

REGULATIONS (General)

Common to all Degree Programmes

NATIONAL INSTITUTE OF TECHNOLOGY GOA

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REGULATIONS (General)
Common to all Degree Programmes

{also refer: REGULATIONS specific to the Degree Programmes}

G1. INTRODUCTION:

- G1.0 The General Regulations that are common to all Degree Programmes of NIT Goa, are presented here. Specific aspects of the Regulations pertaining to a particular Degree Programme are given separately along with the corresponding Curriculum.
- G1.1 The provisions contained in this set of Regulations govern the policies and procedures, on the admission of students, imparting instructions of courses, conducting of the examinations and evaluation and certification of students' performance leading to the said Degree Programme(s).
- G1.2 This set of Regulations, on approval by the Academic Council, may supersede all the corresponding earlier sets of Regulations of the Institute, along with all the amendments thereto, and shall be binding on all students undergoing the said Degree Programme(s).
- G1.3 This set of Regulations may evolve and get revised/refined or updated or amended or modified or changed through appropriate approvals from the Academic Council, from time to time, and shall be binding on all parties concerned, including the Students, Faculty, Staff, Departments, Institute Authorities.
- G1.4 In order to *guarantee fairness and justice* to all the parties concerned, in view of the periodic evolutionary refinements, any specific issues or matters of concern shall be addressed separately, by the *appropriate authorities*, as and when found necessary.
- G1.5 The effect of year-to-year (periodic) refinements in the Academic Regulations & Curriculum, on the students *admitted in earlier years*, shall be dealt with appropriately and carefully, so as to ensure that *those* students are not subjected to any unfair situation whatsoever, although they are required to conform to these revised set of Regulations & Curriculum, without any undue favour or considerations.
- G1.6 The Academic Council may consider any issues or matters of concern relating to any or all the Academic Activities of the Institute, for appropriate action, irrespective of whether a reference is made (or the nature and extent of any reference if so present) here in this set of Regulations or otherwise.
- G1.7 Whenever outside Experts need to be co-opted and/or invited for any of the Academic Committee Meetings, prior approval from the Chairman of the Academic Council shall be obtained, justifying the need, based on the agenda items of such Academic Committee Meetings. The outside experts shall be entitled for TA/DA/etc as per the prevailing Institute Rules.
- G1.8 All disputes arising from this set of Regulations must be addressed to the Academic Council. The decision of the Academic Council is final and binding on all parties concerned. Further, any legal disputes arising from this set of Regulations shall be limited to the legal jurisdiction determined by the location of the Institute and not that of any other parties.

G2. DEFINITIONS: Unless the context otherwise requires –

- **“Institute”/“NITG”/** means, National Institute of Technology Goa.
- **“BOG”** means, the Board of Governors (BOG) of the Institute.
- **“MHRD”** means, the Ministry of Human Resources Development, GOI.
- **“AIEEE”** means, All India Engineering Entrance Examination.
- **“Academic Council”** means, the Faculty Academic Council of the Institute.
- **“Director”** means, the Director of the Institute.
- **“BOS”** means, the Board of Studies of the Institute.
- **“Dean (A)”** means, the Dean (Academic).
- **“NITG Hostels”** means, NIT- Goa Hostels.
- **“Dean (SW)”** means, Dean (Students Welfare).
- **“Division Chairperson”** means, the Division Chairperson.
- **“HOD”** means, the Head of the Department.
- **“Programme Co-ordinator”** means, a faculty in charge of an academic programme
- **“Parent Department”** or **“Degree Awarding Department”** means, the department that offers the degree programme that a student undergoes
- **“DAC”** or **“PAC”** means, the Departmental/Programme Academic Committee.
- **“DUGC”** means, the Departmental Under Graduate Committee.
- **“DAAB”** means, the Departmental Academic Appeals Board.
- **“Faculty Advisor”** means the Faculty Advisor or the Panel of Faculty Advisors, in a Parent Department, for a group(admission-batch) of students.
- **“Course”** means, a specific *subject* usually identified by its *course-number* and *course-title*, with a specified *syllabus/course-description*, a set of *references*, taught by some *teacher(s)/course-instructor(s)* to a specific *class* (group of students) during a specific *academic-session/semester*.
- **“Course Instructor”** means, the teacher or the Course Instructor of a Course.
- **“Class/Course Committee”** means, the Class/Course Committee of a class/course.
- **“Project Guide”** means, the faculty who guides the Major Project of the student.
- **“He”** includes both genders he and she; similarly **“his”** and/or **“him”** includes **“her”** as well, in all the cases.
- **“Regulations”** means, this set of Academic Regulations.
- **“Curriculum”** includes the set of Academic Regulations, Course-Structure and Course-Contents.

