legible, untidy or no markings, free hand drawing, no or incomplete index, maintained, no signatures/ stamp of STO, poor quality of stationery used.	Appropriate sheets used, reasonably tidy task. Diagrams, handwriting legible, tidy markings, no free hand drawing, complete index maintained, task signed and stamped by STO, reasonable quality of stationery used.	Overall presentation of the task is impressive. Appropriate sheets used, very tidy task. Very good quality diagrams, neat and clear handwriting, tidy markings, no free hand drawing, complete index maintained, task signed and stamped by STO, reasonable quality of stationery used.

Table 1: Rubric to be used for assessment of each Project work as listed in Section 10 of CRB

Allocation of marks for scoring of CRB Sections 5, 6, 7 and 9.

CRB Section		Min requirement	Score (each)	Max score	Total
Section 5	Shipboard Safety and Security Familiarisation	25	1	30	
Section 6	Ship's particulars	60	1	60	
Section 7	COLREGS	55	3	170	
	TOTAL				260
Section 9	9.1 Bridge Watchkeeping	720 hrs	Minimum 75 marks for 720 hours 1 mark for every 5 hours in excess of 720 hrs	150	
	9.2 Steering	40 hrs	Minimum 20 Marks for 40 Hours 2 mark for every 5 hours in excess of 40 hrs	40	
	9.3 Port / Cargo Watchkeeping	360 hrs	Minimum 40 marks for 360 hours 1 mark for every 5 hours in excess of 360 hrs	80	
	9.4 Engine Room Watchkeeping	20 hrs	Minimum 10 marks for 20 hours 2 mark for every 5 hours in excess of 20 hrs	20	
	TOTAL				290

Table 2: Allocation of marks for scoring of CRB Sections 5, 6, 7 and 9

Section 9: Min pass marks of 50% to be allotted on achieving the minimum requirement.

Eg. If the cadet does 720 hours of bridge watch, he/she will get 50% marks, he/shewill get additional 50% marks if an additional 375 hours of bridge watchkeeping have been kept.

If the cadet does 40 hours steering he/she gets 50% marks. To get another 50% marks he/she has to do steering for additional 50 hours.

7.5. **Allocation of marks for scoring of CRB Tasks Section 8, Project Work Section 10 and Activity Work Section 11.**

	CRB Tasks	Score(1mark each) Specialised ship's tasks may substitute general cargo-work tasks	Projects (in Cargo work best 22 projects to be marked for general cargo / bulk carrier / container / Oil / Gas / Chemical tanker)	Score (25 marks each)	Activity Work	Score (5 marks each) In cargo work,Tanker tasks may substitute dry cargo tasks Max 18 best activity to be marked	Max Marks	Factor (0.4)	Pass Marks 50%
Navigation	191	200	7	175 + 5*	124	620	1000	400	200
Cargo Work From Table 2 (Section 9)	53	70	22	550	18	90	710 290 Total 1000	400	200
Controlling operations of ship From Table 2 (Section 5,6,7)	155	200	14	350	38	190	740 260 Total 1000	400	200

* For neatness and presentation

Table 3: Allocation of marks for scoring of CRB Tasks Section 8, Project Work Section 10 and Activity Work Section 11

7.6. **Criteria for the marking of Tasks, activity work books and supplements**

It is essential that proper signature and date of the STO and Master are appended in the appropriateboxes

	Percentage of marks awarded
CRB Tasks as listed in Section 8	The tasks should be satisfactorily completed and demonstrated to the STO. It should then be appropriately signed, dated and stamped.The Pre-Sea Institute may check the extent of knowledge gained by the cadet by asking questions in written or oral form.
All project work	The project should be satisfactorily completed as per 7.4 of this notice and appropriately signed, dated and stamped
All Activity workbooks	All activities should be correctly demonstrated to the STOand appropriately signed, dated and stamped. Pre-Sea institute to check the accuracy of the activity done and give score as per Appendix 6.

Activity Supplements	Percentage of tasks satisfactorily completed and appropriately signed, dated and stamped. The cargo specific activities in the supplementary workbook may be scored in lieu of the generic cargo work activities in the Activity Workbook.

Table 4: Criteria for the marking of Tasks, Activity work books and supplements

7.7. The pre-sea institute shall review the cadet's performance during the mid-term assessment using form given in Appendix 5. On final completion after 18 months sea-time the pre-sea institute shall assess the SSTP performance of the cadet as given in 7.5, 7.6 and fill up the score sheet as given in Appendix 6. On successful completion of SSTP an SSTP completion certificate shall be issued as per format given in Appendix 1.

8. Semester III, IV and V examination and Application Process:

8.1. A cadet is eligible to appear in the Semester III, IV and V examination on successful completion of the SSTP. The completion and eligibility criteria are given in Section 6 of this circular. To apply for appearing for semester III, IV and V examination, the cadet then needs to follow the below mentioned processes:

8.1.1 **SSTP completion certificate from the Pre-sea maritime training institute:**

SSTP completion certificate is issued by the pre-sea maritime training institute on successful completion of the onboard training programme

After scrutiny and verification of relevant documents and on meeting all the completion criteria of the SSTP as given in section 5 of this circular,the pre-sea maritime training institute will issue the SSTP completion certificate in the prescribed format (Appendix 1).

8.1.2 **Endorsement of the SSTP completion certificate by IMU:**

The SSTP certificate issued by the pre-sea maritime training institute shall be carried by the cadet along with the following documents to any of the IMU designated officers.

- Pre-Sea Training Completion Certificate issued by the institute.
- SSTP completion certificate issued by the institute. (Appendix 1)
- Mark Sheet for DNS leading to B.Sc Applied Nautical Science with Internal marks assigned by the Pre-Sea Training institute (Appendix 6)
- Sea time certificate from the shipping company. (Appendix 2)
- Continuous Discharge Certificate (CDC)

On satisfactory compliance, the designated officer by IMU shall endorse the SSTP certificate.

8.2. **IMU semester III, IV and V examination:**

Examination by IMU for UG/NS/MS/T1301, UG/NS/MS/T/1401 and UG/NS/MS/T/1501 will be conducted on the basis of SSTP material supplied by IMU for III, IV and V semesters. The examination schedule and application procedure will be notified by IMU from time to time. The examinations shall consist of three written papers, duration of 3 hours each.

- T1301 Function 1 – Navigation
- T1401 Function 2 – Cargo Handling and Stowage
- T1501 Function 3 – Controlling the Operations of the Ship and Care for persons on board

The Syllabus for Semester III, IV, and V examination and Test Paper Pattern is given in Appendix 4.
Details of exam venues, dates, fees, application forms, payment of examination fees and dates:

- The details regarding IMU Semester III, IV and V examinations can be viewed on IMU website.
- Application form can be downloaded from the IMU website
- A cadet needs to submit to his pre-sea maritime training institute, the filled up application form, the IMU examination fees, along with the documents mentioned in 8.3.
- The institute will forward the Application form to the IMU.
- Applications received after the prescribed date and incomplete applications will be summarily rejected.

