

MASTER PLAN

**INDIAN MARITIME UNIVERSITY
2017**



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MASTER PLAN FOR INDIAN MARITIME UNIVERSITY (IMU)

PREFACE

Since its inception in the year 2008, the Indian Maritime University (IMU) has been experiencing troubled times for a variety of reasons. Burdened with an indifferent work force inherited from disparate legacy institutions and chronic delays in academic recruitment, IMU has barely managed to conduct course work with little time and resources left for developmental work. Given its mandate to establish itself as a national facility worthy of a large and emerging maritime nation, IMU urgently needs a well-defined strategy to achieve its goals.

It was therefore felt highly desirable to evolve a master plan to identify intermediate and long-term goals and also to delineate a suitable roadmap. Accordingly, a committee was constituted to prepare a master plan at the request of IMU (vide IMU/HQ/COE/Master Plan/2017 dated 28 June 2017). Members of the committee – listed below – represent the industry, academia, finance and management:

1. Shri U.R.P. Sudhakar, Principal Consultant & Head, IRClass Academy, Indian Register of Shipping, Mumbai (Convener for the Committee).
2. Dr. (Capt.) Suresh Bhardwaj, Resident Director & Principal, MASSA Maritime Academy, Chennai
3. Dr. S. Nallayarasu, Professor, Department of Ocean Engineering, Indian Institute of Technology, Madras
4. Dr. M. Bhasi, Professor, School of Management Studies, Cochin University of Science & Technology (CUSAT), Kochi
5. Shri S. Murugiah, Retired Principal Accountant General, Tamil Nadu & Pudhucherry.

Dr. G. Venkatesh, Finance Officer, IMU, Chennai, has been identified as the nodal officer for the committee.

During the above meeting, following officers of IMU also joined the deliberations to contribute in their domain

6. Dr. A. Mourougane, Associate Professor & HoD, School of Maritime Management
7. Dr. B. Swaminathan, Assistant Professor, School of Maritime Management

Members of the committee met on three occasions at IMU, Chennai, on 17 July, 08 August and 09 September 2017.

This report is expected to serve as a guidance document for IMU's management, enabling it to act cohesively and to ensure continuity across forthcoming plan periods and individual tenures of senior officials.

1. SCOPE OF THE STUDY & STRUCTURE OF THIS REPORT

This report has been structured on the basis of key questions addressed according to the following framework:

- Where does IMU stand today?
(Covered in Ch.2, '**SWOT Analysis**' and Ch. 3, '**Current Status of IMU's Operations**')
- What are the key challenges and issues that need to be addressed immediately?
(Ch.4, '**Consolidating Current Programmes of IMU**')
- What is the future role of IMU as envisioned in the Master Plan?
(Ch.5, '**Future Role of IMU**')
- How to get there? Where would be the milestones along the roadmap – over the next two, five, ten and twenty years?
(Ch.6, '**Roadmap, Milestones & Timelines**')
- What about finances – revenue and capital expenditure projections and how to meet the funding needs along the growth path?
(Ch.7, '**Financial Management**')

2. SWOT ANALYSIS

The SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis as presented below addresses the question: 'Where does IMU stand today?'. As such, it forms the basis for subsequent deliberations and findings listed in this report.

2.1 Strengths

- 1) IMU is a unique Central University established by the Government of India that caters to the educational and training needs of the maritime sector and its associated fields – beginning with the undergraduate level and extending to doctoral and post-doctoral research.
- 2) Having built itself on a reputed and well-established foundation of undergraduate level maritime institutions such as TS Chanakya (earlier TS Rajendra) and MERI (earlier DMET), IMU enjoys a unique advantage of being able to draw upon their reputation as well as a global spread of alumni.
- 3) Apart from inheriting reputed and long-standing pre-sea training institutes as above, IMU has also taken over three more existing institutions that had been functioning in highly specialized maritime domains. These include National Institute of Port Management (NIPM, Chennai), National Ship Design & Research Centre (NSDRC, Visakhapatnam) and Indian Institute of Port Management (IIPM, Kolkata). With these inclusions, IMU has been endowed with strong domain expertise in Port Management and Ship Design and Consultancy – along with the related infrastructural facilities – including buildings, software, hardware, libraries, etc.
- 4) Having functioned for nearly a decade, IMU has accumulated wide-ranging experience and developed an understanding of the key issues and ground realities relating to maritime education and training and is now ready to move on in pursuit of higher goals.

2.2 Weaknesses

- 1) Crucial formative years during which, a solid foundation could have been laid for IMU's future growth have been frittered away on many non-academic issues. IMU has not recovered fully from the initial setbacks it suffered.
- 2) Even after nearly a decade of its establishment, IMU has not been able to gain the confidence of various stakeholders in the maritime industry – Indian or global. Thus, IMU continues to operate in isolation, insulating itself from the changing needs of the industry.
- 3) Excessive dependence on course fees as the major source of revenues coupled with under-utilization of existing capacity of student intake.
- 4) Not geared up currently to meet the emerging educational or training requirements arising from government or industry in the maritime sector, including the port sector.
- 5) IMU continues to be plagued by an acute shortage of well-qualified, trained and experienced faculty members in all the disciplines that it seeks to address.
- 6) Inadequate infrastructure including laboratories/facilities.
- 7) Pre-sea and post-sea maritime education of seafarers has traditionally been skill-based, focusing on shipboard competencies. The unique challenge faced by IMU (unlike other universities) is to expand or evolve beyond seafarer education and training to include knowledge-based education at the post-graduate level and to subsequently move on to research.

- 8) Processes or structures adopted by IMU tend to be rigid and lack flexibility and 'products' of the university, i.e., the students passing out – are often lost sight of – in terms of their employability and their being fit in terms of industry needs.
- 9) At present, there is no benchmarking, self-evaluation and corrective mechanism of IMU's activities and processes.

2.3 Opportunities

- 1) Being the only university of its kind in India, IMU has the potential to emerge as a world-class institution for education and research in maritime and allied disciplines.
- 2) With the current focus of the Indian government on maritime sector in general and promotion of 'Sagarmala' initiative, India is poised to and spreading to inland waterways, offshore oil/gas exploration, deep sea mining, offshore renewable energy, ship design and construction, port and terminal infrastructure creation etc. all need qualified and competent manpower support which can be provided by IMU.
- 3) IMU has a wide range of options at its disposal when it comes to offering post-graduate education and research opportunities in several specialist areas.
- 4) With India continuing to be a key international source of seafarers and with increasing emphasis by various quarters – governmental and non-governmental – on India's future role as a leading maritime nation, an institution such as IMU assumes a major role.
- 5) The government's thrust on increase in supply of Indian seafarers to global maritime industry coupled with emphasis on skill development augurs well for IMU, which spearheads pre-sea training.
- 6) The confidence and trust associated with a central university established with full support from government will be an inherent advantage for IMU while seeking autonomy and exploring funding options through collaborations with industry as well as academia.
- 7) There exist a number of central universities and other institutions of higher learning that have been functioning very well across India and a great deal of lateral learning can happen with IMU adopting some of their 'best practices' as appropriate.

2.4 Threats

- 1) With the continuing downturn in global economy impacting on the maritime sector, industry support, funding opportunities and placements will be hard to find. Consequently, ensuring full intake of students into various courses – current and future – in terms of quality as well as numbers is going to be a challenge.
- 2) Also, in the absence of a long-term growth plan supported by enabling processes, the functioning of the university, there is a risk that IMU could become highly susceptible to and excessively dependent upon the leadership style and individual preferences of the head of the institution.
- 3) In matters of higher maritime education, there exists a risk that various international players may come forward to fill the existing gap which ideally, could be addressed by IMU.

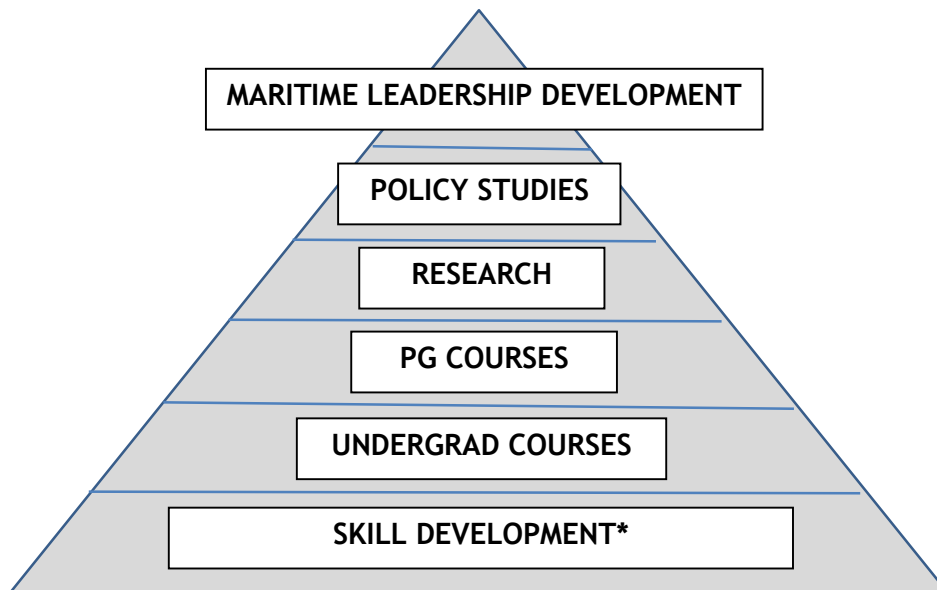
3. CURRENT STATUS OF IMU'S OPERATIONS

This section examines the current status of IMU's operations and key issues and challenges faced by the university.

3.1 The Unique Attributes of IMU: The Pyramid of Learning

Before getting into any discussion on programmes that are currently offered or recommended to be taken up in future by IMU, it is critical to appreciate the uniqueness of the institution.

Unlike conventional universities, IMU is uniquely placed to address the educational and training requirements of the maritime sector in the widest possible sense – as depicted broadly in the figure below:



*Includes skill development as required for pre-sea training, vocational training for shipbuilding, port sector, coastal shipping, inland waterways, fisheries, etc.

Yet another unique attribute of IMU (like other maritime universities the world-over), is its recognition of seafaring certificates of competency and the significance it ascribes to pre-sea training.

The above figure however, is only representational and as such, it is not being assumed that all movement or academic learning is bottom-up. In fact, beginning primarily at the post-graduate level, a great deal of lateral entry of students and faculty takes place. This movement, by and large, facilitates cross-pollination of ideas and encourages the much-needed a) multi-disciplinary approach and b) industry-academia interaction.

3.2 Genesis of IMU

IMU is a **Teaching-cum-Affiliating University** established in the year **2008** to provide quality maritime education, training and research. Headquartered in Chennai, it has **five Regional Campuses** at: Chennai, Kolkata, Mumbai, Visakhapatnam and Cochin. At Mumbai, three legacy institutes that became a part of IMU's Mumbai campus:

1. Training Ship *Chanakya* (successor to *TS Dufferin* – established in the year 1927);
2. Marine Engineering Research Institute or MERI (successor to Directorate of Marine Engineering Training or DMET, established in 1949); and
3. Lal Bahadur Shastri College of Advanced Maritime Studies & Research (1948).

The two legacy institutes that comprise the Kolkata campus of IMU are:

1. Marine Engineering Research Institute (MERI) (1953); and
2. Indian Institute of Port Management (IIPM) (1965)

The erstwhile *National Maritime Academy* (NMA, 1985), Chennai became the Chennai Campus of IMU.

The erstwhile *National Ship Design and Research Centre* (NSDRC), established in 1991 in Visakhapatnam, became the Visakhapatnam Campus of IMU.

Post-November 2008, three new campuses were set up - in Kochi in 2009, in Kandla Port in 2011 and Karaikal in January 2014. However, the Karaikal Campus and the Kandla Port Campus were closed in November 2014 and March 2015 respectively due to zero student intake.

3.3 Current Programmes of IMU

Undergraduate Programmes:

1. B.Tech. (Marine Engineering) - 4 years
2. B.Tech. (Naval Architecture & Ocean Engineering) – 4 years
3. B.Sc. (Ship Building & Repair) – 3 years
4. B.Sc. (Maritime Science) – 3 years
5. B.Sc. (Nautical Science) – 3 years
6. Diploma in Nautical Science leading to B.Sc. (Nautical Science) – 1 year
7. B.B.A. (Retail, e-Commerce, Logistics) – 3 years (started in 2017-18)

Post-graduate Programmes & Research Opportunities

Until IMU came into existence, higher education in maritime sector in India was weighed down by an acute limitation since there were no Post-graduate (PG) or Doctoral Programmes offered in the country. Indian students seeking such qualification had no recourse but to study abroad incurring huge expenditure.

IMU has recently introduced PG Programmes in Marine Engineering and Nautical Science, disciplines in which, the university is well-established. With 90% of IMU's undergraduate students attending courses in these two disciplines, the university has built certain amount of strength in these areas. However, there are still no Doctoral Programmes in Marine Engineering or Nautical Science – a limitation arising from the fact that there are no qualified guides available for supporting PhD programmes.

PG Programmes (on offer from 2018 onwards)

1. MBA (Port and Shipping Management) – 2 years.
2. MBA (International Transportation & Logistics Management) – 2 years.
3. M.Tech. (Naval Architecture and Ocean Engineering) – 2 years.
4. M.Tech. (Dredging and Harbour Engineering) – 2 years.

5. LLM (Maritime Law) – 2 years. [Closed in 2015 for want of demand]
6. Post Graduate Diploma in Marine Engineering – 1 year. (From 2016-17)-
7. M.Tech. (Marine Technology & Management) and
8. M.Sc. (Commercial Shipping & Logistics)

Ph.D. Programmes (on offer from 2008 onwards)

In Naval Architecture & Ocean Engineering only in the Visakhapatnam Campus – where a suitably qualified guide is available.

IMU intends to make all its five campuses as centres for undertaking research leading to Ph.D. before 2018-19.

Modular Courses

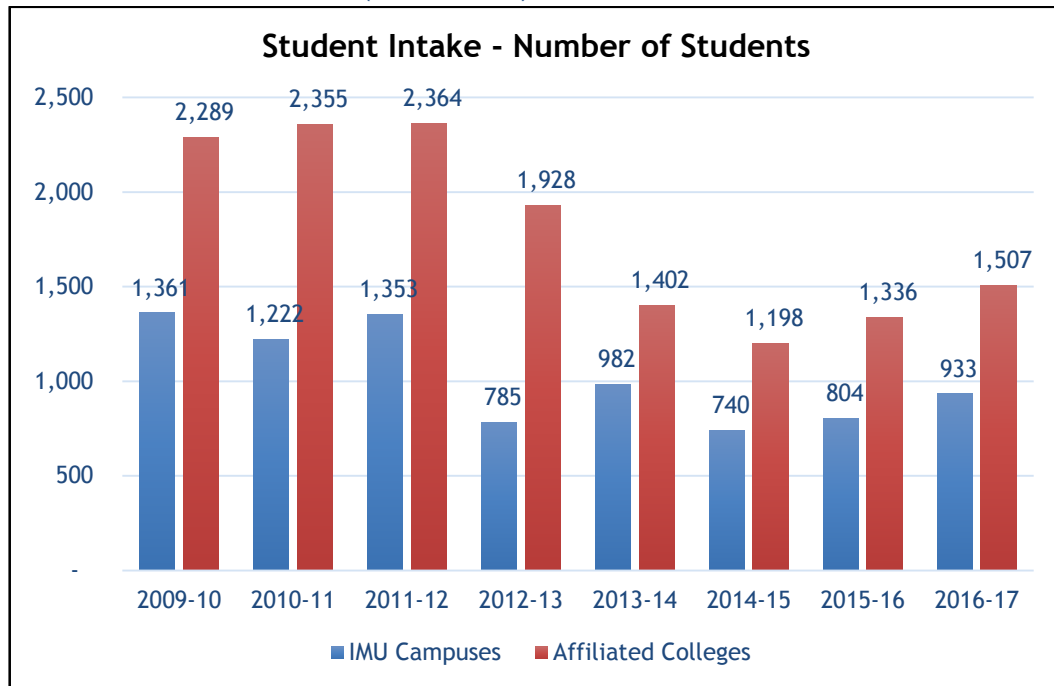
Since seafarers typically serve on a ship for 6 to 9 months in a year, IMU is planning to come up with innovative modular courses/distance-learning programmes whereby a seafarer can study various modules partly while at sea and partly while on land, accumulate credits, and get a degree even while he is an active seafarer.

