



DEPARTMENT OF ZOOLOGY

PATNA UNIVERSITY

PATNA- 800005 (INDIA)

Ref. No. 76/ESM/18

Date : 03.11.2018



To
The Registrar
Patna University, Patna

Sub: Submission of Ordinance and Regulation under Choice Based Credit System for the two year (Four Semesters), M.Sc. Environmental Science and Management Programme.

Sir

Duly Signed revised Ordinance and Regulation under Semester System and Choice Based Credit System (CBCS) of M.Sc. Environmental Science and Management (a self financing course) running in the Department of Zoology, Patna University is being submitted for needful. The same is to be effective from the session 2018-19.

Your's faithfully

(P.Nath)
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Head of the Dept. of Zoology
Patna University

Enclosure:
Revised ordinance & Regulation
M.Sc. Programme under CBCS

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PATNA UNIVERSITY, PATNA

ORDINANCE

&

REGULATION

For

TwoYears (Four Semesters)

Post Graduate Degree Program

M.Sc. in Environmental Science & Management

(Faculty of Science)

A Self Financing Program

under

Choice Based Credit System (CBCS)

(To be effective from the academic session commencing from 2018)

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PATNA UNIVERSITY, PATNA

ORDINANCE AND REGULATION

Two Years (Four Semesters) Post Graduate Degree Program

M.Sc. Environmental Science & Management (a self financing program)

in the Faculty of Science

Under

CHOICE BASED CREDIT SYSTEM (CBCS)

PREAMBLE:

The CBCS provides an opportunity for the students to choose program comprising core, elective and ability enhancement courses. The programs can be evaluated following the grading system, which is considered to be better than the conventional marks system. Therefore, it is necessary to introduce uniform grading system in the entire higher education in India. This will benefit the students to move across institutions within India to begin with and across countries. The uniform grading system will enable potential employers in assessing the performance of the candidates; the program shall follow the guidelines formulated by the UGC in order to bring uniformity in evaluation system and computation of the Cumulative Grade Point Average (CGPA) based on student's performance in examinations.

The Post Graduate degree program for Environmental Science & Management (a self financing program) under Faculty of Science shall be four semesters spread over two years duration. The program shall be named as the 'Master of Science' program and shall be abbreviated as M.Sc.

1. General

1.1 The ORDINANCE and the REGULATIONS shall be called the 'Admission Ordinance' and 'Regulations of Examinations' for M.Sc. Environmental Science & Management, Post Graduate Degree Program to be applicable in the Patna University.

1.2 The ordinance and regulation shall be effective from the academic session 2018-19.

1.3 The M.Sc. Program of Environmental Science & Management shall consist of 20 papers spread over four semesters consisting of **Core Courses (CC)**, **Elective Courses (EC)**, **Discipline Specific Elective Courses (DSE)**, **Ability/Skill Enhancement Courses (AEC/SEC)** and **Ability Enhancement Compulsory Courses (AECC)** as described in Table 1. There shall be five courses/

papers in first semester, six courses/ papers in second semester, six courses/ papers in third semester and three courses/ papers in fourth semester, each course carrying 100 marks. The entire curriculum shall be of 2000 marks taken together. However, the CGPA/ class shall be awarded on the performance of the candidate on 16 courses/papers which include the 14 CC courses/papers and two EC courses/papers having an aggregate of 1600 marks. The various types of courses under CBCS are defined in section 3.

2. The Post Graduate Degree 'Master of Science' (M.Sc.) in Environmental Science & Management will be under Faculty of Science, Patna University.

3. OUTLINE OF THE CHOICE BASED CREDIT SYSTEM (CBCS) for PG DEGREE PROGRAM :

It consists of a number of courses i.e. Core Course (CC), Elective Course (EC), Discipline Specific Elective Course (DSE), Ability/Skill Enhancement Courses (AEC/SEC) and Ability Enhancement Compulsory Courses (AECC). Each course is equivalent to a course/paper. The nature of these courses is defined below.

3.1.1 Core Course (CC) :

A course which should compulsorily be studied by a candidate as a core requirement on the basis of subject of M.Sc. studies and it is termed as a Core Course.

3.1.2 Elective Course (EC)

Generally a course which can be chosen from a pool of courses (Basket) and which may be very specific or specialized or advanced or supportive to the subject/ discipline of study or which provides an extended scope or which enables an exposure to some other subject/discipline/domain or nurtures the candidate's proficiency/skill is called an Elective Course.

3.1.3 Discipline Specific Elective Course (DSE):

Elective courses may be offered by the main discipline/ subject of study is referred to as Discipline Specific Elective. The University/ Institute may also offer discipline related Elective Courses of interdisciplinary nature (to be offered by main discipline/ subject of study).

3.1.4 Generic Elective (GE) Course:

An elective course chosen generally from an unrelated discipline/ subject/ program, with an intention to seek exposure is called a Generic Elective.

Note: A core Course offered in a discipline/ subject may be treated as an elective by other discipline/subject and vice versa and such electives may also be referred to as Generic Elective.

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3.1.5 Ability Enhancement Courses (AEC)/Skill Enhancement Courses (SEC):

The Ability Enhancement Courses (AEC)/ Skill Enhancement Courses (SEC) are the courses based upon the content that leads to life skill enhancement. This course is qualifying in nature and students have to qualify.

3.1.6 Ability Enhancement Compulsory Courses (AECC):

University will run a number of Ability Enhancement Compulsory Courses (AECC) which is qualifying in nature and students have to qualify in all courses.

3.1.7. Dissertation/ Project/ Internship/ Industrial Training:

An elective course designed to acquire special/advanced knowledge, such as supplement study/support study to a project work and a candidate studies such a course on his own with an advisory support by a teacher/ faculty member/scientist of own university/other university or any institution/statutory body is called dissertation/ project.

3.2. CREDIT

3.2.1 The total minimum credits, required for completing the PG program is 100. The details of credits for individual components and individual courses are given in Table .

Table-1: Structure of the 2 Yrs (Four Semesters) Post Graduate Degree Program under CBCS.