8.3. The following documents should be submitted by the cadet to the pre-sea maritime training institute at the time of application for IMU Semester III, IV and V examination.

a. SSTP completion certificate (which includes the list of task exemption granted) issued by the pre-sea maritime training institute and endorsed by the IMU officer. (Sample Format given in Appendix 1).
b. 2 Photographs
c. Required Fees for IMU exam.

9. IMU - BSc Applied Nautical Science degree

The mark sheet of the B.Sc. degree shall contain the marks of all the semesters I to VI.

B.Sc. (AppliedNautical Science) is worth a total 100 credits which include credit transfer worth 30 credits from Mercantile Marine Department (MMD)/Director General of Shipping (DGS). The details of subjects, credits, total marks, and passing percentage can be found in Table 5, 6, 7, 8 and 9.

The overall percentage of marks is computed based on the formula given in section 9.1.

Code	Subjects	Class Assessment Marks (notebook / Journals / assessment / seminars & / assignment / Labworks	Class Test Marks (objective & or written & or oral & or quiz)	First 6 Months Examination marks	Pass Marks (External)	Total Marks (Final)	Total Marks (Passing %)	Lecture Per Week	Practical Per Week	Total Study Hours per week / per Six months	Credits
UG/NS/BS/T/101	Applied Mathematics	10	20	70	35 / 70	100	50	03	N.A.	03/ 50	02
UG/NS/BS/T/102	Applied Sciences	10	20	70	35 / 70	100	50	05	N.A.	05/66	02
UG/NS/MS/T/103	Ship Construction & Ship Stability I	10	20	70	35 / 70	100	50	02	N.A.	02/33	01
UG/NS/MS/T/104	Navigation I: Terrestrial & Celestial	10	20	70	35 / 70	100	50	04	N.A.	04/48	02
UG/NS/MS/T/105	Navigation II: Bridge Equipment, Watchkeeping, and Meteorology	10	20	70	35 / 70	100	50	04	N.A.	04/ 59	02
UG/NS/MS/T/106	Cargo Handling, Stowage and Seamanship I	10	20	70	35 / 70	100	50	05	N.A.	05/ 75	02
UG/NS/BS/T/107	English, Human Factors & Maritime History	10	20	70	35 / 70	100	50	03	N.A.	03/ 47	01
UG/NS/BS/P/108	Applied Sciences Laboratory	20	-	30	15 / 30	50	50	-	02	02/ 20	01
UG/NS/BS/P/109	Computer Laboratory	20	-	30	15 / 30	50	50	-	02	02/ 20	01
UG/NS/MS/P/110	Workshop Practices	20	-	30	15 / 30	50	50	-	05	05/ 56	02
UG/NS/MS/P/111	Seamanship Laboratory	20	-	30	15 / 30	50	50	-	02	02/ 30	01
UG/NS/MS/P/112	English Laboratory	20	-	30	15 / 30	50	50	-	01	01/10	01
						950				**38/514**	**18**

Table 5: Semester I Subjects and Credits

Code	Subjects	Class Assessment Marks (notebook / Journals /assessment / seminars & Labworks)	Class Test Marks (objective & or written & or oral & or quiz)	Second Six Months Examination marks	Pass Marks (External)	Total Marks	Total Marks (Passing %)	Lecture per week	Practical per week	Total Study Hours per week/ per six months	Credits
UG/NS/MS/T/201	Navigation III: Terrestrial, Coastal and Celestial Navigation	10	20	70	35 / 70	100	50	07	N.A.	07/91	03
UG/NS/MS/T/202	Navigation IV: Advanced Bridge Equipment, Watchkeeping, and Meteorology	10	20	70	35 / 70	100	50	05	N.A.	05/64	02
UG/NS/MS/T/203	Cargo Handling, Stowage & Seamanship II	10	20	70	35 / 70	100	50	05	N.A.	05/70	02
UG/NS/MS/T/204	Ship Construction & Ship Stability	10	20	70	35 / 70	100	50	05	N.A.	05/72	03

UG/NS/MS/T/205	MARPOL & Marine Engineering Knowledge	10	20	70	35 / 70	100	50	04	N.A.	04/50	02
UG/NS/MS/T/206	Emergencies, Maritime Communication and Commercial Shipping Knowledge	10	20	70	35 / 70	100	50	04	N.A.	04/54	02
UG/NS/BS/P/207	English Laboratory	20	-	30	15 / 30	50	50	-	01	01/10	01
UG/NS/MS/P/208	Workshop Practices and Seamanship Laboratory	20	-	30	15 / 30	50	50	-	05	05/70	02
UG/NS/MS/P/209	Navigation Laboratory	20	-	30	15 / 30	50	50	-	02	02/30	01
						750				**38/511**	**18**

Table 6: Semester II Subjects and Credits

Code	Subjects	Weightage		SSTP Distribution of Marks					Minimum Passing Marks in SSTP	IMU Exam	Minimum Passing Marks in IMU Exam	Overall Minimum Passing Marks (50%)	DGS	Overall total marks	Credit Points
		SSTP	IMU /DGS	CRB	Projects	Activity	SSTP Total	Total Factor (0.4)					Orals marks		
T1301	Navigation	58%	42 %	200	180	620	1000	400	200	200	100	300	100	700	15
T1401	Cargo Handling and Stowage	58%	42 %	70	550	90	710	400	200	200	100	300	100	700	14
	Watchkeeping CRB Section 9			290			290 Total 1000								
T1501	Controlling the operation of ship and Care for persons on board	58%	42 %	200	350	190	740	400	200	200	100	300	100	700	14
	Safety Familiarisation and COLREGS CRB Sections 5, 6, 7			260			260 Total 1000								
						Total		**1200**		**600**			**300**	**2100**	**43**

Table 7: Semester III, IV and V Subjects and Credits

Code	Subjects	Total Marks (Final)	Minimum Passing Marks	Credit Point
T1601	Terrestrials and Coastal Navigation at Operational Level	200	140	4
T1602	Celestial Navigation at Operational Level	200	140	2
T1603	Meteorology at Operational Level	100	50	2
T1604	Bridge Watchkeeping and Emergencies at Operational Level	200	100	4
T1605	Signals and Communications at Operational Level –Visuals	100	70	1
T1606	Ship Construction, Stability , Ship Safety and Environmental Protection at Operational Level	200	120	5
T1607	Cargo Handling and Stowage at Operational Level	200	120	3
	Total	**1200**		**21**

Table 8: Semester VI(II-Mates (FG) Subjects and Credits

Sr. No	Course Code	Name	SSTP									IMU Exam			Total		Credits
			CRB		Projects		Activity		Actual Total	Maximum Total	Actual Total (Factor 0.4)	Maximum Total (Factor 0.4)	Semester	Actual	Max	Actual	Max	
			Actual	Max	Actual	Max	Actual	Max										
1.		Semester I Subjects together											I		950		950	18
2.		Semester II Subjects together											II		750		750	18
3.	T1301	Navigation		200		180		620		1000		400	III		200		600	12
4.	T1401	Cargo Handling and Stowage		70		550		90		710		400	IV		200		600	11
		Watch keeping CRB Section 9		290						290 Total 1000								
5.	T1501	Controlling the operation of ship and Care of persons on board		200		350		190		740		400	V		200		600	11
		Safety Familiarisation and COLREGS CRB Section 5,6,7		260						260 Total 1000								
6.		Second Mates Exam Written											VI				1200	21
7.		Second Mates Exam Orals											III/IV/V				300	9
		TOTAL		**1020**		**1080**		**900**		**3000**		**1200**			**2300**		**5000**	**100**

