

# A Proposal to Modernize and Harmonize Maritime Curricula in Montenegro and Albania

## Prijedlog modernizacije i usklađivanja pomorskog kurikula u Crnoj Gori i Albaniji

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### Summary

This paper presents achieved results of the TEMPUS project (544257-TEMPUS-1-2013-1-ME-TEMPUS-JPCR) titled Modernizing and Harmonizing Maritime Education in Montenegro and Albania, MARED Project. The main objective of MARED project is to overcome a problem of competent and qualified human resources in maritime sector in Montenegro and Albania. It will be achieved through the modernization and harmonization of educational and training system in accordance to International Maritime Organization (IMO) and Standards of Training, Certification and Watchkeeping for Seafarers (STCW) Convention requirements, together with EU partners from MET institutions in Slovenia, Spain, Croatia and Romania. The paper is divided into following sections: First section is an introduction of the background of the MARED project. Secondly, in the methodology section, analysis of the current situation and a revision of the existing maritime undergraduate study programmes are carried out; the development and design of a programme which meets the new requirements of the STCW for the University of Montenegro and Albania is explained in discussion section. Finally, achieved results and conclusions are presented in the last section.

### Sažetak

Ovaj članak predstavlja postignute rezultate Projekta TEMPUS (544257-TEMPUS-1-2013-1-ME-TEMPUS-JPCR) s naslovom Modernizacija i harmonizacija pomorskog obrazovanja u Crnoj Gori i Albaniji, MARED Projekt. Glavni cilj MARED projekta je nadići problem kompetentnih i kvalificiranih ljudi u pomorskom sektoru Crne Gore i Albanije. To će se postići modernizacijom i harmonizacijom obrazovnog i kvalifikacijskog sustava u skladu sa standardima izobrazbe prema zahtjevima STCW Konvencije Međunarodne pomorske organizacije, skupa s EU partnerima iz MET institucija u Sloveniji, Španjolskoj, Hrvatskoj i Rumunjskoj. Članak je podijeljen u sljedeće odjeljke: Prvi odjeljak je uvod u pozadinu MARED projekta. Drugi je odjeljak metodologije, analiza trenutne situacije i revizija postojećih pomorskih dodiplomskih studijskih programa. Razvoj nacrti programa koji udovoljava novim zahtjevima STCW Konvencije za Sveučilište Crne Gore i Albanije objašnjen je u odjeljku rasprave.

### KEY WORDS

Maritime Education and Training (MET)  
STCW  
BSc Nautical Science  
IMO model course

### KLJUČNE RIJEČI

pomorsko obrazovanje i obuka (MET)  
STCW  
bakalaureus iz pomorskog prometa  
IMO model tečaj

## 1. INTRODUCTION/Uvod

The project arose in response to the obligations of Partner Countries (PC, id est not part of the EU but with future possibilities to be included) concerning the ratification and implementation of the latest amendments to the IMO (IMO STCW 2011) regulations related to education and training of seafarers. All necessary changes and harmonization aim to meet the prescribed international standards to be carried out by 2017, in order to enable the educational and training systems of Partner Countries keep the status of internationally

recognized maritime educational and training institutions. The latest IMO requirements refer to the reform of the existing and development of new study programmes, which anticipates the creation of opportunities for both theoretical and practical training of students, through the modernization of laboratories, marine simulators and practical workshops. Furthermore, by introducing certain IMO model courses for seafarers, the educational institution aims to develop a lifelong learning process for providing the seafarers with the possibility

of continuous professional training. The harmonization of the educational programmes with valid international standards, as stipulated by IMO STCW Convention and its Manila amendments 2010, ensures the survival of maritime educational institutions and their competitiveness in the international market, thus ensuring the competitiveness of the seafarers from Partner Countries, as well.

