



Shri Shivaji Education Society Amravati's  
**SHRI SHIVAJI SCIENCE AND ARTS  
COLLEGE**

**Chikhli, Dist. Buldana- 443201.**

**NAAC Reaccredited with 'B++' Grade (CGPA 2.82)**

**Dr. Omraj S. Deshmukh**  
**Principal**

**Hon'ble Shri Harshvardhan P. Deshmukh**  
**President**

## 1.2.1 Number of Programmes in which Choice Based Credit System (CBCS)/ elective course system has been implemented

### Contents

#### Ordinance and Direction Copy of Affiliated University

- Direction dated 24.06.2010 Scheme for Choice Based Credit System (CBCS) and Awarding Grades to the PG students in the faculty of Science, Direction 2010
- Direction 24.06.2010



  
**Dr. Omraj S. Deshmukh**  
**Principal**  
**Shri Shivaji Sci. & Arts**  
**College, Chikhli, Dist. Buldana**

## Criterion – I- Curricular Aspects [QnM – 1.2.1]

M.Sc. Sem-I to IV  
(Botany)

Prospectus No. 2017126

संत गाडगे बाबा अमरावती विद्यापीठ

SANT GADGE BABA AMRAVATI UNIVERSITY

विज्ञान विद्याशाखा  
(FACULTY OF SCIENCE)

अभ्यासक्रमिका  
विज्ञान पारंगत परिक्षा (वनस्पतीशास्त्र)  
सत्र- १ ते ४

**PROSPECTUS**  
OF  
MASTER OF SCIENCE EXAMINATION  
IN  
BOTANY  
Semester - I & III, Winter 2016  
Semester - II & IV, Summer 2017,



2016

Visit us at [www.sgbau.ac.in](http://www.sgbau.ac.in)

Price Rs. /-

PUBLISHED BY  
Dr. Ajay P. Deshmukh  
Registrar  
Sant Gadge Baba  
Amravati University  
Amravati-444602

- © 'या अभ्यासक्रमिकेतील (Prospectus) कोणताही भाग संत गाडगे बाबा अमरावती विद्यापीठाच्या पूर्वानुमती शिवाय कोणासही पुनर्मुद्रित किंवा प्रकाशित करता येणार नाही.'
- © "No part of this prospectus can be reprinted or published without specific permission of Sant Gadge Baba Amravati University"

## Criterion – I- Curricular Aspects [QnM – 1.2.1]

### INDEX

#### M.Sc.Part-I & Part-II (Semester I to IV) Examinations in Botany (Prospectus No.2017126)

| Sr.No.     | Paper  | Page Nos. |
|------------|--|-----------|
| 1.         | Special Note   | 1         |
| 2.         | Ordinance No.4 of 2008   | 3         |
| 3.         | Direction No.14 of 2009  | 12        |
| 4.         | Direction No.26 of 2010  | 14        |
| 5.         | Direction No.27 of 2010  | 37        |
| 6.         | Direction No.39 of 2011  | 40        |
| 7.         | Direction No.25 of 2012  | 43        |
| 8.         | Direction No.07 of 2014  | 46        |
| 9.         | Direction No.08 of 2014  | 47        |
| <b>10.</b> | <b>M.Sc. Part-I Semester I</b>   |           |
|            | I : Cell Biology, Cytology and Genetics                                  | 1         |
|            | II : Resource Utilization and Conservation                               | 4         |
|            | III: Biology and Diversity of Algae and Bryophytes                       | 9         |
|            | IV: Plant Development and Reproduction                                   | 11        |
| <b>11.</b> | <b>M.Sc. Part-I Semester-II :</b>  |           |
|            | V: Cytogenetics and Molecular Biology                                    | 15        |
|            | VI: Biology and Diversity of Microbes and Fungi                          | 18        |
|            | VII: Plant Physiology  | 22        |
|            | VIII: Plant Metabolism.  | 25        |
| <b>12.</b> | <b>M.Sc. Part-II Semester-III :</b>                                      |           |
|            | IX: Biology and Diversity of Pteridophytes and Gymnosperms.              | 27        |
|            | X : TAXONOMY OF ANGIOSPERMS.   | 31        |
|            | XI : PLANT TISSUE CULTURE-I  | 32        |
|            | XII: Plant Tissue Cultur-II (Elective)                                   | 33        |
|            | XI: Bioinformatics-I (Elective)  | 36        |
|            | XII : Bioinformatics II (Elective )                                      | 37        |
|            | XI: Angiosperm Taxonomy, Phytochemistry and Pharmacognosy-I (Elective)   | 45        |
|            | XII: Angiosperm Taxonomy, Phytochemistry and Pharmacognosy-II (Elective) | 45        |
|            | XI: Advanced Plant Physiology and Biochemistry-I (Elective )             | 48        |
|            | XII: Advanced Plant Physiology and Biochemistry-II (Elective)            | 49        |
|            | XI: Molecular Biology, Biotechnology and Plant Breeding-I (Elective)     | 54        |
|            | XII: Molecular Biology, Biotechnology and Plant Breeding-II (Elective)   | 55        |
|            | XI: Palaeobotany (Evolutionary Botany)-I (Elective)                      | 60        |
|            | XII: Palaeobotany (Evolutionary Botany)-II (Elective )                   | 61        |
|            | XI: Reproductive Biology of Angiosperms-I (Elective)                     | 65        |
|            | XII: Reproductive Biology of Angiosperms-II (Elective)                   | 65        |
|            | XI: Applied Mycology-I (Elective)  | 71        |
|            | XII: Plant Pathology-II (Elective )                                      | 71        |
| <b>13.</b> | <b>M.Sc. Part-II Semester-IV :</b>                                       |           |
|            | XIII: Plant Ecology  | 76        |
|            | XIV: Environmental Ecology   | 80        |
|            | XV : Plant Biotechnology   | 83        |
|            | XVI: Genetic Engineering   | 86        |

## Criterion – I- Curricular Aspects [QnM – 1.2.1]

1

### SANT GADGE BABA AMRAVATI UNIVERSITY SPECIAL NOTE FOR INFORMATION OF THE STUDENTS

- (1) Notwithstanding anything to the contrary, it is notified for general information and guidance of all concerned that a person, who has passed the qualifying examination and is eligible for admission only to the corresponding next higher examination as an ex-student or an external candidate, shall be examined in accordance with the syllabus of such next higher examination in force at the time of such examination in such subjects papers or combination of papers in which students from University Departments or Colleges are to be examined by the University.
- (2) Be it known to all the students desirous to take examination/s for which this prospectus has been prescribed should, if found necessary for any other information regarding examinations etc., refer the University Ordinance Booklet the various conditions/provisions pertaining to examination as prescribed in the following Ordinances.