Table 9: Total Summary of Marks and Credits

9.1. **Calculation** of Overall Percentage of Marks (OPM):

Overall percentage of marks (OPM) shall be calculated as per below::

$$\frac{\text{(Sum total Marks scored in Semester 1)}}{950} \times 18 = \text{---------- (A)}$$

$$\frac{\text{(Sum total Marks scored in Semester 2)}}{750} \times 16 = \text{---------- (B)}$$

$$\frac{\text{(Sum total Marks scored in Semester 3)}}{700} \times 15 = \text{---------- (C)}$$

$$\frac{\text{(Sum total Marks scored in Semester 4)}}{700} \times 14 = \text{---------- (D)}$$

$$\frac{\text{(Sum total Marks scored in Semester 5)}}{700} \times 14 = \text{---------- (E)}$$

$$\frac{\text{(Sum total Marks scored in Semester 6)}}{1200} \times 21 = \text{---------- (F)}$$

Overall percentage of marks, OPM = [(A) + (B) + (C) + (D) + (E) + (F)] %

Example:

Suppose a cadet scored marks as below,

Semester 1	740
Semester 2	540
Semester 3	600
Semester 4	500
Semester 5	450
Semester 6	1050

$$\text{OPM} = \frac{(740 \times 18)}{950} + \frac{(540 \times 18)}{750} + \frac{(600 \times 15)}{700} + \frac{(500 \times 14)}{700} + \frac{(450 \times 14)}{700} + \frac{(1050 \times 21)}{1200} = 77.6\%$$

9.2. Overall Divisions in B.Sc. Applied Nautical Science:

The division is awarded on the basis of Overall Percentage of Marks as per the following scheme:

First Division with distinction	:	75% marks and above
First division	:	60% marks and above but below 75% marks
Second division	:	50% marks and above

10. Timeline

Time	Action by Cadet	Remarks
On Joining ship	• Intimate the Pre-Sea institute on the name and type of ship (see para 11, Sample format)	To be done each time when joining a ship
Quarterly	• Send photo copies/scanned copies of Task Summary Sheet, Project Work Index, Shipboard Training Officer's Monthly Review of the Record Book and Master's Monthly Review of the Record Book duly signed and stamped by the STO to the pre-sea maritime training institute via shipping company CTO.	
Intermediate -Between 6 months to 12 Months of sea-time done	• Carry or send the following documents duly completed to the pre-sea maritime training institute Projects File, CRB, Activity Work Book(s), Watchkeeping Record file • Collect Mid-term Review Report from the institute.	Seatime completed 50% - 3 months- All tasks, projects and activity book exercises for Phase I. Seatime completed 50% + 3 months- All tasks, projects and activity book exercises for Phase I and Phase II.
Final- Completion of 18 months	• Carry following documents duly completed to the pre-sea institute Projects File, CRB, Activity Work Book,Watchkeeping Record file. • Collect SSTP certificate from the pre sea maritime training institute on successfulcompletion of SSTP	CRB: min 80% tasks completed Project File: Complete for type of ships sailed on. Activity Work Book and Supplement: min 80% tasks completed. Watchkeeping: Min 720 hrs Bridge Watchkeeping Min 360 hrs Port / Cargo Watchkeeping Min 20 hrs Engine Room watchkeeping Min 40 hrs Steering Practice

Table 10: Timeline

11. <u>Sample format: Intimation to Pre-Sea maritime training institute regarding vessel joining</u>

Name of Cadet:

IMU enrolment number: Pre-Sea Batch No.

Passport No: CDC No:

INDoS No:

Ship No.	Vessel Name	IMO No.	Type of Ship	Shipping Company	RPSL number	Joining date	Sign off date
Ship 1							
Ship 2							
Ship 3							
Ship 4							

Appendix 1

SSTP COMPLETION CERTIFICATE
TRAINING INSTITUTE LETTERHEAD

Certificate No. : xxxxxxxx

This is to certify that, **xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx**
Date of Birth:xxxxxxxx**Holder of CDC no.:**xxxxxxxxxxxx
Passport No. : xxxxx**INDOS No. :**xxxx
IMU Enr. No. xxxxxxxxxxxxxx**Sponsored by**xxxxxxxxxxxxxxxxxxx

Date of passing out from Pre-sea maritime training institute xxxx Date of passing DNS Semester I and Semester II. xxxx
Has successfully completed **"Structured Shipboard Training Programme"** For deck cadets conducted under Diploma in Nautical Science leading to B.Sc. Degree Programme of DGS – IMU.

It is further certified that programme has been approved as a Structured Shipboard Training Programme (SSTP) as envisaged in STCW Conventionas amended, by the Directorate General of Shipping, Government of India, and the Cadet has completed the programme during his sea service of **xx**Months **xx** Days.

This is to certify that all tasks, activity work, project work has been completed except for the following tasks related to the ship type where he/she did not have the opportunity to sail on.

(1) SEM 3 : xxx
(2) SEM 4 : xxx
(3) SEM 5 : xxx

The above mentioned tasks and projects are exempted due to non-availability of equipment on vessels cadet sailed /circumstances beyond his/her control.

This SSTP completion certificate meets the requirement of IMU Notification__ of 2015, read in conjunction with M.S. Notice No. 21 of 2009.

Signature of Candidate | **SSTP Incharge**

Principal
xxxxxxxxxxxxxxxxxx

Issued at **Mumbai**this ***XX*** **day** of **XXX 20XX**

ENDORSEMENT OF IMU

Date: **Signature**

(NAME :)

STAMP

Appendix 2- Sample format of Seatime Certificate

COMPANY LETTERHEAD

Sr.No.

Date:

To,
The Principal Officer,
Mercantile Marine Department

Sub: Sea Service

Name :
Rank :
Indian Passport No. :
Indian C.D.C. No. :

This is to certify that the above named CADET is employed with the company and has sailed on following vessels managed by xxxxxxxxxxxxxxxxxx whose business address is as follows:

We certify below service which is as per his/her Indian Continuous Discharge Certificate, as noted below:

VESSEL	IMO No.	GRT / NRT	DWT	Type	Date signed ON	Date signed OFF

Thanking you,
Yours faithfully
For

_____

COMPANY SEAL

Note: Our email id is xxx

Registered with Seaman's Employment Office, Mumbai under Licence No: RPSL –

Appendix 3

IMU

DECK CADET

STRUCTURED SHIP BOARD TRAINING PROGRAMME

PROJECT FILE

NAME: _____

IMU ENROLMENT No. _____

INDoS No._____

Deck Cadet Record Book No. _____

DATE: From - _____

To - _____

10.1. PROJECTS: NAVIGATION

First Phase

1) Draw a plan showing the layout of the navigation bridge and equipment.
2) Draw the radar shadow/blind sectors and describe the procedure for testing the performance of the radar/ARPA. Observe and record theperformance monitor readings and compare them with the original readings.