Both Montenegro and Albania are strategic Adriatic countries with long maritime tradition, sharing the similar problems of derogation of maritime sector caused by transition. Namely, the Montenegrin shipping fleet before 1990's war period consisted of two shipping companies with 50 ocean going merchant ships, employing more than 2,500 Montenegrin seafarers, while rest of 2,500 were employed at international shipping companies. At that time, it was the second largest economic sector in the country. Today, there are only two ocean going merchant ships, and about 100 small vessels of up to 3,000 DWT, employing about 300 Montenegrin seafarers. The rest of 4,000 are employed internationally. Before 1990's, Albanian shipping fleet was organized as a state-owned enterprise with a capacity of about 90,000 DWT. Currently, this fleet is represented by many private owners who have vessels with a capacity of 1,000 – 2,000 DWT. Still, this sector is weak, at both the technical and management level. Nowadays, the Albanian commercial fleet is almost absent and the only chance for the employment of the graduates is the international commercial fleet (The Nautical Institute 1997).

Such situation significantly affected the maritime education and training process in both countries. The following disadvantages are notable: the curriculum is not harmonized with IMO STCW Convention, which is the precondition for internationally recognized maritime education and training, the teaching process is mainly theoretical due to poor laboratory and marine simulator conditions (or without any), difficulties in involving active and experienced seafarers (masters and chief engineers) for practical training, difficulties in organizing on board trainings, staff trainings, decreased number of interested students and similar. All this resulted in the deterioration of maritime competencies and therefore difficulties in employment of graduates and seafarers on international maritime market.

The Governments and policy makers in both countries are making efforts to improve the situation and to bring maritime education sector in the focus of development. Montenegrin Government adopted several strategies covering this area: National strategy for transportation sector (Transport Development Strategy of Montenegro 2014), National strategy for sustainable development (revised in 2012), while Albanian adopted: Transport Sector Strategy 2008-2013 (European Commission 2010) and Fisheries and aquaculture development strategy (2007-2015). Those national strategies are in accordance with the European Maritime Strategy 2008-2018 (FAO UNJP/ALB/013/UNJ 2006).

Such intention can be achieved only through developing the synergy of maritime industry and maritime education. With the introduction of IMO model courses (IMO 2005), as a way of lifelong learning, the seafarers will be provided with the continuous professional training on order to remain competitive at the international labour market. That way,

partner countries will be able to keep their status of the countries meeting the strictest IMO requirements.

The project idea itself helps the PCs obtaining a certain status at the international maritime market, and therewith also a step forward towards European and Euro-Atlantic integrations.

The harmonized educational systems in PC and EU countries results in the creation of competitive maritime staff at an international level, which enables the national maritime companies to employ national, but, at the same time, competent and highly educated staff. This way, it would contribute to the economic status of the PCs, and therewith also meet the prerequisites for easier and faster reaching of European standards.

## 2. METHODOLOGY/*Metodologija*

The main objective of this paper is to overcome a problem of competent and qualified human resources in maritime sector in Montenegro and Albania. It will be achieved through the modernization and harmonization of educational and training system in accordance to IMO and STCW Convention requirements. The specific objectives of the paper are: Revision of undergraduate study programme of the bachelor's degree in Nautical Science (BSc Nautical Science) - 180 ECTS- at University of Montenegro and; Revision of undergraduate study programmes of BSc Nautical Science-180 ECTS- at University of Vlore.

The first activity was to analyse current situation and to identify possibilities and adequate harmonization strategy (model) for each mentioned institution. Secondly, a revision of existing study programmes of four EU maritime universities: University of Ljubljana (Slovenia), Universitat Politècnica de Catalunya (Spain), Constanta Maritime University (Romania) and University of Split (Croatia) was essential for the harmonization of existing undergraduate study programmes because it consists of information such as new courses have to be developed, number of hours should be changed per each course and specification of theoretical and practical topics should be implemented. The final step was to create syllabi per each course according to the accepted study programme curricula.

## 3. DISCUSSION/*Diskusija*

### 3.1. Analysis of the existing study programmes in Montenegro and Albania / *Analiza postojećih studijskih programa u Crnoj Gori i Albaniji*

Maritime Faculty of Kotor of University of Montenegro (UoM) has 54 years of tradition in educating students and training seafarers. It acknowledged the Bologna Declaration (European Union 1999) in 2003/2004 so that today it has fully implemented European Credit Transfer System (ECTS) in all its studies. Attention is being paid on the education of future and training of existing seafarers, who seek opportunities at international labour market.