Semester	No. of Course/ Paper	Credit per Course/ Paper	Total Credit	Minimum No. of Learning Hours	No. of Core Course/ Paper	No. of Elective Course/ Paper	Code & Nature of Elective Courses/ Paper
I	05	05	25	250	4	1	AECC-1
SEMESTER BREAK							
II	06	05	30	300	5	1	AEC/SEC-1
SEMESTER BREAK							
III	06	05	30	300	5	1	AECC-2
SEMESTER BREAK							
IV	03	05	15	150	0	3	EC-1* EC-2* DSE-1 or GE-1
Total	20		100	1000	14	6	

For Tutorial (T)/ Practical (P)/ Project Work (PW)/Field Work (FW)/ Internship etc., extra working hours may be added as per requirement and will be decided by the BOCS of the respective subject.

* The two Elective Courses (EC) to be studied in semester IV may be

One Theory paper and One Practical paper/ One Theory paper and One Project work/ One Theory paper and One Field work/ Both Project work/ Internship

IMP: It is desirable that all students of all courses be given adequate exposure over and above the class room teaching to enhance the scope of employability.

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3.2.2 The distribution of the six elective courses/papers shall be two EC, one DSE or one GE, two AECC; one AEC/SEC. Students may opt for any elective course out of a list of elective papers (**Basket**) offered by the parent department or any other departments as per his/her choice with the prior permission of the parent department. The list of elective papers, syllabus and prerequisite of the elective course will be decided by the Board of Courses of Studies (BOCS) of the concerned subject/department.

3.2.3 The final CGPA/ class will be decided on the performance of the student in the courses/papers including the 14 core courses (CC)/ papers and two elective courses (EC)/ papers.

3.2.4 The one DSE or one GE, two AECC, one AEC/SEC course /paper will be qualifying in nature and a student has to score at least 45% marks in these courses/papers. Grade will be awarded separately for these courses, however, performances in these elective courses/ papers will not be considered for awarding the final CGPA / class.

3.2.5 Ability Enhancement Compulsory Courses (AECC):

University will run two **Ability Enhancement Compulsory Courses (AECCs)** which are qualifying in nature and a student has to qualify in both these courses. The courses are:

AECC-1

Environmental Sustainability (3 Credit) & Swachchha Bharat Abhiyan Activities (2 Credit)

AECC-2

Human Values & Professional Ethics (3 credits) and Gender sensitization (2 credits)

Students will do assignments/project work related to institutional social responsibilities including Swachchha Bharat Abhiyan Activities during SEMESTER BREAK.

3.2.6 University will run a number of **Ability Enhancement Courses (AEC)/ Skill Enhancement Courses (SEC)**; a student can choose one from these. For example:

Basket of Ability/Skill Enhancement Courses (AEC/SEC)

- Computers and ICT
- Web Designing
- Derivatives and Risk Management
- Solid Waste Management
- Mushroom Technology
- Biofertilizer Technology
- Environmental Law and Policy
- Tourism and Hospitality Management
- Life and Communication Skill Development
- Yogic Sciences
- Water Harvesting & Conservation
- Any other course decided by the University / Department

3.2.7 Discipline Specific Elective (DSE):

In each program the Core Course-5 (CC-5) being taught in the second semester will be open and can be selected as a DSE course by other Department in 4th Semester. In the first phase a student will be allowed to choose a DSE course/paper from any subject other than his/ her Core Course (CC) from the same faculty in the same university.

3.2.8 Generic Elective (GE) Course:

University will run a number of **Generic Elective Courses (GE)**; a student can choose one from these. For example:

Basket of Generic Elective (GE) courses

- Music
- Dramatics
- Fine Arts
- Graphic Design
- Inclusive Policies
- Human Rights
- Any such course run by any department

4. Admission to M. Sc. Environmental Science and Management Program is open to candidates who have passed Bachelor or an equivalent examination conducted by a University established or incorporated by law, are eligible to apply for admission.
5. **Eligibility Criteria for Admission:** To be eligible for admission to this program, a candidate must have:

Bachelor degree in Environmental Sciences or in related/ allied subjects (Such as Environment & Water Management, Disaster Management etc.)

Or

Bachelor degree in Life Sciences or in related/allied subjects (Such as Botany, Zoology, Biochemistry, Biotechnology, Microbiology, Industrial Microbiology, Fish & Fisheries, Aquaculture, Bioinformatics, Agriculture, Veterinary Sciences, Wild Life, Forestry, M.B.B.S,BDS, Pharmacy, Nursing etc.)

Or

Bachelor degree in Chemistry or in related /allied subjects

Or

Bachelor degree in Geography/Geology or related /allied subjects (Geohydrology etc.)

Or

Bachelor degree in Engineering with at least one core paper related to environmental science or its any allied paper.

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6. Written aptitude / Entrance Test & Viva-Voce :

Admission to the Post Graduate Program in Environmental Science and Management shall be made on the basis of the marks obtained at the written aptitude /entrance test (100 marks) followed by Viva-Voce (25 marks) conducted by the Department. The merit list for admission will be made on the basis of performance in the written test and viva-voce marks taken together i.e.125 marks. It is mandatory for a candidate to appear both in entrance test followed by a viva-voce.

7. Number of Seats and Reservation:

- (a) The total number of seats available for admission to the course is 20 (Twenty) including both general and reserves categories.
- (b) The reservation of seats belonging to SC, ST, EBC (BC I) and OBC (BC II)'s categories will be provided as per the Patna University rules.

8. Fee Structure:

8.1 The application fee for applying for admission to this course will be Rs. 750/-(Seven hundred fifty only). This will include the fee for admission test. On the recommendation of the Academic Council and with the approval of the statutory bodies of the Patna University, application fee may be revised whenever required.

8.2 The fee structure (In Indian Rupees) for the course per semester is mentioned in **Table 2**. The fee structure may be revised from time to time by the Patna University with the consultation of course director and course coordinator. Fee for non-residents Indian (NRI) and foreign students will be in US Dollar equivalent to usually ten times of the Indian rupees at the time of admission.

8.3 The candidates of other university admitted in the 1st Semester of the program have to pay the registration fee as decided by the Patna University.