3.4 Colleges Affiliated to IMU

IMU has 24 Affiliated Institutes:

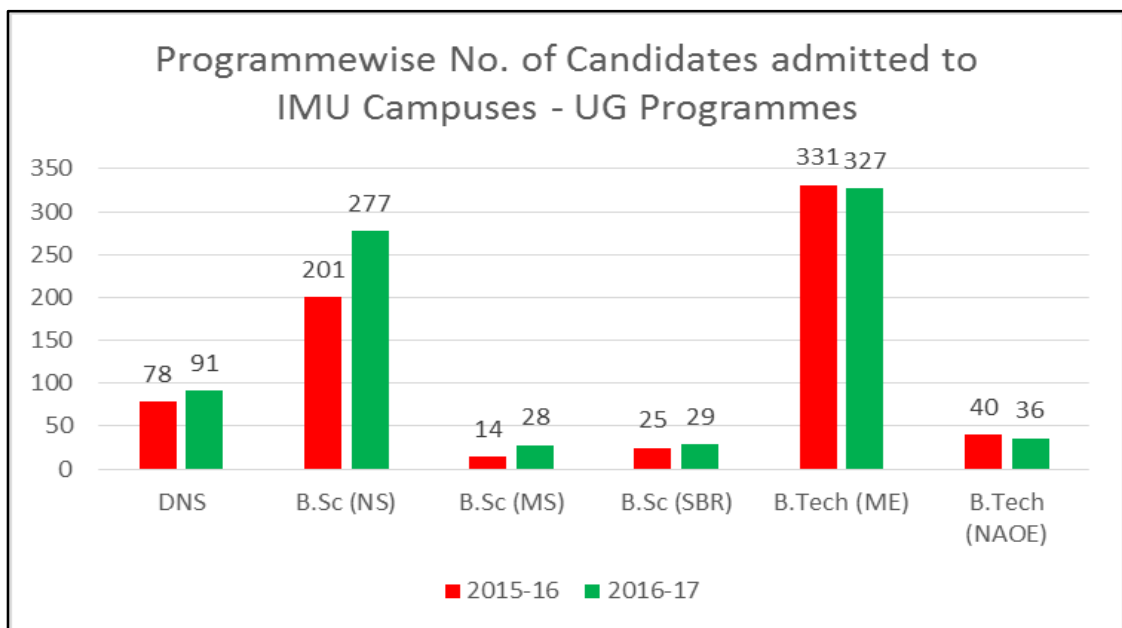
1. Anglo Eastern Maritime Academy, Mumbai
2. Applied Research International, New Delhi
3. Coimbatore Marine College, Coimbatore
4. College of Ship Technology, Palakad
5. Dr. B R Ambedkar Institute of Technology, Port Blair
6. Euro Tech Maritime Academy, Cochin
7. HIMT College, Chennai
8. Hind Institute of Nautical Science & Engineering, Noida (U.P)
9. International Maritime Institute, New Delhi
10. MMTI'S Education & Research Trust, Mumbai
11. Park Maritime Academy, Coimbatore
12. Maritime Training Institute (SCI), Mumbai
13. Maritime Training Institute (SCI), Tuticorin
14. Perunthalaivar Kamarajar Institute of Maritime Science & Engineering, Chidambaram
15. RL Institute of Nautical Sciences, Madurai
16. Sailors Maritime Academy, Visakhapatnam
17. Samundra Institute of Maritime Studies, Mumbai
18. Sriram Institute of Marine Studies, New Delhi
19. Southern Academy of Maritime Studies, Chennai
20. The Great Eastern Institute of Maritime Studies, Mumbai
21. Tolani Maritime Institute, Pune
22. Training Ship Rahman, Mumbai
23. Vishwakarma Maritime Institute, Pune
24. Yak Education Trust, Mumbai

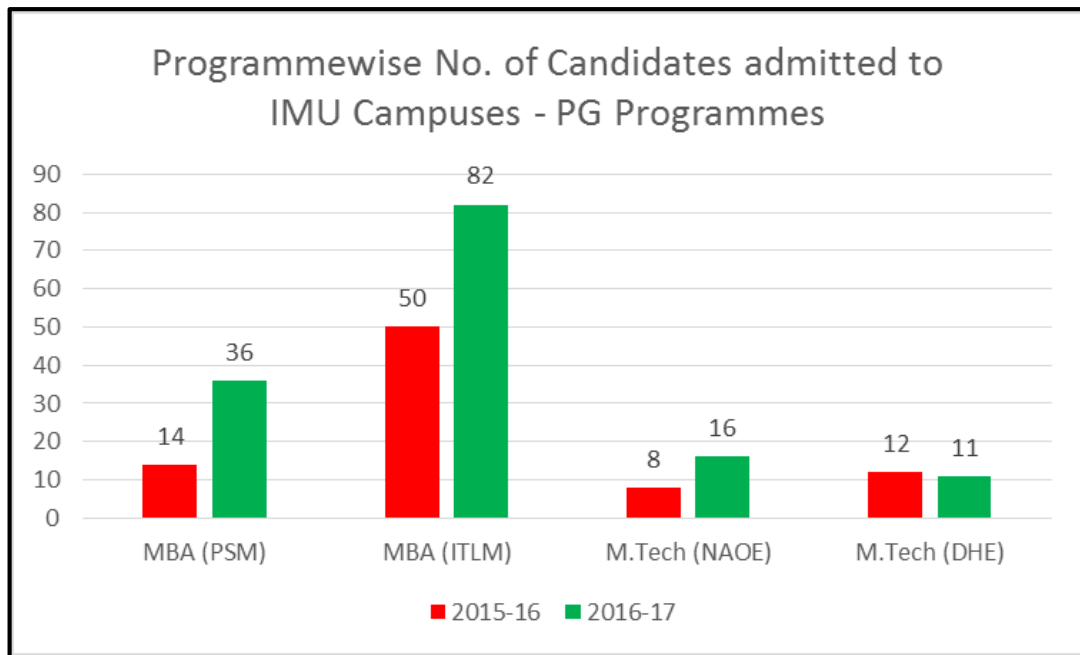
3.5 Trends in Student Intake (Admissions)



As can be seen in the chart above, depicting year-wise trends in student intake – into IMU’s own campuses as well as its affiliated colleges, there was almost 50% reduction in admissions between 2012-13 and 2014-15. This is attributed to the prolonged recession in global shipping industry since 2009 which is yet to bottom out.

However, of late, admissions to IMU Campuses have been showing an upward trend (in 2015-16 and 2016-17), as depicted in the following chart:





In terms of capacity utilization, however, most of the courses have a long way to go – as can be seen from the table below:

Year ->	2014-15	2015-16	2016-17
Total Intake Capacity of all programmes	1,341	1,326	1,301
Admissions made	737	794	950
% of admission to total intake capacity	55%	60%	73%

From the following table, which depicts the break-up of course-wise capacity utilization (with courses reporting < 50% capacity utilization highlighted in yellow), a few inferences can be drawn:

- 1) Over the past three years, there has been a significant improvement in capacity utilization of all the courses.
- 2) Pre-sea training and undergraduate courses are doing well in terms of capacity utilization and yet, there is some scope for further improvement.
- 3) Post-graduate Diploma courses in Marine Engineering (PGDME) are not doing well and a re-think is required in the design and delivery of this course. What could possibly add value to serving marine engineers and attract more numbers – is a Continuous Professional Development (CPD) approach through which serving marine engineers are prepared for their future roles ashore.
- 4) Some of the MBA courses too require re-design and alignment with industry-requirements.

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Programme	Campus	2014-15			2015-16			2016-17		
		Sanctioned Strength	No. of Candidates allotted	% of Actual Vs Sanctioned Strength	Sanctioned Strength	No. of Candidates allotted	% of Actual Vs Sanctioned Strength	Sanctioned Strength	No. of Candidates allotted	% of Actual Vs Sanctioned Strength
Undergraduate										
B Tech (ME)	Chennai	80	58	73%	-	-	-	-	-	-
B Tech (ME)	Kolkata	246	211	86%	286	266	93%	286	255	89%
B Tech (ME)	Mumbai	40	28	70%	80	59	74%	80	69	86%
Total		366	297	81%	366	325	89%	366	324	89%
B Tech (NA&OE)	Visakhapatnam	40	26	65%	40	35	88%	40	36	90%
Total		40	26	65%	40	35	88%	40	36	90%
B.Sc (NS)	Cochin	-	-	-	-	-	-	40	25	63%
B Sc (NS)	Chennai	80	40	50%	120	45	38%	120	91	76%
B Sc (NS)	Mumbai	185	134	72%	185	156	84%	185	150	81%
Total		265	174	66%	305	201	66%	345	266	77%
B.Sc (SBR)	Cochin	40	17	43%	25	25	100%	40	29	73%
Total		40	17	43%	25	25	100%	40	29	73%
B Sc (MS)	Mumbai	40	28	70%	40	14	35%	40	28	70%
Total		40	28	70%	40	14	35%	40	28	70%
Diploma										
DNS	Chennai	80	22	28%	80	25	31%	80	38	48%
DNS	Cochin	40	6	15%	40	7	18%	-	-	-
DNS	Kolkata	40	14	35%	-	-	-	-	-	-
DNS	Mumbai	80	35	44%	80	46	58%	80	47	59%
Total		240	77	32%	200	78	39%	160	85	53%
PGDME	Cochin	40	2	5%	40	3	8%	-	-	-
PGDME	Mumbai	120	55	46%	120	29	24%	120	37	31%
Total		160	57	36%	160	32	20%	120	37	31%
Post Graduate										
M Tech (D&HE)	Visakhapatnam	20	6	30%	20	12	60%	20	14	70%
Total		20	6	30%	20	12	60%	20	14	70%
M Tech (NA&OE)	Visakhapatnam	20	4	20%	20	8	40%	20	13	65%
Total		20	4	20%	20	8	40%	20	13	65%
MBA (ITL)	Cochin	30	11	37%	30	16	53%	30	33	110%
MBA (ITL)	Chennai	30	20	67%	45	31	69%	45	43	96%
MBA (ITL)	Kolkata	30	1	3%	15	3	20%	15	6	40%
Total		90	32	36%	90	50	56%	90	82	91%
MBA (PSM)	Cochin	30	7	23%	30	-	-	30	8	27%
MBA (PSM)	Chennai	30	12	40%	30	14	47%	30	28	93%
Total		60	19	32%	60	14	23%	60	36	60%
	Grand Total	1341	737	55%	1326	794	60%	1301	950	73%

The immediate challenge before IMU therefore is: How to make the existing courses attractive to the students and ensure 100% capacity utilisation?

Capacity utilization, which has a direct bearing on revenues generated, is an important measure of the success of the courses. It is driven mostly by:

- Placement records (especially the previous year's performance)
- Industry's perception of the quality of 'products' from IMU in terms of employability
- Reputation of the institution in the society as a whole
- Fee structure
- Other options available to the students at the time of admissions

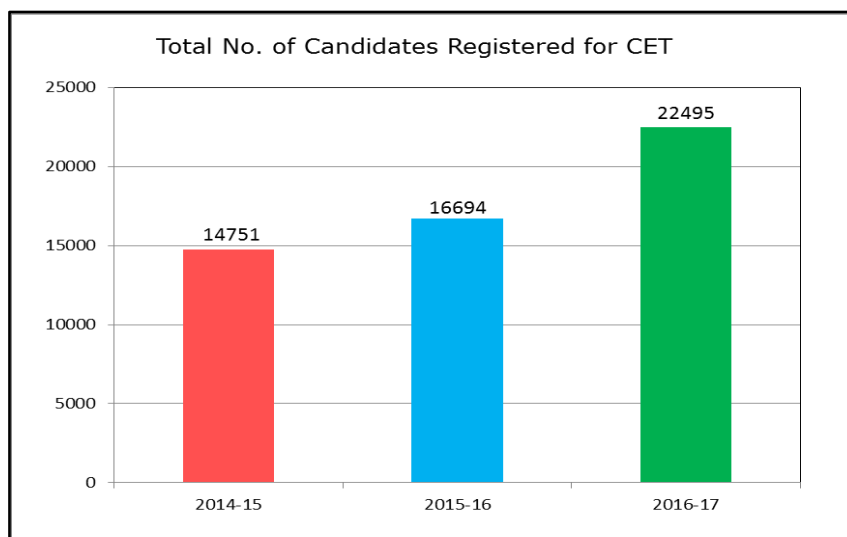
Quality of the 'products' of the students passing out is a function of value addition by faculty, curriculum and facilities together with the quality of the student intake. While on the subject of intake, it is worth examining, however briefly, the admission process and selection criteria.

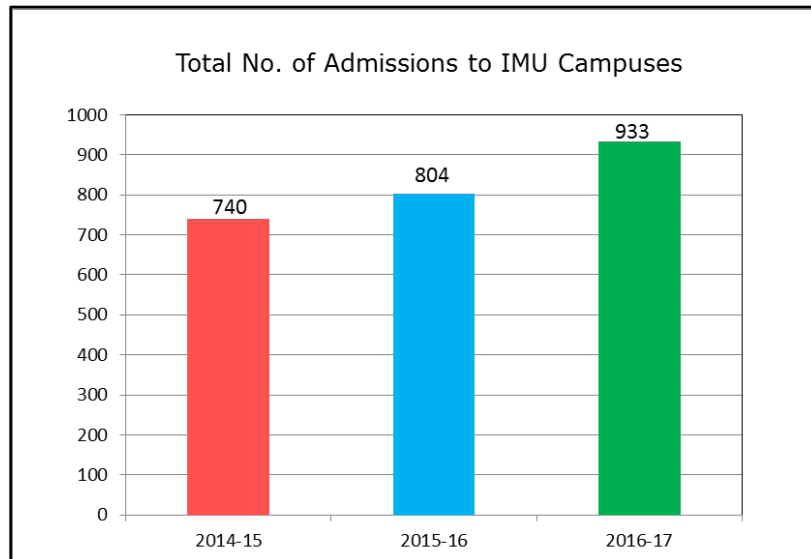
3.6 Admission Process & Selection Criteria

IMU successfully switched over from the pen-and-paper mode of Common Entrance Test (CET), which was inefficient, time consuming and a logistic nightmare, to the **Online CET** in June 2014 for admissions to its various Programmes. Online CET has now become the norm.

IMU switched over from the physical mode of Counselling (which required students from all over India to come to Chennai and stay there for a couple of days) to **Online Counselling** in July 2014 for making admissions to IMU Campuses and Affiliated Institutes. Online Counselling has now become the norm. From 2016-17, IMU's Online Counselling has been restricted to IMU Campuses only.