Table 1 shows the initial situation of the Bachelor's degree in Nautical Science program at Maritime Faculty of Kotor (training courses are not included in regular study program).

Table 1 Initial situation of hour's distribution of BSc Nautical Science at Maritime Faculty of Kotor  
 Tablica 1. Početna situacija rasporeda sati bakalaureusa u nautičkim znanostima na Pomorskom fakultetu u Kotoru

English	Navigation	Cargo handling	Other STCW	General	Elective	On board
270	465	225	705	360	0	0
<b>Total: 2025</b>						

Source: Maritime Faculty of Kotor, University of Montenegro

Table 2 Initial situation of hour's distribution of BSc Nautical Science at University of Vlore  
 Tablica 2. Početna situacija rasporeda sati bakalaureusa iz pomorskog prometa na Sveučilištu Vlore

English	Navigation	Cargo handling	Other STCW	General	Elective	On board
75	615	75	450	450	6	75
<b>Total: 1746</b>						

Source: University of Vlore, Albania

Today, the University of Vlore is the leading maritime academic institution in Albanian. This position mainly attributed to the tradition and also thanks to the continued efforts to prepare future deck and marine officers with knowledge and better training in this area (Lapa et al. 2016). The Department of Maritime Science and the Department of Mechanical and Naval Engineering aim at the formation of qualified specialists in maritime sector, and are the only institutions in Albanian higher education offering study programs in these areas.

Table 2 shows the initial situation of the Bachelor's degree in Nautical Science program at University of Vlore (training courses are not included in regular study program).

More specific information of ECTS distribution in BSc Nautical Science at the University of Vlore can be observed in table 3.

Both, Montenegro and Albanian institutions recognized great need for harmonization and modernization of maritime undergraduate study programs with EU practices and values.

Table 3 Initial distribution of ECTS of BSc Nautical Science program at University of Vlore  
 Tablica 3. Početna distribucija ECTS bodova studija nautika, bakalaureusa iz pomorskog prometa na Sveučilištu Vlore

Compulsory Courses			ECTS
General Formation Courses (40 credits)	1	Calculus I	8
		Calculus II	8
	2	General Chemistry	8
	3	Introduction to Physic I	8
		Introduction to Physic II	8
	Characterizing Courses of the program (87 credits)	4	Maritime Safety
5		Meteorology and Oceanography	7
6		Coastal Navigation	8
7		Ship Handling & Manoeuvring	8
8		Operation of Emergency Onboard & Care for Persons	8
9		Electronic Navigation	8
10		Celestial Navigation	8
11		Theory and Techniques of Maritime Transport	8
12		Maritime Radio communication	8
13		Ship Management	8
Formative and integrative Courses (21 credits)	14	Maritime Law	8
	15	Ship Theory	7
	16	Basic Electronics & Navigational Technical Equipments	7
Foreign Language and Informatics Courses (19 credits)	17	Ship Knowledges	7
	18	English	6
	19	Navigational Chartography	8
Elective Courses	20	Navigational Practical Training	5
Elective Courses (6 credits)	21	Maritime Ecology	6
		Maritime History	
		Introduction to Computer	
Diploma Thesis (7 Credits)	22	Thesis	7

Source: University of Vlore, Albania

### 3.2. Analysis of the existing study programmes in selected EU maritime universities / *Analiza postojećih studijskih programa na odabranim pomorskim sveučilištima*

This section reviews existing study programmes of four EU maritime universities: University of Ljubljana (Slovenia), Universitat Politècnica de Catalunya (Spain), Constanta Maritime University (Romania) and University of Split (Croatia). Information related on these maritime institutions was used as a basis for next implementation step: creation of the Guideline for the curricula revision and development. The Guideline is essential for the harmonization of existing and development of new undergraduate study programmes.