8.4 Each candidate shall have to pay Rs. 1000.00 (Rupees one thousand only) as caution money in first semester only. It may be changed by the Patna University time to time by the consultation of the Head/ Director and Coordinator of the course. The caution money will be refunded to the student when the student will take Transfer Certificate or Department Leaving Certificate on the basis of his /her requisition.

8.5 The university examination fee (ESE) in each semester will be same as the ordinance and regulation of regular mode of M.Sc.in the Faculty of Science, Patna University, Patna effective from 2018 (**Vide PU Letter No. Acad./3864, Dated :21.6.2018**). It may be changed by the Patna University time to time.

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8.6 Each candidate shall have to pay Rs. 3000.00 (Rupees Three thousand only) as for the honorarium of supervisor of Project work/ dissertation work before fourth semester. It may be changed by the Patna University time to time by consultation with the Director/ Head and the Coordinator the course.

9. Course structure & Syllabus may be changed by the consent of the Hon'ble Vice-Chancellor, P.U. in consultation with the Director/ Head and the Course Coordinator.

Table 2. Fee structure per semester for M. Sc. Environmental Science & Management

Sl. No.	Head/ Item	For Indian Resident Fee in Indian Rupees
I	Admission fee (Per semester)	150 /-
II	Tuition fee (Per Semester)	6000 /-
III	Laboratory Fee	6000 /-
IV	Departmental Library Fee	2400 /-
V	Development Fee	1000 /-
VI	Contingency	1000 /-
	Total	16550/-
VII	Miscellaneous (Per semester)	
	(a) Central Library	100 /-
	(b) Electricity fee	300 /-
	(c) Identity card fee	60 /-
	(d) NSS fee	50 /-
	(e) Parking	50 /-
	(f) Internal Examination fee	300 /-
	(g) Building Maintenance Fund	100/-
	(h) Medical Fee	100 /-
	(i) Athletic Fund (for University)	100/-
	(j) Common Room fund	50/-
	(k) Extra-curricular Fee (Cultural / Day Celebration etc.)	100/-
	(l) Environmental Protection Fee	20/-
	(m) Student's Welfare Fee	10/-
	(n) Poor Student's Fund	10/-
	(o) Student's Union Fund	100 /-
	(p) Society Subscription	50/-
	(q) Magazine Fund	50/-
	(r) Hand Book / Directory	50 /-
VIII	Total	1600 /-
X	Eklavya & Tarang (One time in each academic session)	10 /-
IX	Grand Total	18160/-
XI	Total amount (1st semester)	18160 /-
XII	Total amount in subsequent semesters	18150 /-
	2 nd Semester(excluding Eklavya & Tarang)	18160 /-
	3 rd Semester(including Eklavya & Tarang)	18150 /-
	4 th Semester (excluding Eklavya & Tarang)	
XIII	Field Work (per semester) if applicable	2000 /-

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REGULATIONS FOR EXAMINATION OF POST GRADUATE (M. Sc.) COURSE (SEMESTER SYSTEM)
IN ENVIRONMENTAL SCIENCE AND MANAGEMENT UNDER CBCS

1. General

- 1.1 These regulations shall be called the "Regulations of Examinations" for M.Sc. (Science) Environmental Science & Management Program.
- 1.2 These regulations shall come into force from the academic year session commencing from 2018.

2. Program of Study / Course structure

- 2.1 Student shall undergo a certified study extending to four semesters of two years Post Graduate degree. Each semester will consist at least 90 teaching days of four to six hours each.
- 2.2 Didactic lectures shall not exceed two third of the time schedule. Regular Seminar/symposium /workshop, group discussions and problem concern discussion / activities related to International/National day, week will be held regularly.
- 2.3 The durations of M.Sc. (Semester System) Program shall be of four semesters spread over two academic years. Each semester shall be of at least ninety teaching days.
- 2.4 Each academic session shall consist of two semesters I and III from July to December and II and IV from January to June
- 2.5 The M.Sc. program shall consist of 20 courses/papers spread over four semesters. There shall be five courses/papers in first semester, six courses/papers in second semester, six courses/papers in third semester and three courses/papers in fourth semester carrying 100 marks in each course/paper. The entire curriculum shall be of 2000 marks taken together. However, the class/ grade shall be awarded on the performance of the candidate on 16 courses/papers including 14 CC and two EC courses/ papers having an aggregate of 1600 marks.
- 2.6 In each semester each elective course shall carry 100 marks. The four elective courses – one AEC/SEC, two AECC and one DSE or one GE will be qualifying in nature. A student shall not be considered pass and eligible for award of the final degree unless he/she obtains minimum qualifying marks in these four courses. A complete description of courses is given in Table-3.
- 2.7 The distribution of courses/papers like theory, practical, field work, project, internship, dissertation etc. with number of credits is specified in each subject in the program structure of the subject concerned of the department.

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Table : 3
Course Structure for M.Sc. Environmental Science & Management (Choice Based Credit System)
Effective from Session 2018-20

