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Curriculum for the Master Programme

# “Biodiversity Conservation and Environmental Protection” – BioCEP

Established with means of the ERASMUS+ project

“Supporting modernization, accessibility, and internationalization of environmental protection in Myanmar’s higher education sector” – MuEuCAP

For further information, please see the official project webpage: [www.myanmar-edu.org](http://www.myanmar-edu.org).

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## Preamble

Currently:

- Myanmar is facing serious environmental challenges
- Myanmar students have few chances to study environmental sciences, including environmental protection
- There is a need within Myanmar for environmental studies.

MuEuCAP, as implemented through the ‘Biodiversity Conservation and Environmental Protection: BioCEP’ curriculum, offers the chance for Myanmar students to study environmental science and environmental protection in their country.

- The curriculum as outlined below is a summary of the official text, which sets out the legal framework and the structure of the study plans for the students
- The text defines all classes students need to subscribe to, to finish the studies successfully.
- BioCEP has core and elective courses:
  - Core courses are compulsory and must be completed by the students. The core courses are developed by MuEuCAP and will be offered by the teaching staff of the three MUPs.
  - For elective courses, the students are free to select any Master's course offered by the participating departments, including, but not limited to, those listed in Annex 5 below, providing they meet the requirements of the ECTS points.
- This text serves as a baseline clearly outlining the rights and responsibilities of students and teachers.

## 1. Justification and Background

Rapidly increasing human populations together with increasing wealth and associated unsustainable consumption of natural resources are rapidly changing the face of our earth. This adverse effect is further worsened by poor environmental controls leading to pollution, habitat and biodiversity loss, and unsustainable exploitation of natural resources.

Worldwide, including Myanmar, ecosystems need specific protection and enhancement. Meanwhile, there is little understanding amongst the public and decision makers of the role that biodiversity and the environment plays in ensuring that the world remains safe and productive for mankind as well as for nature. For example, there is little general understanding of the essential role of:

- nature's ecosystem services in assisting food production, such as through pollination
- forests in assisting with the seasonal provision of ground water, limiting the potential effects of floods and droughts
- birds and small mammals with the reforestation of heavily degraded and unproductive habitats
- the role of niche habitats, such as mangroves, in providing breeding grounds for commercially important fish and prawns species and in coastal protection.

Currently, the world, including Myanmar, needs experts with a comprehensive knowledge of ecological and environmental facts and processes. These individuals also need comprehensive skills to communicate their expertise into policy processes and to translate their knowledge into action for the good of the people and the nature surrounding them.

The proposed curriculum, 'Biodiversity Conservation and Environmental Protection – BioCEP', seeks to address this challenge by bringing together relevant academic fields that are necessary to give young ambitious students the academic education to become these experts and serve these goals. This is a service not only to Myanmar but to the whole world.

The Master's programme 'Biodiversity Conservation and Environmental Protection – BioCEP' will lead to a new cohort of young, skilled and motivated scientists who:

- understand the environmental challenges facing Myanmar today and in the future
- are trained in problem-solving and providing expertise to reduce environmental threats
- understand that the study of environmental protection requires a multidisciplinary approach, using knowledge and technical skills from a wide range of scientific disciplines
- have hard and soft skills (including ICT and foreign language) relevant to a career in the environmental sciences, be it working in higher education, for an NGO, the government or the private sector

- have a national and international outlook, working with an internationally recognised curriculum, which is part of the Bologna process, and with a strong network of scientific colleagues worldwide
- have an understanding of the importance of communicating scientific knowledge to a variety of end-users, including decision makers and the general public.

## 2. Admission Requirements

The Master's programme 'Biodiversity Conservation and Environmental Protection – BioCEP' is open to graduates from a recognised university (or equivalent higher education institution) in Myanmar or abroad (including the European Union). These studies must relate to one or more of the following:

- Basics of Ecology, or
- Basics of Zoology, or
- Basics of Botany, or
- Basics of Marine Science, or
- Basics of Chemistry, or
- Basics of Geography, or
- Basics of Geology, or
- Basics of Physics, or
- Basics of Forestry.