While the above-mentioned improvements speak highly of administrative changes introduced in the admission process, it is worthwhile to examine the outcomes. From the three charts below, it seems that despite high levels of initial interest and despite being qualified for counselling most of the candidates are opting to join other colleges. This conclusion is further supported by the fact that capacity utilization has been consistently low over the past three years (55%, 60% and 73%) although an incremental improvement is visible.





On the question of shifting IMU's selection criteria to Joint Entrance Examination (JEE) for undergraduate courses, to Graduate Aptitude Test in Engineering (GATE) for PG selections and Common Admission Test (CAT) for management courses, it is recommended that IMU may persist with its current practice of utilizing its own examination system of CET for reaching out to large number of aspiring applicants to its courses – as it is doing currently.

Eventually, IMU may consider opting for JEE/GATE/CAT as the basis for intake. By then, the demand for the courses offered by IMU is expected to grow substantially and consequently, the best talent will be attracted to compete for admissions in sizeable numbers.

IMU may consider three phases for the transition:

- 1) CET alone (next two years)
- 2) CET+JEE (after two years from now)
- 3) JEE alone (after five years from now)

4. CONSOLIDATING CURRENT PROGRAMMES OF IMU

It is necessary to critically examine the ongoing programmes of IMU before taking up the questions and issues associated with the Master Plan. The purpose is to identify priorities and explore means of consolidating current operations before venturing into expansion.

Beginning with 'Skill Development' placed at the bottom of the pyramid (ref. figure in section 3.1, 'The Unique Attributes of IMU: The Pyramid of Learning'), various programmes currently on offer have been considered for discussion in this section.

4.1 Skill development to meet industry needs

The fact that assured availability of skilled workforce is a pre-requisite for sectoral growth of any industry is well established and cannot be overemphasised. Being a specialist university with a focus on practical training of seafarers and competency development at the undergraduate level, IMU is uniquely placed to be the nodal agency for promoting skill development.

However, any strategic initiatives at industrial skill development on a large scale need to be undertaken in close consultation with all the stakeholders. This is particularly true in the Indian scenario given the increased participation of private sector in areas that have been inaccessible to them – such as naval shipbuilding. The skill-sets targeted are to be modern and forward-looking, aiming at grooming the youngsters in areas of future growth and at the same time, upgrading the skill-levels of the existing workforce.

In this connection, it is heartening to note that IMU has embarked on a large-scale, ambitious project to establish a Centre of Excellence (CoE) for skill development in shipbuilding in collaboration with M/s Siemens of Germany and the Indian Register of Shipping. The details of this initiative are awaited.

There also exists a strong need for skilling for Shipyards, the Ports, Inland Waterways, NCVs, River Craft, Fishing Vessels, etc.

On the commercial operations front, there is need to upgrade knowledge and skills of employees and aspirants on the supply chain like warehousing, inland container depots, logistics operations and so forth.

As one of the early exercises to be taken up is establishing Centres of Excellence (CoEs) at various campuses, it is recommended that IMU may list important skill requirements region/ industry/sector-wise and link their development to the facilities, growth plans of the respective CoEs themselves and initiate action to Train the Trainer and instructor programmes. To begin with however, the existing facilities, infrastructure, manpower, etc., may be utilised to the fullest extent.

4.2 Expanding Scope of Maritime Studies

Maritime Education and Training (MET) in countries such as India – which have been at the forefront of supplying seafarers for global shipping markets – is at cross-roads today.

On the one hand, there is a dire need to enhance the competence of Indian seafarer in terms of skill and knowledge levels to keep up with the changing technologies,

regulations and operational practices. On the other hand, there is also a compelling need to enrich the academic content and paving the path to higher education and research in maritime industry making it accessible to the aspirants.

Yet another pull is the need to respond to the demands for India's rapidly growing logistics supply chain and the related maritime services. It therefore should not come as a surprise that the specialist MBA course offered by IMU in International Transportation & Logistics Management has become very popular. Surely, this is certainly one of the areas that IMU is uniquely placed to play a defining role in leading the way and shaping the maritime education of the country.

At a broader level that a university engages in its academic and research pursuits (as acknowledged recently by WMU), the scope and reach of Maritime Studies has undergone a sea change. At the level of IMU, it therefore is advisable to think and plan in terms of Maritime Studies rather than limiting oneself to MET which is only a subset.

For example, WMU has recently moved on to embrace Marine Sciences as its broader field of learning.

According to the renowned scientific journal 'Nature' -

***Ocean sciences** span the physics, chemistry, and biology of marine systems. The field encompasses ocean circulation, energy dissipation, marine biology, ecology, biogeochemical cycles, water mass formation and movement, ocean temperature and salinity, and marine carbon and carbonate chemistry.*

(www.nature.com/subjects/ocean-sciences)

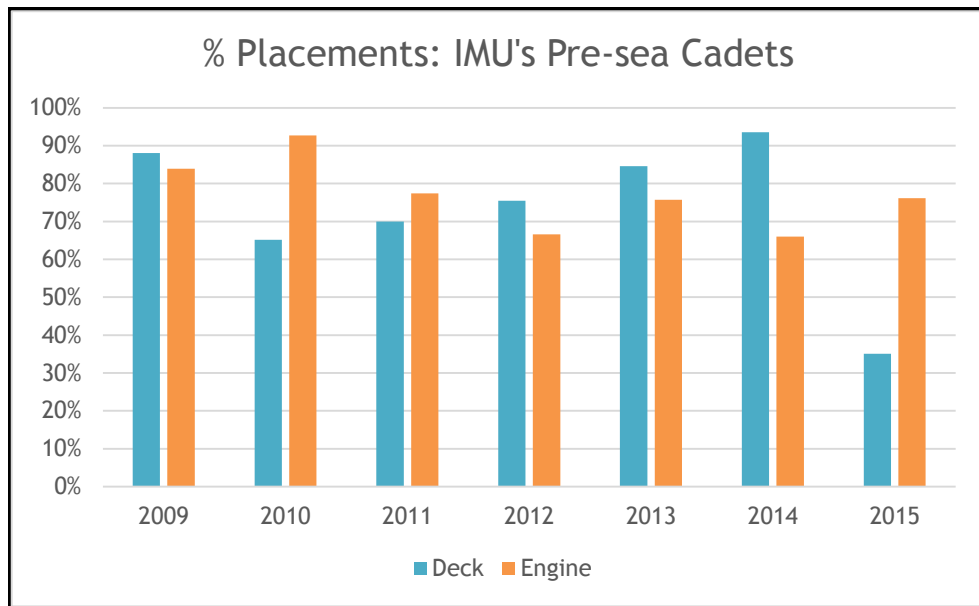
Under broad spectrum of ocean sciences, IMU may consider, in due course, several fields of interest for teaching as well as research, e.g.,

- Maritime Policy Studies
- Marine Sciences (Geological, Geo-physical, Biological, Physical, Climatic, Environmental, etc.)
- Ocean Resources (Energy, Food and Minerals)
- Offshore and Underwater Technologies
- Port and Coastal Engineering

4.3 Undergraduate Programmes

a) Own Pre-sea MET Institutions

As mentioned earlier (ref. Section 3.2, 'Genesis of IMU') IMU has been endowed with two of India's finest, oldest and most renowned pre-sea maritime education and training institutions – namely, TS *Chanakya* (formerly *Rajendra*) and MERI (formerly, DMET). It is alarming to note that the placement records of both these institutions in recent years have been below par.



Knowing the global presence of the alumni of the institutions and noting that shipping industry is operated by a close-knit community, it is a matter of concern for everyone in the industry and that the placement levels have not been satisfactory – of late (e.g., figures for the year 2015 in the above chart).

It is critical that IMU devotes all its attention to these flagship pre-sea courses and ensures 100% intake and 100% placement through campus selections. It is not an exaggeration that IMU's reputation – current and future – is determined by the performance of the B.Sc. Nautical Science offered at TS *Chanakya* and B.Tech. Marine Engineering course delivered at MERI. Every possible measure is to be taken to ensure that they spearhead the pre-sea MET in India and show the way forward for all other pre-sea training institutes.

IMU signed an MOU with Andaman & Nicobar Administration, by which A & N Administration has agreed to provide 120 assured on-board training slots in the vessels owned by it for the undergraduate students of IMU Campuses.

This is a welcome development and shows the way forward for IMU when it comes to collaborating with governmental agencies and administration. This aspect has been discussed further in section 5.2, 'Cooperating with Governments'.

b) Colleges affiliated to IMU

While it is understood that IMU has been able to provide academic and administrative support to the affiliated colleges, it is not clear what is the value-addition that the affiliation is able to bring about towards pre-sea MET.

A word of caution is perhaps not out of place here about the pre-sea MET in India. Nearly two decades ago, pre-sea MET in India was opened to private sector participation. Consequently, many institutes sprang up across the country, seeking to maximise profits and at the same time, cater exclusively to a cyclical industry, resulted in dynamic imbalance between the supply and the demand.

Sub-standard institutes typically have no organic link to the industry. They largely remain focused on intake rather than the outcome. The "push" of supply into the labour

markets (of prospective seafarers) tends to distort the picture – especially when the demand “pull” (i.e., requirements of industry) is neither clear nor stable.

The revised rating mechanism of the Comprehensive Inspection Programme (CIP) for pre-sea training institutes mandated by the Directorate General of Shipping focuses primarily on placement records.

IMU may consider adopting the CIP norms for its own pre-sea training institutes and for the affiliated colleges to link their performance with placements. It is important to bear in mind that many of the privately owned and managed pre-sea institutes have been established for the sole purpose of profit-making and therefore they are not committed to placements. IMU, on the other hand, being a national institution of repute, operating under the Ministry of Shipping, will be targeted and held accountable by the students passing out of the affiliated colleges, by parents, media and by the public at large. In a highly cyclic industry such as shipping, it is a big challenge to predict the demand for seafarers.

Presently, IMU has no say on the content or delivery of the pre-sea or post-sea courses as applied to seafarer education and training. It would be desirable if IMU plays a more proactive role in collaboration with DG-Shipping in design of these courses and involves itself in policy-making regarding maritime education in India.

4.4 Postgraduate Programmes

Regarding the PG courses offered currently by IMU as listed in section 3.3 (‘Current Programmes of IMU’) and the discussion in section 3.5 (‘Trends in Student Intake’), it could be seen that:

- a) Some of the PG courses (e.g., LLM in Maritime Law, offered at Kochi campus) had to be discontinued for want of demand; and
- b) Overall, the capacity utilization for the PG courses offered has been low, with a few exceptions.

It would therefore be prudent to review and re-ascertain the demand for all the PG courses currently on offer in terms of:

- a) Placement records; and
- b) Industry needs.

IMU’s commitment towards running undergraduate courses is fixed – as of now. IMU does however, have a degree of flexibility with regard to the PG courses. Offering any PG course will require availability of faculty (and in some cases, expensive facilities) with the requisite specialisations. It would therefore be prudent to assess the long-term needs of the industry before proceeding with any of the courses. This will also help to customise or fine-tune the curriculum in line with industry’s requirements.

About the suggestions and recommendations made on the question of establishing and sustaining a synergetic relationship with the Indian as well as the global maritime industry, section 5.4 ‘Organic Links with Stakeholders’ may please be referred.

4.5 PhD Programmes & Research Projects: Areas of Research

As of now, very little research activity is being undertaken at IMU. MS (by Research) and PhD programs are planned to be launched in January 2018.

MASTER PLAN FOR INDIAN MARITIME UNIVERSITY (IMU)

PhD programmes and research projects represent the way forward for IMU for building its reputation and for establishing itself as a top international university.

Following is a representative list of topics of research in area relating to shipping industry:

Research areas	Research topics
Shipping	<ul style="list-style-type: none"> • Shipping policy, regulation and legal issues in corporate management and performance Shipping market • Freight rate and economic impact, Shipping risk and maritime security, Shipping finance, Routes and networks, • competitiveness and performance Sailing speed, green shipping and environment-related issues • Maritime logistics and supply chain operational management, mode choice, empty container shipping services
Port	<ul style="list-style-type: none"> • Terminal studies, berth allocation • Ports in transport and supply chain • Port governance, port policy, regulation and legal issues • Port planning, development, cluster, network, and economic impact • Port management, performance, efficiency and competitiveness • Port choice, Port risk and security
Maritime fleet	<ul style="list-style-type: none"> • Fleet structure, deployment, ownership and operation • Ship registration, shipbuilding, demolition, new orders & second-hand ships
Other	<ul style="list-style-type: none"> • Maritime affairs, fisheries • Labor and employment, promotion of shipping clusters, • Maritime education and Training • Maritime Occupational Health and Safety

It is recommended that a similar list of research topics may be proposed by the faculty from technical courses – as the recruitment progresses. Beginning with the existing capabilities in terms of faculty members to act as research guides and facilities and both are to be gradually augmented in due course.

To identify such topics, it is important to carry out a survey of ongoing research to identify ‘hot topics’ and ascertain the current requirements of stakeholders.

There certainly is a need to identify and prioritise areas of research that IMU wishes to promote or take up. Accordingly, availability of research guides and therefore, the faculty recruitment need to be aligned. Special measures to encourage faculty members to pursue PhD programs need to be put in place.

Once again, as in the case of PG programmes the research topics be determined by the industry needs and in addition, by –

- a) Alignment with own faculty recruitment and availability of research guides
- b) Research funding from Governmental sources

- c) Partial or full funding from non-governmental sources including international professional bodies
- d) Opportunities for consultancy work for industry
- e) Opportunities for collaborating with other academic and research bodies
- f) Access to facilities vis-à-vis cost of developing own
- g) Opportunities for publication of papers in leading journals
- h) Opportunities for innovation and patents

It is recommended that CoEs may take the lead in identification of research topics – current and future – and in building necessary resources – human as well as physical.

4.6 Urgent need to add/renew facilities

The ongoing UG and PG courses are in urgent need of following facilities – procurement of which, has been delayed for several reasons:

Pre-sea MET Courses (UG):

- Navigation Simulators including ECDIS and ARPA
- Full-mission (Bridge & Engine Room) Simulators
- Marine Engineering Laboratory
- Ship engine needs to be procured
- Ship Spare parts (old)

High priority may be accorded to above procurement.

UG & PG Courses in Naval Architecture & Ocean Engineering:

- Setting up of laboratories for Naval Architecture is essential to run B.Tech. and M.Tech. courses and urgent action is required for the same. In fact, this should be given the high priority and implemented within the next two years.

Design/modelling software (NAPA, ANSYS, DELFT-3D, etc.)

- Use of engineering software being an essential part of learning processes, it is recommended that IMU expedites procurement of same.

In view of the difficulties faced in the procurement process, IMU may suitably review and revise the procedures involved; and

Proactively identify and initiate measures for procurement and development of facilities since some of them have a long lead-time.

4.7 School of Marine Design and Research

National Ship Design & Research Centre (NSDRC) was established in 1990 with the support and cooperation of the government of The Netherlands at considerable expense and with a long-term vision to develop ship design capabilities in India. After nearly three decades, the objective remains unfulfilled. There is a crying need for developing indigenous capabilities in ship design and for systematically capturing the knowledge and learning from various shipyards for future reference and use.

Following merger of NSDRC with IMU, it is reassuring to note that IMU is considering revival of some of the core activities of erstwhile NSDRC through establishment of an exclusive school for marine design and research.

It is indeed a welcome move that must be pursued with all vigour to ensure fruition at the earliest. A school of this nature will open several opportunities for – not only design and research – but also for an ongoing collaboration with industry.

4.8 Global Collaborations

It is understood that IMU has, in recent times, offered short-term courses to a group of about 100 government officials from East African nations under the aegis of the Ministry of External Affairs. The courses are offered in four disciplines, each for a duration of six weeks.