Ordinance No. 1 : Enrolment of Students.

Ordinance No. 2 : Admission of Students

Ordinance No. 4 : National cadet corps

Ordinance No. 6 : Examinations in General (relevant extracts)

Ordinance No. 18/2001 : An Ordinance to provide grace marks for passing in a Head of passing and Improvement of Division (Higher Class) and getting Distinction in the subject and condonation of deficiency of marks in a subject in all the faculties prescribed by the Statute NO.18, Ordinance 2001.

Ordinance No. 9 : Conduct of Examinations (relevant extracts)

Ordinance No. 10 : Providing for Exemptions and Compartments

Ordinance No. 19 : Admission of Candidates to Degrees.

Ordinance No. 109 : Recording of a change of name of a University student in the records of the University.

2

Ordinance No.19/2001 : An Ordinance for Central Assessment Programme, Scheme of Evaluation and Moderation of answerbooks and preparation of results of the examinations, conducted by the University, Ordinance 2001.

**Dr. Ajay P. Deshmukh**  
Registrar  
Sant Gadge Baba Amravati University.

### PATTERN OF QUESTION PAPER ON THE UNIT SYSTEM.

The pattern of question paper as per unit system will be broadly based on the following pattern

- (1) Syllabus has been divided into units equal to the number of question to be answered in the paper. On each unit there will be a question either a long answer type or a short answer type.
- (2) Number of question will be in accordance with the unit prescribed in the syllabi for each paper i.e. there will be one question on each unit.
- (3) For every question long answer type or short answer type there will be an alternative choice from the same unit. However, there will be no internal choice in a question.
- (4) Division of marks between long answer and short answer type question will be in the ratio of 40 and 60
- (5) Each short answer type question shall contain 4 to 8 short sub question with no internal choice.



## Criterion – I- Curricular Aspects [QnM – 1.2.1]

3

### %ORDINANCE NO. 4 of 2008

#### Examinations leading to the Degree of विज्ञान पारंगत (Master of Science)(Four Semesters Degree Course), Ordinance, 2008.

Whereas it is expedient to provide an Ordinance regarding Examinations leading to the Degree of विज्ञान पारंगत (Master of Science) (Four Semesters Degree Course), in the faculty of Science. The Management Council is hereby pleased to make the following Ordinance.

1. This Ordinance may be Called, "Examinations leading to the Degree of विज्ञान पारंगत (Master of Science) (Four Semesters Degree Course), Ordinance, 2008".
2. This Ordinance shall come into force w.e.f. the date of its approval by the Management Council.
3. The duration of the course shall be two academic years,
  - (a) M.Sc. Course is divided into Semester-I, Semester-II, Semester-III & Semester-IV.
  - (b) University shall hold examinations in Winter and in Summer every year for all semesters.
  - (c) The main examination of odd semesters shall be held in Winter and the main examination of even semesters shall be held in Summer every year. The supplementary examination for odd semesters shall be held in Summer and the supplementary examination for even semesters shall be held in Winter every year.
4. The period of Academic Session/Term shall be such as may be notified by the University and the Examination shall be held at such places and on such dates as may be fixed by the Board of Examinations.
5. Subject to their compliance with the provisions of this Ordinance and of other Ordinances in force from time to time, the following persons shall be eligible for admission to the examinations, namely:-
  - (A) For विज्ञान पारंगत भाग-१ प्रथम सत्र M.Sc.Part-I:-
    - (a) A collegiate candidate admitted to the Degree of Bachelor of Science who has prosecuted a regular course of study in a college or a University Department.
    - (b) a teacher admitted to the Degree of Bachelor of Science and eligible under Ordinance No. 18;
    - (c) a woman candidate admitted to the Degree of Bachelor of Science, who has not pursued a course of study in the University or a College;

% As approved by Management Council on dated 30.5.2008, Vide Item No. 196, and latest amended vide Ordinance No. 14 of 2009 (M.C. dated 25.5.09)

4

Provided that, applicants eligible under clauses (b) and (c) above shall, if laboratory work is prescribed in the subject which they offer for examination, attend the full course of laboratory instruction in the University Department or a College or a recognised Institution imparting instruction upto the standard of the examination;

Provided further, that in the case of applicants under clauses (b) and (c) above, not less than one academic year shall have elapsed since the date of their passing the examination for the Degree of विज्ञान स्नातक (Bachelor of Science);

- (d) Candidate who has passed B.Sc. Examination of Sant Gadge Baba Amravati University with Chemistry as one of the optional subjects and has also passed the Diploma of Associateship of Institution of Chemists (India) Calcutta and is working as Jr/Sr. Laboratory Asstt. in National Environmental Engineering Research Institute, Nagpur (NEERI) or Council of Scientific and Industrial Research (CSIR), Nagpur or Indian Bureau of Mines (IBM) will be eligible to appear at M.Sc. Semester-I in Chemistry only, without prosecuting a regular course of study in a College/ Department in the University.

Provided he produces certificate of completion of practical course prescribed for M.Sc. Part-I (Semester-I & Semester-II) Examination in Chemistry from his employer.