This knowledge must be proven by submitting documentation of a BSc study with the equivalent of at least 80.0 Credits in any of the topics listed above.

## 3. Composition and Structure of the Master's programme

### *Structure of Course and Credits*

The Master's programme of the new 'Biodiversity Conservation and Environmental Protection – BioCEP' comprises a workload of 128 Credits.

This corresponds to a study duration of four semesters (a total of 3,000 hours of 60 minutes each; 1 Credit equals a class of 60 minutes duration and is equivalent to 1.0 ECTS). For explanation of ECTS, please refer to Annex 4.

The Master's programme is divided into:

- Eight 'Core courses' (which are compulsory for all students) to be taken in Semesters 1 and 2 and comprising 32 credits; this forms the basis of this curriculum
- Eight 'Elective courses' (chosen by the students from all participating Departments within the university) to be taken in Semesters 1 and 2 and comprising 32 credits  
OR
- Six 'Elective courses' (chosen by the students) to be taken in Semesters 1 and 2 comprising 24 credits and one four week internship comprising 8 credits (total = 32 credits)
- A Master Thesis (including defence) to be taken in Semester 3 and 4 and comprising 64 credits.

Regular assessment of student's progress should take place at Master's Seminars. These university-based discussion groups should be scheduled at least once per semester and are obligatory for students.

**Table 1. Structure of the Master's programme 'Biodiversity Conservation and Environmental Protection – BioCEP'.**

No.	Name	Teaching time	Student Work load	ECTS	MC	Semester	Modules	Remarks
BioCEP-611	Ecology, Biodiversity & Conservation Biology	1	2	3	4	1	Core	Theory
BioCEP-612	Environmental Law & Environmental Impact Assessments (EIA)	1	2	3	4	1	Core	
BioCEP-613	Protected areas management	1	2	3	4	1	Core	Forest conservation & management
BioCEP-614	Methods in BioCEP (field/practical)	1	2	3	4	1	Core	
BioCEP-615	Elective Course 1	1	2	3	4	1	Elective	Out of Zoology, Botany,
BioCEP-616	Elective Course 2	1	2	3	4	1	Elective	Geography, Geology, Marine
BioCEP-617	Elective Course 3	1	2	3	4	1	Elective	Science as of Appendix D
BioCEP-618	Elective Course 4	1	2	3	4	1	Elective	and amendments.
BioCEP-621	Statistics & environmental modelling	1	2	3	4	2	Core	
BioCEP-622	Scientific Writing	1	2	3	4	2	Core	
BioCEP-623	Project management & implementation	1	2	3	4	2	Core	
BioCEP-624	Master Seminar for BioCEP	1	2	3	4	2	Core	
BioCEP-625	Elective Course 5	1	2	3	4	2	Elective	Out of Zoology, Botany,
BioCEP-626	Elective Course 6	1	2	3	4	2	Elective	Geography, Geology, Marine
BioCEP-627	Elective Course 7	1	2	3	4	2	Elective	Science as of Appendix D
BioCEP-628	Elective Course 8	1	2	3	4	2	Elective	and amendments.
BioCEP-631	4-week internship	0	4	6	8	3		Replaces Elective Courses 7 & 8
BioCEP-632	Research background					3		
BioCEP-633	Title Defence					3		
BioCEP-634	Research Proposal					3		
BioCEP-635	Progress Report					3		
BioCEP-641	Master Thesis					4		Can start in semester 3.
BioCEP-642	Master thesis, including defence				64	3 & 4	Core	
Sum:		16	32	48	128			

### *Core courses (for further description of Core Course see Annex 1)*

The eight compulsory core courses in the Master's programme 'Biodiversity Conservation and Environmental Protection – BioCEP', are all new. They are similar in all three Myanmar universities (Mandalay, Mawlamyine and Myeik) and comprise:

1. Ecology, biodiversity and conservation biology
2. Environmental Law and Environmental Impact Assessments (EIA)
3. Protected areas management
4. Methods in BioCEP (field/practical)
5. Statistics and environmental modelling
6. Scientific writing
7. Project management and implementation
8. Master Seminar for BioCEP.