Semester	Course/ Paper Code	Nature of Course/ Paper	Credit	Marks	Marks of CIA	Marks of ESE	Passing criterion	Qualifying Criterion
SEMESTER I	MESCC-1	Basics of Environmental Sciences	5	100	30	70	45% in CIA 45% in ESE	Marks decide class/ CGPA
	MESCC-2	Environmental Geosciences	5	100	30	70	45% in CIA 45% in ESE	Marks decide class/ CGPA
	MESCC-3	Statistical Methods & Computer Applications	5	100	30	70	45% in CIA 45% in ESE	Marks decide class/ CGPA
	MESCC-4	Practical (Based on MESCC 1, 2 & 3)	5	100	30	70	45% in CIA 45% in ESE	Marks decide class/ CGPA
	MESAEC-1	Environmental Sustainability & Swachchha Bharat Abhiyan Activities	5	100	50	50	45% in CIA 45% in ESE	Qualifying
SEMESTER II	MESCC-5 DSE-1 for other Department	Resources, Biodiversity and Wildlife	5	100	30	70	45% in CIA 45% in ESE	Marks decide class/ CGPA
	MESCC-6	Environmental Chemistry	5	100	30	70	45% in CIA 45% in ESE	Marks decide class/ CGPA
	MESCC-7	Environmental Biology	5	100	30	70	45% in CIA 45% in ESE	Marks decide class/ CGPA
	MESCC-8	Recombinant DNA technology, Environmental Biotechnology, Ethics & Scientific Communications	5	100	30	70	45% in CIA 45% in ESE	Marks decide class/ CGPA
	MESCC-9	Practical (Based on MESCC 5, 6, 7 & 8)	5	100	30	70	45% in CIA 45% in ESE	Marks decide class/ CGPA
	MESAEC-1/SEC-1	One selected from basket	5	100	50	50	45% in CIA 45% in ESE	Qualifying
SEMESTER III	MESCC-10	Environmental Monitoring & EIA	5	100	30	70	45% in CIA 45% in ESE	Marks decide class/ CGPA
	MESCC-11	Environmental Management	5	100	30	70	45% in CIA 45% in ESE	Marks decide class/ CGPA
	MESCC-12	Environmental Planning , Policy and Legislations	5	100	30	70	45% in CIA 45% in ESE	Marks decide class/ CGPA
	MESCC-13	Environmental Pollution	5	100	30	70	45% in CIA 45% in ESE	Marks decide class/ CGPA
	MESCC-14	Practical (Based on MESCC 10, 11, 12 & 13)	5	100	30	70	45% in CIA 45% in ESE	Marks decide class/ CGPA
	MESAEC-2	Human Values & Professional Ethics and Gender sensitization	5	100	50	50	45% in CIA 45% in ESE	Qualifying
SEMESTER IV	MESEC-1	Subject specific elective	5	100	Will be decided by the BOCS	Will be decided by the BOCS	Will be decided by the BOCS	Marks decide class/ CGPA
	MESEC-2	Subject specific elective	5	100	Will be decided by the BOCS	Will be decided by the BOCS	Will be decided by the BOCS	Marks decide class/ CGPA
	MESDSE-1	Opt a Course (CC-5) of other Program/Department.	5	100	30	70	45% in CIA 45% in ESE	Qualifying

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2.8 The term 'credit' means weightage given to a course in relation with the instructional hours assigned to it. One credit will generally consist of ten hours of instruction. The M.Sc. Science program shall be of one hundred credits divided as 25 credits in first semester, 30 credits in second semester, 30 credits in third semester and 15 credits in fourth semester. The number of credit for each course/paper of the Master's Degree program shall be specified in the course structure of the subject.

3. Evaluation of Performance Under Semester System

3.1 The Performance of a student in each course (CC) will be assessed on the basis of a continuous Internal Assessment (CIA) of 30 marks and the End of Semester Examination (ESE) consisting of 70 marks.

3.2 The components of CIA (Core Course) shall be

- | | | |
|----|---------------------------------------------|--------------------|
| a. | Two Mid-Semester Test of one hour duration | 7.5 x 2 = 15 marks |
| | (Third repeat test for genuine absentees) | |
| b. | Seminar/ Quiz/ Viva-voce | 5 marks |
| c. | Home assignment/ Field Work/ Report Writing | 5 marks |
| d. | Regularity and Behavior | 5 marks |

Total : 30 marks

Note: Marks for regularity and behavior will be awarded as follow:

Attendance	Marks
75%	1
Above 75% to 80%	2
Above 80% to 85%	3
Above 85% to 90%	4
Above 90%	5

3.3 The performance of a student in the elective courses /papers AEC/SEC and AECC in each semester addressing the issues of (i) Skill Development (ii) Human Values and Professional Ethics and Gender Sensitization.(iii) Environment and Sustainability and Swachchha Bharat Abhiyan Activities shall be assessed on the basis of a Continuous Internal Assessment (CIA) of 50 marks and the End Semester Examination (ESE) consisting of 50 marks.

3.4 The components of C.I.A. in the courses/papers (mentioned in 3.4) shall be as follows :

- | | |
|--------------------------------------------------------------------------------------------------------|-------------------|
| (a) One mid-semester written tests of one hour duration each | = 10 Marks |
| (ii) Seminar/ Quiz | =10 Marks |
| (iii) Assignment | = 15 Marks |
| (iv) Discharge of Institutional Social Responsibility
/ Community Services (report to be submitted) | = 15 Marks |
| Total | = 50 Marks |

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3.5 The concerned teacher of the course/ paper shall be responsible for conducting the mid-semester tests and other components of the CIA.

3.6 The ESE will be written examinations of 3 hours duration conducted by the university.

3.7 The evaluation of laboratory course/paper and field work, wherever applicable will also be based on CIA and an end-semester practical examination.

3.8 All such examinations shall be as per the provisions of examination board and moderation board of the Patna University.

3.9 Only those students who secured minimum qualifying marks in of 45% in the CIA shall be allowed to fill up the End Semester Examination form.

3.10 The marks of CIA in each course/paper be submitted by the Department along with the End Semester Examination form failing which the student may not be issued admit card for the examinations.

4. Examinations:

4.1 The End Semester Examination will be conducted by the University. The Mid Semester examinations and other components of CIA shall be conducted and evaluated by the concerned departments. The practical examinations wherever applicable will be conducted in the department. The Director/Head of the department will appoint external examiners for practical End Semester Examinations with the approval of the Patna University, The mid semester tests will be conducted and evaluated by the teacher concerned. The answer scripts of the mid-semester tests shall be shown to students by the concerned teacher.

4.2 The End of Semester Examination (ESE) shall be named as follows

(a) M.Sc. Part (I)-Semester I Examination and Semester II Examination

(b) M.Sc. Part (II) - Semester III Examination and Semester IV Examination

(c) Syllabus for each paper/course shall be divided into at least 5 units. Based on this, the question paper pattern for the End Semester Examination shall have divided into three parts A, B, C comprising of objective type questions with multiple choice, short answer type questions and long answer type questions respectively as mentioned below.