- (e) any other graduate in Science not eligible under clause (a) (b) or (c) above, shall be eligible for admission to the examination in Mathematics only, after a lapse of not less than one academic year since the date of his passing the examination for the Degree of विज्ञान स्नातक (Bachelor of Science);
- (f) an applicant holding the भेषजी स्नातक (B.Pharm) or the विज्ञान स्नातक कृषी (B.Sc.Aagri.) Degree shall be eligible for admission to the विज्ञान पारंगत (M.Sc.) Course in Biochemistry only;  
(Note: The विज्ञान स्नातक (B.Sc.) Degree referred to in clause (a) above, shall include the विज्ञान स्नातक (B.Sc.) Degree of the University or an equivalent Degree of any other Statutory University)

## Criterion – I- Curricular Aspects [QnM – 1.2.1]

| 5   | 6   |
|---|---|
| <p>(g) an applicant holding the B.Sc. (Ind.Chem.) Degree of the Banaras Hindu University;</p>   | <p>(l) for admission to (M.Sc.) Petrochemical Science, a candidate shall have offered Petrochemical Science subject to study and examination at the B.Sc. Degree.</p>   |
| <p>(h) an applicant holding B.A./B.Sc. with Mathematics/ Statistics or Bachelor of Computer Science Degree for admission to M.Sc. Course in Statistics or Mathematics ;</p>   | <p>(m) i) for admission to M.Sc. Part-I (Environmental Science) a candidate shall have offered one of the optional subject as Environmental Science or Botany or Zoology or Life Sciences or Microbiology or Biochemistry or Biotechnology at B.Sc. degree,</p>   |
| <p>(i) i) for admission to M.Sc. Microbiology a candidate shall have offered Microbiology or Industrial Microbiology or Biochemistry as a subject of study and examination at the B.Sc. degree.</p>   | <p>ii) Sixty percent seats of the total intake shall be reserved for students who have passed B.Sc. with Environmental Science. If students having Environmental Science as an optional subject are not available then students having other optional subjects be considered.</p>   |
| <p>ii) for admission to M.Sc. Biochemistry a candidate shall have offered Microbiology or Industrial Microbiology or Biochemistry as a subject of study and examination at the B.Sc. degree.</p>  | <p>(n) for admission to M.Sc. Geoinformatics or Remote Sensing and GIS, a candidate shall have passed B.Sc. in any discipline of Life Sciences. Preference shall be given to graduates having offered Geology at undergraduate level.</p>   |
| <p>For admission to M.Sc. Biochemistry, in case of vacancies, a students offering Chemistry alongwith Biological Science shall be admitted.</p>   | <p>(o) for admission to M.Sc. Bioinformatics a candidate shall have passed B.Sc. in any discipline of Life Sciences, Bio Sciences or Bachelor Degree in Agriculture, Veterinary and Fishery Sciences, Pharmacy, or Medical Sciences - Bachelor of Medicine and Bachelor of Surgery, Bachelor of Dental Surgery, B.A.M.S., B.H.M.S. or any equivalent examination recognised by Sant Gadge Baba Amravati University.</p> |
| <p>(j) i) for admission to M.Sc. Electronics (Instrumentation) a candidate shall have offered Physics or Electronics (Instrumentation) or Electronics or Electronics Science or Computer Maintenance as subjects of study and examination at the B.Sc. level and B.C.S. degree of this University or any other equivalent Degree of Statutory University.</p>   | <p>(B) For विज्ञान पारंगत भाग-२ (M.Sc. Part-II) Examination:-</p>   |
| <p>ii) a person passing B.E. (Electronics &amp; Telecommunication or Industrial Electronics) Examination of Sant Gadge Baba Amravati University is eligible to take admission directly at second year of M.Sc. Electronics (Instrumentation). Such a student who is admitted to second year of M.Sc. Electronics (Instrumentation) shall be awarded M.Sc. degree on the basis of his performance at M.Sc. Part-II only.</p> | <p>(a) a student who has been admitted to the Degree of विज्ञान स्नातक (Bachelor of Science) and who has since passing the M.Sc. Part-I (Semester-I &amp; II) Examinations, prosecuted a regular course of study for not less than one academic year in the University or in the College in the subject in which he offers himself for the M.Sc. Part-II Examinations;</p>  |
| <p>(k) for admission to (M.Sc.) Geography a candidate shall have offered Geography as a subject to study and examination at the B.Sc. Degree.</p>   | <p>(b) a teacher admitted to the Degree of विज्ञान स्नातक (Bachelor of Science) and eligible under Ordinance</p>  |