This is a welcome development and augurs well for IMU. Regional collaboration is indeed the way forward as IMU endeavours towards global rankings. For further discussion on this, section 5.2, 'Cooperating with Governments' may be referred.

It is also understood that IMU has, in recent years, signed several MoUs with leading academic and research institutions from across the world. The list of parties with which the MoUs have been entered (given below) is quite impressive:

1. Plymouth University, Plymouth, UK (established in 1862).
2. Admiral G.I. Nevelskoi Maritime State University, Vladivostok, Russia (1890).
3. Institute of Chartered Shipbrokers, London, U.K (1912).
4. Bangabandhu Sheikh Mujibur Rahman Maritime University, Dhaka, Bangladesh (2014).
5. University Teknikal Mara SDN. BHD. (UniKL), Kuala Lumpur, Malaysia (2002).
6. University of Southampton Solent, UK.

However, there has not been much progress or follow-up action after signing of the MoUs. In this connection, the experience gathered by IMU in the joint programme offered (in dredging) along with another globally-renowned institution – namely, Delft University, The Netherlands, may be recalled. Despite the success of the programme in terms of value-addition and excellent placements received by the students of the course, the course had to be discontinued. The reason cited was that IMU had little to offer in return to Delft University. This once again goes to show that such collaborations demand an Indian component to be in place and IMU can deliver it only after it has the faculty, facilities and the local industry support in place.

4.9 Outcomes Targeted from Consolidation

Taken together, all the above measures, i.e., the proposed establishment of Centres of Excellence, MoUs with foreign universities and national-level collaborations, strengthening existing courses through infrastructure and faculty resources, faculty development programs and measures for attracting and retaining excellent faculty, addition of matching facilities, being in synch with the ongoing projects of Ministry of Shipping (MoS) and being responsive to the needs of the industry, harnessing strengths of affiliated colleges, will significantly contribute to emergence of IMU as a leader in maritime education and training and a role model to the academia.

5. FUTURE ROLE OF IMU

5.1 Vision of IMU

The present report has been guided by the following vision for IMU:

IMU will emerge as a leading global institution for maritime education, training and research by actively developing, promoting and facilitating:

- *Maritime policy studies*
- *Maritime leadership and managerial resources*
- *Continuous professional development of all personnel in maritime sector*
- *Cooperation with governments and industry and all other stakeholders in the maritime sector*
- *Research in the fields of marine sciences and technologies; and*
- *Development of world-class seafarer competencies through post-sea and pre-sea training.*

Executive/Professional Development Programme of short duration would be a good starting point to explore allied, multi-disciplinary areas, which in due course can be developed into regular PG courses.

5.2 Cooperating with Governments

On the lines that WMU actively promotes the agenda of IMO, IMU is to emerge as a primary instrument for maritime policy studies by working in tandem with the Ministry of Shipping, Government of India.

In due course, IMU should explore cooperating with other governments in the South Asian Region. For this purpose, working with bodies such as SAARC and execution of joint, inter-governmental consultative and research projects may be explored.

This approach will:

- Enhance the role of IMU as knowledge provider, facilitator and enabler for policy studies in the South Asian Region.
- Encourage participation for senior bureaucrats and technocrats from the region in the programmes offered by IMU.
- Overall, encourage enrolment of foreign students.
- Open avenues for faculty exchange programmes and joint delivery and accreditation of courses.
- Open additional funding sources from countries other than India.

Examples of areas in which IMU could contribute to promotion of implementation of the policies of Government of India include active participation in following programmes:

- Sagarmala (Offers excellent scope for reinforcing the ongoing courses in logistics, shipping and port operations – including expansion of funding base. New opportunities present themselves in Ports & Terminals, Near Coast Vessels, Coastal Shipping and Inland Waterways, etc.)
- Skill India (IMU's plan to work with SIEMENS will fit well into this initiative)
- Organising seminars and workshops on topical issues impacting the maritime sector, viz.,
 - The completely revamped version of the Indian Merchant Shipping Act (2014) which came into force recently

- The Maritime Admiralty Act that was passed by the Indian Parliament as recently as 25 July 2017
- Challenges and opportunities in India's coastal shipping
- Challenges and opportunities in India's Inland Waterways
- Impact of GST on the maritime sector and shipbuilding industries
- With increased focus on ease of doing business, can Indian ports emerge as maritime hubs (like Singapore, Hong Kong, etc.)?

5.3 Centre for Maritime Policy Studies

IMU to take the lead in establishing and managing a Centre for Maritime Policy Studies on the lines of Academic Staff College (Hyderabad) for:

- Grooming maritime leadership among bureaucrats, technocrats and top/senior management of industry
- Providing a platform for exchange of ideas and views aimed at development of maritime policies at the national, regional and global levels and
- For conduct of seminars, workshop and courses to promote discussions, exchange of ideas on policy development and refinement

This centre will try and create the support system for high-end research and working papers on various areas of importance in Maritime studies focused both at the national and international levels. It will be a repository of information and centre to facilitate Maritime studies. It will work mainly on funded research projects. The Centre would be headed by a Director and will have two research associates on contract to start with.

The basic function of the Centre would be to create and maintain a repository of Maritime related data and knowledge base. It is also expected to come out with periodic working papers to help in policy making in the Maritime sector.

The Centre would also attempt to help India participate effectively in International Maritime policy making. The Centre will identify potential areas for study and find sponsors for the study and will tie-up with experts inside or outside of IMU to conduct the study. The support staff for the study would be recruited temporarily by the Principal Investigator for the Study with concurrence of the Director.

Areas of Study

Examples of India-based Areas of Study:

1. The Indian Maritime sector
2. The Legislations governing the Indian Maritime sector and their effectiveness
3. Maritime sub-sector performance
4. Maritime Economics of India
5. Maritime Safety and Security in India and for Indian Flag ships
6. Maritime Environmental Science in India
7. Maritime Human Resource of India
8. Maritime Management
9. Ship building and Breaking in India

Examples of Global Areas of Study:

1. International Laws, Maritime Conventions and role of International Bodies
2. The IMO system for Maritime Governance
3. Maritime Economics
4. Maritime Safety and Security
5. Maritime Environmental Science
6. Maritime Management

Funding of the Centre

The centre would also seek and get budgetary grants to develop and maintain a basic Maritime Database for common use and study. The Budgetary support for the Centre from IMU is estimated to be Rupees Two Crores every year. A twenty-five percent hike year-on-year will be needed to run the core establishment, maintaining the Maritime Information Repository. The remaining funds for more studies shall be sourced from specific funded studies. It could also earn from selling data resources from the database created, to other researchers and institutions in India and abroad.

5.4 Organic Links with Stakeholders

IMU to actively engage and involve corporates from the public as well private sectors within the maritime sector in:

- Design and development of courses
- Funding support to the courses (including institution of Professorial Chairs, scholarships, awards/medals, bursaries, etc.)
- Active support and involvement from industry are to be sought to doctoral and post-doctoral research
- Industry support is to be explored – not just for placements but also for internships, joint projects, access to design/operational data, development of case studies, etc.

As a general rule, assured support and participation from end-users of IMU's products are to be considered as a pre-requisite for all the courses that are offered by IMU. This will lead to qualifications and competencies that are sought after by industry and will pave the way for funding by industry (as above).

Establishing channels of consistent support from industry to include:

- 1) Participation of Indian National Ship Owners' Association (INSA), Indian Ports Association (IPA), Indian Shipbuilders' Association in appropriate advisory committees of IMU.
- 2) Cooperation with and development and delivery of courses that would interest Indian Navy and Indian Coastguard.
- 3) Similar approach to be explored with MASSA, FOSMA, Anglo-Eastern, Maersk, International Chamber of Shipping, BIMCO, etc.

5.5 Directorate for Research, Training & Consultancy (DRTC)

It is understood that IMU has recently mooted the idea of establishing a dedicated Directorate for Research, Training & Consultancy (DRTC). This could be well suited to interface with industry/stakeholders on a continuous basis – covering all the core activities of the university.

Currently, the in-house faculty of IMU design and deliver courses on the basis of their perception of industry needs. In the absence of a structured or systematic approach in assessing the changing needs of the industry, these courses tend to be out of alignment with the competencies that the industry is seeking. The proposed DRTC will bridge the gap in understanding and assessing the industry needs from time to time and in revising the curriculum as appropriate.

DRTC will play a significant role in establishing and maintaining external links and endow client focus in all the activities undertaken by IMU - from undergraduate and post-graduate education to research and consultancy. It can also be instrumental in interacting with governmental bodies and other academic and research institutions.

It is therefore strongly recommended that IMU establishes at the earliest, a dedicated Directorate for Research, Training & Consultancy (DRTC).

5.6 Centre for Information Resource Management (CIRM)

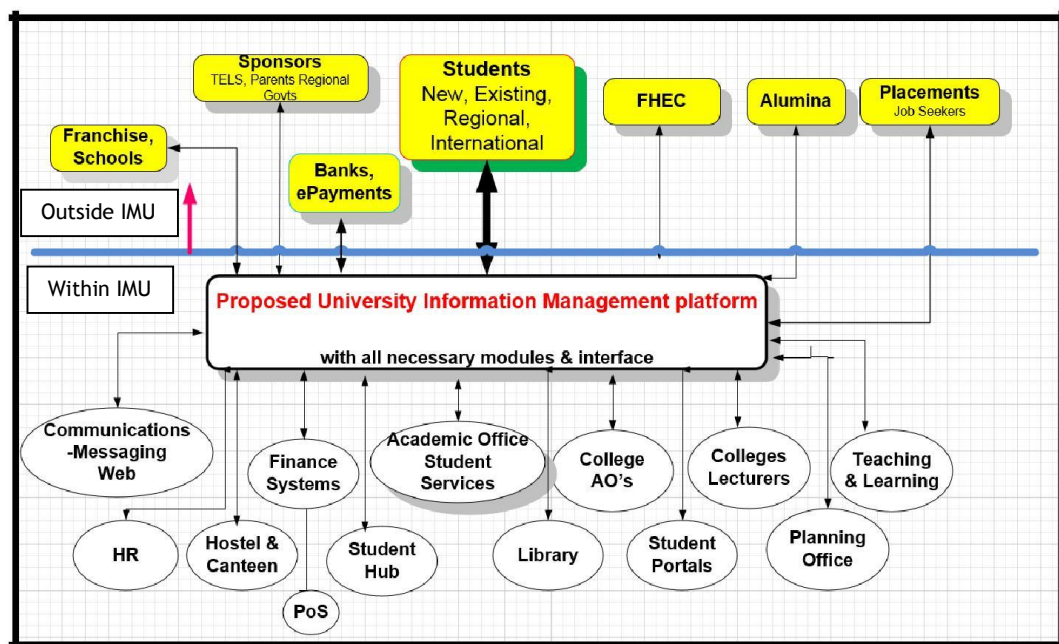
Given the need for implementation of several IT-related initiatives (ERP, administrative and operational linking of IMU's geographically spread-out campuses, use of IT in programme administration and delivery, use of advance simulators, ship design software, data management needs of a repository of maritime information repository, etc.) and their upkeep and maintenance and constant race that occurs between software and hardware, establishment of a dedicated Centre for Information Resource Management (CIRM) strongly recommended.

Objective & Purpose of CIRM

To have a University Wide Integrated Information System and its support mechanisms that would facilitate IMU's Operational, Managerial and Executive Functions across and with all Centres, Affiliated Institutions, Departments, Students, Faculty, Administration, Sponsors, Government of India and other stakeholders.

Functions & Scope of CIRM

The Centre for Information Resource Management (CIRM) will take care of the Information systems for all Institutional Administrative Systems, Student Services, Timetabling Service and will not operate in isolation; as it will integrate with other systems such as Virtual Learning Environment (VLE), Financial system, Student portal, communications platform thus providing a holistic service to students, staff and all stakeholders, as per map below. The proposed solution may gradually replace standalone systems.



Aim

To deliver a secure portfolio of integrated and resilient information systems which will:

- Provide an accurate and reliable Management Information System
- Underpin the University's strategic goals in achieving excellence in education and student experience
- Efficient and effective delivery of IMU's administrative functions.

Staffing & Leading the CIRM:

The Organization for CIRM may be evolved with the advancement of application deployment and usage. The centralized control with decentralized users and outsources, facilities management model is most suitable for IMU.

The University should have one CIRM Director who is of the rank of Professor with experience in heading a University IT cell or Centre and effectively implementing IT programs in a University (on regular or contract basis, even retired persons may be considered up to the age of 70 years). Hands on experience in IT project development and implementation is desirable.

One or two programmers/ Assistant system administrators are also required at the Headquarters of the University and at least one Asst system Administrator is required in each Centre/ campus.

All application development may be carried out using third party/parties. The hardware maintenance may also be assigned to a third party through an Annual Maintenance Contract (AMC).

The Director of CIRM shall first be appointed and the detailed IT implementation plan shall be then developed under the leadership and guidance of the CIRM Director.

The Director shall facilitate the system study and finalization of user requirements for the software and hardware and networking to be done in IMU. The running of the applications and maintenance of the systems and user training shall also be done under his leadership and guidance in CIRM.

For an outline of function and features of ERP system relating to academic administration and the scope and role of the centre, **Annexure-1** may please be referred. However, this is to be considered as an initial exercise and further refinement is to be taken up by IMU.

5.7 Publications & Own Journal

Faculty of IMU are to be actively encouraged to undertake research projects in collaboration with industry and to publish papers in refereed journals of international repute. Also, they must be encouraged to take part in international conferences and seminar and make presentations. This will enhance the visibility of IMU on a global scale.

IMU to take up publishing books (including e-books) in a variety of topics relating to the maritime sector, including standard text books, monographs, directories and compendiums.

In due course, IMU should establish and start publishing its own academic journal, setting high standards and reach out for the global academia.

5.8 Adjunct & Visiting Faculty & Professor of Practice

Whenever delivery of specialised courses with diverse topics is planned, it becomes imperative to involve and marshal support of external Subject Matter Experts (SMEs) by way of visiting faculty. WMU for example, made use of some 100 external faculty members to supplement 27 of their own (in the year 2016).

IMU has been making extensive use of visiting faculty – chiefly to make for its chronic shortage of teaching staff. Once the faculty recruitment issues are addressed, IMU may:

- **Empanel external SMEs** – not in place of regular faculty taking on bulk of the workload but as specialists complementing the teaching processes in select areas of short duration. Such faculty members could be utilised, to not only deliver courses but also to design and develop new courses in which their contribution as SMEs could be critical.
- **Adjunct Professors/Faculty** – could be identified from a collaborating institution or university whose pre-determined availability is assured through advance planning and coordination. In this manner, the courses can progress smoothly using known and established resources and ad hoc arrangements could be avoided with predictable costs and clearly defined roles and responsibilities.
- **Professors of Practice** - is a category of full-time, non-tenure-track faculty appointments. While appointments to these positions have commonly been reserved (within the academia, globally) for practitioners who are appointed because of skills and expertise acquired in non-academic careers, such appointments are also being offered to individuals with academic backgrounds. These latter professors of practice are principally engaged in teaching and are not expected to be significantly involved in research activities.

They are usually appointed following a national search. Their academic performance is regularly evaluated according to criteria appropriate to their positions. The length of their renewable term appointments is typically five years rather than one year. Their salaries and benefits often approach those of probationary and tenured faculty members, although they do not match them. They may also have more opportunity to participate in departmental and institutional structures of faculty governance than is ordinarily the case with full-time faculty not on the tenure track, including the opportunity to serve as department chairs.