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Part	Nature of Questions	Number of Questions to be asked	Number of Questions to be answered	Marks of each question	Total Marks
Part-A	Objective type questions with 4 multiple choices	10	10	02	20
Part-B	Short answer type questions	05	04	05	20
Part-C	Long answer type questions	04	03	10	30
Total Marks					70

Part-A

Ten objective type questions -All questions to be answered (Questions shall be picked up from the whole syllabus, two questions preferably from each unit) $10 \times 2 = 20$ marks

Part-B

Five short Answer Questions- Four questions to be answered (Questions shall be picked up from the whole syllabus, one question preferably from each unit) $4 \times 5 = 20$ marks

Part-C

Five long answer questions – Three questions to be answered. (Question shall be picked up from the whole syllabus, one question preferably from each unit) $3 \times 10 = 30$ marks

4.3 The examination of I and III semesters, shall be generally held in the month of November-December and that of II and IV semester shall be held in the month of May-June.

4.4 In formulating the entire program of studies, the Department shall be guided by the consideration that at the Post Graduate level, students should be familiar with all the sub-disciplines, trends, trends and paradigms of the subject contributing to the knowledge pool and also the value education and employability factor, Keeping this in view the Department will decide subject based 14 core course/papers, 2 EC course/ papers and other 4 elective course/papers.

4.5 Paper setting, for ESE, 50 % examiners will be engaged from outside the university by the parent University as per the provisions of the examination board.

4.6 All practical courses/project/dissertation/internship shall be evaluated by two external examiners.

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Promotion Rules

5.1 There shall be no supplementary examination in any of the course/ papers in any semester (I, II, III, and IV).

5.2 The candidates who have been admitted to the First Semester of a two years Post Graduate Program in a session can be placed in the following categories on the basis of their attendance in the semester.

(i) Those candidates who have cleared the CIA and attended the required minimum percentage (75%) of attendance of lectures/ Practical courses separately.

(ii) Those who have not attended the required minimum percentage of attendance (75%) both in Theory and Practical courses shall in no case be permitted to appear in the End Semester Examinations.

5.3 After appearing at the Semester Examinations, the candidates can be placed in following categories in the context of declaration of the results of the Semester Examination (ESE)

(i) To be declared passed in End Semester Examination in any subject, a candidate must secure at least 45% marks in each course/paper separately in CIA, theory and practical, wherever applicable.

(ii) If a candidate secures 45% marks in at least three course/papers in his/her First/Second/ Third End Semester Examination he/she shall be promoted to next higher semester.

(iii) Candidates shall have to clear their backlog course(s) /paper(s) in the next end semester examination of that semester whenever it is available.

(iv) Even if a student is promoted to Fourth Semester, his/her final result will only be declared when he/she has cleared all their backlog courses/papers.

(v) Final result of M.Sc. Program shall be published on the basis of candidate's performance in the 16 course / papers spread over four semesters provided he/she has passed with minimum qualifying marks of 45% in the elective courses/ papers of each semester.

(vi) The Final result will be published only after he/she has cleared all the 20 courses / papers securing minimum qualifying marks.

(vii) Since it is a continuous evaluation program, student shall be awarded Grade Point (GP) at the End of each Semester Examination and Cumulative Grade Point (CGP) at the End of the Final End Semester Examinations in 10 point scoring system.

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(viii) There shall be no supplementary examination. A student has to score minimum 45% marks in his CIA. Failing to secure minimum marks he/she shall have to repeat the CIA along with the students of the same semester of the next academic session.

(ix) If students fail to secure minimum 45% marks in CIA of any course / paper, his/her result will be declared as failed in that paper. Students shall have to reappear in that paper in the same semester of next academic session.

(x) The name of the promoted candidate/ candidates will not be included in the merit list of that program/subject.

(xi) A promoted candidate, if he has passed in CIA but fails in theory course(s)/paper(s), he/she shall retain his/her CIA score and will reappear in the course /theory paper only of the semester whenever available. However if a candidate is declared fail in any End Semester Examination shall retain nothing and will have to redo the course work of failed semester again and he has to appear again in CIA as well as theory course / paper.

6. Improvement of Result:

If candidate passes in End Semester Examination (ESE), he/she may apply for the improvement of his/her result in maximum of two courses of the fourth semester. He/she can avail this facility only in theory course. Better of the two results will be treated as final result of candidates in those courses.

However, the name of such candidates with improved result will not be included in the merit list.

7. Declaration of Result:

The following grading system shall be used by Teacher/Examination Department:

Letter Grade	Percentage Range	Numerical of Letter Grade	Description of Grade
O	100-91	10	Outstanding
A++	90-81	9	Excellent
A+	80-71	8	Very Good
A	70-61	7	Good
B+	60-51	6	Average
B	50-45	5	Pass
F	Less than 45	Less than 5	Fail

8. Examinations:

8.1 The End Semester Examinations (ESE) shall be conducted by the University. The Continuous Internal Examinations (CIA) shall be conducted by the concerned department.

9.7 The award sheet of the students will show the grades obtained in all the courses offered in each semester, grades/ categories without numerical value (if applicable) the GPA and the promotion status.

9.8 To be eligible for the award of Master Degree, students must obtain a minimum final cumulative Grade Point Average (CGPA) of 5.0

9.9 To find percent equivalent to CGPA the following formula may be used, **Percent = CGPA x 10.**

9.10 Answer books or sheets will be coded before being passed on the examiner and decoded before tabulation work.

10. Wherever this regulation is silent, such matter will be governed by the regulation already existing for the Post Graduate Science Program of the Patna University.

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GOVERNOR'S SECRETARIAT, BIHAR
RAJ BHAVAN, PATNA-800022

Letter No.PU-(Regulations)-36/2013-72/ GS (I), 23 JAN 2014 Dated 10-01-2014

From, U.K. Choubey
Addl. Secretary

To, The Vice Chancellor
Patna University
Patna.

Sub:- Regarding approval of the Admission Ordinance (Semester System) and the Examination Regulations (Semester System) of **M.Sc. in Environmental Science and Management**, Under self-financing course.