Second Phase

3) Describe the procedure for correction of navigational charts and publications- ALRS, ALL, Sailing Directions. Correct these publications onat least one occasion under the supervision of the officer concerned.
4) Describe activities on the bridge for arrival and departure.

Third Phase

5) Plan a passage between any two ports under the supervision of the officer concerned, including selection of charts, plotting of courses on the charts, and use of publications. Explain in detail the four stages of a voyage plan; appraisal, planning, execution and monitoring.
6) Describe the operation and set-up (manual and automatic) of the bridge navigational watch alarm system.
7) Prepare AMVER messages “Arrival Port”, “Departure Port”, “At Sea Noon”.

10.2. PROJECTS: CONTROLLING THE OPERATION OF THE SHIP AND CARE FOR PERSONS ON BOARD

First Phase

1) Draw plan views of the decks showing all LSA and FFA with the proper IMO symbols and also the sounding pipes with their color coding.
2) Locate the sounding pipes and air pipes of all the tanks on the ship, including ballast tanks, bunker tanks, cofferdams and peak tanks.
   Also locate the sounding pipes of hold bilges. Draw a color coded plan indicating the location of all these items.
3) Draw the ventilation arrangement on board and state clearly the natural and forced types of ventilators.
4) Draw the bilge and ballast piping plan showing the outline of pumps, eductor, ballast, tank, non-return and cross-over valves in the system. What sort of bilge pumping arrangement is used? Write down the procedure of how you would pressure test the bilge line and thenon-return valve.
5) List all the safety precautions to be taken when working aloft and when working overside.
6) Describe the precautions to be taken when entering a double bottom ballast tank for inspection.
7) State how many mooring ropes and wires are on board. Describe where they are kept, their sizes and lengths, characteristics, strengths, advantages and disadvantages and whether and where any spares are carried. Describe the precautions you would take to prevent damage to a coil of polypropylene rope.

Second Phase

8) Draw a figure to show the mooring arrangements at your last port of call and explain why such configuration was used. What does the mooring plan of the ship indicate? Sketch the snap back zones on the forecastle mooring drawing.
9) Draw a block diagram of the steering system and explain the operation of the emergency steering.
10) Draw the outline of the fixed fire-fighting system and explain its operation.
11) Observe the loadline marks, make a detailed sketch of these marks and explain the function of each mark.

Third Phase

12) Prepare a monthly report on the maintenance carried out on the LSA and FFA.
13) List the procedures and checks to be carried out before and after flooding in dry-dock.
    Draw a plan view of all bottom plugs.
14) Make a table of the various areas of the vessel, with the type of paint coating used (including primer, number of coats, type of surface preparation most suited) - as per the paint scheme provided by the paint manufacturer.

10.3. ADDITIONAL PROJECTS

Ship type specific projects are listed in Section 10.3 to Section 10.10 of the CRB.

PROJECT WORK

INDEX

Sr. No	Project Name	Page Nos.	Date

STO Signature, date and stamp to be taken prior sign off from each ship:

Appendix 4

DNS Leading to BSc Applied Nautical Science Syllabus

DNS Syllabus- Semester 3, 4, 5

FUNCTION I: NAVIGATION AT OPERATIONAL LEVEL

A1: Plan and conduct a passage and determine position

Sextant instrument errors; Bearings of celestial and terrestrial bodies; Star constellations; Star Finder; Star Chart; various landmarks and aids to navigation, including lighthouses, beacons, buoys; Rising and Dipping of lights; Characteristics of lights; Dead reckoning position; IALA Maritime Buoyage System for
Region A and Region B; Chart Folio System; Chart 5011- (Symbols and Abbreviations used on Admiralty Paper Charts); Chart 5012, Inventory of publications; BA publications- Weekly, Cumulative and Annual Notices to Mariners, Mariner's Handbook (NP 100), Catalogue of Admiralty Charts and Publications (NP 131),Sailing Directions, Ship's Routeing Information, Ocean Passages for the World, List of Lights and Fog Signals (including Digital list of lights), Tide Tables, Tidal Stream Atlases, Admiralty List of Radio Signals, Routeing charts; GPS fixes and datum errors; Operation of Echo-Sounder; Boxing of compass; Magnetic variation and deviation; Deviation card; Comparing compasses; Compass error using azimuth, amplitude and transit bearings; Change-over from manual to automatic steering and vice versa; Various controls available in the steering control system; Various alarms associated with the steering control system; Off-course alarm; Barometer; Barograph; Hygrometer/psychrometer; Sea and air temperatures; Wind direction; Swell direction and height

Sextant altitudes of celestial bodies; Calculation of latitude by Polaris or by meridian altitude of the sun;
Celestial observations (sights); Ship's position by plotting position lines; Sunset, sunrise and twilight using the Nautical Almanac; Position fixing using simultaneous observations; Procedures for correction of charts as explained in the publication "How to keep your Admiralty products up to date NP 294; Use of BA 133A; Instruments required for chart correction and chart work; Correction of charts using Notices to Mariners in paper or digital format and chart tracings; Checking of new charts received; Correction of Admiralty Sailing Directions, Admiralty List of Radio Signals, Admiralty List of Lights and Fog Signals, and voyage charts for T & P notices and navigational warnings; Traffic separation schemes; Record keeping with respect to the echo sounder and markings on the recorder; Entries in Compass error book; Main cloud types; Weather Observations.

Charts and publications for an intended voyage; Passage planning; Gnomonic chart for planning an ocean crossing track and transfer the track to Mercator charts; Practical operation of GPS; Principle and use of DGPS; Satellite navigation systems under development; Principle of Enhanced Loran (E-Loran); Maintenance of Echo sounder equipment; Setting up of the "course recorder" for heading and GMT; Procedures for the changeover for autopilot from gyro compass to transmitting magnetic heading device if fitted; Procedures for the changeover for emergency steering; Interpreting weather reports and

warnings; Predicted positions and path of a TRS system with respect to the ship's position and prediction of weather expected enroute; Procedures to reduce the adverse effects of heavy seas; Meteorological information from routeing charts; Wind roses; Calculation of tides and tidal streams; Buys Ballot's law.

A2: Maintain a safe navigational watch

Watch keeping arrangements and principles to be observed concerning navigation watch at sea and anchor as stated in STCW 2010; Reporting objects correctly during lookout; Assessing and determining risk of collision; Master's Standing and Bridge Orders; Bridge familiarization; AMVER
reports; Closed loop communication;

Procedure for handing over and taking over a bridge watch; Principles of safe watchkeeping and bridge manning levels; Keeping a safe navigational watch at sea; Keeping an anchor watch; Operation of Navtex, Weather fax, Distance/speed logs and Bridge controls during maneuvering; Renewal of recording paper of various equipment; Navigational equipment powered by the emergency switchboard for safe navigation; Ship reporting systems.

