

**Ordinances For**

**B. Tech. (Mechanical Engineering)**

## Syllabus and Scheme

**Session 2022-2023**

**(U/S 2(f) and 12B of the UGC Act1956, NAAC Accredited)**

**DESH BHAGAT UNIVERSITY, MANDI GOBINDGARH**

**Faculty of Engineering and Applied Sciences**

### Department of Mechanical Engineering Bachelor of Technology (ME) - Ordinances

1. **Duration of Course:**

The duration of course shall be four academic years consisting of eight (8) semesters i.e. two semesters in each year. In case of admission under lateral entry, the duration of the course shall be three years consisting of six (6) semesters i.e. two semesters in each year. The duration of each semester will be 18-20 weeks with ninety (90) teaching days.

## Maximum period for passing B. Tech. (Mechanical Engineering)

The candidate must pass all the subjects of all the semesters of B. Tech. in eight (8) years. The maximum period to pass the course for lateral entry candidates shall be six (6) years. If the candidate fails to pass all the subjects of the course within stipulated period, his/her registration will be cancelled.

## Eligibility for admission

* 1. **Direct Entry:** A candidate must have passed 10+2 examination with Physics and Mathematics as compulsory subjects with one of the subjects of Chemistry, Biotechnology, Computer Science and Biology from recognized Boards or any other examination recognized as equivalent thereto, with 45% marks. 5% relaxation in marks shall be given to Schedule Caste/ Schedule Tribe or any rural and under privileged candidates.

## Lateral Entry

A candidate must have passed Diploma from a recognized State Board of Technical Education with minimum of 45% marks. 5% relaxation in marks shall be given to Schedule Caste/ Schedule Tribe or any rural and under privileged candidates.

## Medium of Instructions

The medium of instruction during the course and examinations shall be English.

## Examination Schedule, examination fee and examination forms:

* 1. The examination of Odd semesters shall ordinarily be held in the month of December and that of even semesters in the month of May, or on such other dates as may be fixed by the competent authority.
  2. The candidates will be required to pay examination fees as prescribed by the University from time to time.
  3. The Examination Form must reach in the office of the Controller of Examinations as per the schedule notified, from time to time.
  4. The Examination Forms must be countersigned by the Director/Head of the Department along with the following certificate:--
     1. that he/she has been on the rolls of the University Teaching Department during the academic term preceding the end semester examination;
     2. that he/she has attended not less than 75% lectures delivered to that class in each paper and
     3. that he/she has a good moral character.
  5. The shortage in the attendance of lectures of the candidate may be condoned by the Vice-Chancellor, on the recommendations of Head of the Department, as per rules.

## Re-admission

In case name of a student is struck off from the rolls due to non-payment of fee or continued absence from classes in any subject for one month and he/she will be re-admitted after payment of re-admission fee as prescribed by the University from time to time. However, the student will be allowed to appear in the end semester examination of that paper (s) only after attending the required lectures/practicals delivered to that paper(s). However, if a student falls short of attendance in all courses offered in a semester he/she shall be required to repeat the semester, along with the next batch of students.

## Scheme of Examinations

The examination in each semester shall be conducted according to the syllabus prescribed for the semester. The end semester examination for each paper shall be of three hours duration.

## Minimum pass marks

The minimum number of marks required to pass in each semester shall be 40% marks in each in Theory and Practical/Laboratory/Seminar/Viva-Voce paper and in Internal Assessment, separately.

## Grading of performances

* 1. **Letter grades and grade points allocations:-**

Based on the performances, each student shall be awarded a final letter grade at the end of the semester for each course. The letter grades and their corresponding grade points are given hereunder:-

|  |  |  |
| --- | --- | --- |
| **Percentage of marks obtained** | **Letter Grade** | **Grade Point** |
| 91 – 100 | O (Outstanding) | 10 |
| 81 – 90 | A+ (Excellent) | 9 |
| 75 – 80 | A (Very Good) | 8 |
| 71 – 74 | B+ (Good) | 7 |
| 61 – 70 | B (Above average) | 6 |
| 51 – 60 | C (Average) | 5 |
| 40 – 50 | P (Pass) | 4 |
| Less than 40 | F (Fail) | 0 |
| Absent | Ab (Fail) | 0 |

* 1. Grades O, A+, A, B, B+, C and P are pass grades.
  2. A student who fails in any end semester examination shall be assigned a letter grade ‘F’ and a corresponding grade point of zero. A student who remains absent for any end semester examination shall be assigned a letter grade of ‘Ab’ and a corresponding grade point of zero. The student who has scored F &Ab grades should reappear in due course.
  3. **Computation of SGPA and CGPA**

The Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) will be computed as follows:-

1. The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student, i.e

**SGPA** (Si) = Σ(Ci x Gi) / ΣCi

whereCi is the number of credits of the ith course and Gi is the grade point scored by the student in the ith course.

1. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme, i.e.

**CGPA =** Σ(Ci x Si) / Σ Ci

where Si is the SGPA of the ith semester and Ci is the total number of credits in that semester.

1. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.
   1. **Conversion Formula**

Percentage of marks can be calculated as: CGPA X 9.5

1. **Award of Division**

The division shall be awarded on the basis of Letter Grade as follows:

|  |  |
| --- | --- |
| Letter Grade A, A+ and O, provided the candidate must have passed all the Semester Examinations in the first available attempt. | First Division with Distinction |
| Letter Grade B+, A, A+ and O | First Division |
| Letter Grade B | Second Division |
| Letter Grade C and P | Pass |

1. Internal Assessment of failed candidate

The internal assessment award of a candidate who fails in the external examination shall be carried forward to the next Examination, if passed in Internal Assessment.

1. Grace Marks

12.1 The grace marks of 1% of total marks of the semester shall be given to a candidate to his best advantage so as to enable him to pass in one or more written papers, to make up aggregate to pass the examination/paper or for changing the result from FAIL to COMPARTMENT/PASS. If a fraction works out to be half or more, it shall be counted as one mark and fraction less than half shall be ignored

12.2 If a candidate appears in an examination to clear re-appear/compartment paper, the grace marks of 1% will be given only on the total marks of that particular paper.

## 13. Re-evaluation

A candidate who is not satisfied with his result may apply to the Examination Branch for re-evaluation in a subject/paper within 15 days of declaration of result along with a fee as prescribed by the university from time to time.

## Re-checking

A candidate who is not satisfied with his result may apply to the Examination Branch for re-evaluation in a subject/paper within 15 days of declaration of result along with a fee as prescribed by the university from time to time.

## Special examination

A Special Examination will be conducted for those students who are passing out but having re-appear(s) in the last semester and/or in the lower semesters. The special examination will be conducted within one month of the declaration of final semester result. The student shall have to pay prescribed fee for Special Examination.

## Re-appear/Supplementary examination

In case of re-appear examination, the University will adopt even/odd semester examination or open semester system. The student will be eligible to appear in the re-appear papers of odd semester along with the odd semester regular examinations of subsequent batches and re-appear of even semester’s paper of the even semester regular examinations in the case of even/odd semester examination. The student will be eligible to appear in the re-appear papers of all semesters (even/odd) along with regular examinations of open semester examinations. Controller of Examination will implement any of the above examination system with the approval of the Vice-Chancellor.

## Mercy Chance

The candidate will be given maximum two chances to appear in the supplementary examinations. After that, mercy chance may be given by the Vice-Chancellor on the recommendations of the Director of the concerned school on payment of a special fee.

## Syllabus for re-appear candidates

A student who obtains re-appear(s) in a subject will be examined from the same syllabus which he/she studied as a regular student.

## Promotion Criteria

* 1. A candidate who joins First Semester of B. Tech. (Electrical Engineering) may on completing attendance requirements appear in 1stsemester examination. He/she shall be allowed to continue his/her studies in the 2ndSemester even if he/she does not clear any paper of the 1stsemester and on completing attendance requirements may appear in the 2ndSemester examination.
  2. A candidate shall not be eligible to join 3rdSemester of B. Tech (Electrical Engineering) if he/she has yet to clear more than 50% papers of First and Second Semesters taken together. A candidate who has cleared 50% or more papers of B. Tech. (Electrical Engineering) 1stand 2ndSemesters taken together may join 3rdSemester and on completing attendance requirements may take 3rdSemester Examination. He/she shall be allowed to continue his/her studies in the 4thSemester even if he/she does not clear any paper of the 3rdSemester and on completing attendance requirements may appear in 4thSemester examination.
  3. A candidate shall not be eligible to join 5thSemester of B. Tech. (Electrical Engineering) if he/she has yet to clear more than 50% papers of 3rdand 4thSemesters taken together. A candidate who has cleared 50% or more papers of B. Tech. (Electrical Engineering) 3rdand 4thSemesters taken together may join 5thSemester and on completing attendance requirements may take 5thSemester Examination. He/she shall be allowed to continue his/her studies in the 6thSemester even if he/she does not clear any paper of the 5thSemester and on completing attendance requirements may appear in 6thSemester examination.
  4. A candidate shall not be eligible to join 7thSemester of B. Tech. (Electrical Engineering) if he/she has yet to clear more than 50% papers of 5thand 6thSemesters taken together. A candidate who has cleared 50% or more papers of B. Tech. (Electrical Engineering) 5thand 6thSemesters taken together may join 7thSemester and on completing attendance requirements may take 7thSemester Examination. He/she shall be allowed to continue his/her studies in the 8thSemester even if he/she does not clear any paper of the 7thSemester and on completing attendance requirements may appear in 8thSemester examination.