Subjects covered will include aspects of: behavioural ecology, community based conservation, conservation biology, environmental impact assessments; environmental law, environmental science, evolution, information and communication technology in environmental protection, natural resource management, pollution management, protected area management, and wildlife ecology.

Skills will be developed in aspects of: data presentation, field techniques, GIS (ArcGIS/QGIS), monitoring, outreach/dissemination in environmental protection, scientific articles reading, proposal and scientific report writing, Remote Sensing research methods, project design, research analysis, statistics using open access software such as R, seminar practice, and scientific English.

### *Elective courses*

The eight elective courses in the new Master's curriculum in Environmental Protection at the three Myanmar universities are not new and will be selected by the students from:

- all existing Master's courses (including those listed in Annex 5) currently offered by the Departments of Botany, Chemistry, Forestry, Geography, Geology, Marine Science, Physics, and Zoology. A total of 32 credits must be completed by the students.

It should be noted that the Elective Courses are already offered by other curricula at the University, such as MSc in Zoology, MSc in Botany, MSc in Geography, MSc in Geology, and MSc in Forestry and complement the skills required for the MSc in BioCEP.

### *Internship*

Wherever possible, each student should undertake an internship with an organisation outside the university to deepen their understanding of competences learned in theory during the Master's core and elective courses. Such organisations will include Myanmar-based NGOs, government departments and the private sector, including business.

This internship will comprise 8 credits and replace two elective courses, providing:

- it lasts at least 4 weeks in total (it may be completed in smaller units that together total 4 weeks)
- it includes the submission of an activity report in the form of a manuscript ("paper-style" details in Appendix B) and an oral presentation of the internship during a Master Seminar.

The internship aims to promote a task-oriented application of theoretical knowledge and the establishment of relationships between the student and potential employers. It is recommended to complete the internship between the 2nd and 3rd semesters. The internship is organised during participation of an obligatory Master seminar.

### *Master's thesis*

For the 'Biodiversity Conservation and Environmental Protection – BioCEP' Master's programme, the thesis, which has 64 credits, must:

- be dedicated to a scientific topic, which is to be written within the framework of biodiversity conservation and environmental protection
- be written in "paper-style", i.e. following the form and formatting of a Scientific Paper
- show that the student is capable of researching a scientific question on his/her own initiative, on an ongoing basis and with a methodology that is justifiable and without plagiarism
- must be completed within 12 months
- be capable of being assessed separately, even if there is joint processing of a topic by several students
- be written in English with a defence conducted in English
- be supervised by a professor (Lecturer, Assistant Prof., Prof., Associate Prof., and Adjunct Prof.) of one of the Myanmar universities; a committee of two further teachers from any of the MuEuCAP partners will advise or co-supervise the Master Thesis in the form of a committee.

### *Practical examples of students taking part in the new Master's programme*

Example 1: 'Student A' has a BSc in Geology from Patheingyi University. She switches to Mandalay University and decides to study the new Master's programme in 'Biodiversity Conservation and Environmental Protection – BioCEP' with a geological/botanical focus. Therefore, in addition to her eight compulsory core courses (32 credits), she chooses eight elective courses (32 credits): Evolutionary Survey of Plant Kingdom (Bot 611), Embryo and Morphogenesis (Bot 612), Principle of

Taxonomy (Bot 613), Applied Pharmacognosy (Bot 614); Advance Paleontology (Geol 612 R), Advance Structural Geology (Geol 613 R), Advance Igneous and Metamorphic Petrology (Geol 614 R), and Environmental Geology (Geol 621 R/ 621CMG /621 EC). She undertakes a Master's thesis (64 credits).

'Student 2' has a BSc in Zoology from Mawlamyine University. He decides to continue at Mawlamyine University to study the new Master's programme in 'Biodiversity Conservation and Environmental Protection – BioCEP' with a focus on animals. In addition to all eight core classes (32 credits), he selects six existing elective courses (24 credits) from the Zoology Master's curriculum and undertakes a four week internship at a Myanmar-based NGO (8 credits). He undertakes a Master's thesis (64 credits).