In other words, services of visiting faculty are to be integrated with IMU's operations in a structured and strategic manner (rather than ad hoc) to derive long-term benefits and in the short-term, to overcome the faculty crunch.

5.9 Outreach Courses & Collaborating with WMU

IMU may consider working closely with WMU in delivering outreach courses involving curricular and faculty support from WMU. The model has been developed and is being applied by the Chinese maritime university successfully for delivering courses leading to qualifications recognised globally through WMU. Details of the collaboration are given below:

Shanghai Maritime University

In Shanghai, China, WMU offers a Master of Science in International Transport & Logistics. The China-based programmes are designed and taught by WMU professors. Established in 2005, the programme is designed to extend the professional education that WMU has offered since 1983 to a new clientele in China to meet the maritime industry's demand for high-level specialized professionals.

The intensive, 15-month programme consists of five taught units plus a research project. The first unit includes foundation studies that provide the pre-requisites for the later units covering all aspects of logistics and international transport with a special focus on shipping

and finance. Staff from Shanghai Maritime University teach the first unit and supervise project work, while WMU staff teach the remaining units.

The programme is taught entirely in English and the entry requirements, grading system and quality assurance processes are those in force at WMU Headquarters. Successful students graduate with a WMU Master of Science degree in International Transport & Logistics.

Dalian Maritime University

In Dalian, China, a Master of Science in Maritime Safety & Environmental Management is offered by WMU on similar lines. The programme is delivered by WMU in Dalian in collaboration with Dalian Maritime University (DMU).

The 15-month programme consists of four taught units plus a research project. The first unit, foundation studies, is followed by specialization units that cover all aspects of maritime safety and environmental management. Staff from DMU teach the first unit and supervise project work while WMU staff teach the remaining units.

It would therefore be worth-while for IMU to consider cooperating with established institutions such as WMU offer courses – to the extent such courses are in demand from the domestic and regional industry.

5.10 Flexible Programmes

In cooperation with the IMO's International Maritime Law Institute (IMLI) in Malta, WMU offers a Master of Philosophy in International Maritime Law & Ocean Policy.

WMU offers a PhD programme in Maritime Affairs that can be completed at WMU or elsewhere. The University also offers Postgraduate Diplomas by distance learning in Executive Maritime Management, International Maritime Law, Marine Insurance, Maritime Energy, and Maritime Safety & Security.

Flexible training programmes that make use of a modular approach in their design and make use of innovative, technology-driven methods such as e-learning, blended learning and webinars in their delivery have become the preferred option in executive education. Busy managers as well as seafarers would like to pace their learning according to their convenience and from their preferred locations. IMU may consider offering such courses for the benefit of the maritime professionals and give the participants credits for successful completion – which in certain cases, could lead to award of a diploma or PG qualification.

5.11 Professional Development Courses

An extensive programme of short-term Professional Development Courses (PDCs) are offered by WMU each year to about 700 participants interested in high-quality professional offerings to update their expertise. PDCs can be specifically designed to fit client needs and can be taught in any location.

In addition to PDC offerings, WMU arranges tailor-made Executive Professional Development Courses allowing individual clients to benefit from the University's expertise and meet training needs in specific areas.

Considering that IRClass Academy of Indian Register of Shipping (IRS) focuses on maritime professional development, IMU may consider design, development and delivery of joint courses with this Academy.

5.12 The International Association of Maritime Universities (IAMU)

Founded by seven universities in 1999, IAMU functions as a non-profit organization and has significantly expanded its membership, and now boasts 62 members from 33 Countries, (as of May 2017,) of the world's maritime education and training institutions. Members of IAMU agreed that they shall:

- Cooperate with each other in a range of scientific and academic studies, developments, and practical applications associated with Maritime Education and Training;
- Endeavour to achieve measurable and worthwhile outcomes for Maritime Education and Training through IAMU activities;
- Publicize the results of their activities as extensively as possible both within and outside IAMU, and shall endeavour to accumulate scientific results for the benefit of the international maritime community; and
- Contribute to the enhancement of Maritime Safety, Security and Environmental Protection.

IMU could soon become a member of IAMU and explore various possibilities of cooperating with other members in terms of joint delivery of courses, faculty and/or student exchange programmes, etc.

5.13 Benchmarking

As IMU embarks on its ambitious voyage of growth and begins its journey towards global eminence, it would be a good idea to have a reality-check in place – by way of benchmarking and periodically checking the progress made. For this purpose, following accreditations/ assessments may be considered:

- 1) ISO 9001: 2015 Quality Certification (by end of Academic Year 2018-19)
- 2) Rating by NAAC (starting from Academic Year 2019-20)
- 3) Rating by an independent global body (starting from AY 2020-21), e.g.,
 - a. Times Higher Education World University Ranking
 - b. QS World University Ranking
 - c. Academic Ranking of World Universities (also known as Shanghai Ranking)

ISO 9001: 2015

ISO 9001 (the current version being the 2015 standard) is a generic and internationally-accepted Quality Assurance (QA) certification that focuses on:

Detailed development of manuals to capture the critical and supportive processes and Presentation of records to establish that the above processes have been adhered to.

The current version of the ISO 9001 Quality Management System (QMS) standard focuses for the first time, on risks associated with organisational endeavours and the risk mitigation measures.

It is recommended that IMU may, as a first step, aim to obtain ISO certification – which will involve preparation of QMS Manuals and adherence to the same. This will enable IMU to establish clearly defined processes that are transparent and at the same time, open to continuous improvement. Such a system will also facilitate uniformity in academic as well administrative processes across the geographically spread-out campuses of IMU.

Given the increasing emphasis on self-regulation of quality by NAAC for example, beginning with ISO certification will help in meeting requirements of Internal Quality Assurance Committee (IQCA) propagated by NAAC.

It is therefore recommended that while preparing the QMS manuals for ISO certification, the process, documentation and record requirements of NAAC may also be borne in mind so that the transition becomes smooth. Finally, it is recommended that IMU may continue with ISO certification irrespective of its NAAC accreditation.

Rating by NAAC

Established in 1994 as an autonomous institution of the University Grants Commission (UGC), the mandate of National Assessment and Accreditation Council (NAAC) is making quality assurance an integral part of the functioning of Higher Education Institutions (HEIs).

The vision of NAAC is: To make quality the defining element of higher education in India through a combination of self and external quality evaluation, promotion and sustenance initiatives.

NAAC's assessment lays focus on the institutional developments with reference to three aspects: *Quality initiative, Quality sustenance and Quality enhancement*. NAAC has identified the following seven criteria to serve as the basis for assessment of HEIs:

1. Curricular Aspects
2. Teaching-Learning and Evaluation
3. Research, Consultancy and Extension
4. Infrastructure and Learning Resources
5. Student Support and Progression
6. Governance, Leadership and Management
7. Innovations and Best Practices

Grade Qualifiers for University

- Minimum CrGPA of 3.01 in Criterion 1, 2 and 3 respectively (For A, A+, A++ Grade)
- Minimum CrGPA of 2.01 in Criterion 1, 2 and 3 respectively (For B, B+, B++ Grade)
- Minimum CrGPA of 1.51 in Criterion 1, 2 and 3 respectively (For C Grade)

The CGPA will be calculated based on the scores obtained from the three sources, viz.,

- 1) The System Generated Scores (SGS) of the quantitative Metrics which comprise about 70% of the total

- 2) The scores from the qualitative, critical appraisal by the Peer Team through on site visit and
- 3) The scores obtained on the Student Satisfaction Survey. These will be collated through an automated procedure based on 'benchmarks' and assessed on a five-point scale. The Final Grade Based on the CGPA obtained by the institution, the final grade is assigned on a seven-point scale as shown in the Table below:

<u>Cumulative Grade Point Average (CGPA)</u>	<u>Letter Grade</u>	<u>Status</u>
3.51-4.00	A++	Accredited
3.26-3.50	A+	Accredited
3.01-3.25	A	Accredited
2.76-3.00	B++	Accredited
2.51-2.75	B+	Accredited
2.01-2.50	B	Accredited
1.51-2.00	C	Accredited
≤ 1.50	D	Not Accredited

For details about NAAC guidelines their website may be referred: <http://www.naac.gov.in/>

Ratings by an independent global body

As IMU strives to emerge as a globally renowned university ratings by global bodies would become applicable in due course. It is recommended that IMU may initiate measures to obtain a suitable rating in the FY 2020-21.

5.14 Course Delivery Modes

Considering the ongoing developments in technologies deployed to facilitate education and training and at the current stage of IMU's own evolution, the university has at its disposal, several options to choose from.

Given India's reputation as a world-leader in development of software, IT and IT-enabled services, e-learning, content development, Learning Management Systems (LMS), etc., IMU is uniquely placed to take full advantage of the country's pre-eminent position in IT and claim a position at the very top in making best use of IT-driven educational, training and e-learning technologies.

5.15 Professional PG Education & PhDs

Many academic institutions world over are increasingly providing professional education on subjects that traditionally emphasized on non-academic, practical learning approach. They focus on Professional PG Education that aims to bridge scientific knowledge and practical performance. (E.g., University of Leicester, Professional Doctoral Degrees www2.le.ac.uk/research-degrees/professional)

IMU is uniquely placed to facilitate increased professionalization of the maritime sector. There is a need for maritime programs to adopt a wider strategic view, as opposed to a narrow, operational view.

Professional Doctorates: The UK Government's White Paper on Research Policy (1993) identified limitations of *narrow career* focus of traditional PhDs and introduced Professional doctorates.

Professional Doctorates have strong relationship with the workplace. The Doctorate degree in UK is no longer only an academic qualification, but also a professional and in some cases a vocational qualification. In USA and Australia this has existed much earlier.

Professional Doctoral Degrees: An Example from UK

The Engineering Doctorate (DEng as it is called) is a four-year doctoral research programme that combines advanced technical and commercial skills training with PhD level research, & completed in collaboration with an industry sponsor.

So, they will have an industrial supervisor as well as a supervisory team at the University. Research projects are developed collaboratively by academic supervisors as well as the research student in consultation with their sponsoring company.

The first year is University based; students participate in a taught course in advanced academic areas relating to their research. Years 2 to 4 are spent conducting applied research, with the opportunity to gain valuable industry and commercial experience.

Students conduct PhD equivalent research. Successful candidates are awarded the degree of Doctor of Engineering (EngD) and are addressed as *doctor*. It belays the notion that somebody with a PhD is totally academic. It is a rigorous research-based and research-driven qualification - focused on the improvement of professional practice.

5.16 Coastal Shipping & Inland Waterways

Continuing Maritime education for a holistic maritime career: Instead of looking at seafaring in isolation, IMU may consider creating a well-defined career path that originates in seafaring and provides an excellent foundation - and build on tertiary education - supplementing the need to move on to shore based - wider maritime industry - and to where they would be best suited.

For example: with the thrust on the development of Inland Waterways and Coastal shipping, we need to quickly come up with programs on following lines:

- (A) To provide induction, up-gradation and professional development training to the manpower for manning, operating inland vessels and for development of waterways and for repair and maintenance of vessels as per Inland Vessel Act for obtaining respective certificate of competency. Personnel trained can work on deck and in engine room of Inland Vessels.

Examples of areas in which professional development courses could be developed and delivered include: hydrographical surveying, dredging, repair, operation and maintenance operations of Inland vessels.

- (B) IMU can conduct NCV preparatory course for NWKO (Near Coastal Voyages) certification of Competency and Basic Safety Courses. Other related courses to conduct are Radar Observer Simulator Course (ROSC), Automatic Radar Plotting Aid (ARPA), Ship Manoeuvring Simulator Course (SMS), Liquid Cargo (Oil) Handling Simulator Course (LCHS-Oil) and Electronic Chart Display and Information System course (ECDIS). These courses can be quickly and easily culled out of the present resources on Foreign-Going courses that IMU already conducts.

6. ROADMAP, MILESTONES & TIMELINES

In previous chapters, current operations of IMU have been examined at length (Ch.4, 'Consolidating Current Operations of IMU'). This was followed by a detailed picture of where IMU would like to find itself in the years to come (Ch.5, 'Future Role of IMU'). In the present chapter, the roadmap for connecting the present with the future has been discussed. The journey has been divided into three sections representing following timelines:

- 1) Two years from now;
- 2) Seven years from now; and
- 3) 12 years from now.

6.1 Two Years from now

During the first two years from now (i.e., by FY 2019-2020), highest priority is to be accorded to following action points:

1. Revamp the recruitment rules and employment terms (align with 'HR Best Practices' from India's leading academic institutions)
2. Complete the recruitment of faculty and non-teaching staff to a minimum of 90% of the sanctioned strength and initiate action for the faculty recruits to undergo training of teachers.
3. Target a criterion of 15:1 in respect of Student-Teacher Ratio.
4. Faculty development programmes to be in place
5. Strengthening of ongoing UG and PG Courses (no new courses to be added in this period)
6. Ensure 90% capacity utilization of student intake and 80% placement of the passed-out students through campus selections for the Diploma, UG as well as PG students.
7. CoEs to identify research topics and start building research capabilities that fit well with ongoing courses in terms of availability of research guides and facilities
8. PhD programs to be launched as targeted - in January 2018 – ensuring a fit with the existing capabilities - as above
9. Carryout the preparatory works to establish organic and synergetic links with industry at the local level through Centres of Excellence in various campuses.
10. Establish the Directorate for Research, Training & Consultancy (DRTC) and leverage it to connect with industry and government at the IMU's HO level.
11. Faculty recruitment to consider, the requirements for DRTC, besides Professor of Management Practice and experts for the Centre for Advanced Maritime Studies, especially on Maritime policy, Maritime Law and Maritime Economics.
12. Ways and means of collaborating with the ongoing and future projects and vision of government of India and state governments are to be actively explored – beginning with Sagarmala.
13. Establish Centres of Excellence in various campuses.
14. Carry out gap analysis in each of the proposed 'Centres of Excellence' to identify current and future requirements in respect of infrastructure, facilities, equipment, laboratory requirements and manpower. Establish priorities, prepare procurement plan and budgetary estimates. Once again, highest priority to be accorded to ongoing UG and PG courses.
15. Complete the processes required and obtain ISO 9000: 2015 certification.

16. Chennai and Visakhapatnam campuses to move into new facilities and create world-class learning environment.
17. Focus on academic value-addition to affiliated colleges.
18. IMU's own pre-sea training courses/institutions to undergo CIP and obtain a grading of B+ as a minimum.
19. Ensure uniformity of academic and admin processes across all campuses.
20. Establish School of Marine Design & Research.
21. Obtain membership of International Association of Maritime Universities (IAMU)
22. Opportunities for collaborating with IRClass Academy for offering Professional Development courses to seafarers and other maritime personnel may be explored.
23. Identify research topics that fit well with ongoing courses in terms of availability of research guides and facilities.
24. In a nutshell, it is recommended that IMU may initiate measures – as a minimum – to undertake a detailed study of the following aspects in due course – so as to prioritize implementation of actions relating to them within the next two years:
 - 1) Faculty recruitment and training of faculty members
 - 2) Strengthening of pre-sea courses
 - 3) Post-sea programs
 - 4) Centers of Excellence
 - 5) Academic staff training
 - 6) Uniformity of processes and administrative activities across all campuses
 - 7) ISO 9001: 2015 certification
 - 8) IT-led management of the learning environment and administration
 - 9) Consultancy
 - 10) Development of HQ functions and facilities
 - 11) Infrastructure for R&D
 - 12) Center for strategic plan and policy studies for Indian Maritime affairs
 - 13) Collaboration with domestic and foreign institutions/universities
 - 14) Establish and operationalize DRTC and CIRM

While many of the points above are self-evident and discussed in previous sections, it is felt necessary to dwell at length on some of the most important aspects – as follows:

Faculty

First and foremost, task that calls for immediate attention at IMU is filling of faculty positions that have been vacant with suitable personnel. For the first two-year period, the faculty recruitment is to be prioritised on the basis of:

- 1) Meeting the requirements of undergraduate courses;
 - 2) Strengthening the ongoing PG courses;
 - 3) Finally, building a pool of research guides in select areas.
-
1. Training of the teachers and improving their teaching skills – including use of technologies are to be given high priority and taken up on a continuous basis.
 2. To this end, IMU may tie-up with reputed and well-established institutions such as the National Institute of Technical Teacher training, Taramani, Chennai and the Teacher Training facility at IIT, Madras.