G3. ACADEMIC CALENDAR:

- G3.1 The normal duration of the course leading to B.Tech degree will be *EIGHT* semesters.
- G3.2 Each academic year shall be divided into 2 semesters, each of *20 weeks* duration, including evaluation and grade finalization, etc. The Academic Session in each semester shall provide for at least *70 Teaching Days*, with atleast 40 hours of teaching contact periods in a five-days session per week. The semester that is typically from August to Mid-December is called the *ODD SEMESTER*, and the one that is from January to Mid-May is called the *EVEN SEMESTER*. Academic Session may be scheduled for the *Summer Session/Semester* as well.
- G3.3 The schedule of academic activities for a Semester, including the dates of registration, mid-semester examination, end-semester examination, inter-semester vacation, etc. shall be referred to as the Academic Calendar of the Semester, which shall be prepared by the Dean (Academic), approved by the Academic Council, and announced at least *TWO* weeks before the Closing Date of the previous Semester.
- G3.4 The Academic Calendar must be strictly adhered to, and all other activities including co-curricular and/or extra-curricular activities must be scheduled so as not to interfere with the Curricular Activities as stipulated in the Academic Calendar.
- G3.5 Under any circumstances when any of the Teaching Days gets declared as a Holiday or otherwise when the classes get suspended, irrespective of whatsoever be the reasons, appropriate makeup for such loss shall be made by having the class/lab/teaching sessions conducted on a suitable Saturday by following the particular Class Time Table of that Teaching Day which was so lost.

G4. REGISTRATION:

- G4.1 Every Student after consulting his Faculty-Advisor/Research-Guide is required to register for the approved courses with the DUGC of Parent Department at the commencement of each semester on the days fixed for such registration and notified in the academic calendar.
- G4.2 **Lower and Upper Limits for Course Credits Registered in a Semester, by a Full-Time Student of a Degree Programme:**
A full time student of a particular degree programme shall register for the appropriate number of course credits in each semester/session that is within the minimum and maximum limits specific to that degree programme as stipulated in the specific Regulations pertaining to that degree programme.
- G4.3 **Mandatory Pre-Registration for higher semesters:**
In order to facilitate proper planning of the academic activities of a semester, it is essential for the students to *declare their intent to register* for an elective course well in advance, before the actual start of the academic session, through the process of Pre-Registration, which is mandatory for all students of second or higher semesters.
- G4.4 All Under Graduate students (other than the freshly admitted students) intending to register for the next higher semester are required to have completed the *Mandatory Pre-Registration* of elective courses, at least *TWO* weeks before the Last Day of Classes in the current semester. To facilitate this Pre-registration all teaching departments shall announce the list of courses to be offered for the next higher semester, at least *FOUR* weeks before the Last Day of Classes in the current semester.

G4.5 Course Pre-Requisites:

In order for a student to register for some courses, it may be required either to have exposure in, or to have completed satisfactorily, or to have prior *earned credits* (refer Clause No: G5.8) in, some specified courses. In such instances, the DUGC shall specify clearly, any such course pre-requisites, as part of the curriculum.