Supervision of ratings in watchkeeping duties; Coastal navigation and during navigation under pilotage, including berthing and unberthing; Procedures for navigating in restricted visibility; Entries in Deck log book and Bridge movement book; Master-Pilot information exchange; Notices to engine room for arrival and departure; ETA calculations; Noon calculations; Bridge Navigational Watch Alarm System; Sound reception system; Automatic Identification System; Backup procedures of the Voyage Data Recorder / Simplified Voyage Data Recorder; Steering gear checks; VTIS; Role of the Pilot on the bridge team; Bridge team meetings; Challenge and response; Engine telegraph and communication equipment during arrival and departure.

A3: Use of Radar and ARPA to maintain safety of navigation

Radar set-up procedure; System tests; Conspicuous land marks on a radar picture; Plotting fixes by radar using radar ranges and bearings; Methods of target acquisition (including auto-acquire) and their limitations; Optimum settings of anti-sea and rain clutter controls; Comparing and correlating the actual visual scenario with the radar picture; Determining range, bearing, course, speed, CPA and TCPA of targets.

Limitations of the radar and ARPA; Radar performance monitors; Parallel indexing techniques; CPA/TCPA alarms; Long range scanning.
Sea stabilized mode; Ground stabilized mode; Heading line marker alignment; True and relative trails; Manual radar plotting; Trial manoeuvres; True and relative vectors

A4: Use of ECDIS to maintain the Safety of Navigation

Operation of ECDIS and ENC chart symbols (S-52); various display options (base, standard, all and customized); Differences between ECDIS and ECS (Electronic Charting System) raster scan and vector charts.

Correcting / updating electronic charts; Limitations of ECDIS and dangers of over reliance; Monitoring route using ECDIS; Optimum ECDIS settings; Various ECDIS alarms and indicators.
Safety depth/spot soundings; various inputs to the ECDIS. ECDIS Management Card, Admiralty Information Overlay

A5: Respond to emergencies

Abandon ship drill; Contact list for port stay; Fire wallet.
Emergency response exercises e.g. heavy weather damage, collision, grounding, flooding, rescue of survivors / assisting a ship in distress, shipboard oil pollution incident at sea/port, gyro failure, steering failure, main engine / power failure, security incident/ drill at sea/ port, and fire in the cargo area while in port.
Vessel's Shipboard Oil Pollution Emergency Plan (SOPEP), Procedure for alerting port emergency services.

A6: Respond to distress signal at sea

Distress signals used at sea; Contents of ALRS Volume 5 related to operation of GMDSS; Actions to be taken upon receiving distress messages and signals at sea; Procedure for transmitting a distress alert using MF/HF, DSC and EPIRB. Procedure for transmitting distress messages using MF/HF, R/T, VHF, Inmarsat C, NBDP, Inmarsat B and Fleet-77.
International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual Volume III; Duties and Responsibilities of Designated distress communication officer; DSC routine and test alerts; Daily, weekly and monthly checks and testing of GMDSS equipment.
Procedures for cancelling a false distress alert; Entries in the GMDSS log book.

A7: Use the IMO Standard Marine Communication Phrases and use English in written and oral form.

Hand held transceivers (walkie-talkies); Communication during drills and exercises, and at arrival and departure stations. Communication with other ships, coast stations and VTIS using the SMCP (IMO's Standard marine communication phrases); Log book entries; On-board communication.

Communication during anchoring, mooring and unmooring operations.

A8: Transmit and receive information by visual signalling

International Code of Signals flags and principal national flags; Single letter flag hoists; Code and decode using the International Code of Signals; Flag etiquette.
Visual Signalling; International Code of Signals single letters; Distress signal (SOS) by Morse light; Daylight signalling lamp; Signals covered by 2 and 3 letter hoists.

A9: Maneuver the ship

Manoeuvering information on board; Stopping distances and turning circle parameters; Vessel’s advance; Recommended procedure for emergency stop and slow down of engines;

Preparation for mooring stations; Mooring and unmooring operations including securing and letting go tugs; Heaving line; various types of mooring ropes; Markings on anchor cables.
Mooring winches and windlass; Brake lining and brake adjustment bolt clearance; Rope and chain stoppers; Procedure for turning up mooring lines; Safe handling of moorings; Snap back zones; Minimum turns on the winch drum; Mixed Mooring, Correct direction of reeving rope on the drum; Precautions when using self-tensioning winches; Anchoring operations; Anchor lashings; Preparation of anchors and letting go; Walking back anchor in a controlled manner (deep water anchoring); Weighing of anchor; Inspecting for damage and fouling; Use of bow stopper and anchor brakes; Securing of anchors for sea; Procedure for releasing the bitter end of anchor chain.

Squat, shallow water and similar effects; Chain locker; Stowage of ropes after mooring operations; Use of rat guards; Precautions required for hydraulic mooring systems; Man overboard drill; Williamson turn.

FUNCTION II: CARGO HANDLING & STOWAGE AT THE OPERATION LEVEL

B1: Monitor the loading, stowage, securing and unloading of cargoes and their care during the voyage

Preparation of cargo holds for loading cargo; Capacity of spaces available for loading cargo; Bilges, wells
and strum boxes; Hold scuppers; Bilge suctions; Loading and discharging of cargo; Chief Officer's standing and night orders; Ship-shore safety checklist; Drafts; Freeboard; Hog and sag; Dock water density; Dock water allowance; Hold temperatures; Record of hold ventilation.
Bilge non-return valve; Rigging and operation of cranes and derricks; Routine maintenance and inspection of cranes and derricks; Topping and lowering cranes and derricks; Blocks and shackles; Crane limits; Maintaining the vessel in an upright condition; Quantity of cargo loaded, stability and loading stresses using loading computers, stress indicators, etc.; Calculation of arrival drafts using trim; Communications on board and with shore personnel during loading and unloading; Effects of loading heavy lifts and high density cargo on the stability of the vessel.
Chain register; Precautions during heavy lift operations with regards to cargo gear; Difference between Zeal (draft survey) and load line hydrometers; various types of containers and container stowage positions; Refrigerated containers; Cargo Securing Manual; Lashing requirements; Cargo securing and lashing requirements; Securing containers; Container lashings and fittings; Dangerous goods containers and IMO classification and stowage position; IMDG Code procedures for identifying a product, its hazards, handling procedures and use of Emergency Schedules (EmS) and Medical First Aid Guide (MFAG) tables; Segregation of IMDG cargo; Documentation requirements for carrying IMDG cargo onboard; Document of Compliance (DOC); Loading procedures for dangerous goods. International Maritime Solid Bulk Cargoes Code.

B2: Inspect and report defects and damage to cargo spaces, hatch covers and ballast tanks

Inspection of cargo spaces and holds on completion of cargo discharge prior to sailing and report defects and damage; Maintenance of hatch covers; Opening, closing, battening down and securing of hatch covers; Inspection of hatch covers; Precautions to be taken whilst opening and closing hydraulic and mechanical hatch covers.
Stevedore damages, Emergency operation of hatch covers; Draining arrangement for hatch covers; Corrosion in cargo spaces and ballast tanks.
Ballast tank inspection; Principal structural members of tanks; Tank inspection report; Inspection and cleaning of fresh water tanks.