3. Faculty recruitment program coupled with HR best practices to be streamlined keeping in view the nuances of each discipline and attracting good faculty.
4. Faculty members to have less teaching loads (i.e., not exceeding the prescribed hours per week/month) and more time to spend on self-development, further studies, research and development of new courses, supervision of affiliated programs etc.
5. Faculty development programs where faculty is encouraged to take up further studies and in course of time qualify and equip themselves - e.g., a concurrent MS (by Research) followed by PhD could be allowed. This way, in 5 years' time, there will be a pool of well-qualified faculty.
6. Faculty promotions may be guided by the UGC model of Academic Performance Indicators (API) and Performance Based Appraisal system (PBAS) so that faculty gets a direction to move towards excellence.

Facilities

- Gap analysis to be carried out on infrastructure, equipment, laboratory requirements and additional manpower (if any) and benchmarked with best in the world in keeping with aspirations of 'Centres of Excellence' planned at various campuses and same to be procured.

Strengthening of the ongoing UG Courses

1. IMU to assume a more proactive role in design and delivery of pre-sea and post-sea courses in collaboration with DG-Shipping in order to meet the industry requirements and enhance the employment opportunities for the Indian seafarers.
2. Infuse academic rigor and discipline strictly. Emphasise on syllabus coverage, course delivery, internal assessments, weak students counselling, mock orals, etc. Strictly follow QMS processes, internal audits, course feedbacks and reviews.
3. CIP criteria can be integrated with QMS audit criteria for audits and actions taken on deficient areas.
4. Nautical Science and Marine Engineering have rich traditions of regimented training. Same to be strengthened, including extra-curricular activities, initiative tests and project works. Proctor could be appointed for off-classroom activities including drills and march past.
5. Inter-collegiate seminars and workshops to be encouraged amongst affiliated colleges.
6. Placement Cell to be strengthened to focus on placement through contacts and interaction with industry on a continuous, round-the-year basis and for grooming of students to face interviews.
7. Specific focus on marketing of courses to be undertaken to attract right intake quality and in adequate numbers to fill 100% capacity.
8. Undertake Self-study as per NAAC Self Study report and then identify specific areas of weakness that will provide concrete direction and can be addressed in specific time-bound manner to reach excellence.
9. Non-technical stress coping skills, communication and presentation skills, team-work, etc., to be initiated and imparted to all students. Here a 3-day 'Wellness at Sea' program of Sailors Society UK is very popular which is made available to academic institutions at a nominal cost. This could be particularly useful to the cadets undergoing pre-sea courses.

Re-engineering through Information Technology

1. An exercise on Process Re-engineering through Information Technology – and that is coupled with ERP/LMS (Enterprise Resource Planning/Learning Management) System (workflow management systems) is to be undertaken.
2. This will give the opportunity to analyse and redesign workflows and processes, identify and optimise inefficient, repetitive, non-value adding processes across the University and its various campuses.
3. To enable this a concrete structure on governance and administration needs to be in place with respect to centralization of key support processes and delegation of power and authority to each campus locations. This is to be in line with the mission, strategic goals and needs of the University.
4. Virtual Classroom as an online learning environment where students at different campuses can participate in synchronous instructions to be enabled. This will be of great assistance to tide over the qualified faculty shortage scenarios.
5. Centralized integrated digital library that houses subscription to top-class e-journals, e-books, multimedia and resources that can be accessed by all campuses students. Appropriate search tool to enable best quality resources for learning, teaching, and research to be deployed.
6. Computer based laboratories to run specialized software's like AVEVA (Tribon) for naval architecture, Computer based learning systems right from English language to high end CBT modules.

Centres of Excellence (CoEs)

CoEs may be described as organisational environments that strive for and succeed in developing high standards of conduct in a field of research, innovation or learning. They are often highly attractive to research and development (R&D) investments and talent in their field. Therefore, they possess the ability to absorb and generate new knowledge. Ideally, they would distribute and utilise this new knowledge in the form of new capacity in their field, be it research results, innovations or talent.

CoEs are typically geographically concentrated and focused on high potential/growth areas in science and industry, but they may also be virtual/distributed and consist of a network of co-operative partners with a co-ordinating centre.

IMU with its present setup and distributed geographical campuses has over the years acquired expertise and infrastructure in specific disciplines like marine engineering, nautical science, management and naval architecture. It would be prudent to build on the strengths at each campus and strive to achieve excellence in a focussed manner. The proposed CoEs could be as follows:

- 1) Vizag : Naval Architecture
- 2) Chennai campus : Management
- 3) Chennai HQ : Research & PhD - Multispeciality courses [Marine Engineering, Dredging, Port Engineering, Ocean Technology, Inland Waterways, Marine Occupational Health and Safety]
- 4) Kolkata : Marine Engineering
- 5) Mumbai : Nautical Science
- 6) Kochi : Maritime Law

The domains indicated are not exclusive to the campuses, but indicate the specialisation to become Center of Excellence. Most of campuses will continue with multiple courses offered by various schools within University as standard but one core area will be focussed for achieving Excellence.

It would be prudent for IMU to build on these strengths at each campus location and strive to establish CoE for that specific discipline as above. Within the strategic orientation, the aim should be to:

- a) To create support for basic and advanced strategic research. This can be defined as support for “frontier fields of science” and “internationally competitive (world class) research” capabilities.
- b) To connect researchers across fields and geographical locations, including support for multidisciplinary or interdisciplinary research.
- c) To connect the science system to international research networks. This includes developing partnerships with scientifically strong environments in other countries and thereby creating the conditions for improvement of international standing in selected fields of knowledge.
- d) To support strategic and applications-oriented research and expertise with potential industrial applications with the aim of generating innovation. Sometimes this is done with a focus on government-defined priority areas.
- e) Bringing together the complementary resources needed from other locations for technical development and industrial application. This includes concentrating multi-disciplinary competence areas of research to further the development of products, processes and services, typically by focusing on problems that demand larger efforts than can be provided by smaller projects or individual CoEs with different strategic orientation.
- f) Bridging the gap between researchers and users, and stimulating and strengthening triple-helix relationships (industry-academia-government). This is to increase the likelihood of scientific research being used by industry, and to make the university generally more responsive to industry needs. Expertise development and PhD training in areas of industry interest is one of the aims in this regard.
- g) To achieve distinction in research but with an aim to addressing social and economic issues of national importance and generating qualified human resource capacity. Rather than exclusively focusing on supporting basic science capability and industrial innovation, this mainly includes improving the skills of researchers across the community and training young researchers in areas of national priority. Capacity-building is the main aim.

To facilitate this, IMU must identify institutions globally who excel in that discipline and orientation and enter into strategic partnership with them.

Membership of International Association of Maritime Universities (discussed in section 5.11) will assist to get closer to the various Maritime Universities of the world and with whom closer partnerships can be pursued.

6.2 Seven Years from now

During the five-year period 2019-20 to 2023-24, the following actions are to be accomplished:

1. Accreditation by NAAC – target a grading of ‘A’ as minimum.
2. Achieve recruitment of staff to 100% of the sanctioned strength aligning with newer PG courses, research and PhD programmes planned.
3. IMU to extend its courses and learning opportunities across the entire ‘Pyramid of Learning’ – from skill development and pre-sea MET to development of managerial cadre and policy studies.
4. Move over to JEE/GATE/CAT as the admission test criteria for the UG, PG and management courses respectively.
5. Set-up the centres (CoEs) for undertaking industry-sponsored R&D projects and for offering consultancy services at the local campus-levels. At the HO level, establish centre for maritime policy studies, Directorate for Research, Training and Consultancy, Centre for Information Resource Management.
6. Set-up virtual classrooms, e-library and strengthen the centre for skill development by creating/augmenting the infrastructures, equipment and deployment of exclusive, qualified and required manpower to support the centres/activities listed above.
7. Create laboratories and other facilities for industry sponsored R&D projects.
8. Expand areas of research into a wider range of topics – once again, in alignment with availability of research guides and facilities.
9. Explore consultancy opportunities. Formulate procedures and guidelines for same.
10. Promote publications in refereed journals
11. Having strengthened its ongoing courses in terms of faculty and facilities, IMU may explore in this stage, possible collaborations with top foreign universities – including WMU – to jointly offer PG courses in select areas.
12. Facilitate entry of foreign students with focus on admissions from South Asia, Middle East and Africa in the programmes offered by IMU
13. IMU may consider delivering ‘Outreach Courses’ along with WMU on the lines such collaborations already exist between WMU and Chinese Maritime Universities
14. IMU to explore offer of Professional MS and Doctoral Programmes on the lines adopted currently by leading UK universities.
15. Delivery of course to take place across a wide range of technology-driven modes such as e-learning, virtual classrooms, etc.
16. IMU to become financially self-sufficient through not only course fees but additionally through financial support from industry and revenues from research and consultancy projects.

All these action points have been discussed in Ch. 5, ‘Future Role of IMU’. In a nutshell, at the end of seven years from now, IMU will emerge as a leading university in India with the following attributes:

IMU in the year 2024

By the year 2024, IMU would be graded as 'A' by NAAC and much sought after by aspiring students going through JEE/GATE/CAT for admissions. It will have a full-strength team of highly qualified and trained faculty – complemented ably by visiting faculty in select areas. The highly motivated faculty and non-teaching staff will be supported by excellent facilities, and extensive use of IT in course delivery as well as in academic, administration, finance and asset management.

In addition to teaching, the faculty members will devote their time to research, consultancy projects and paper publication and take part in national and international forums, seminars, conferences, etc. IMU will continue with its emphasis on academic excellence with 100% intake and 100% placement. IMU will collaborate actively with other leading maritime universities from across the world and will have a sizeable number of foreign students.

IMU will have the best-in-the-country infrastructure/expertise for research in the fields of -

- Marine Engineering*
- Ocean Engineering*
- Ship design & Building*
- Mariners Health and safety*
- Inland waterways*
- Management & Logistics*

Colleges affiliated to IMU will derive much value in terms of academic direction and curriculum upgrades in line with changing technologies, regulations and markets.

By virtue of its active participation in addressing the educational and training needs of various governmental projects and policy-implementation measure, IMU is an active academic arm of the Indian government in all matters maritime.

IMU has by now, would have established close links with industry and other stakeholders and all new courses would be designed and developed in line with industry needs.

IMU will be self-sufficient financially and its revenue sources include – apart from fees, funds generated from sponsored research and consultancy services, endowments and earnings from foreign collaborations.

apart from fees – funds generated from sponsored research and consultancy services.

IMU will establish a reputation for being a 'Great Place to Work'.

6.3 Twelve Years from now

IMU in the year 2030

Graded as 'A++' by NAAC and high on the list of top universities in the world as rated by renowned agencies, IMU would be acknowledged globally as a leading maritime university.

Based on their cutting-edge research and high-end, multi-disciplinary support extended to industry through consultancy services, the faculty of IMU would be publishing regularly in renowned journal and will also contribute to edited volumes and textbooks. IMU will start publishing its own academic journal of international repute.

IMU will be recognised as the educational and training partner by the international maritime industry.

IMU will provide managerial cadre and thought-leadership to policy makers to not only government of India but to several other governments in the region.

7. FINANCIAL MANAGEMENT

Indian Maritime University has been meeting its expenditure from Government of India (GOI) grants and from its internal resources. The GOI grants consist of plan fund for capital expenditure and non-plan fund for revenue expenditure. The internal resources of the university consist of student's fees (course fee, programme fee, examination fee and affiliation fee), income from professional / consultancy services, interest earned on bank deposits and other income.

The capital expenditure includes expenditure on construction of buildings, setting up of laboratories and workshops, procurement of lab equipment and machineries, IT, simulators, etc. The revenue expenditure covers broad categories of establishment expenses, administrative expenditure and depreciation.

7.1 Capital Expenditure

I. Expenditure Finance committee (EFC) period.

After the university came into existence in 2008, GOI sanctioned plan fund of Rs.275.33 crore towards capital expenditure during the EFC period of 2009-10 to 2013-14. The split up of the sanction was (a) for new works Rs.224.56 crore (b) implementation of OBC reservation Rs.34.80 crore and (c) renovation & maintenance works Rs. 15.97 crore. A sum of Rs.256.43 crore was released by GOI by 31.01.2014 and the entire amount was spent by the university by that date. To the extent of short release of plan fund (Rs.18.90 crore), IMU foreclosed some of the envisaged projects as non-doable and not required.

II. Standing Finance Committee (SFC) period

Plan funding for the SFC period 2014-15 to 2018-19 as approved by GOI was Rs.294.19 crore. The year wise phasing of allocation, release & shortfall in release of fund by GOI as of 30.06.2017 are as follows:

(Figures in Rs. crores)

	2014-15	2015-16	2016-17	2017-18	2019-20	Total
Allocation of fund	0	129.51	99.68	58.10	6.90	294.19
Release of fund	-	75.00	35.00	21.25	-	131.25
Expenditure by IMU	-	75.00	35.00	-	-	110.00
Shortfall in release of fund	-	54.51	64.68	36.85	-	

Till 30-06-2017, there was short release of plan fund to the tune of Rs.119.19 crore. IMU has spent the entire released fund of Rs.110 crore. The category wise allocation and expenditure of plan fund as of 31 March 2017, is given below:

(Figures in Rs. crores)

Particulars		Allocation	Expenditure incurred	Gap
(i)	Civil works	161.72	100.56	60.56
(ii)	Simulators	50.50	0.00	50.50
(iii)	Lab equip., workshops & machinery	53.05	1.05	52.00
(iv)	IT automation	16.98	6.45	10.53
(v)	Library services	12.54	1.94	10.60
Total		294.19	110.00	184.19

It could be seen from the above that for want of release of the fund due till 2016-17, purchase of simulators essential for training, setting-up of the workshops and laboratories, digitalization of the library and computerization of the various activities of IMU have not materialized.

As a result, the objectives of introduction of PG courses, research leading to Ph.D., and setting up of the laboratories had suffered and the only progress made as planned was in the case of civil works. The university needs to pursue with GOI to release the balance allocated fund to complete all the envisaged developmental activities during the remaining two years of SFC. If the large number of vacancies of staff remain unfilled and the inadequate facilities continue to persist, they will surely have an impact of the quality of teaching.

7.2 Revenue Expenditure

During the EFC period of 2009-10 to 2013-14, GOI also released the sanctioned non-plan fund of Rs.6.92 crore to bridge the revenue deficits projected for the period. IMU had then committed to the Government that it would become self-reliant on the revenue front by revising the student fees by 20 percent every two years.

In May 2015, GOI sanctioned non-plan funds of Rs.40 crore per year to IMU for the 4-year period from 2015 - 16 to 2018-19. It released Rs.30 crore in 2015-16 and another Rs.30 crore in 2016-17 leaving a shortfall of Rs.10 crore in each of these two years. IMU had spent the entire released amount of Rs.60 crore on salary and other essential requirements.