Sir,

I am directed to invite a reference to the University's letters no Acad/1359, dated 27.09.2013, Acad/1551, dated 29.10.2013, Acad/1572, dated 30.10.2013 and Acad/1596, dated 02.11.2013 on the subject noted above and to inform that the Hon'ble Chancellor, after due consideration of the proposal of the University, advice of the Advisory Committee and in exercise of powers vested in him under Section 38(4) and 39(2)(ii-proviso) of the Patna University Act, 1976, as amended up to date, has been pleased to approve the Admission Ordinance (Semester System) and Examination Regulations (Semester System) of **M.Sc. in Environmental Science and Management**, a self-financing course (**copy enclosed**) from the Session 2012-13, with the condition to seek approval of the number of seats from the State Government from the next academic Session (2014 onwards) and send compliance to this Secretariat before commencement of the next Academic Session and also communicate to this Secretariat the approval of the Ordinance and Regulations by the Senate in the very next meeting.

Further necessary action may kindly be taken accordingly.

Yours faithfully

(U.K. Choubey)
Addl. Secretary

Encl:-As above

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PATNA UNIVERSITY

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Proposed Ordinance for Admission of Students (Semester system) to Post Graduate Degree (M.Sc.) Course in Environmental Science and Management

1. Admission to M.Sc. Environmental Science and Management course is open to candidates who have passed Graduate or an equivalent examination conducted by a University established or incorporated by law, are eligible to apply for admission.
2. Eligibility for Admission: To be eligible for admission to this course, a candidate must have:
 - a. Graduate degree in Life Sciences (Botany, Zoology, Biotechnology, Microbiology, Industrial Microbiology, Fish & Fisheries, Aquaculture, Environmental Science & Water Management and Environmental Sciences as major subject)
Or
Graduate degree in Biochemistry, Bioinformatics as major subject
Or
B.Sc. (Agriculture), Bachelor of Veterinary Science
Or
Graduate degree in Geology, Geohydrology, Chemistry, Wild Life, Geography and Forestry as major subject
Or
M.B.B.S. degree or equivalent, thereof

Every candidate must have obtained at least 55% marks (for general category) and 45% (for OBC, SC and ST) marks in Graduation.

- b. Appeared and qualify in the Written Aptitude/Entrance Test followed by a Viva-Voce to be conducted by the Department.
3. Written aptitude/entrance test: Admission to the Post-graduate course in Environmental Science and Management shall be made on the basis of the marks obtained at the written aptitude/entrance test (100 marks) followed by viva-voce (25 marks conducted by the Department. The

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merit list for admission will be made after combining both written aptitude and viva-voce marks (altogether 125 marks).

4. Number of seats and reservation:
- The total number of seats available for admission to the course is 20 (twenty) including both general and reserved categories.
 - The reservation of seats belonging to SC, ST, EBC(BCI) and OBC(BCII)'s categories will be provided as per the Patna University rules.
5. The fee structure for the course shall be the following:
- | | | |
|--------------------|----------|------------------------------|
| a. Admission Fee | - | 100.00 |
| b. Tuition Fee | - | 5000.00 |
| c. Laboratory Fee | - | 7500.00 |
| d. Library Fee | - | 2500.00 |
| e. Development Fee | - | 1000.00 |
| f. Field Work | - | 2000.00 |
| g. Medical Fee | - | 50.00 |
| Total | - | 18150.00 Per semester |

The full course fee shall be payable at the time of admission in each semester.

6. Each candidate shall have to pay Rs. 1500.00 (Rupees one thousand five hundred only) as examination each semester. It may be changed by the University time to time.
7. Each candidate shall have to pay Rs. 2000.00 (Rupees two thousand only) for the honorarium of supervisor of project work before fourth semester. It may be changed with the consent of the honorable Vice-Chancellor, P.U. in consultation with the Head and the Co-ordinator of the course.
8. The fee structure may be revised from time to time by the Vice-Chancellor, P.U. in consultation with the Head and the Co-ordinator of the course.
9. Course structure & syllabus may be changed by the consent of the honorable Vice-Chancellor, Patna University.
10. The Post Graduate Degree in Environmental Science & Management course shall be placed in the Faculty of Science, P.U.

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PATNA UNIVERSITY, PATNA

REGULATIONS FOR POST GRADUATE (M.Sc.) COURSE IN
ENVIRONMENTAL SCIENCE AND MANAGEMENT

1. Student shall undergo a certified study extending to four semesters. Each semester will consist of at least 90 teaching days of six hours each.
2. **Eligibility for Admission:** To be eligible for admission to this course, a candidate must have:

2.1. Graduate degree in Life Sciences (Botany, Zoology, Biotechnology, Microbiology, Industrial Microbiology, Fish & Fisheries, Aquaculture, Environmental Science & Water Management and Environmental Sciences as major subject)

Or

Graduate degree in Biochemistry, Bioinformatics as major subject.

Or

B.Sc. (Agriculture); Bachelor of Veterinary Science

Or

Graduate degree in Geology, Geohydrology, Chemistry, Wild Life, Geography and Forestry as major subject

or

M.B.B.S. degree or equivalent, there of

Every candidate must have obtained at least 55% (for general category) and 45% (for OBC, SC and ST) marks in Graduation.

- 2.2. Appeared and qualify in the Written Aptitude/Entrance Test followed by a viva-voce to be conducted by the Department.

3. **Written aptitude/entrance test and Viva-voce:**

3.1. Admission to M.Sc. Environmental Science and Management course shall be made on the basis of a written aptitude/entrance test (100 marks) followed by viva-voce (25 marks), both to be conducted by the Department. The merit list for admission will be made after combining both written aptitude and viva-voce marks (altogether 125 marks).

3.2. The questions of written aptitude/entrance test will cover the disciplines such as botany, zoology, chemistry, environmental science, cell biology, molecular biology, genetics, microbiology, biochemistry, physiology, geology, statistics and computer science. The details of the written test will be available along with the application form.

4. Reservation seat to SC, ST, EBC (BCI) and OBC (BC II) category students unless specified otherwise, will be as per the rules of Patna University applicable at the time of admission.

5. Didactic lectures shall not exceed two third of the time schedule. Regular seminar, group discussions and problem-oriented discussion shall be held regularly.