'Student 3' has a BSc in Geography. She would like to study the new Master's programme in 'Biodiversity Conservation and Environmental Protection – BioCEP' in the University of Mandalay. In addition to the eight core classes (32 credits), she decides to focus on the environmental protection of birds. Therefore, she is taking for her eight elective courses, "EPBC-612 Biodiversity conservation" in the Zoology Department. She then selects seven further classes out of the Geography curriculum, e.g. waste management, GIS and mining.... (32 credits) and completes her thesis (64 credits).

#### **4. Completion and Examination Regulations**

The Master's programme in 'Biodiversity Conservation and Environmental Protection – BioCEP' is completed if the following requirements are met:

- the positive completion of the Core Courses to the extent of 32 Credits;
- the positive completion of the Elective Courses to the extent of 32 credits, or positive completion of the Elective Courses of 24 credits and 8 credits of the internship;
- the positive assessment of the Master thesis and the Defence of 64 Credits.

The evaluation of the student is based on course examinations. The course examinations can be written and/or orally tested and take into account the extent of the Credits.

Proof of achievement for each subject is provided by the proof of achievement of the courses belonging to the subject. The overall assessment for a subject results from the mean value of the courses completed within the subject weighted according to credits. If the mean value after the decimal point is less than or equal to five, the system rounds to the better grade, otherwise to the worse grade. In justified cases, the Dean of Studies may provide for a subject examination.

The examination method must be based on the type of course: lectures are to be concluded with oral and/or written examinations, if these are not assessed during the reading.

The topic of the Master Thesis can be found in one of the subjects of the study programme. The student has to announce the topic to the supervisor of the Master thesis and to the Dean before the beginning of the work.

The completed Master's Thesis, which has been evaluated positively by the reviewers, must be presented to the public after all courses have been completed and defended in a scientific discussion (defence). The commission is composed of the chairperson and two other university teachers. The overall performance (Master Thesis and defence) is assessed with an overall grade, whereby both parts must be completed positively. The written evaluation of the written Master Thesis and the defence, which is based on written justification, are separately included in the overall grade and are documented separately.

The valuation key is:

- Master's Thesis: 70%
- Defence (including presentation): 30%.

An overall assessment is to be given for the overall study success.

## **5. Academic Title**

Graduates of the Master's programme of 'Biodiversity Conservation and Environmental Protection – BioCEP' awarded the academic degree "Master of Science", abbreviated "MSc" or "M.Sc.". The academic degree "MSc" ("M.Sc.") must follow the name.

## **6. Occupational Field and Field of Activity**

It should be stressed that the interdisciplinary orientation of the Master's programme 'Biodiversity Conservation and Environmental Protection –BioCEP', which draws on skills and technical knowledge from a range of disciplines such as Botany, Chemistry, Forestry, Geography, Geology, Marine Science, Physics, and Zoology, offers a significant advantage for graduates of this programme when applying for employment both in national institutions and in organisations of international cooperation. It opens up access to jobs in the following fields, including:

- Conservation and Conservation Biology – working for NGOs, government and higher education
- Ecological and Environmental Assessment - including undertaking EIAs for the private sector
- Environmental Sciences – including aspects of pollution and pollution control both in the public and private sector
- Environmental Policy – working with or in government and with international organisations
- Biodiversity Research – both in higher education and with NGOs,
- Marine Science – in higher education, for the government or NGOS, and with commercial fishing organisations
- Forestry – both through research and through the implementation of sustainable forestry policies
- Natural Resources Management – working in the public and private sector
- Landscape Ecology and Land Use Planning – working with the public sector, for example in urban design and in the development of sustainable planning processes
- Ecotourism – working for government or in the private tourism sector
- Botany – working in higher education but also for the private sector
- Agriculture – supporting Myanmar's large and expanding food production
- Ecology and Zoology - in a range of nature-based jobs – everything from the provision of fresh water to urban populations, to promoting sustainable agriculture that recognises the role of nature's ecosystem services in food production, to protected areas management.