Following table (table 4) shows a review of Syllabus of these universities. The Faculty of Maritime Studies and Transport of the University of Ljubljana is a higher education institution and its mission is to provide educational as well as research activities, primarily in the fields of traffic and maritime studies, the BSc Nautical Science programme consists of 180 ECTS and lasts three years (six semesters). At Barcelona School of Nautical Studies (UPC) the BSc Nautical Science is 4 years long (8 semesters) and is covered by 240 ECTS credits (training courses are not included in regular study program), this syllabus is highly above the minimum requirements denoted in STCW IMO Model Course 7.01 (IMO 2014). At Constanta Maritime University training courses are not included in regular study program, this syllabus is 4 year program and highly above the minimum requirements denoted in STCW IMO Course 7.01. Finally, at Maritime Faculty of Split, regular study program includes 12 STCW training courses (381 hours), and additional 5 (123 hours) within elective subjects, this syllabus is 3 year program.

Table 4 Distribution of group of subjects depending of the different EU maritime universities.

Tablica 4. Raspored grupa predmeta koji sadržavaju EU pomorska učilišta

	Slovenia	Spain	Romania	Croatia
English	285	144	196	285
Navigation	480	465	970	335
Cargo handling	135	165	112	120
Other STCW	585	663	294	401
General	420	795	952	399
Elective	465	300	294	342
TOTAL	2370	2532	2818	1882

Source: own based on data from MAED project data, 2016.

From the above table, we can state that the considered countries establish different number of hours per credit ECTS established by European Commission (2009). The correspondence of 60 credits to a full-time workload in one year is formalized by national legal provisions and in most cases means from 1500 to 1800 hours, what corresponds to 25 to 30 hours of work. There is a clear difference of total number of hours among the four cases of EU countries, being the Romanian case the one with the highest number of credits.

### 3.3. Development of new study programmes / *Razvoj novih studijskih programa*

The final step was to create syllabi per each course according to the accepted study programme curricula. In this implementation

phase, the EU maritime universities were engaged as auditors, just to monitor the implementation process and the main work was performed by the Montenegro and Albania Universities.

The International Maritime Organization implemented IMO model courses covering all maritime subjects and helps MET institutions and maritime administrations providing appropriate training and assessment of maritime personnel/seafarers. IMO Model Course 7.01 aims to meet the mandatory minimum requirements for knowledge, understanding and proficiency in Table A-II/2 of STCW Code for the function Navigation at the Management Level, for the function Cargo Handling and Stowage at the Management Level and the background knowledge to support Controlling the Operation of the Ship and Care for Persons on Board at the Management Level.

IMO Model Course 7.01 (Master and Chief mate), edition 2014, was used as guide for minimum course/subject duration for the mandatory minimum requirements for knowledge, understanding and proficiency listed in Column 2 in Table A-II/2 of STCW Code. This course was used as a guide with the course duration given as indicative of the expected time required to cover the required outcomes. Moreover, the legal framework related with University Education and the requirements of the Bologna Declaration were taken into account.

#### 3.3.1. Restructuring of the BSc Nautical Science Studies (University of Montenegro) / *Restrukturiranje Studijskog programa Nautičke znanosti (Sveučilište u Crnoj Gori)*

This section describes the work carried out during the review of syllabus of Navigation studies at University of Montenegro. New Navigation bachelor program will be 3 years program (6 semesters). Considering IMO Model Course 7.03 (IMO 2014), two first years will be enough to cover all competences of operational level of STCW code, table A-II/1. To obtain the required hours of IMO Model Course 7.01 and competences and knowledge of STCW defined in table A-II/2, part will be done in the first two years and part in the 5th semester of the program. Last sixth semester will be without formal STCW subjects, also called elective subjects (25 ECTS); this last semester can also be exchangeable with 12 months of sea time practices on board. English subject will be introduced in each semester. New Subjects are introduced in the new curricula: Basics of Marine Navigation (75 hours), knowledge of ship and cargo (75 hours), Seamanship (105 hours), Physics (30 hours), Navigation practice (60 hours with 2 weeks), Voyage planning (3rd year, 90 hours).

#### 3.3.2. Restructuring of the BSc Nautical Science Studies (University of Vlore) / *Restrukturiranje Studijskog programa Nautičke znanosti (Sveučilište Vlore)*

This section describes the work carried out during the restructuring of the Bachelor program in navigation studies at the University of Vlore. Work was focused in four main functions, aiming to achieve a harmonious structure of the programs, in accordance with the STCW standards. Moreover, a review of subject's credits was carried out.