FUNCTION III: CONTROLLING THE OPERATION OF THE SHIP AND CARE FOR PERSONS ON BOARD AT THE OPERATION LEVEL

C1: Ensure compliance with pollution prevention requirements

Deck scuppers; Bunkering operations; Fuel oil tank soundings; Inventory of all pollution control equipment; Vessel's operational requirements under the International Convention for the Prevention of Pollution from Ships (MARPOL) annexes to prevent pollution; Vessel's garbage management plan; Regulations for segregation of garbage and disposal of garbage at sea (special and non-special areas) in compliance with MARPOL; Entries in Vessel's garbage record book; Ballasting and deballasting operations.
Ship's bunkering procedures; Bunkering checklists; Pre-bunkering meeting; Connection and disconnection of bunker hoses; Portable (Wilden) pump. Entries made in the oil record book; Special areas under MARPOL Annex I and Annex V; Criteria for disposal of batteries, tube lights, and expired medicines; Ballasting and deballasting operations; Pumping out of chain locker, forward stores and bilges.
Drip sampling procedure; Emergency shutdown procedure during bunkering; Emergency response exercise for controlling spillage of oil (pipeline failure, equipment failure, structural failure, stranding); Clean-up of hazardous cargo spillage; Bunker line pressure testing operation; Criteria for disposal of cargo residues; Emission Control Area (ECA) under MARPOL Annex VI; Operation of Oily water separator; Regulations governing sewage disposal;

C2: Maintain sea-worthiness of the ship

Principal structural members of a ship; Safety lines and guard rails; Securing vessel for sea; Various knots, bends, hitches and whippings; Sounding plan; Recording soundings; Calibration/sounding tables; Lubrication of deck equipment; Lubrication techniques; Breakout of new coils of ropes and wires; Stowage of wires and ropes; Receiving fresh water from ashore and from barges; Rigging of clusters and portable lights; Maintenance of stays and aerials.
Stability booklet; Free surface effect; Cargo lashings; Various portable gas analyzers on board (Oxygen analyzer, Multi gas detector, Toxic gas detector, Personal gas monitors, Explosimeter; Deck and gangway watch; Rigging of stages and Bosun's chair; Splicing of ropes and wires; Maintenance of fairleads; Ship's stores; Pilot ladder and combination ladders; Accommodation ladder, gangway and gangway net; Various painting techniques and correct procedure for mixing of paints.
Specific loading limitations; Hose testing (weather tightness) of hatches and watertight doors; Load line related item including all closing appliances, air vents, ventilators, load line marks; Condition of freeboard assignment form; Maintenance of the watertight doors, ports and hatches; Inspection of the doubler/striker plate; Inspection of air pipe; Purging points

provided on hydraulic lines and machinery; Material Safety Data Sheets (MSDS) for the paints onboard.

C3: Prevent, Control and Fight Fires on board

FFA Training Manual on board; Fire control plan; Self-contained breathing apparatus (SCBA) set; Safety harness and line; Main and emergency fire pump; Emergency escape breathing device (EEBD); Difference between a SCBA set and an emergency escape breathing device (EEBD); Classes of fire and components of the fire triangle; Fire hazards; Actions to be taken in the event of fire.

Fixed fire detection and alarm system; Inspection and maintenance of portable fire extinguishers; Maintenance of fire hoses, nozzles and couplings; Safety locker; Emergency headquarters (fire station room); Safety precautions and procedures required prior to operating the fixed firefighting system; Breathing apparatus record/ control board; Fire line isolation valves; Emergency generator; Fire drills in sea and at port.

Testing of the fire detection and alarm systems, fixed CO2/DCP extinguishing system, fixed steam extinguishing system, fixed automatic sprinkler system, fixed firefighting system in paint room, fixed foam extinguishing system, fire flaps and dampers, foam applicators, automatic and manual fire doors, emergency shut off valves, pump stops and main engine stop; Breathing apparatus (BA) air compressor; Fire drills; Fire rounds; Search and rescue drill for an enclosed space.

C4: Operate Life-saving appliances

Lifeboat and rescue boat engines; Procedures for testing the operation of Search and rescue transponder, hand-held VHF transceivers, Emergency Position Indicating Radio Beacon; Lifesaving signals table; Emergency muster list; SOLAS training manual; Lifeboat launching instructions; Procedures of abandoning a ship; Procedure for launching and inflating life rafts.

Permanent markings on the survival craft (lifeboat, rescue boat and life raft); Weekly 'moving' of lifeboats; Monthly 'turning out' of lifeboats; Maintenance of LSA equipment, including life jackets, immersion suits, thermal protective aids, lifebuoys, self-igniting lights, and man overboard markers; Pyrotechnics; Maintenance of survival craft and equipment including lifeboats and rescue boats, lifeboat equipment and provisions, launching davits and gear, and lifeboat falls.

Preparing and lowering of lifeboats; Statutory equipment required to be carried in a survival craft (lifeboat, rescue boat, liferaft); Minimum food and water requirements for survival craft occupants; Routine lowering and maneuvering of a lifeboat; Procedure for recovering a rescue boat in rough weather; Securing arrangements of a liferaft; Function of the hydrostatic release unit (HRU) and weak link; LSA checks as per planned maintenance system; Regulations concerning annual and other servicing and testing requirements of liferafts, lifeboats and launching and recovery arrangements; Routine maintenance of a lifeboat and rescue boat engine; Inspection and overhaul of a davit winch.

C5: Apply medical first aid on board the ship

International Medical Guide for Ships; First Aid boxes.

Radio medical advice; Resuscitation equipment; Medical locker; Narcotics in Master's custody

First aid drill; First aid procedures for arresting the bleeding of a casualty, cardiopulmonary resuscitation, and treatment of suffocation and drowning; Procedures for treatment of burns and scalds, minor fractures, handling a casualty in shock, dealing with electric shock, heat stroke and treating casualty with hypothermia; Recovery position.

C6: Monitor compliance with legislative requirements

SOLAS; Designated Person Ashore.

Common port state control detainable deficiencies; Certificates and manuals issued under SOLAS, MARPOL, International Load Line, STCW Convention and other regulations; Ballast water management plan; Ballast water exchange.

Importance of keeping records; ISM Code; Ship's articles of agreement; Official log book entries; STCW 2010/ILO Rest hour requirements

C7: Contribute to the safety of personnel and ship

Tool box meetings; various checklists and precautions required for various critical jobs such as entry into

enclosed spaces, working aloft, working overside, carrying out hot work, using power tools, manual lifting and carrying; Personal protection equipment (PPE).

Safety inspection rounds.

Hazard identification and control measures; Risk assessment; Company's accident investigation and reporting procedure; Analysis of near misses.

D1: Contribute to the enhancement of maritime security through heightened awareness

Security levels; Duties and responsibilities of Ship Security Officer and Company Security Officer.

Ship Security Alert System (SSAS); Declaration of Security (DOS); Security drills.