## 7. Supporting information

### Annex 1: Courses

**Table 2. Core courses for the BioCEP Master's programme.**

No.	Name	Contents	Reference
BioCEP-611	Ecology, Biodiversity & Conservation Biology	The class delivers all theoretical background information in ecology and teaches classical concepts, including concepts of interaction and nutrition cycles. In addition to ecology, all aspects of biodiversity in science and society are explained as well as issues relevant to conservation biology.	Begon, M, Townsend, CR & Harper, JL. (2006) Ecology: From Individuals to Ecosystems, Blackwell, Oxford.
BioCEP-612	Environmental Law & EIA	The course teaches the environmental laws of Myanmar and relevant Environmental Impact Assessment (EIA) procedures. Objectives of the course, include (i) the role of scientific research in environmental planning and developmental projects, (ii) Myanmar EIA legislation, (iii) an introduction to environmental law and regulations, (iv) an understanding of economic and social contexts and (v) training in the administrative and technical processes of preparing EIA documents.	Fortlage, CA (2017) Environmental assessment: a practical guide Routledge.
BioCEP-613	Protected areas management	The course provides theoretical and practical information on protected areas, both in Myanmar and globally. As part of the course, a protected area in Myanmar is visited; the local staff (park warden of the PA) will explain the practical issues relating to his/her work and all relevant issues.	Dudley, N (2008) Guidelines for applying protected area management categories IUCN. Clarke, J (1999) Biodiversity and protected areas: Myanmar. Unpublished report to the Regional Environmental Technical Assistance 5771.
BioCEP-614	Methods in BioCEP (field/practical)	The class will teach relevant methods in 2 parts (modules): GIS/Remote sensing Field methods for environmental protection.	Hawksworth, D. (2010): Methods and Practice in Biodiversity Conservation.
BioCEP-621	Statistics & environmental modelling	In this class, theory of basic and advanced statistics is explained. Practical examples, based on biodiversity or environmental protection (with data), are provided for the student to help her/him understand the technical, theoretical and practical applications of statistics. The main aim is to ensure that students use the appropriate experimental design and use appropriate statistical analyses. In addition, environmental modelling approaches will be taught, which provide improved understanding of environmental systems.	R Core Team. (2017) R: A language and environment for statistical computing, R Foundation for Statistical Computing, Vienna, Austria. Zuur, AF, Ieno, EN, Walker, NJ, Saveliev, AA & Smith, GM (2009) Mixed effects models and extensions in ecology with R. Springer, New York, USA.
BioCEP-622	Scientific Writing	The course aims to develop a student's awareness of the underlying structure and patterns of scientific research articles and to improve proficiency in writing up scientific English. It will use a combination of short lectures, examples, and exercises to understand and apply the principles of scientific writing. Specific topics included are: (1) Fundamentals of effective scientific writing (2) Structure of scientific papers (3) Writing a scientific paper (4) Writing an abstract (5) The review process.	<ul style="list-style-type: none"> <li>• Writing science: how to write papers that get cited and proposals that get funded, Joshua Schimel</li> <li>• The elements of style, William Strunk, Jr. (available online: <a href="http://www.bartleby.com/141/">www.bartleby.com/141/</a>)</li> <li>• Science research writing: a guide for non-native speakers of English, Hilary Glasman-Deal</li> </ul>
BioCEP-623	Project management & implementation	The class is preparing the students for conducting a research project, which includes, the following eight stages: (1) Develop a research question and carry out a literature search (2) Develop testable hypothesis/measurable indicators (3) Design the (empirical) study (4) Plan analysis and statistics (5) Write a project outline and presentation (6) Collect data /conduct sampling/carry out fieldwork (7) Analyse and interpret the data (8) Write the report/MSc thesis/PhD thesis/paper.	Online document at the MuEuCAP project.
BioCEP-631	4-week internship (voluntary as two elective courses)	Internship, details in "Error! Reference source not found.".	n/a

## **Annex 2: Types of classes**

The following class types are available:

- Lecture (Lec)
- Laboratory class (Lab)
- Practice (Pra)
- Mandatory Internship (Int)
- Seminar (Sem)
- Excursion (Exc)
- Master Seminar (MaS)
- Projects (Pr)

### **Annex 3: Report layout and structure**

All reports by students, including the Master Thesis shall follow a manuscript style (“paper-style”) layout. The text should be precise and as short as possible, but include all relevant information. Therefore, the length of each section and the entire text depends on the topic, not on the academic title. The following guidelines are considered as recommendations for all students. It should be strictly adhered to this structure, not, for example, bringing a description of a method in the results’ section or anticipating results in the methods’ section already:

#### *Title*

A 2-line title

#### *Author*

Author name, academic titles, directions, phone/email, ...

#### *Supervisor(s)*

Add the full name(s) of all supervisors

#### *Abstract*

Add a 250-word abstract of the thesis (and structure the abstract in the following sections):

- Scientific background including the (new) aspect(s)
- Research question and/or general hypothesis,
- Method outline
- Results

#### *Key words*

Add up to 10 keywords; separated by semicolon.

#### *Introduction*

Prepare the reader on the background and justification of your thesis and lead towards the research question(s) and hypothesis. Mention any knowledge gap or methodological issue there might be, particular if you are decreasing the knowledge gap. Write short and precise, do not distract the reader with wordy elaborations of not specifically relevant points.

#### *Methods*

Present the study area (including habitat types, environmental structure etc.), methods of observation/sampling, or describe the data and experiments in all needed detail.

Add an extra section on statistical analysis.

#### *Results*

Present your results. Add figures (preferred over tables) and tables as needed. As a rule of thumb: If you need to cite something in the results section, the sentence is probably wrongly placed and should be moved to methods or discussion.

#### *Discussion and conclusions*

Discuss your finding in the broader context. Compare it to findings of other authors. Address challenges. Describe what you would possibly do differently next time. Address future research topics. Discuss what your findings mean regarding science and regarding practical applications.

Avoid writing the discussion like a summary!

## *Acknowledgements*

Add a short acknowledgment of all those persons who gave significant support to your study, including funding sources if applicable.

## *References cited*

ONLY list all reference cited in the text – but list all references mentioned there. Follow one style throughout and be congruent. Double check that the citations and references cited match up.

Journal articles: Always cite all authors following the year, title, Journal, volume, pages, and DOI, for example: Renner, S.C., Lüdtke, B., Kaiser, S., Kienle, J., Schaefer, H.M., Segelbacher, G., Tschapka, M. & Santiago-Alarcon, D. 2016 Forests of opportunities and mischief: disentangling the interactions between forests, parasites and immune responses. *International Journal for Parasitology* 46, 571-579. (doi:10.1016/j.ijpara.2016.04.008).

Books: Valkiūnas, G. 2005 Avian malaria parasites and other haemosporidia, CRC Press.

Book chapters: Renner, S.C. & Markussen, M. 2005 Human impact on bird diversity and community structure in a tropical montane cloud forest in Alta Verapaz, Guatemala, with special reference to the Quetzal (*Pharomachrus mocinno*). In: *Valuation and Conservation of Biodiversity: Interdisciplinary Perspectives on the Convention on Biological Diversity* (eds. M. Markussen, R. Buse, H. Garrelts, M.A. Máñez Costa, S. Menzel & R. Marggraf), pp. 373-390. Heidelberg, Berlin, Springer.

Webpages and unpublished reports: **Do not cite.**

## *Tables*

Number the tables as emerging in the text and add the table BELOW the caption (first text then table).

## *Figures*

Number the figures as emerging in the text and add the caption BELOW the figure (first figure then text).

## *Appendices*

Add any information in numbered Appendices following the text. All lengthy information distracting the reader or being of secondary interest only and not at the core of understanding the research should be moved from the main text into the Appendix section. For example, photos, taxonomic lists, statistical background information, r-codes or any other secondary information. Do always consider whether it is necessary and helpful for the reader at all to include it.