On the grounds that IMU has a cash balance of Rs.336.16 crore (as on 31.03.2016) in its bank accounts, GOI has since (2017-18) stopped releasing further non-plan grants to IMU. Now the university is left with no option but to depend on its own internal resources for meeting the revenue expenditure.

In the background of limited non-plan support from Government and with the intention to become self-reliant on the revenue front, IMU had fixed very high rate of students' fees (Rs.2.25 lakh/year/student). Notwithstanding that, the university had in the SFC proposal sent to GOI proposed to revise the fees first from 2016-17 and second revision from 2018-19. But, on the ground of global recession and contraction of demand for man power for the shipping industry and any upward revision of fees would adversely affect the admission of the already stagnating growth in students' intake, the university did not revise the fees.

In any case, this move of IMU did not have adverse impact on the receipts from internal resources of IMU as its fees were already high on the one hand and on the other, there were practically no new recruitments to fill up the huge number of vacancies in the teaching & non-teaching staff and not many new courses/ projects were added to the existing ones. As a result, even after ignoring the non-plan grants received from GOI from time to time, the university has been making operational surplus as can be noted from the following table:

MASTER PLAN FOR INDIAN MARITIME UNIVERSITY (IMU)

(Figures in Rs. crores)

Particulars	2013-14	2014-15	2015-16	2016-17
(I) Income				
Fee receipts including from services	69.00	73.53	74.61	82.88
Interest earned & income from investment	12.65	12.69	14.41	16.76
Others	2.13	2.45	2.75	3.40
Total	83.78	88.67	91.77	103.04
(II) Expenditure				
Establishment expenses	28.29	28.20	28.77	36.83
Administrative expenses	38.33	42.34	46.34	56.41
Depreciation	6.91	6.26	5.70	5.55
Total	73.53	76.80	80.81	98.79
(III) Surplus (deficit) from operation	10.25	11.87	10.96	4.25
(IV) Non-plan grants from GOI	6.58	38.28	36.64	32.59
(V) Excess of income over expenditure (III+IV)	16.83	50.15	47.60	36.84

IMU has been making its own operational surplus of about Rs.5 to 10 crores per year, which resulted in overall excess of income over expenditure. This led to accumulation of cash surplus over the years as discussed in the succeeding paragraphs.

7.3 Accumulated cash balance in bank deposits

IMU had a bank balance of Rs.398.87 crore including earmarked funds as on 31.03.2017. The closing bank balance as on 31 March of every year has progressively grown from Rs.113.53 crore at the closing of 2009-10 to Rs.398.87 crore including earmarked funds at the end of 2016-17. This was due to operational surplus (Revenue income – Revenue expenditure) made by the University.

Some of the reasons for the huge cash balance in bank deposits were: (i) shortfall in recruitment of the teaching & non-teaching staff leaving huge vacancies; (ii) high rate of student's fee; and (iii) interest earned from the bank deposits.

In the background of the above-mentioned accumulated cash balance, IMU cannot expect to get continued non-plan grants from GOI. In fact, GOI had from time to time directed the university to meet the revenue expenditure from the internal resources of the university and in 2017 stated that hereafter it will not release any more grant under non-plan. Therefore, the university should plan to meet its revenue expenditure exclusively from the internal resources including the available accumulated cash balance.

7.4 Augmentation of resources

1. Endowment Funds

Setting up of endowment funds by mobilizing donations from other institutions / PSUs / industries, etc. as has been just initiated by the University. It is to be appreciated that the university has obtained endowments of Rs.30 lakh from Mumbai Port Trust and Rs.8 lakh from Tuticorin Port Trust towards scholarships for SC/ST students. Efforts need to be put in place to mob up more endowments.

2. Professional / consultancy services

There is a great scope to raise the resources from consultancy services. The receipt of Rs.1.52 crore from such activities in 2014-15 has reduced to Rs.61.92 lakh in 2015-16 and to Rs.69.77 lakhs in 2016-17. While Chennai, Kolkata and Visakhapatnam campuses earn some income from consultancy services, etc., the Mumbai and Cochin campuses do not earn any income at all. This needs to be looked into and focus must be on offering more consultancy / professional services and earn revenue. A target of income of Rs.5.00 crore / year could be fixed.

3. Fees from the students

As mentioned above, the fees from the students (course fee, programme fee, examination / counseling fees from seminar etc. and affiliation fee) form the major junk of revenue receipts of the university. Even at the existing rate of fee structure, which has not been revised upward despite commitments in EFC & SFC, it accounts for about 81.30 % of the total revenue receipts in 2015-16 & 80.43% per cent in 2016-17. For the reasons mentioned above and comfortable accumulated cash balance of IMU in banks, it is reiterated that the committed fee revisions during the SFC period need not be put to practice, till the expiry period (2018-19) of SFC. On the other hand, the student's intake for various courses in the University should be augmented to the full established capacity.

4. Full Capacity Utilisation

As mentioned above, the current levels of student intake in various courses across the campuses for the last three years ranged from 55 to 73 percent of the capacity during the period 2014-15 to 2016-17. Even at this level of enrollment, the revenue from student's fee accounts for 80.4% of the total revenue receipts during 2016-17. Therefore, the route for further earnings of income from student's fee is to increase the intake (admissions) to the full capacities of various courses and not by upward revision of the fees, at least for the time being.

Considering the advantage of intake to full capacity over the likely adverse impact of fee revision, it is suggested that actions should be taken to admit students to the full capacities of at least well-established courses by appropriate and wide publicity, conducting / participation in student fairs, admitting students who cleared the All India competitive entrance test such as JEE (instead of limiting to the university's CET) and strengthening of the placement services etc. Once this is achieved, the scope / need for fee revision after 2018 -19/ during the 5-year period of the next SFC (2019-20 to 2023-2024) could be examined. Meanwhile, IMU may work out the cost of education per student in the various courses, as the existing rates of fee are arbitrary and not based on any costing / estimate.

5. Rationalise & Consolidate First

The existing fee structure subject to full enrollment along with the accumulated cash balance will be adequate to consolidate and run the existing courses up to 2018-19. Any new courses could be started during the next SFC period after recruitment of the faculty & other staff to the full sanctioned strength, procurement of the required machinery, setting up of the laboratories, modernization of Library, IT services, etc. envisaged in SFC. The remaining period of SFC (2017-18, 2018-19) should be

MASTER PLAN FOR INDIAN MARITIME UNIVERSITY (IMU)

exploited to rationalize and consolidate running of the existing courses / courses already envisaged in SFC and to strengthen the attendant infrastructure etc. New courses & the staff / facilities required therefore are to be considered for implementation during the next SFC period, after completion of the current consolidation / rationalization.

7.5 Fund requirement for the period 2017-18 to 2023-24

(1) Revenue expenditure

The details of the estimated revenue expenditure for the next two years of the current SFC and for the five years of the next expected SFC are given in the **Annexure-2**. Inter alia, it has been assumed that there will be no revision of the fees, admission of the students will be augmented to 90% of the existing capacity by 2019-20 and to 100% by 2021-22, teaching and non-teaching posts will be filled to 90 % of the sanctioned strength by 2019-20 and to 100% by 2021-22, there will be no introduction of new courses and the revenue gap will be met from the accumulated cash balances. Summary of the estimate is given below (Figures in Rs. Crores):

S No.	Particulars	2016-17 Actual	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
I	Income								
	Fee Receipts	70.70	73.82	73.82	105.50	105.50	117.25	117.25	117.25
	Interest	16.76	13.58	13.58	11.50	10.00	7.00	5.00	5.00
	Others	15.55	12.18	13.08	23.80	24.60	25.50	26.40	27.30
	Total	103.01	99.58	100.48	140.80	140.10	149.75	148.65	149.55
II	Expenditure								
	Establishment expenses	36.90	42.69	51.99	77.20	84.90	103.75	114.15	125.57
	Admin. Exp	59.82	67.54	78.13	79.45	87.39	96.10	105.75	116.32
	Total	96.72	110.23	130.12	156.65	172.29	199.85	219.90	241.89
III	Surplus/Deficit	6.29	-10.65	-29.64	-15.85	-32.19	-50.10	-71.25	-92.34

It could be noted from the above that the deficit will range from Rs.10.65 crores in 2017-18 to Rs.92.34 crores in 2023-24, which need to be met from the accumulated cash balances. However, it is suggested that IMU should continue to project the deficit in their proposal to the ministry seeking assistance of non-plan grants.

(2) Capital expenditure.

- (i) The qualitative and quantitative improvements suggested to be undertaken by IMU have been listed in sections 6.1 and 6.2. It may be noted therefrom that in the next two years from now (remaining part of 2017-18 and 2018-19), due to the current state of acute shortage of faculty and snail's pace in procurement of equipment caused by technical clichés etc., no major activities are proposed

to be undertaken except rationalization, consolidation and running of the existing courses and preparing for the next five years period (next SFC period of 2019-20 to 2023-24). In any case, as detailed in the section 7.1, the capital fund requirement for the period up to 2018-19 has already been included in the current SFC sanctioned by the Ministry of Shipping. Therefore, IMU should take all efforts to get the sanctioned Plan fund and spend for the items included in the SFC.

- (ii) The next five years beyond 2018-19 will be the period of expansion of the infrastructures, laboratories and equipment; augmentation of the staff to full strength; admission of students to full capacity; creation of many centres catering to special tasks; modernization and comprehensive computerization; international collaborations; and introduction of new courses, etc., to take the University to a higher pedestal. As the exact scope, physical facilities and manpower etc. required for the various centres/activities proposed to be taken up during this period are not amenable for identification and quantification now, no attempt has been made to compute the capital fund required for the period 2019-24. Once the capital expenditures envisaged in the current SFC are met with, there may not be requirement to create major infrastructural facilities in the immediate following years. Therefore, it is suggested that as and when things become crystal clear, IMU will estimate the fund required for the capital expenditure and project the same in the annual budgets/proposal for the next SFC. Capital expenditure should continue to be met from the plan grants of GOI.

4. Other measures to raise resources

(i) *Sponsored projects:*

At present the university has no project works sponsored by stakeholders like Port trusts, shipyards, Navy, shipping industries and others. IMU must explore raising resources by obtaining sponsored projects. A beginning may be made by fixing a revenue target of Rs. 5.0 crores per year for earning from sponsored projects and consultancy services.

(ii) *Reconciliation of balances & recovery of dues:*

There are large numbers of non-reconciled balances in the books of accounts pending for long time. Special agency has been engaged to reconcile & clean up the accounts. This needs to be completed within a time frame. Linked to the issue is recovery of some of the outstanding dues to the university. Examples are TDS wrongly recovered by banks, rent from MMERI, Mumbai, affiliation fees etc. The university should identify such dues and take speedy & effective actions to recover them.

(iii) *Rationalization of bank accounts / balances:*

The campuses are operating so many bank accounts in different scheduled banks. The bare minimum number of accounts & banks need to be identified for each campus. The internal auditors have pointed out several bank accounts having huge balances in savings / current accounts than deploying the excess amount (more than 3 months' operational requirement) in high interest bearing fixed deposits. For parking the funds in banks, the bank giving better service and yield should be preferred instead of ad hoc

selection. The university should examine and standardize the banking procedure & optimization of the bank balances in savings bank/current accounts.

(iv) *Standardization of the procedures:*

The campuses do have different practices for similar activities. For example, engagement of casual labourers for the mess, maintenance of Fixed Asset register, physical verification of assets, library activities etc. The university should standardize the procedures (best practices) for the major activities for identical implementation in all the campuses.

(v) *Disposal of old / unserviceable dead stock:*

The university may identify the old, unserviceable vehicles, machinery, assets transferred from the legacy institutions but not use, deadstock etc., and dispose them to realize the residual / scrap value.

(vi) *Ownership / leasing of land:*

IMU should examine the title deed of lands / buildings in the campuses and ensure proper title deeds in the name of IMU. Wherever lands / assets are leased out to IMU, the lease agreements should be examined for their appropriateness & legality to ensure *uninterrupted functioning of IMU in the leased lands/ properties.*

---End of Report---

Annexure-1: Key Functions & Features of IMU's ERP System

KEY FUNCTIONS & FEATURES OF IMU'S ERP SYSTEM

The solution must have General Setup of the application to support multiple faculties (Centres and Affiliated Colleges of the University) across multiple campuses distributed across India. It must also support pre-defined study terms such as Semesters and Trimesters however it must also support custom block level study terms.

The following are the core requirements for the solution.

1. Student Administration

This feature must support admitting a student into program until graduation and beyond as an alumnus.

1.1. Registration of New Applications

New applicants submit their applications to register into offered programs into the University, attached with their Qualification documents. Applications are verified against the upload of secondary school results from the Ministry of Education and Date of Birth are verified against the registration record uploaded from the Registration office. Applications are vetted to verify if student has achieved the Minimum Entry Requirement of program in which they applied for, which can be later shortlisted.

1.2. Admission of Students into Programs

Applicants are offered a place in the University in program of their choice should they meet the Minimum Entry Requirements. Otherwise, they will be provided with an alternative program. The students are provided with the offer letter upon acceptance in a program by the University.

1.3. Enrolment of Students into Courses

After a student is provided an offer letter, they can enrol into offered courses for the given program. The solution should also allow a student to withdraw and adjust the course enrolments (Take new course as well as drop enrolled courses within specified duration). Students should not be able to enrol in courses for which prerequisites are not met.

1.4. Cross Credit of Internal & External Courses

The solution must allow appropriate courses as part of student's program to be credited with another Internal or External Course. The solution must have the provision to charge monetary value per course which requires cross credit.

1.5. Registration to Hall of residence

Student to register into Hall of Residence/Hostel and other authorized charged accommodation, meal, and caution fees. Start and end dates of occupancy is recorded, which can also be adjusted. Fees charged and invoiced accordingly.

1.6. Invoicing

Student's invoices are generated, providing them with fees owing upon on study term basis. Invoice should contain student's Identification Number, Student Name, Guardian Name (Sponsor), Permanent Address, Program of study, Campus, Study Term, Course Name(s), Invoice Date, due date of payments and withdrawals, date when invoice was generated, fee breakdown of all

courses, and other costs charged to student (Accommodation, Meals, Excursion, etc). The invoice must also include bank deposit slip to allow students to pay at the bank.

1.7. Payments

The solution should be able to process the following mode of fee payment.

- i. Cash Payment – Full – Students should be able to pay for full amount on invoices.
- ii. Cash Payment – partial – Students should be able to make partial payments.
- iii. Payments from Sponsors – Solution must allow full/ partial payments to be processed from sponsors
- iv. Payments through advance settlement – Solution must allow full/ partial payments to be processed through superannuation
- v. Payments through Bank – Solution must allow processing payments received directly through backs
- vi. Electronic Payments - The solution must also support electronic payments through credit cards and other digital currency such as mobile money.
- vii. Fee Waiver - The solution must allow waiving student fees for students who are deemed eligible by the University
- viii. Student Worker Schemes – The University allows students who face financial difficulties to work for the University for certain hours. Depending on the hours the student works, the amount of fee gets paid by the section of the University where the student is working.

The solution must also be able to send payment reminders to students.

1.8 Receipting

Students will receive a receipt after making payments to their outstanding fees. Receipt should contain student ID, Invoice Number for which fee is paid, Student Name, Student Address, receipt date, detail item list of what was paid, amount, credit balance, and total amount paid.