DNS Leading to B.Sc.(N.S.)

Semester 3, 4, 5 Examination
T1301 – NAVIGATION

Note:
1. Use nautical almanac year 1992
2. Use of non-programmable scientific calculator is permitted; however, each step should be clearly shown
3. Question 1 is compulsory. Answer any 7 question from rest.
4. All questions carry 25 marks each

Max Marks: 200 Time : 3 Hours
Pass Marks: 100

---

1. Write Short Notes on:

a.
b.
c.
d.
e.

[Topics: Selection of Charts & Pub for voyage; Principles of Passage Planning - berth to berth; Use of Gnomonic Charts for Ocean passages; GPS Alarms - HDOP, Cross track, Arrival, W/point, Anchor Watch; Principle and use of DGPS; Global Navigation Satellite systems other than GPS; Change-over from Gyro to 'TMH device' for Auto steering; Change over from Emcy Steering to local control; Tide timings in STD and Sec ports; Calculate HOT given Time and vice versa; Use of Tidal Diamonds given on charts, ETA calculations; Noon calculations; Bridge Navigational Watch Alarm System; Sound reception system; Automatic Identification System; Backup procedures of the Voyage Data Recorder / Simplified Voyage Data Recorder; Steering gear checks; VTIS; Role of the Pilot on the bridge team; Bridge team meetings; Challenge and response; Engine telegraph and communication equipment during arrival and departure.]

2.

[Topics: Bridge W/Keeping duties during Coastal Navigation/ Pilotage/ Berthing/ Unberthing; Navigation in Restricted Visibility; Entries in deck log book; Master-Pilot info exchange; Notices to E/R during arrival and departure; ETA Calculations taking into account Time Diff/ Dist/ Estimated Speed/ Wx/ Current; Daily Noon Calculations; Knowledge and use of Buys Ballot's Law]

3.

[Topics: Different alarms of BNWAS; Use of Sound reception system; Setting up AIS prior voyage; Limitations of AIS; Back-up procedure of VDR/ S-VDR; Controls testing - Steering gear/Nav equipment's/ Internal Communication/ Synchronizing Clocks/ Bridge Check-lists. Identifying VTIS Reporting points; Role of Pilot in 'Bridge Team'; Use of 'Bridge Team Meetings'; Concept of "Challenge and Response" among Bridge Team; Squat - Calculations; Various Shallow water effects]

4.
[Topics: Radar - Sea stabilized and Ground stabilized modes; Adv and Disadv of both; Heading Marker alignment with Vessel fore-aft line; True and Relative trails; Trial Manoeuvre; Adv and Disadv of True and Rel vectors.]

5.
[Setting up safety depth/ spot soundings on ECDIS; Various inputs to ECDIS; Use of Radar and AIS data to ECDIS; How to cancel a false distress alert; Routine checks of GMDSS Equipment's]

6.
Checking of new charts received; Correction of Admiralty Sailing Directions, Admiralty List of Radio Signals, Admiralty List of Lights and Fog Signals, and voyage charts for T & P notices and navigational warnings; Traffic separation schemes; Record keeping with respect to the echo sounder and markings on the recorder; Entries in Compass error book; Main cloud types; Weather Observations. Procedures for the changeover for emergency steering; Interpreting weather reports and warnings; Predicted positions and path of the weather systems with respect to the ship's position and prediction of weather expected enroute; Procedures to reduce the adverse effects of heavy seas; Meteorological information from routeing charts; Wind roses; Calculation of tides and tidal streams; Buys Ballot's law.

7.
Limitations of the radar and ARPA; Radar performance monitors; Parallel indexing techniques; CPA/TCPA alarms; Long range scanning. Correcting / updating electronic charts; Limitations of ECDIS and dangers of over reliance; Monitoring route using ECDIS; Optimum ECDIS settings; Various ECDIS alarms and indicators.
Sea stabilized mode; Ground stabilized mode; Heading line marker alignment; True and relative trails; Manual radar plotting; Trial manoeuvres; True and relative vectors

8.
Emergency response exercises e.g. heavy weather damage, collision, grounding, flooding, rescue of survivors / assisting a ship in distress, shipboard oil pollution incident at sea/port, gyro failure, steering failure, main engine / power failure, security incident/ drill at sea/ port, and fire in the cargo area while in port.

9.
International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual Volume III; Duties and Responsibilities of Designated distress communication officer; DSC routine and test alerts; Daily, weekly and monthly checks and testing of GMDSS equipment.

DNS Leading to B.Sc.(A.N.S.)

Semester 3, 4, 5 Examinations
T1401 – Cargo Handling and Stowage

Note: Question 1 and 2 are compulsory;
Answer any SIX out of remaining EIGHT questions.
All Questions carry 25 marks each

Max Marks: 200 Time : 3 Hours
Pass Marks: 100

1. Calculation of Cargo that can be loaded within space available (Given, Stowage Factor, Broken Stowage, Load Density etc.)

2. Calculation involving Blocks, Tackles and Purchases (Mechanical Advantage, Velocity Ratio, SWL, Breaking Stress, Factor of Safety) OR
   Calculation of Ship's Displacement/ Cargo loaded/ discharged, given various Deductibles/ Drafts/ Density of Dock water

3. Hazards on board an Oil Tanker and various precautions required / Flammability Diagram/ ISGOTT Guidelines/ Ship – Shore checklist

4. Basics about Chemical Tankers and the cargoes carried on board/ Use of IBC Code

5. Basics about Gas Tankers and cargoes carried on board/ Use of IGC Code

6. IMDG Code/ Classes/ Segregation requirements/ Use of MFAG and EmS.

7. IMSBC Code/ Classification of Solid Bulk Cargoes/ Hazards/ Precautions /Carriage of Coal/ Trimming of Ventilators, Use of Ship-Shore Check list/ Preparation of Hold for loading/ Stowage and Securing of cargo on dry cargo ships/ Grain cargo securing

8. Precautions while loading 'Heavy Lift'/ High density cargo on board/ loading of 'Deck Cargo'/ Rigging Cranes/ Derricks for Cargo work; Maintenance and Inspection of Lifting Gear; Use of 'Heeling Tanks' to keep vessel upright during Cargo Opn; Maintaining Stability during Cargo Opn; Use of Trim Tables; Use of Loading Computer/ Testing of lifting gear and appliances/ Entries in Chain Register/ Ship's structures which are critical for safety of ship; Corrosion control in cargo spaces/ Ballast tanks

9. Container Ships; Stow plan/ Container Lashing Equipments/ CSC Plate contents/ IMDG Containers

10. Precautions while opening and closing Hatch covers/ Checking water tightness of Hatch covers/ Inspection of Cargo hold and Hatch covers prior loading and after discharge/ Hold Bilge well preparation/ O'Hauling of Bilge N/R Valve/ Chief officer's Standing Orders.

DNS Leading to B.Sc.(A.N.S.)
Semester 3, 4, 5 Examinations
T1501 – Controlling the Operation of the Ship and Care for Persons on Board

Note: Questions in Section - A are compulsory and carry 25 marks each.
Attempt 6 out of 7 questions from Section -B and carry 25marks each.