## *Further*

Add a 1-page scientific CV.

#### **Annex 4. Credits in Myanmar and ECTS**

Myanmar Credits (MC) are not equivalent to the European Credits Transfer System (ECTS). To translate MC to ECTS, 1 (one) MC corresponds to 4 lessons of 50 minutes each, plus two tutorials of 100 minutes each (1 credit =  $(4 \times 50) + (2 \times 100) = 400$  minutes = 6.67h).

1 ECTS in the European Higher Education Area (EHEA) corresponds to 25h of work, but includes lessons, practices, tutorials and estimated student study time and homework. The latter, including student study time, is currently not included into the MC system. We recommend to add this information to the MC system to reach fully the ECTS and hence future exchange.

A 2-years Master in EHEA usually compromises 120 ECTS, 60 credits ECTS per year. Each ECTS is 25 hours of work, including lessons, practices, seminars, tutorials, and homework and study hours. In my University, we assume that each ECTS (25h) compromises approx. 10h of lectures/practice/tutorials, plus 15h homework and study hours.

Usually courses in Myanmar Master's programmes are 4 credits (including lessons, practices and tutorials). That is,  $4 \times 6.67h = 26.68h$ . In the proposed NEW Myanmar Master's programme BioCEP, each course will have 3 ECTS credits. Each course will comprise of 1 ECTS credit (25h) for lessons, practices and tutorials, and the remaining 2 credits will be study hours/homework. Therefore, the number of teaching hours per course will be the same as courses already offered for other Myanmar Master's programmes.

With the aim to adjust this new Myanmar Master programme to ECTS credits, MuEuCAP suggests to adjust MC to ECTS. This process is relatively easy, because the approximate number of teaching hours per course as the MC will be complemented with student homework hours until 25h per credit (= 1 ECTS credit).

## Annex 5: Elective Courses for BioCEP

University	Department	Title	Large group/ Lab/ Seminar/ Tutorial	Student homework	Total ECTS credits	Credits	Semester	Module Topic Name
Myeik, Mawlamyine and Mandalay University	Botany	Evolutionary Survey of Plant Kingdom	1	2	3	4	I	Bot 611
Myeik, Mawlamyine and Mandalay University	Botany	Embryo and Morphogenesis	1	2	3	4	I	Bot 612
Myeik, Mawlamyine and Mandalay University	Botany	Principle of Taxonomy	1	2	3	4	I	Bot 613
Myeik, Mawlamyine and Mandalay University	Botany	Applied Pharmacognosy	1	2	3	4	I	Bot 614
Myeik, Mawlamyine and Mandalay University	Botany	Advanced Microbiology	1	2	3	4	II	Bot 621
Myeik, Mawlamyine and Mandalay University	Botany	Environmental Science	1	2	3	4	II	Bot 622
Myeik, Mawlamyine and Mandalay University	Botany	Plant Biochemistry and Physiology	1	2	3	4	II	Bot 623
Myeik, Mawlamyine and Mandalay University	Botany	Advanced Microbiology	1	2	3	4	II	Bot 624 Molecular Biology and Biotechnology
Mandalay University								
Myeik, Mawlamyine and Mandalay University	Botany	Plan and Progress Report	1	2	3	4	I	
Myeik, Mawlamyine and Mandalay University	Botany	Research Outline and their Presentation	1	2	3	4	I	
Myeik, Mawlamyine and Mandalay University	Zoology	Zoological Nomenclature and Postgraduate Study in the Biological Science	1	2	3	4	I	ALL Topic names are the same with Mandalay
Myeik, Mawlamyine and Mandalay University	Zoology	Zoogeography and Ecology	1	2	3	4	I	
Myeik, Mawlamyine and Mandalay University	Zoology	Quantitative and Population Genetics	1	2	3	4	I	
Myeik, Mawlamyine and Mandalay University	Zoology	Developmental Biology	1	2	3	4	I	
Myeik, Mawlamyine and Mandalay University	Zoology	Animal Physiology and Endocrinology	1	2	3	4	II	
Myeik, Mawlamyine and Mandalay University	Zoology	Environmental Studies and Conservation Management	1	2	3	4	II	