1.9. Student Identification Card

The solution must allow printing of ID cards to standard, as well as Smart cards, possessing authentic mode of verification (using biometrics for example). The solution must allow checking of validity of card (by active enrolment, Fee status, Hold status etc.) by security personnel, library services, IT services and Examination Offices, etc.

Students who may have enrolled in courses however if they have not generated their invoice, or those who may have generated the invoice but did not pay the minimum mandatory fee are not allowed into the classroom. The solution must have adequate reporting for Lecturers, and authorized administration officers to view legitimate student lists.

1.10. Results Management

The solution must support assigned course lecturers to enter student assessments (Coursework and Final Examination) for their assigned groups. The coursework mark shall be visible to the students but not the final examination mark and grades until approved by appropriate body (School and college exam board). The solution should allow the examinations office to vet the grades and approve the results, hence making the final examinations marks and the grades visible to the students.

Pending results can be entered or edited via admin modules, accessed only by the office of the Registrar. The solution must allow colleges, office of the Registrar, Parents and Sponsors to view the student's progressive assessment any time during the study term. The solution must also allow authorized staff and students to print transcripts.

1.11. Completion Tracking

The solution must flat lists of students who have met the requirements of a programme and are eligible for graduation. The solution must also flag the list of students who have completed 90% (should be customizable) of their programme requirements. The solution must notify the students of their completion status, as well as notify the Office of the Registrar through system generated messages/emails.

1.12. Graduation & Certificate Printing

The solution must support processing records of graduating students, assigning certificate numbers and printing of certificates.

1.13. Holds

The solution must support holding certificates, examinations, etc. which a student is on various kinds of holds, such as financial hold, disciplinary hold etc.

1.14 Alumni

The solution must allow managing student graduates and former graduates of the University.

2. Program & Course Management

This feature must support in managing programs and courses

2.1. Program Management

The solution must support creating and editing programs, allocating Core and Elective courses and Industrial attachment requirements

- i. **Adding Programs** – The solution must allow creating of new programs
- ii. **Editing Programs** – The solution must allow modifying courses and other requirements for the existing programs.

2.2 Course Management

The solution must allow creation of courses, setting appropriate credit points (which is used to calculate the fee for the course), setting up pre-requisites, etc.

3. Study Term Management

This feature must support managing study terms, scheduling course offering, allocating course coordinators and assigning lecturers to groups.

3.1. Study Terms

The solution must allow creation of study terms and assign start to end dates.

3.2. Program Offering

The solution must allow to offer selected programs by campus.

3.3. Allocating Course Coordinators

The solution must allow authorized officers to assign course coordinators to each offering. Certain courses might have course coordinator per campus while certain courses might have one centralized course coordinator.

3.4. Allocating Other Teaching Staff

The solution must support course coordinators to make groups of students and to assign to lecturers. Certain courses might have just one faculty.

3.5. Attendance Management

The solution must support lecturers taking attendance, which the sponsors, parents and the students can track.

4. Reports Management

This feature must support authorized staff to extract reports from the system.

4.1. Report Types

The following are the key types of reports that the system must be able to generate. All reports must be exportable to Excel and PDF format.

i. Financial Reconciliation Reports

The solution must be able to automatically generate financial reconciliation reports from the system and notify authorized staff.

ii. Audit Reports

The solution must be able to generate period audit reports for internal/ external use.

iii. Program Reports

The solution should be able to generate program reports, such as offered programs, dropped programs, student numbers, revenue collection, etc.

iv. Enrolment Reports

The solution should be able to generate enrolment reports, such as offered courses, dropped courses, student numbers, revenue collection, etc.

v. Course Reports

The solution should be able to generate student lists for the entire course as well as selected course groups. The solution should also generate reports to show student fee status. The solution must also allow generating progressive records, coursework, examination attendance sheets, grade reports and summary reports in tabular and graph format for exam and enrolment statistics.

vi. Finance Reports

The solution must allow generating of reports for all invoices, receipts, refunds, de-registration of enrolments, withdrawals of enrolments, credit notes, payments for overdue invoices and detailed invoice reports.

vii. Executive Management Reports

The solution must be able to generate summarized reports for executive managements.

viii. Security Reports

The solution must be able to log client device details for each activity, including the IP address and the MAC address. The solution must be able to generate reports of abnormal activated, including failed attempts, attempts to alter results or fee.

4.2. Report Filter

The solution should be able to filter the reports based on the following parameters:

- i. Year
- ii. Month
- iii. Campus
- iv. Faculty (College, School & Department level)
- iv. Study Term
- v. Custom Date Range
- vi. Combination of all of the above filters

4.3 Scheduled Reports

The solution must be able to support scheduling of one time and recurring reports.

4.4 Reports for External Parties

- i. The IMU is under the Ministry of Shipping, Government of India the ministry should be able to access to generate and extract some high level real time reports.
- ii. The solution must allow sponsors (Scholarship agencies) to extract progressive reports, gradebooks, Fee status of their sponsored students and other custom reports as per their requirements.

5. Finance Management

This feature must support finance departments to deal with student activities.

5.1. Invoicing

The solution should can generate individual Proforma Invoices during the enrolment period. The solution must also have the capability to generate batch invoices upon the end of the enrolment period. Authorized officers should also be able to process individual invoices for late enrolments and adjustments to course enrolments.

5.2. Reversal of Invoice, Credit Notes, Receipts and Refund activities

For any invoice, credit note, receipt, or refund generated, the solution must be able to allow the reversal of any of these activities.

5.3. Electronic Invoicing

The students should be able to generate and print their own Invoices online.

5.4. Electronic Payments

The students should can make online payments and printing of receipts.

5.5. Refunds

The solution must be capable of processing refunds for student's credit balances.

5.6. Transfer of Credit Balances

The solution must allow students to transfer their credit balance to another student

5.7. Withdrawals from Courses

When a student withdraws from a course, the total fee is updated in the invoice should there still be outstanding amount.

5.8. Fee Management

All programs and courses must be tagged with a fee. The fee can either be pre-specified or calculated based on the credit points.

5.9. Canteen/ Bookshop Management with Point of Sale Support (POS)

The solution must have Point of Sale feature to cater for students who are residence other users of the canteen.

5.10. Halls of Residence

The solution must provision to manage student accommodation, as well as to cater for fines, and other disciplinary cases

6. Grants Management

The system should be recording all grants received head-wise and keeping track of its spending and should provide grant utilization reports for Grant Management.

7. Online Portals

The solution must have online portal for students (New & Existing) to perform the following activities:

7.1. New Application

Students should be able to apply for a new program of study online.

7.2. Admission

Students applications are automatically evaluated against the minimum entry requirements. The entered marks are automatically verified with results provided by Ministry of Education. Applicants meeting the requirements are automatically offered the program by sending the applicants the offer letter to their specified email address. The unsuccessful applicants are forwarded to the Office of the Registrar for an alternate program of study.

7.3. Enrolment

Students should be able to enrol online in courses offered under their approved program. The solution must check for pre-requisite for courses prior to enrolling.

7.4. Cross Credit

Students should be able to apply for cross credit online.

7.5. Graduation

Students should be able to apply for graduation online.

7.6. Hall of Residence/Hostel

Students should be able to apply online for hostel and its related package such as transportation, meals, etc.

7.7. Attendance Tracking

Student attendance's is captured and can be viewed by students online to verify class attendance progress.

7.8. Course Grading Reports

Students can view their course work as well as view and print unofficial transcripts online.

7.9. Examination

Student can view their exam venues, dates, exam seat numbers and results online

7.10. Profile View

Student having access to all their records online and having the functionality to check the outstanding payments, fees, enrolment status, timetables, transcripts, library books available and booked, view their fines if any etc.

7.11. Bulletin Board

The solution must support event publication, university calendar, campus shuttle transports etc. on a bulletin board easily accessible upon login on student portal. This would serve as a core communication tool with active students.

7.12. Library

The solution must allow students to search for books and reserve a copy if available.

7.13. E-Learning Management

The solution must have the ability to support e-learning, fostering collaboration amongst the students. Feature such as discussion forum, online exam must be included.

7.14. Customer Service

The solution must allow students to book consultations with staff, support call centre, allow students to live chat with authorized staff etc.

7.15. Student Mobile Application

The solution must have mobile app to allow students to use the system as well as to engage in online learning.

7.16. Job Placement Service

The solution should allow students who are about to complete their program to apply as a job seeker. Registered employers can browse through the candidates' profiles and select students for employment.

8. Scheduling Applications

The solution must be able to meet Universities scheduling needs.

8.1. Timetabling of Lectures and Examinations

The solution must be able to automatically generate timetables based on certain constraints keeping in consideration of student and staff clashes. The lecture timetable must also consider time for movement of students across multiple campuses for specialized classes.

8.2. Facility Management

The solution must support booking for conference rooms and other similar facilities

8.3. Fleet Management

The solution must be able to support scheduling of transport, bookings and publishing shuttle time to online portals

9. Collaboration

The solution must have the ability to send messages within the application as well as external through Emails and SMS (Short Message Service).

10. Other University Management System Requirements

The solution must be able to integrate with other popular applications to ensure accurate and up-to-date data. The solution must allow phasing out other systems to use the built-in system with minimum effort with Data migration

10.1. Finance System

- i. The solution must be able to integrate on real time basis with any Financial system for student invoicing, payments, receipts and reversals
- ii. The solution must have a finance system of its own, which may replace University's current solution.

10.2. Learning Management System

- i. The solution must have able to integrate with Moodle LMS on real time basis.
- ii. The solution must have a learning management system of its own, which may replace University's current solution

10.3. Library System

- a. The solution must be able to integrate with library management system to search for books, reserve books, pay fines etc.
- b. The solution must have a library management system of its own, which may replace University's current solution

10.4. Bank Systems (Online Payments) & Other Electronic Payment Modes

The solution must be able to integrate with banks, government organizations and other solutions such as mobile money to empower students to make payments from any of these modes.

10.5. Human Resource Management System

- i. The solution must be able to integrate with Human Resource System and to generate staff workload.
- ii. The solution must have a HR system of its own, which may replace University's current solution.
- iii. The solution must have capability to take staff attendance through biometric devices and to process payroll.

10.6. Properties Management

The solution must have a Properties Management system which would enable keeping records of multi campus buildings, fleet, their maintenance schedule etc.

10.7. Inventory Management

The solution must have Inventory management system with ability to tag fixed assets by location and departments.

10.8. Document Management

The solution must have Document Management system to allow

- i. Support paperless concept to apply for services, track application, seek approvals etc.
- ii. Support filing of approved organizational documents in vaults with limited access to read only.

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Annexure-2: Estimated Revenue Expenditure

Estimated Revenue Expenditure for the next two years of the current SFC & for five years of the next expected SFC								
(Figures in Rs. lakhs)								
Particulars	Actuals 2016-17	Estimates 2017-18	Estimates 2018-19	Estimates 2019-20	Estimates 2020-21	Estimates 2021-22	Estimates 2022-23	Estimates 2023-24
A) Receipts/Income								
Course Fee Income	7,070.00	7,382.00	7,382.00	10550.00	10550.00	11725.00	11725.00	11725.00
Other Income								
i) Professional Consultancy	71.00	52.00	57.00	500.00	550.00	600.00	650.00	700.00
ii) Interest on Bank Deposits	1,676.00	1,358.00	1,358.00	1150.00	1000.00	700.00	500.00	500.00
iii) Exam Fee	1,152.00	921.00	921.00	1500.00	1500.00	1500.00	1500.00	1500.00
iv) Miscellaneous Income/ Receipts	315.00	245.00	297.00	330.00	360.00	400.00	440.00	480.00
v) Affiliation Income	17.00	-	33.00	50.00	50.00	50.00	50.00	50.00
Total Receipts/Income	10,301.00	9,958.00	10,048.00	14,080.00	14,010.00	14,975.00	14,865.00	14,955.00
B) Expenditure								
Establishment Expenses	3,690.00	4,269.00	5,199.00	7720.00	8490.00	10375.00	11415.00	12557.00
Academic Expenses	3,290.00	3,395.00	3,480.00	4297.00	4727.00	5200.00	5720.00	6292.00
Administrative Expenses	2,692.00	3,359.00	4,333.00	3648.00	4012.00	4413.00	4855.00	5340.00
Total Expenditure	9,672.00	11,023.00	13,012.00	15,665.00	17,229.00	19,988.00	21,990.00	24,189.00
Surplus/ (Deficit) (B-A)	629.00	-1,065.00	-2,964.00	-1,585.00	-3,219.00	-5,013.00	-7,125.00	-9,234.00
Academic Exp. as % of Course Fee Income	46.53%	45.99%	47.14%	40.73%	44.81%	44.35%	48.78%	53.66%
Assumptions:								
1) The income and expenditure estimates for the years 2017-18 and 2018-19 are as per the B.E/R.E already approved by the FC and EC.								
2) The income from course fee has been estimated at 90% students intake in 2019-20 & 2020-21 and thereafter at 100% of the capacity, retaining the fees at the								
3) The income from professional consultancy is estimated at Rs.500.00 lakhs from 2019-20 and with 10% increase/year thereafter.								
4) The interest on bank deposits has been arrived at taking into account the utilisation of the corpus fund for meeting the revenue deficit.								
5) The examination fee and Affiliation income are estimated to remain same at Rs.1500.0 lakhs and Rs.50.0 lakhs respectively from 2019-20 to 2023-24.								
6) The establishment expenses have been estimated taking into account filling up of 90% of the sanctioned strength of faculty and non-faculty posts during 2019-								
7) The academic expenses estimates that include student activity expenses, expenses of post sea programmes, examination expenses etc for the year 2017-18								
8) The administrative expenses estimates for the year 2017-18 and 2018-19 are as per B.E/R.E approved by the FC and EC. For the year 2019-20, it is estimated								
9) Figures have been rounded to Rs.in lakhs.								
Estimates of Expenditure submitted before the Committee of Non-Plan Expenditure (CNE)								
(Figures in Rs. Lakhs)								
Particulars	2014-15	2015-16	2016-17	2017-18	2018-19			
F-1 Faculty Cost (Regular Faculty)	786.25	1,729.75	2,354.76	2,590.24	2,849.26			
F-2 Faculty Cost (Non regular) - Contract & Visiting faculty	341.26	614.61	676.07	743.68	818.05			
F-2.a Research Scholars Stipend	29.43	35.61	41.30	47.00	70.26			
F-3-Student Activity Expenses	2,384.42	2,503.64	2,628.83	2,760.26	2,898.28			
F-4-Expenses on Post Sea/Short Term/ Management Development Programmes	799.66	839.64	881.62	925.71	971.99			
F-5-Academic staff College	5.00	50.00	100.00	100.00	100.00			
F-6 Examination Expenses (including CET and Counseling)	351.30	368.87	387.31	406.67	427.01			
F) Total(Academic/Training Expenses)	4,697.32	6,142.12	7,069.89	7,573.55	8,134.85			
G) Maintainance Expenses	1,495.30	1,570.07	1,648.57	1,731.00	1,817.55			
H) Administrative Expenses								
H-1-Non faculty cost (including deemed deputationist and other legacy employees)	2,287.34	2,401.71	2,521.79	2,647.88	2,780.28			
H-2- TA/DA expenses	120.80	127.10	133.70	140.60	147.90			
H-3- Other Administrative Expenses excluding depreciation on assets	1,295.70	1,360.49	1,428.51	1,499.93	1,574.93			
H) Total (Administrative Expenses)	3,703.84	3,889.30	4,084.00	4,288.41	4,503.11			
I) SMDR Expenses	-	68.26	125.35	215.66	255.10			
Total Expenditure (B) [F+G+H+I]	9,896.46	11,669.74	12,927.81	13,808.63	14,710.60			