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Head
Department of Zoology
Patna University

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merit list for admission will be made after combining both written aptitude and viva-voce marks (altogether 125 marks).

4. Number of seats and reservation:

- a. The total number of seats available for admission to the course is 20 (twenty) including both general and reserved categories.
- b. The reservation of seats belonging to SC, ST, EBC(BCI) and OBC(BCII)'s categories will be provided as per the Patna University rules.

5. The fee structure for the course shall be the following:

a. Admission Fee	-	100.00
b. Tuition Fee	-	5000.00
c. Laboratory Fee	-	7500.00
d. Library Fee	-	2500.00
e. Development Fee	-	1000.00
f. Field Work	-	2000.00
g. Medical Fee	-	50.00
Total	-	18150.00 Per semester

The full course fee shall be payable at the time of admission in each semester.

6. Each candidate shall have to pay Rs. 1500.00 (Rupees one thousand five hundred only) as examination each semester. It may be changed by the University time to time.
7. Each candidate shall have to pay Rs. 2000.00 (Rupees two thousand only) for the honorarium of supervisor of project work before fourth semester. It may be changed with the consent of the honorable Vice-Chancellor, P.U. in consultation with the Head and the Co-ordinator of the course.
8. The fee structure may be revised from time to time by the Vice-Chancellor, P.U. in consultation with the Head and the Co-ordinator of the course.
9. Course structure & syllabus may be changed by the consent of the honorable Vice-Chancellor, Patna University.
10. The Post Graduate Degree in Environmental Science & Management course shall be placed in the Faculty of Science, P.U.

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PATNA UNIVERSITY, PATNA

REGULATIONS FOR POST GRADUATE (M.Sc.) COURSE IN
ENVIRONMENTAL SCIENCE AND MANAGEMENT

1. Student shall undergo a certified study extending to four semesters. Each semester will consist of at least 90 teaching days of six hours each.
2. **Eligibility for Admission** To be eligible for admission to this course, a candidate must have:

2.1. Graduate degree in Life Sciences (Botany, Zoology, Biotechnology, Microbiology, Industrial Microbiology, Fish & Fisheries, Aquaculture, Environmental Science & Water Management and Environmental Sciences as major subject)

Or

Graduate degree in Biochemistry, Bioinformatics as major subject.

Or

B.Sc. (Agriculture); Bachelor of Veterinary Science

Or

Graduate degree in Geology, Geohydrology, Chemistry, Wild Life, Geography and Forestry as major subject

or

M.B.B.S. degree or equivalent, there of

Every candidate must have obtained at least 55% (for general category) and 45% (for OBC, SC and ST) marks in Graduation.

- 2.2. Appeared and qualify in the Written Aptitude/Entrance Test followed by a viva-voce to be conducted by the Department.

3. **Written aptitude/entrance test and Viva-voce:**

- 3.1. Admission to M.Sc. Environmental Science and Management course shall be made on the basis of a written aptitude/entrance test (100 marks) followed by viva-voce (25 marks), both to be conducted by the Department. The merit list for admission will be made after combining both written aptitude and viva-voce marks (altogether 125 marks).
- 3.2. The questions of written aptitude/entrance test will cover the disciplines such as botany, zoology, chemistry, environmental science, cell biology, molecular biology, microbiology, biochemistry, physiology, geology, etc.

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Semester - IV					
Code	Subject	Credit	End Semester Exam (ESE)	Continuous Internal Assessment (CIA)	Total
ESM-M-401	Elective Paper- I A ₁ /B ₁	5	70	30	100
ESM-M-402	Elective paper-II A ₂ /B ₂	5	70	30	100
ESM-M-403	Practical -IV (Based on ESM-M-401 & 402)	4	70	30	100
ESM-M-404	Project/Dissertation & Viva	6	70	30	100

Major Elective Papers: Two to be selected

1. ESM-M-401 A₁- Natural Resources, Wildlife and Biodiversity
2. ESM-M-401 A₂- Environmental Pollution
3. ESM-M-401 B₁- Disaster Management
4. ESM-M-401 B₂- Environmental Health

- Additional elective papers will be included in the syllabus in due course by the consent of Honorable Vice-Chancellor, Patna University.
- Some more practical works may be incorporated depending upon the infrastructures of the department.
- Course structure & syllabus may be changed by the consent of Vice-Chancellor, Patna University.

7. Examination :

- 7.1. Only a student registered with the Patna University after admission in this course will be eligible for appearing in the examinations.
- 7.2. There shall be one end semester examination (ESE) in each semester.
- 7.3. Theory paper will be set as prescribed in the syllabus by the examiners out of panel as approved by the moderation board and assented by the Vice-chancellor, Patna University. The each theory paper will be distributed in 5 Units. The duration of the theory examination will be of 3 (three) hours and students are required to answer total of 5 (Five) questions out of which question number one and two will be compulsory which will be of objective type and short answer type, respectively.

The details of question: break-up for each theory paper (Total Marks-70) will be:

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Course Structure:

Semester - I					
Code	Subject	Credit	End Semester Exam (ESE)	Continuous Internal Assessment (CIA)	Total
ESM-M-101	Basics of Environmental Science	5	70	30	100
ESM-M-102	Environmental Geosciences	5	70	30	100
ESM-M-103	Statistical methods & Computer Applications	5	70	30	100
ESM-M-104	Practical - I (Based on ESM-M-101,102,103)	5	70	30	100

Semester - II					
Code	Subject	Credit	End Semester Exam (ESE)	Continuous Internal Assessment (CIA)	Total
ESM-M-201	Environmental Chemistry	5	70	30	100
ESM-M-202	Environmental Biology	5	70	30	100
ESM-M-203	Environmental Biotechnology, Instrumentation & Scientific Communications	5	70	30	100
ESM-M-204	Practical - II (Based on ESM-M-201, 202, 203)	5	70	30	100

Semester - III					
Code	Subject	Credit	End Semester Exam (ESE)	Continuous Internal Assessment (CIA)	Total
ESM-M-301	Natural Resources, Environmental Monitoring	5	70	30	100
ESM-M-302	Environmental Management	5	70	30	100
ESM-M-303	Environmental Planning, Policy and Legislation	5	70	30	100
ESM-M-304	Practical - III (Based on ESM-M-301, 302 & 303)	5	70	30	100

- (ii) The components for continuous internal assessment (CIA) are. There shall assess the values, skill and knowledge imbibed by students. Internal Assessment be done by the Department. It would comprise 30 marks in each paper. The of marks in each paper are given below:

S.No.	Components	Marks
01	T. tests (One hour duration each)	7.5x2 = 15(Third repeat test for genuine Absentees)
02	Seminar/Quiz/Viva voce	5
03	Home Assignment/field work/report writing	05
04	Regularity and Behaviour	05
	Total	30 Marks

9. AWARD OF DEGREE AND PROMOTION RULES

Degree is awarded to the examinees as per the rules of Patna University.