Max Marks: 200 Time: 3 Hours
Pass Marks: 100

SECTION – A

1. Question on Ship Stability - M.V. HINDSHIP (Problems on GZ/ List/ Change in Trim Loading/ Discharging/ Shifting of weights; Free surface effect in tanks; Calculation of Final GM/ Final Trim/ Draft Forward and Aft)

2. Ship Construction (Sketch & Label) – Peak Tanks/ DB Tanks/ Mid-ship Sections/ Framing system/ Rudder/ Stern frame

SECTION – B

3. MARPOL /BALLAST WATER MANAGEMENT
   (SOPEP Equipments, Garbage Management Plan, Garbage Record Book entries, Ballast Water Management; Ballast Water Exchange at Sea; Entries in Oil Record Book; Special Areas Marpol Annex 1 and Annex 5)

4. CORROSION PREVENTION/ ENVIRONMENT PROTECTION/ PSC & FSI
   (Protecting Steel from Corrosion; Surface Preparation for Painting; Seaworthiness of Ship, PSC Detainable deficiencies; Mandatory Certificates under SOLAS/ MARPOL/ ILL/ STCW Conventions)

5. ISM CODE/ SAFE WORKING PRACTICES/ USE OF CHECKLISTS.
   (ISM Code, Role of DPA, Use of Checklist for Critical jobs on board, Use of PPE specific for the job; Bunkering Procedures and Check list;

6. Pre-bunkering meet; Deck Cargo Lashing checks; Portable Gas Meters; Calibration & Records; Deck and Gangway watch in port; Rigging Pilot/ Combination Ladder)

7. SHIP'S MEDICINE CHEST
   (Medicine Chest up-keep; Procedure for Radio Medical Advice; Use of Resuscitation Equipment; Medicine Chest inventory)

8. MARITIME SECURITY
   (Security Levels 1, 2 and 3; Duties of SSO, Duties of CSO; Procedures for keeping Security watch at Sea and Port; Duties of key personnel at different Security Levels; Procedures to follow at different security levels (Access Control, Cargo, Ship Stores Etc.); Identifying 'Restricted Areas' on board)

9. LSA/ FFA
   (Control and Fight Fire on board, Emergency Drills, SOLAS Training Manual, Operation of Life Saving Appliances, Emergency Muster List, Life Saving Signals, Testing of SART/ EPIRB; Use of SCBA and Checks; Fire Drill procedures; Permanent Markings on Survival Crafts; Location and Number of Pyrotechnics on board; Maintenance of LSA Equipment; Recharging of Portable Fire Extinguishers; Procedures for 'Fixed Fire Fighting' systems; Use of Deck Isolation Valve)

Appendix 5

Institute Logo

Pre-Sea Training Institute

DNS Cadets Mid Term Review Report

IMU-SSTP	Rev no. : 01	Date : 01-01-15	Page 1/1

Name of Cadet	
Date of Assessment	
Time From / To	
CRB Book No.	
INDOS No.	
Sea Service at the time of Assessment	
Type of Ships served on	

CRB Tasks Status (New Book)			
	Semester 3	Semester 4	Semester 5
Navigation	/67	/61	/63
Cargo	/18	/15	/20
Operations	/44	/51	/50
Security	/3	/4	/3

Activity Book Status:	
Phase 1/2/3: Approx. _____ % done	Signed by STO

Projects Done Onboard:

Navigation : ____ /7 Controlling Operation of Ship and Care for Persons on board : _____ / 14

Ship Specific: Type: _____ Ship Specific: Type: _____

	BRIDGE WATCHES	Total No. of Watches / Hours (Ship 1/2/3)		
Total No. of Video/CBTs Seen:	At Sea	/	/	/
	At Anchor	/	/	/
Port Watches: number___hours___	During Arr&Dep	/	/	/
E.Rm Watches: number__hours___	Steering Cert: Yes /No	Hours (day/Night) D_____/N_____	Hours (sight/Arr-Dep) S_____/AD_____	

Mid Term Assessment (oral questions to assess knowledge and understanding gained by the cadet)

Corrective actions to be taken for improving CRB task made at the time of Mid Term Assessment:

Sr.No	Remarks

Corrective actions to be taken for improving project work made at the time of Mid Term Assessment:

Sr.No	Remarks

Corrective actions to be taken for improving Activity book made at the time of Mid Term Assessment:

Sr.No	Remarks

Received the above report and agreed on the shortcomings and recommendations

Cadet : _____

Date : _____

SSTP OFFICER NAME AND SIGNATURE	PRE -SEA INSTITUTE STAMP

Appendix 6: Mark Sheet for DNS leading to B.Sc Applied Nautical Science

STRUCTURED SHIPBOARD TRAINING PROGRAMME - SEMESTER III, IV and V - INTERNAL MARKS AWARDED

NAME OF THE TRAINING INSTITUTE		**IMU ENROLMENT No.**	**Date:**
CADET'S NAME		**PASSPORT No:**	**CDC No:**
DATE OF BIRTH		**SHIPPING COMPANY**	
EMAIL	**PHONE:**	**SEA SERVICE**	

Total Summary of Marks and Credits

Sr. No	Course Code	Name	SSTP									IMU Exam			Total		Credits
			CRB		Projects		Activity		Total marks								
			Actual	Max	Actual	Max	Actual	Max	Total Actual Marks	Total Actual Marks (Factor0 .4)	Total Max Marks (Factor0 .4)	Semester	Actual Marks	Max	Actual Marks	Max	
1.		Semester I Subjects together										I		950		950	18
2.		Semester II Subjects together										II		750		750	18
3.	T1301	Navigation		200		180		620			400	III		200		600	12
4.	T1401	Cargo Handling and Stowage		70		550		90			400	IV		200		600	11
5.	CRB Section 9	Watch keeping		290													
6.	T1501	Controlling the operation of ship and Care for persons on board		200		350		190			400	V		200		600	11
7.	CRB Section 5,6,7	Safety Familiarisation and COLREGS		260													
8.		Second Mates Exam Written										VI				1200	21
9.		Second Mates Exam Orals										VI				300	9
		TOTAL		**1020**		**1080**		**900**			**1200**			**2300**		**5000**	**100**

SSTP OFFICER NAME AND SIGNATURE	**PRE -SEA INSTITUTE STAMP**	**PRINCIPAL - PRE-SEA INSTITUTE- NAME AND SIGNATURE**

Appendix 7: Abbreviations

Abbreviations	
B.Sc.	Bachelor of Science
CDC	Continuous Discharge Certificate
CRB	Cadet Record Book
CTO	Company Training Officer
DGS	Directorate General of Shipping
DLM	Distance Learning Material
DNS	Diploma in Nautical Science
FG	Foreign Going
IMO	International Maritime Organization
IMU	Indian Maritime University
INDOS	Indian National Database of seafarers
MMD	Mercantile Marine Department
OPM	Overall Percentage of Marks
SSTP	Structured Shipboard Training Programme
STCW	Standards of Training, Certification and Watchkeeping
STO	Ship's Training Officer