Myeik, Mawlamyine and Mandalay University	Zoology	Evolutionary Biology and Animal Behaviour	1	2	3	4	II	
Myeik, Mawlamyine and Mandalay University	Zoology	Invertebrate Immunology	1	2	3	4	II	
Myeik, Mawlamyine and Mandalay University	Geology	Photogeology and Remote sensing	1	2	3	4	I	Geol 611 R
Myeik, Mawlamyine and Mandalay University	Geology	Advance Paleontology	1	2	3	4	I	Geol 612 R
Myeik, Mawlamyine and Mandalay University	Geology	Advance Structural Geology	1	2	3	4	I	Geol 613 R
Myeik, Mawlamyine and Mandalay University	Geology	Advance Igneous and Metamorphic Petrology I	1	2	3	4	I	Geol 614 R
Myeik, Mawlamyine and Mandalay University	Geology	Environmental Geology	1	2	3	4	II	Geol 621 R/ 621CMG /621 EC
Myeik, Mawlamyine and Mandalay University	Geology	Global and Regional Tectonics	1	2	3	4	II	Geol 622 R
Myeik, Mawlamyine and Mandalay University	Geology	Sedimentology	1	2	3	4	II	Geol 623 R
Myeik, Mawlamyine and Mandalay University	Geology	Stratigraphic Paleontology/Selected Topics	1	2	3	4	II	Geol 624 R
Myeik, Mawlamyine and Mandalay University	Marine Science	Quantitative Ecology	1	2	3	4	I	Quantitative Ecology (MS 611)
Myeik, Mawlamyine and Mandalay University	Marine Science	Oceanography of the Marginal Seas	1	2	3	4	I	Oceanography of the Marginal Sea (MS 612)
Myeik, Mawlamyine and Mandalay University	Marine Science	Biology of Large Marine Mammals	1	2	3	4	I	Biology of Large Marine Animal (MS 613)
Myeik, Mawlamyine and Mandalay University	Marine Science	Conservation and Protection of Coastal and Marine Environment	1	2	3	4	I	Advanced Phycology (MS 614)
Myeik, Mawlamyine and Mandalay University	Marine Science	Evolutionary Biology and Marine Biogeography	1	2	3	4	II	Evolutionary Biology and Marine Biogeography (MS 621)
Myeik, Mawlamyine and Mandalay University	Marine Science	Marine Microbiology	1	2	3	4	II	Marine Microbiology (MS 622)
Myeik, Mawlamyine and Mandalay University	Marine Science	Marine Spatial Planning	1	2	3	4	II	Marine Bioactive Substances (MS 623)
Myeik, Mawlamyine and Mandalay University	Marine Science	Estuarine Ecology	1	2	3	4	II	Estuarine Ecology (MS 624)

Mandalay University	Zoology	EPBC-611 Ecology and climate change mitigation	1	2	3	4	I	Zoological Nomenclature and Postgraduate Study in the Biological Science (Zool 611)
Mandalay University	Zoology	EPBC-612 Biodiversity conservation	1	2	3	4	I	Zoogeography and Ecology (Zool 612)
Mandalay University	Zoology	EPBC-613 Waste water management	1	2	3	4	I	Quantitative and Population Genetics (Zool 613)
Mandalay University	Zoology	614	1	2	3	4	I	Developmental Biology (Zool 614)
Mandalay University	Zoology	EPBC-621 Geospatial Analysis	1	2	3	4	II	Animal Physiology and Endocrinology (Zool 621)
Mandalay University	Zoology	EPBC-622 Environmental Modelling and Geochemistry		2	3	4	II	Environmental Studies and Conservation Management (Zool 621)
Mandalay University	Zoology	EPBC-623 Environmental Ethic, Law and Management	1	2	3	4	II	Evolutionary Biology and Animal Behaviour (Zool 623)
Mandalay University	Zoology	EPBC-624 Research methodology	1	2	3	4	II	Invertebrate Immunology (Zool 624)