## Criterion – I- Curricular Aspects [QnM – 1.2.1]

| 7   | 8  |  |  |  |                           |  |                           |                            |  |                                |                              |            |                              |                             |            |                                   |
|---|--|--|--|--|---------------------------|--|---------------------------|----------------------------|--|--------------------------------|------------------------------|------------|------------------------------|-----------------------------|------------|-----------------------------------|
| <p>No. 18 and who has not less than one academic year previously, passed the M.Sc. Part-I Examination in the subject in which he offers himself for M.Sc. Part-II Examinations;</p> <p>(c) a woman candidate admitted for the Degree of विज्ञान स्नातक (Bachelor of Science) and who has not less than one academic year previously, passed the M.Sc. Part-I Examination in that subject in which she offers herself for the M.Sc. Part-II Examinations;</p> <p>(d) a candidate who has been admitted under Para 3 (A) (d) above and who has not less than one academic year previously, passed M.Sc. Part-I Examination in the subject Chemistry in which he offers himself for the M.Sc. Part-II Examination.</p> <p>Provided he produces a certificate of completing of practical course prescribed for M.Sc. Part-II Examination in Chemistry from his employer;</p> <p>(e) any other Graduate in Science not eligible under clause (a) (b) or (c) who has not less than one academic year previously, passed the M.Sc. Part-I (Semester-I &amp; Semester-II) Examinations in the subject which he offers himself for the Part-II Examination;</p> <p>6. Subject to his / her compliance with the provisions of this Ordinance and other Ordinances (Pertaining to Examination in General) in force from time to time, the applicant for admission, at the end of the course of study of a particular term shall be eligible to appear at it, if,</p> <p>(i) He / She satisfied the conditions in the table and the provisions thereunder.</p> <p>(ii) He / She has prosecuted a regular course of study in the university / college affiliated to the university.</p> <p>(iii) He / She has in the opinion of the Head of the Department / Principal shown satisfactory progress in his / her study.</p> | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Name of Exam.</th> <th style="width: 30%;">The student should have passed the Examination of satisfactory</th> <th style="width: 40%;">The student should have completed the session/semester</th> </tr> </thead> <tbody> <tr> <td>M.Sc. Part-I (Semester-I)</td> <td>The qualifying examination mentioned in para 5</td> <td>M.Sc. Part-I (Semester-I)</td> </tr> <tr> <td>M.Sc. Part-I (Semester-II)</td> <td></td> <td>M.Sc. Part-I (Semester-I &amp; II)</td> </tr> <tr> <td>M.Sc. Part-II (Semester-III)</td> <td>Semester-I</td> <td>M.Sc. Part-II (Semester-III)</td> </tr> <tr> <td>M.Sc. Part-II (Semester-IV)</td> <td>Semester-I</td> <td>M.Sc. Part-II (Semester-III &amp; IV)</td> </tr> </tbody> </table> <p>7. Without prejudice to the provisions of Ordinance No. 6 relating to the Examinations in General, the provisions of Paragraphs 8, 10, and 31 of the said Ordinance shall apply to every collegiate candidate.</p> <p>8. The fee for each Semester Examination shall be as prescribed by the University time to time.</p> <p>Provided that a non-collegiate candidate, other than an ex-student shall also pay a registration fee as prescribed by the University time to time.</p> <p>9. Every candidate for admission to the examination shall offer one of the following subjects for his examination, namely-</p> <ol style="list-style-type: none"> <li>(1) Mathematics,</li> <li>(2) Physics,</li> <li>(3) Chemistry,</li> <li>(4) Botany,</li> <li>(5) Zoology,</li> <li>(6) Geology,</li> <li>(7) Statistics,</li> <li>(8) Biochemistry,</li> <li>(9) Microbiology,</li> <li>(10) Electronics (Instrumentation),</li> <li>(11) Geography,</li> <li>(12) Geoinformatics,</li> <li>(13) Remote Sensing &amp; GIS,</li> <li>(14) Environmental Science, and</li> <li>(15) Bioinformatics.</li> </ol> | Name of Exam.  | The student should have passed the Examination of satisfactory | The student should have completed the session/semester | M.Sc. Part-I (Semester-I) | The qualifying examination mentioned in para 5 | M.Sc. Part-I (Semester-I) | M.Sc. Part-I (Semester-II) |  | M.Sc. Part-I (Semester-I & II) | M.Sc. Part-II (Semester-III) | Semester-I | M.Sc. Part-II (Semester-III) | M.Sc. Part-II (Semester-IV) | Semester-I | M.Sc. Part-II (Semester-III & IV) |
| Name of Exam.   | The student should have passed the Examination of satisfactory   | The student should have completed the session/semester |  |  |                           |  |                           |                            |  |                                |                              |            |                              |                             |            |                                   |
| M.Sc. Part-I (Semester-I)   | The qualifying examination mentioned in para 5   | M.Sc. Part-I (Semester-I)                              |  |  |                           |  |                           |                            |  |                                |                              |            |                              |                             |            |                                   |
| M.Sc. Part-I (Semester-II)  |  | M.Sc. Part-I (Semester-I & II)                         |  |  |                           |  |                           |                            |  |                                |                              |            |                              |                             |            |                                   |
| M.Sc. Part-II (Semester-III)  | Semester-I   | M.Sc. Part-II (Semester-III)                           |  |  |                           |  |                           |                            |  |                                |                              |            |                              |                             |            |                                   |
| M.Sc. Part-II (Semester-IV)   | Semester-I   | M.Sc. Part-II (Semester-III & IV)                      |  |  |                           |  |                           |                            |  |                                |                              |            |                              |                             |            |                                   |



## Criterion – I- Curricular Aspects [QnM – 1.2.1]

9

Provided firstly, that an examinee who has passed Part-II Examination in one of the subjects listed above from 1 to 15 and is desirous of appearing.

- (a) in any other subject, or
- (b) in a new paper or a combination of papers in the subject in which he has passed, may, without prosecuting a regular course of study present himself in any subsequent academic year for Part-I of the Examination in that other subject or that new paper or new combination of papers, and after not less than one academic year after passing the said Part-I Examination, for Part-II Examination in the said new paper or the said new combination of papers.

Provided secondly, that a candidate eligible for appearing at an examination under the first proviso shall, in the subject or a new paper or the new combination of papers which he is offering for the examination, attend the full course of practical Training, wherever such training is prescribed in the University Department or a College or a recognised Institution imparting instruction upon the standard of the Examination.

Provided thirdly, that an examination successful under clause (b) of the first proviso shall not be awarded division nor shall he be eligible for any scholarship, medal or prize of the University.

10. An examinee at the M.Sc. Part-I or the M.Sc. Part-II Examination shall have the option of not being declared successful at the examination in case he does not secure a minimum of Second Division marks /Higher Second Division marks fifty five percent marks (55%) at the Examination. The option will have to be exercised everytime an application is submitted to any of the three examinations and shall be on the proforma printed on the application form itself. Once exercised the option shall be binding upon the examinee, and shall not be revoked under any circumstances.
11. Any person who has obtained a Third Division at the M.Sc. Examination of this University shall be eligible to take the examination again under this Ordinance in the same subject or group of subjects as the case may be for improving his division. In such a case the provisions of Ordinance No.138 relating to Improvement of Division shall apply.
12.
  - (1) The scope of the subject shall be as indicated in the syllabus.
  - (2) The medium of instruction and examination shall be English.
13. The number of papers and marks allotted to each subject and the minimum marks which an examinee must obtain in order to pass the examination shall be as indicated in Appendix- 'A'

10

14. Examinees who are successful in the M.Sc. Semester-I, II, III & IV Examination and have obtained not less than 60% marks in the aggregate of the M.Sc. Semester-I, II, III & IV Examinations taken together shall be placed in the First Division, those obtained less than 60% but not less than 55% marks, in the Higher Second Division, those obtained less than 55% but not less than 48% marks, in the Second Division, and all other successful examinees, in the Third Division.
15. Provision of Ordinance No. 18 of 2001 relating to the an Ordinance to provide grace marks for passing in a Head of passing and improvement of division (higher class) and getting distinction in the subject and Condonation of Deficiency of Marks in a subject in all the faculty prescribed by the Statute No.18, Ordinance, 2001, shall apply to the examinations under this ordinance.
16. As soon as possible after the examination, but not later than 30th, June next following, the Management Council shall publish a list of successful examinees arranged in Three Divisions. The names of examinees passing the examination as a whole in the minimum prescribed period and obtaining the prescribed number of places in each subject in the First or Second Division, shall be arranged in Order of Merit as provided in the Examinations in General Ordinance No.6.
17. Save as provided in Paragraph 11 of this ordinance, no person shall be admitted to an examination under this ordinance, if he has already passed the same examination of this University or an equivalent examination in M.Sc. Part-I (Semester-I & II), and M.Sc. Part-II (Semester-III & IV) of any other Statutory University.
18. Examinees successful at the M.Sc. Part-I (Semester-I & II), and M.Sc. Part-II (Semester-III & IV) shall on payment of the prescribed fees, be entitled for the award of the respective Degree in the prescribed form, signed by the Vice-Chancellor.