## Division Improvement

A candidate who has passed B. Tech (Electrical Engineering) examination from this University may re-appear for improvement of division in one or more subjects in the succeeding semesters with regular candidates in order to increase the percentage for obtaining higher division. However, final year candidates who have passed an examination of the University may re-appear for improvement of performance under special examination as per rules of the university.

## Migration to this University

* 1. Migration to this University will be allowed only after completion of the 1styear and is applicable only to those students who are eligible to register for 3rdsemester.
  2. Migration shall be allowed after completion of the second semester but before start of the 3rdsemester.
  3. The candidates shall not be allowed to change his/ her discipline of study in the process of migration.
  4. Migration to an affiliated College /Institute of the University from other recognized universities will be allowed 15 days prior to of the start of the 3rdsemester. The following conditions shall be apply:-

1. The candidate should have passed all the courses of the first year of the University from where he/she wants to migrate.
2. The courses studied by the candidate in first year must be equivalent to the courses offered in this University. Deficiency, if any, should not be of more than two subjects. The candidate would be required to furnish an undertaking that he/she will attend classes and pass these courses (found deficient). The institute and the University where the student is studying and the Institute, to which migration is sought, have no objection to the migration.
3. There is a vacant seat available in the discipline in the college in which migration is sought.
   1. Power of Relaxation: Notwithstanding the existing Migration Rules, the Vice-Chancellor, after obtaining an undertaking/affidavit from the candidate, to his satisfaction, to be recorded in writing, shall be authorized to consider the migration for the cases that are not otherwise covered under the above Migration Rules, with the approval of the Chancellor.

## Migration to any other University

* 1. Migration to any other University will be allowed 15 days prior to of the start of the 3rdsemester.
  2. The candidate seeking migration from this University shall be apply for the approval of his migration to the University within 15 working days after passing the 2ndSemester/First Year Examination.
  3. The Director/Head of the department concerned of the University will issue “No Objection Certificate” after the candidate has paid all the fees due for the remaining period of the full session as well as the annual dues as per rules. In addition to the above, Migration fee as prescribed by the University shall be charged from such candidates.
  4. If a candidate, on completion of any course, applies for Migration Certificate, the same shall be issued on receipt of fee prescribed for Migration Certificate and on completion of other formalities etc.

## Award of Detail Marks Card

Each candidate of First Year B. Tech. (Electrical Engineering) (i.e. Semester-I & Semester-II), Second Year (i.e. Semester-III & Semester-IV), Third Year (i.e. Semester-V & Semester- VI) and Fourth Year (i.e. Semester – VII and Semester – VIII), on successfully completion of course and passing all the papers of each semester, shall be supplied detail of Marks Cards indicating CGPA score and Division obtained by him/her in the examination.

## Award of Degree

The degree of B. Tech. (Electrical Engineering) stating the CGPA score and Division, will be awarded to the candidate who has successfully completed the course and passed all the papers of all the semesters,. The degree will be awarded at the University Convocation. However, a degree in absentia can be issued before the convocation, on completion of required formalities and payment of prescribed fee.

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**DESH BHAGAT UNIVERSITY, MANDI GOBINDGARH**

#### Faculty of Engineering & Applied Sciences

#### Department of Mechanical Engineering

**Vision of the Department**

To be a global knowledge hub in mechanical engineering education, research, entrepreneurship and industry outreach services.

#### Mission of the Department

**M1:** Impart quality education and training to the nurture globally competitive mechanical engineers.

**M2:** Provide vital state of the art research facilities to create, interpret, apply and disseminate knowledge.

**M3:** Develop linkages with world class educational institutions and R&D organizations for excellence in teaching, research and consultancy services.

#### Program Educational Objectives (PEOs)

**PEO1:** To transform students into engineering graduates who would possess technical competencies and problem solving skills in the field of mechanical engineering.

**PEO2:** To prepare students capable of generating innovative solutions and practice their profession with due regards to environmental and social requirement.

**PEO3:** To develop professional development skills in consort with dynamic learning and team building capabilities.

#### Program Specific Outcomes

**PSO1:** Ability to understand various concepts, principles and techniques related to mechanical engineering.

**PSO2:** Ability to investigate, analyse, design, develop and implement mechanical systems or processes.

**Program Outcomes**

**PO1. Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

**PO2. Problem analysis**: Identify, formulate, research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

**PO3. Design & Development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

**PO4. Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

**PO5. Modern tool Usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

**PO6. The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

**PO7. Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

**PO8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

**PO9. Individual and team** work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

**PO10. Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

**PO11. Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one’s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

**PO12. Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.