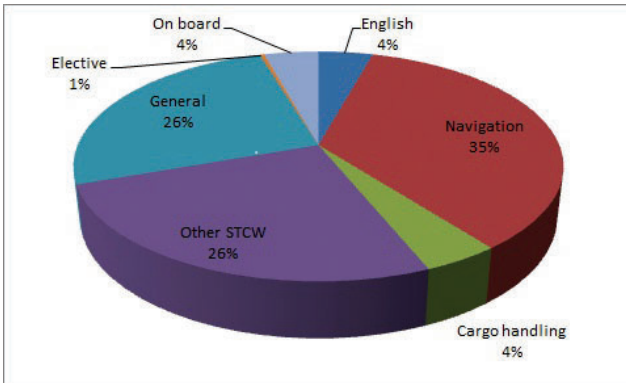
Table 5 The expected situation after restructuring of the Bachelor Programs in Navigation Studies

Tablica 5. Očekivana situacija nakon restrukturiranja studijskog programa bakalaureus iz nautičkih znanosti

English	Navigation	Cargo handling	Other STCW	General	Elective	On board
225	615	150	450	525	75	150
Total: 2190						

Source: University of Vlore

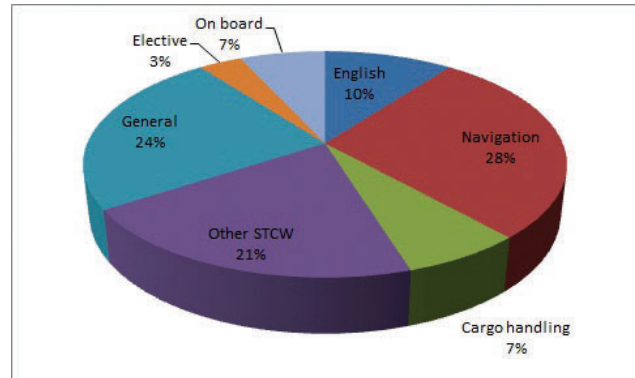
Comparing table 2 and 5, main differences can be appreciated in figure 1.



Finally, the distribution of subjects after restructuring programs is drawn in Table 6.

As can be seen in the shaded text of Table 6 for the restructuring of the Bachelor program, more noticeable differences between two distributions (table 3 and table 6) can be described as follows:

- Restructuring the syllabus of the "Theory and Techniques of Maritime Transport" subject (Cargo Work), before the total credits was 8 and after the restructuring the subject was divided into two courses of 5 ECTS each one. This subject treats widely the acknowledges connected with



Source: University of Vlore

Figure 1 Distribution of subjects before (left) and after restructuring programs (right)

Slika 1. Raspodjela predmeta prije (lijevo) i nakon restrukturiranja programa (desno)

Table 6 Structure of the restructured BSc Nautical Science Studies

Tablica 6. Struktura restrukturiranog stupnja bakalaureus iz Studija Nautičkih znanosti

Compulsory Courses		ECTS
General Formation Courses (35 credits)	1 Algebra & Geometry I	7
	Algebra & Geometry II	7
	2 General Chemistry	7
	3 Introduction to Physic I	7
Characterizing Courses of the program (93 credits)	Introduction to Physic II	7
	4 Maritime Safety	7
	Operation of Emergency Onboard & Care for Persons	7
	5 Meteorology and Oceanography	7
	6 Coastal Navigation	7
	7 Ship Handling & Manoeuvring	7
	8 Electronic Navigation	7
	9 Celestial Navigation	7
	10 Theory and Techniques of Maritime Transport I	5
	Theory and Techniques of Maritime Transport II	5
	11 Maritime Radio communication	7
12 Ship Management	7	
13 Maritime Law	7	
14 Navigational Chartography	7	
15 Navigational Practical Training	6	
Formative and integrative Courses (22 credits)	16 Ship Theory	7
	17 Basic Electronics & Navigational Technical Equipments	8
	18 Ship Knowledges	7
Foreign Language and Informatics Courses (18 credits)	English	6
	19 Maritime English I	3
	Maritime English II	3
20 Introduction to Computer	6	
Elective Courses		ECTS
Elective Courses (6 credits)	21 Maritime Ecology	6
	Maritime History	
Diploma Thesis (6 Credits)	22 Thesis	6