\*\*\*\*\*

(Note : - " P.G Workload in the faculty shall be as per Ordinance No. 131.")



# Criterion – I- Curricular Aspects [QnM – 1.2.1]

## Direction 24.06.2010

| 11  |            |            |                     | 12   |   |     |  |
|---|------------|------------|---------------------|--|---|-----|--|
| APPENDIX-A  |            |            |                     | DIRECTION  |   |     |  |
| SCHEME OF EXAMINATION FOR M.Sc. PART-I & II.  |            |            |                     | No. : 14 / 2009 Date : 29.6.2009   |   |     |  |
| (FOR ALL SUBJECTS)  |            |            |                     | Subject : Examinations leading to the Degree of विज्ञान पारंगत (Master of Science) (Four Semester Degree Course), Direction, 2009. |   |     |  |
| i) M.Sc. Part-I   | Paper-I    | - 50 Marks | Practical-I         | - 40 Marks   | Whereas, Ordinance No.4 of 2008 in respect of Examinations leading to the Degree of विज्ञान पारंगत (Master of Science) (Four Semester Degree Course) Ordinance, 2008 is in existence in the University.   | AND |  |
| Semester-I  | Paper-II   | - 50 Marks | Internal Assessment | - 10 Marks   | Whereas, the Board of Studies in Computer Science (including Computer Application and Computer Science (Computer Software)) in the faculty of Science in its meeting held on 5.6.2009 has resolved to accept revised syllabi of M.Sc. Semester-I to IV Computer Software, eligibility criteria and other details.             | AND |  |
|   | Paper-III  | - 50 Marks | Practical-II        | - 40 Marks   | Whereas, the Board of Studies further recommended that the scheme of examination will be applicable as per Ordinance No.4 of 2008 to M.Sc. Computer Software, as it is, and the revised syllabi shall be implemented from the academic session 2009-10 expeditiously in the light of advancement of knowledge in the subject. | AND |  |
|   | Paper-IV   | - 50 Marks | Internal Assessment | - 10 Marks   | Whereas the Hon'ble Vice-Chancellor has accepted the revised syllabi of M.Sc. Computer Software, Eligibility criteria, Scheme of examinations and other details under section 14(7) of the Maharashtra Universities Act, 1994 on behalf of the faculty of Science and Academic Council.                                       | AND |  |
| M.Sc. Part-I  | Paper-V    | - 50 Marks | Practical-III       | - 40 Marks   | Whereas, Original Ordinance No.4 of 2008 is required to be amended for inclusion of the above said course.  | AND |  |
| Semester-II   | Paper-VI   | - 50 Marks | Internal Assessment | - 10 Marks   | Whereas, the matter for the admission to student at the examination of above said course is required to be regulated by an Ordinance, and making amendments in Ordinance is time consuming process.   | AND |  |
|   | Paper-VII  | - 50 Marks | Practical-IV        | - 40 Marks   |   | AND |  |
|   | Paper-VIII | - 50 Marks | Internal Assessment | - 10 Marks   |   | AND |  |
| M.Sc. Part-II   | Paper-IX   | - 50 Marks | Practical-V         | - 40 Marks   |   | AND |  |
| Semester-III  | Paper-X    | - 50 Marks | Internal Assessment | - 10 Marks   |   | AND |  |
|   | Paper-XI   | - 50 Marks | Practical-VI        | - 40 Marks   |   | AND |  |
|   | Paper-XII  | - 50 Marks | Internal Assessment | - 10 Marks   |   | AND |  |
| M.Sc. Part-II   | Paper-XIII | - 50 Marks | Practical-VII       | - 40 Marks   |   | AND |  |
| Semester-IV   | Paper-XIV  | - 50 Marks | Internal Assessment | - 10 Marks   |   | AND |  |
|   | Paper-XV   | - 50 Marks | Project Work        | - 40 Marks   |   | AND |  |
|   | Paper-XVI  | - 50 Marks | Internal Assessment | - 10 Marks   |   | AND |  |
| ii) For the subject Mathematics, there shall be five theory papers of sixty marks for each semester.  |            |            |                     |  |   |     |  |
| <b>Notes:-</b> (1) Minimum pass marks for theory and practical examination including internal assessment shall be 36% separately.   |            |            |                     |  |   |     |  |
| (2) (a) Topic of project work shall be given by concerned supervisor with prior approval of Head of Department.   |            |            |                     |  |   |     |  |
| There shall be no duplication of the topic of the project work. Project shall be based on research in the laboratory and / or field work. Project work shall be allotted at the beginning of third semester and the student shall have to submit it atleast 15 days before commencement of practical examination of the fourth semester. Project work will be evaluated by external and internal examiners. |            |            |                     |  |   |     |  |
| (b) There should be atleast 2 to 3 external examiner for a batch of 10 students or 3 to 5 external examiner for a batch more than 10 students.  |            |            |                     |  |   |     |  |
| (3) There shall be separate exemption in theory and / or practical on getting minimum pass marks.   |            |            |                     |  |   |     |  |
| (4) Internal Assessment marks for all semesters shall be granted on the basis of - performance of students in any of the following activities:-<br>(i) Study tour, (ii) Seminar, (iii) field visits, (iv) Industrial visits, (v) visit to research institute / organisation.<br>(vi) Assignments, (vii) Unit test and any other co-curricular activities.   |            |            |                     |  |   |     |  |
| (5) The concerned Department or College shall have to maintain the record of award of internal assessment marks.  |            |            |                     |  |   |     |  |
| *****   |            |            |                     |  |   |     |  |

## Criterion – I- Curricular Aspects [QnM – 1.2.1]

13

Now, therefore, I, Dr. Kamal Singh, Vice Chancellor of Sant Gadge Baba Amravati University, in exercise of powers conferred upon me under subsection (8) of section 14 of the Maharashtra Universities Act, 1994, do hereby direct as under:

1. This Direction may be called "Examinations leading to the Degree of विज्ञान पारंगत (Master of Science) (Four Semester Degree Course), Direction, 2009".