There shall be no supplementary examination in any of the semester courses (I, II, III and IV).

The candidates who have been admitted to the First Semester of a 2-year Post-Graduate Programme of Environmental Science & Management in a session can be placed in the following categories on the basis of their attendance in the semester.

1. Those who have appeared at the CIA (Continuous Internal Assessment) and attended the required minimum percentage (75%) of attendance of lectures/ practical classes or both or otherwise as per the provisions contained under the section 4 and 5 of the chapter III of the old Regulation of Patna University for appearing at the First Semester Examination and filled up the examination form in time for appearing at the First Semester Examination – **Category 1**.
2. Those who have not attended the required minimum percentage of attendance (75%) for appearing at the First Semester Examination or have not filled up examination forms in the time for appearing at the First Semester Examination- **Category 2**.

Candidates under the **category 1** are eligible for appearing at the First Semester Examination, while the candidates under the **Category 2** will not be allowed to appear at the First Semester Examination, but are allowed to seek **readmission** in First Semester.

Category I and category II will be decided in subsequent semesters II ,III and IV.

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Patna University

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Section 1

Questions 1: **Objective type** carrying 20 marks: 10 multiple choice questions (2 from each unit).
Examinee will answers all questions (10x2=20 marks)

Section 2

Question 2: **Short answer type**: Five questions to be set (one from each Unit).
Examinee will answer any four questions (5 marks x 4 question = 20 marks)

Section 3

Five questions to be set (One form each Unit), out of which examinee will answer any three questions (10 marks x 3 question = 30 marks)

- 7.4. Candidate's skill in interpretation of common investigated data, identification of specimens etc. will be evaluated.
- 7.5. The examination is to be designed with a view to ascertain whether the candidate has developed necessary knowledge and skills along with clear concepts of fundamentals which are necessary for him/her day to day work competently.
- 7.6. There shall be two external examiners preferably from outside the university or state in each practical paper (of six hours duration).
8. **Distribution marks in each semester:**

Evaluation of each semester shall be done by a Continuous Internal Assessment (CIA) by the concerned course teacher not below than the rank of an assistant professor or equivalent there of as well by an End Semester Examination (ESE) and will be consolidated at the end of the course.

(i) Distribution of marks in End Semester Examination (ESE):

- a) **First semester:** There shall be three theory papers and one practical paper of 70 marks each carrying a total of 280 marks.
- b) **Second semester:** There shall be three theory papers and one practical paper of 70 marks each carrying a total of 280 marks.
- c) **Third semester:** There shall be three theory papers and one practical paper of 70 marks each carrying a total of 280 marks.
- d) **Fourth semester:** There shall be two theory papers (Elective papers) and one practical paper based on elective papers of 70 marks each and a Project/dissertation of 70 marks carrying a total of 280 marks. In the project/dissertation work each student shall have to undertake a mini research project on the topic related as mentioned in the paper ESM-M-404 and submit his or her results in scientific manuscript form for evaluation on the dissertation and viva-voce. For research project/ dissertation, students may go outside for about one month. During dissertation work, regular classes will not be held in the department.

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After appearing at the Semester Examination, the candidates can be placed in the following categories in the context of declaration of the results of the Semester Examination:

1. A candidate shall be declared to have **passed** in a Semester Examination provided
 - (a) He / She has secured at least 40 % marks in each paper with the ESE (End Semester Examination) and CIA (Continuous Internal Assessment) marks taken together and ;
 - (b) He /She has secured at least 45 % marks in the aggregate of all the papers of the Semester Examination.
2. Those who **have not passed** in examination of all the papers of the First Semester shall be treated as **promoted** to the Second Semester;
3. Such candidates who have failed in examination of First Semester are allowed **promotion to Second Semester** on the condition that they have to clear their First Semester Examination, together with the Third Semester Examination;
4. Candidates who have **not passed** in Second Semester Examination shall be **promoted to Third Semester but have to clear the** Second Semester Examination together with the Fourth Semester Examination;
5. All the candidates who have appeared at the CIA and have the minimum required percentage of attendance in the IIIrd Semester and filled up the examination form in time shall be promoted to the IVth Semester;
6. Before appearing at the Semester IV examination, such candidates who are promoted shall have to pass with at least 40% marks in individual paper and 45% marks in the aggregate in at least 8 papers i.e. 50 % papers which they have offered.
7. Such **promoted** candidates, however, will carry on the CIA marks obtained earlier;
8. The candidates who have failed in any semester examination will appear in the ensuing corresponding Semester Examination and such candidates are also allowed to appear in those papers (in addition to the papers they have failed) in which they have secured less than 45% marks. It shall be applicable only in the End Semester Examination.
9. Candidates may clear their **failed papers** in subsequent examinations as **ex-students**.
10. Candidates shall have to clear all the papers of his /her course within the maximum period of four academic sessions from the date of his /her first admission to the semester programme.

10. **Attendance:** 75% of the attendance in a subject for appearing in the examination shall be compulsory.

11. Regular periodical exams will be conducted throughout the course.

12. The Vice-chancellor will appoint a board of moderator and all the examinations conducted and results published under the examination Board, Patna University.

13. Wherever this regulation is silent, such matter will be governed by the regulation already existing for the postgraduate science course of the Patna University.

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Department of Zoology

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