Source: University of Vlore



the elaboration technology of the sea transport ships in general and particularly those of the general charges, open merchandises, dangerous merchandises and the container transport. There are treated knowledge about the kind of ships that are used in sea transport, also the different manuals for the stability maintenance and the ship constancy in navigation.

- A completely altered point of view for the "English Language" subject, increasing from 6 ECTS to 12 ECTS. English language subject is divided into three courses: general English, maritime English I and maritime English II. Maritime English I and II is programmed for advance students of Nautical Sciences, mainly students should update what they have learned before and what they really need to know for a career in nautical field.
- Restructuring the syllabus of the "Basic Electronics & Navigational Technical Equipment" from 7 ECTS to 8 ECTS. The subject is now composed by two parts: knowledge about conductors and semiconductors, diodes, electronic, electronic circuits, transistors and amplificatory and the second part deals with knowledge about Navigational Technical Equipment.
- Replacing of Calculus I and II subjects by Algebra and Geometry I and II subjects, decreasing from 16 ECTS to 14 ECTS.
- The last point, relates with Onboard Training subjects for cadets. Practice on board always is one difficult tasks to be performed in accordance with the requirements and standards of STCW. Before the restructuring Onboard Training subjects counted 75 hours. There was an agreement with Albanian Maritime Administration which has enabled onboard training of Albanian students in the liner ferries ships between Vlora – Brindisi, Durres-Bari and Durres - Brindisi routes. This is one week onboard plus hours of simulators training. After the restructuring the practice will take place during three academic years, 150 hours in totally, distributed as following: first year 5 days meaning 38 hours (familiarization with ship and port activities and structures); second year 7 days meaning 56 hours (navigation and onboard activities at operational and managerial level); and third year 7 days meaning 56 hours (navigation and onboard activities at operational and managerial level).

Not only the programs and curricula were updated as required, but also the cycles of study were structured in operational and managerial level.

#### 4. CONCLUSION/Zaključak

In January 2012 new amendments to the STCW Convention came into force. Consequently, maritime educational institutions had to modernize and harmonize their curriculums and syllabuses according to the Manila amendments 2010. In the light of these changes the Tempus MAREd project was launched representing modernizing and harmonizing maritime education in Montenegro and Albania.

Both countries had difficulties in the area of maritime education, and with the help of EU partner from Slovenia, Croatia, Spain and Romania both, the Maritime Faculty of Kotor (Montenegro) and the Faculty of Technical Science of Vlōre (Albania) have successfully finished the revision of existing and development of new undergraduate study programs, upgraded

teaching materials and methodology, completed (re)training of teaching staff and (re)accredited undergraduate study programs (Brcko and Perkovic 2016).

This paper gives new vision for maritime educational and training system in Montenegro and Albania regions. The analysis is undertaken to evaluate and restructure the current programs. This work is based on the standards and requirements provided by the IMO STCW, the comparison with similar programs of the other EU Universities, the legal framework related with University Education and finally the requirements of the Bologna Declaration.

The study has shown an analysis of current programmes and the identification of possibilities and adequate strategy for Montenegro and Albania institutions. Existing curriculum and syllabi has indicated that there are some units from the IMO model courses 7.03 and 7.01 that need to be included in the teaching process in order to meet the latest STCW Convention requirements from Manila. These findings suggested the development of the new restructuring programmes presented in this paper.

One of the conclusions arisen is the different share distribution of the group of subjects even being studies submitted to 7.01 IMO course. This is a question to be further analyzed in order to get a real homologation among different nautical studies in Europe. Furthermore, the harmonization of the curriculum and syllabi will increase the number of working hours of certain teaching units enrichment of laboratories and didactic base and a further important aspect is the introduction of more practical training on simulators.

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