2. This direction shall come into force from the date of its issuance.

3. Eligibility criteria for admission to M.Sc. Computer Software shall be as given below.

"A person who has passed the Degree of Bachelor of Science with Computer Science/Vocational Computer Application Subjects

OR

A person who has passed the Degree of Bachelor of Science with Post Graduate Diploma in Computer Science of this University

OR

An Examination Recognised as an equivalent of this University or of any other statutory University."

4. The Scheme of Examination for M.Sc. Computer Software shall be as per Ordinance No.4 of 2008 as other Science subjects, as it is.

Amravati  
Date : 29/6/2009

Sd/  
(Dr.Kamal Singh)  
Vice-Chancellor

\*\*\*\*\*

14

### DIRECTION

No. : 26 / 2010

Date : 24/06/2010

**Subject : Scheme for Choice Based Credit System (CBCS) and Awarding Grades to the Post Graduate Students in the Faculty of Science, Direction, 2010.**

Whereas, University Grants Commission, New Delhi vide D.O.No.F-2/2008(XI Plan), Dtd.31 Jan.2008 regarding new initiatives under the 11<sup>th</sup> Plan – Academic Reforms in the University has suggested for improving quality of higher education and to initiate the Academic Reform at the earliest.

AND

Whereas, the Academic Council while considering the above letter in its meeting held on 30.4.2008, vide item No.55 has resolved to refer the same to Dean's Committee, and the Dean's Committee in its meeting held on 19.07.2008 has decided to refer the matter to all Board of Studies.

AND

Whereas, the recommendations of various Board of Studies in the faculty of Science regarding Upgradation and Revision of various syllabi and introduction of choice based credit pattern Examination System at post graduate level was considered by the faculty of Science in its meeting held on 7.12.2009 and constituted a Committee of all Chairmen of Board of Studies and one member nominated by Chairmen of respective B.O.S. under the Chairmanship of Dean of faculty to decide the policy decision regarding choice based credit system examination pattern at P.G. level.

AND

Whereas, the faculty of Science in its emergent meeting held on 11<sup>th</sup> May, 2010 vide item No.27, has considered, accepted and recommended to Academic Council, the policy decision regarding introduction of Scheme for Choice Based Credit System (CBCS) and Awarding Grades to the Post Graduate Students in the Faculty of Science under ordinance No.4 of 2008. The recommendations of the faculty was approved by the Academic Council in its emergent meeting held on 28.5.2010, vide item No.36.

AND

Whereas, Ordinance No.4 of 2008 in respect of Examinations leading to the Degree of विज्ञान स्नातक (Bachelor of Science) is in existence in the University as per semester pattern examination system.



## Criterion – I- Curricular Aspects [QnM – 1.2.1]

15

Whereas, it is necessary to frame the Regulation regarding the Scheme for Choice Based Credit System (CBCS) and Awarding Grades to the Post Graduate Students in the Faculty of Science which is to be implemented from the Academic Session 2010-11 of M.Sc.Semester-I & onwards to all subjects in the faculty of Science and framing of Regulation for the above examination is likely to take some time.

AND

Whereas, the admission of students in the above pattern at M.Sc. Part-I (Semester-I) of all subjects in the faculty of Science are to be made in the Academic Session 2010-11.

Now, therefore, I, Dr. Kamal Singh, Vice Chancellor of Sant Gadge Baba Amravati University, in exercise of powers conferred upon me under sub-section (8) of section 14 of the Maharashtra Universities Act., 1994, do hereby direct as under:

1. This Direction may be called "Scheme for Choice Based Credit System (CBCS) and Awarding Grades to the Post Graduate Students in the Faculty of Science, Direction, 2010.
2. This Direction shall come into force with effect from the examination as shown below for all subjects for the Examinations leading to the Degree of Master of Science in the faculty of Science-
  - (i) Winter 2010 examination for M.Sc. Part-I, Semester-I,
  - (ii) Summer-2011 examination for M.Sc. Part-I, Semester-II,
  - (iii) Winter-2011 examination for M.Sc. Part-II, Semester-III,
  - (iv) Summer-2012 examination for M.Sc. Part-II, Semester-IV.
3. The detailed Scheme for Choice Based Credit System (CBCS) and Awarding Grades to the Post Graduate students in the Faculty of Science is as given below-

### I. The CBCS System

All Programmes (named after the Core subject) mentioned in para 9 of Ordinance No.4 of 2008 shall be run on Choice Based Credit System (CBCS) and the grades in 7 point scale will be awarded to the students. It is an instructional package developed to suit the needs of students to keep pace with the developments in higher education and the quality assurance expected of it in the light of liberalization and globalization in higher education.

### II. Credits and Degrees

- i) A candidate who has successfully completed all the core courses Compulsory, Elective/ Specialised courses and project prescribed and optional approved by the University for the programme

16

and accumulated not less than 72 (52 core and elective) Credits and who has put in the minimum residence time shall be eligible to receive the degree.

- ii) One Credit shall mean one teaching period per week for one semester (of 16 weeks) for theory courses and one laboratory session of two periods / week for one semester. One teaching period shall be of 60 minutes duration including 10 minutes for discussion / movement.

### III. Courses

- (i) **Core Course** :- A core course is a course that a student admitted to a particular programme must successfully complete to receive the degree. There may be two kinds of core courses: The **hard-core** courses which cannot be substituted by any other course and which must be successfully completed and **soft-core** courses which may be substituted by equivalent courses from the same department. In all P.G. programmes a project with 03 credits shall be included. The project may include a viva-voce examination with a credit of 1, Normally no theory course shall have more than 4 credits.
- (ii) **Elective Course** : Means an optional course from the basic subject or specialization.

The core credits for any P.G. programme (inclusive of hard-core, soft-core and project) shall not exceed 60 credits and shall not be less than 48 credits. Each Board of Studies shall specify the core-credit load for their respective programme apart from approving syllabi, for all the courses offered by the department.

### (iii) General Interest Course (GIC)

The General Interest Course shall be the choice of student. The student who chooses the GIC shall have to register for it on payment of fees as prescribed by the University.

The Departmental Committee shall follow a selection procedure on a first come first served basis, fixing the maximum number of students, after counselling to the students etc. to avoid overcrowding to particular course(s) at the expense of some other courses.

- (iv) Each **Course** is designed such that it includes lectures / tutorials / laboratory or field work / Seminar / Practical training / Assignments / Term paper / Report writing or review of literature and any other innovative practice etc., to meet effective teaching and learning needs.

## Criterion – I- Curricular Aspects [QnM – 1.2.1]

17

- (v) **Attendance** :- Students must have 75% of attendance in each Core and Elective course for appearing the examination. However student having attendance less than 75% may apply to the H.O.D. for condonation of attendance upto 15% under the provision of para 6-A (i) of Ordinance No.6.

#### IV. Registration for General Interest Course :-

- i) Each student, on admission shall be assigned to a faculty advisor who shall advise the student about the academic programme and counsel him on the choice of courses listed in Appendix-Q depending on his general interest, academic background and objective.
- ii) With the advice and consent of the faculty advisor the student shall register for courses he plans to take for the semester before classes start. No student shall be permitted to register for courses exceeding 30 credits per semester including those of repeat courses nor shall any student be permitted to register for any course without satisfactorily completing the prerequisites for the course except with the permission of the concerned teacher in the prescribed format.
- iii) If the student feels he has registered for more courses than he can handle, he shall have the option of dropping one or more of the courses he has registered for, with the consent of his advisor before the end of 3<sup>rd</sup> week of the semester. However, a student, to retain his status, should have registered at least for core course and elective course of that semester.
- iv) Students, other than those freshly admitted, shall register for the courses of their choice in the preceding semester by filling in the prescribed forms.
- v) The University shall prescribe the maximum number of students in each General Interest Course taking into account the teachers and Physical facilities available in the Department.
- vi) The University may make available to all students a listing of all the courses offered in every semester specifying the credits, the prerequisites, a brief description or list of topics the course intends to cover, the instructor who is giving the courses, the time and place of the classes for the course. This information shall be made available on the University website.
- vii) Normally no course shall be offered unless a minimum of 10 students are registered.

18

- viii) The student shall have to pay the prescribed fee per course for the registration.

#### V. Programme Committee :-

There shall be the programme committee at the University level constituted as under-

- i) Dean of the faculty (Chairman)
- ii) Heads of all the Departments – (Member)
- iii) Three teachers from the affiliated colleges having post graduate courses other than University Department – nominated by the Vice-Chancellor. (Member)
- iv) Deputy Registrar (Acad) – (Secretary)

#### Duties and responsibilities of the Programme Committee shall be as under-

- i) To identify the General Interest Courses (GIC) as per the need of the student and availability of teachers in the Departments.
- ii) To approve the time table of GIC and make it available to the students before the commencement of respective semester. This time table also be made available on the University website.
- iii) To consider and approve the report of grievance redressal committee.
- iv) To remove the difficulties if any faced during implementation of the CBCS and report it to Hon'ble Vice-Chancellor for further action.
- v) Any other matter as it think fit for the effective implementation of CBCS.

#### VI. Departmental Committee

1. Every P.G. programme of the University/College shall be monitored by a committee constituted for this purpose by the Department.

The Committee shall consist of H.O.D. as a Chairman and all the teachers of the Deptt. of its members including one student members per class. There shall be atleast one student member on the committee.

#### VII. Grievances Redressal Committee

The University or College shall form a Grievance Redressal Committee for each course in each department with the Course Teacher and the HOD. This Committee shall solve all grievances relating to the Internal Assessment marks of the students.



## Criterion – I- Curricular Aspects [QnM – 1.2.1]

19

### VIII. Total credits per semester :-

**Table-I**

**For all subjects other than Mathematics,  
Biotechnology & Computer Science**

| Course       | Credits   |                 |                 |                 | Total      |
|--------------|-----------|-----------------|-----------------|-----------------|------------|
|              | Sem-I     | Sem-II          | Sem-III         | Sem-IV          |            |
| Core         | 12        | 12              | 12              | 12              | 48         |
| Elective     | 04        | 04              | 04              | 04              | 16         |
| GIC          | 00        | 04              | 04              | 04              | 12         |
| Lab. Course  | 06        | 06              | 06              | 03              | 21         |
| I.A.         | 04        | 04              | 04              | 04              | 16         |
| Project      | 00        | 00              | 00              | 03              | 03         |
| <b>Total</b> | <b>26</b> | <b>26 or 30</b> | <b>26 or 30</b> | <b>26 or 30</b> | <b>116</b> |

**Table-II**

**For Mathematics**

| Course              | Credits   |                 |                 |                 | Total      |
|---------------------|-----------|-----------------|-----------------|-----------------|------------|
|                     | Sem-I     | Sem-II          | Sem-III         | Sem-IV          |            |
| Core courses        | 12        | 12              | 12              | 12              | 48         |
| Elective Courses    | 08        | 08              | 08              | 08              | 32         |
| GIC                 | —         | 04              | 04              | 04              | 12         |
| Internal Assessment | 05        | 05              | 05              | 05              | 20         |
| Project             | —         | —               | —               | 04              | 04         |
| <b>Total</b>        | <b>25</b> | <b>25 or 29</b> | <b>25 or 29</b> | <b>25 or 33</b> | <b>116</b> |

**Table-III**

**For Biotechnology**

| Course              | Credits   |           |           |           | Total      |
|---------------------|-----------|-----------|-----------|-----------|------------|
|                     | Sem-I     | Sem-II    | Sem-III   | Sem-IV    |            |
| Core courses        | 16        | 12        | 12        | 08        | 48         |
| Elective Courses    | —         | 9         | —         | 9         | 18         |
| Lab courses         | 24        | 18        | 18        | 12        | 72         |
| Seminar             | —         | 01        | 01        | —         | 02         |
| Project             |           |           |           | 06        | 06         |
| Assignment          |           |           | 02        |           | 02         |
| Internal Assessment |           |           | 02        |           | 02         |
| <b>Total</b>        | <b>40</b> | <b>40</b> | <b>35</b> | <b>35</b> | <b>150</b> |

20

**Table-IV**

**For Computer Science**

| Course       | Credits   |           |           |           | Total      |
|--------------|-----------|-----------|-----------|-----------|------------|
|              | Sem-I     | Sem-II    | Sem-III   | Sem-IV    |            |
| Core         | 25        | 20        | 15        | 10        | 70         |
| Elective     | -         | 05        | 05        | 05        | 15         |
| GIC          | -         | -         | 05        | -         | 05         |
| Lab. Course  | 06        | 06        | 06        | 03        | 22         |
| I.A.         | -         | -         | -         | 02        | 02         |
| Project      | -         | -         | -         | 04/02     | 06         |
| <b>Total</b> | <b>31</b> | <b>31</b> | <b>31</b> | <b>26</b> | <b>119</b> |

### IX. Grade Awards :-

- (i) A seven point rating scale is used for the evaluation of the performance of the student to provide letter grade for each course and overall grade for the Master's Programme. Grade points are based on the total number of marks obtained by him/her in all the heads of examination of the course. These grade points and their equivalent range of marks are shown separately in Table-I. The performance of the student in theory, practical, internal assessment, subjects shall be evaluated in accordance with following Table-I.

**TABLE -I**

| Grade | Range of Marks obtained out of 100 or Equivalent fraction | Grade Points | Remarks<br>(Not to be displayed On transcripts) |
|-------|---|--------------|---|
| O     | 90-100  | 10           | Outstanding                                     |
| A+    | 80-89   | 9            | Excellent                                       |
| A     | 70-79   | 8            | Very Good                                       |
| B+    | 60-69   | 7            | Good  |
| B     | 55-59   | 6            | Fair  |
| C+    | 50-54   | 5            | Average   |
| C     | 40-49   | 4            | Below Average                                   |
| F     | Below 40  | 0            | Fail  |

## Criterion – I- Curricular Aspects [QnM – 1.2.1]

23

- (iv) Every student shall have the right to scrutinize answer scripts of sessional/end-semester examinations and seek clarifications from the teacher regarding evaluation of the scripts immediately thereafter or within 3 days of receiving the evaluated scripts.
- (v) The Department shall display the grade points and grades for the notice of students.
- (vi) The department shall send all records of evaluation, including sessional evaluation, for safekeeping to the Controller of Examinations as soon as all the formalities are over.

### XII. Grade Card

The University shall issue at the beginning of each semester a grade card for the student, containing the grades obtained by the student in the previous semester and his Semester Grade Point Average (SGPA).

The grade card shall list:

- (a) the title of the courses along with code taken by the student
- (b) the credits associated with the course,
- (c) the grade and grade points secured by the student,
- (d) the total credits earned by the student in that semester.
- (e) the SGPA of the student,
- (f) the total credits earned by the students till that semester and
- (g) the CGPA of the student (At the end of the IV<sup>th</sup> Semester)

**XIII.** At the end of the IV<sup>th</sup> semester, the University shall issue the statement of marks to the Students showing details of marks obtained by the student in each Head in each semester along with grade total marks.

### XIV. Power to modify and remove difficulties :-

1. Notwithstanding anything contained in the foregoing, Hon'ble V.C. in consultation with the Dean of the faculty shall have the power to issue directions or orders to remove any difficulty,
2. Nothing in the foregoing may be construed as limiting the power of the University to amend, modify or repeal any all of the above.

Amravati  
Date : 2/6/2010

sd/-  
(Dr.Kamal Singh)  
Vice-Chancellor



24

### Appendix-A

#### Examination Scheme under C.B.C.S. for the subject other than Mathematics, Biotechnology and Computer Science in the faculty of Science

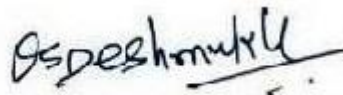
#### M.Sc. Part-I Semester-I

SA-Subject abbreviation; C-Core; E- Elective

| Sr.No. | Paper / Code | Course | Theory               |                                 |                     |                                  | Practical                               |                     |                               |
|--------|--------------|--------|----------------------|---------------------------------|---------------------|----------------------------------|---|---------------------|-------------------------------|
|        |              |        | Max. Marks (Credits) | Min Pass Marks (Min. Grade Pt.) | Int. Ass. (Credits) | Min. Pass Marks (Min. Grade Pt.) | Th+ Int. Ass. Min. Pass Mar (Grade Pt.) | Max. Marks (Credit) | Min. Marks (Min. Grade Point) |
| 1      | 2            | 3      | 4                    | 5                               | 6                   | 7                                | 8                                       | 9                   | 10                            |
| 1      | ISA-1        | C      | 80 (04)              | 32 (04)                         | 20 (01)             | 08 (04)                          | 40 (04)                                 | —                   | —                             |
| 2      | ISA-2        | C      | 80 (04)              | 32 (04)                         | 20 (01)             | 08 (04)                          | 40 (04)                                 | —                   | —                             |
| 3      | ISA-3        | C      | 80 (04)              | 32 (04)                         | 20 (01)             | 08 (04)                          | 40 (04)                                 | —                   | —                             |
| 4      | ISA-4        | E      | 80 (04)              | 32 (04)                         | 20 (01)             | 08 (04)                          | 40 (04)                                 | —                   | —                             |
| 5      | ISA-5        | Lab-I  | —                    | —                               | —                   | —                                | —                                       | 100 (03)            | 40 (04)                       |
| 6      | ISA-6        | Lab-II | —                    | —                               | —                   | —                                | —                                       | 100 (03)            | 40 (04)                       |

Total Marks : 600; Minimum Total Credits : 26

- Note :-** (1) If the student has scored minimum marks or minimum grade points mentioned in Column No.8 out of the sum of total marks of theory and internal assessment taken together then he/she will be declared to have cleared with (04+01) 05 credits.
- (2) If the student has scored minimum marks or minimum grade points in either theory or in internal assessment then he/she will be declared to have cleared in that particular head.

  
**Dr. Omraj S. Deshmukh**  
**Principal**  
**Shri Shivaji Sci. & Arts**  
**College, Chikhli, Dist. Buldana**