G4.6 Students who do not register on the day announced for the purpose may be permitted *LATE REGISTRATION* up to the notified day in academic calendar on payment of late fee.

G4.7 *REGISTRATION IN ABSENTIA* will be allowed only in exceptional cases with the approval of the Dean (Academic) after the recommendation of DUGC through the authorized representatives of the student.

G4.8 A student will be permitted to register in the next semester only if he fulfills the following conditions:

- (a) satisfied all the Academic Requirements to continue with the programme of Studies without termination (refer Clause No: G8);
- (b) cleared all Institute, Hostel and Library dues and fines (if any) of the previous semesters;
- (c) paid all required advance payments of the Institute and hostel for the current semester;
- (d) not been debarred from registering on any specific ground by the Institute.

G4.9 Medium of Instruction/Evaluation/etc. shall all be in English.

G5. EVALUATION SYSTEM:

G5.1 Course Credit Assignment:

Every Course comprises of specific Lecture-Tutorial-Practical (L-T-P) Schedule. The Course Credits are fixed based on the following norms:

Lectures/ Tutorials :	One hour per week is assigned one Credit.	
Practicals :	(i) a 3-hour session per week	}
	OR	
	(ii) a 2-hour session per week	} is assigned one credit
	(iii) a 4 - hour session per week is assigned two credits	

For example, a theory course with a L-T-P schedule of 3-1-0 will be assigned 4 credits; a laboratory practical course with a L-T-P schedule of 0-0-3 will be assigned 1 credit.

G5.2 The Academic Performance Evaluation of a Student shall be according to a **Letter Grading System**, based on the **Class Performance Distribution**, and *not* based upon any fixed a priori mappings or any absolute scale conversions from the Raw-Scores Scale (e.g. percentage-marks) to the Grade-Points Scale. The entire evaluation system (including these *Regulations*) comprising of the *Policies, Procedures, Mechanisms, Guidelines*, etc., have-been/shall-be designed, developed, evolved, implemented and adhered to, in order to meet the most fundamental/basic *quality* characteristics of being: fair/justifiable, objective/unbiased, reliable/precise, robust/resilient, while also being flexible/responsive and transparent/verifiable. It is equally essential to maintain appropriate level of *confidentiality* in terms of certain specific details, in order to achieve the above *quality* characteristics.

G5.3 The *double-letter grade* (AA, AB, BB, BC, CC, CD, DD, FF) indicates the level of academic achievement, assessed on a decimal (0-10) scale.

G5.4 *Letter-Grades and Grade-Points:*

LETTER-GRADE	GRADE-POINTS	REMARKS
AA	10	
AB	9	
BB	8	
BC	7	
CC	6	
CD	5	
DD	4	
FF	0	Fail due to poor performance
FA	0	Fail due to attendance shortage
I	-	Incomplete
U	-	Audited
W	-	Withdrawal
S	-	Satisfactory
N	-	Unsatisfactory

G5.5 The *double-letter grade* awarded to a student in a course other than a 0-0-P (Practical) course, for which he has registered shall be based on his performance in quizzes, tutorials, assignments etc., as applicable, in addition to one mid-semester examination and one end-semester examination. The distribution of weightage among these components may be as follows:

End-Semester Examination	: 40 to 50% (3 - 4 hours duration)
Mid-Semester Examination	: 20 to 25% (1 – 1½ hours duration)
Quizzes, Tutorials, Assignments, etc. (<i>continuous evaluation</i>)	: 25 to 40% (to make up for 100%)

Any variation, other than the above distribution, requires the approval of the pertinent DUGC.

G5.6 The *double-letter grade* awarded to a student in a 0-0-P (Practical) course, is based on an appropriate continuous evaluation scheme that the course instructor shall evolve, with the approval of the pertinent DUGC.

G5.7 The Course Instructor shall communicate clearly to the students, by announcements in the class, and/or by displaying prominently at the faculty door/website, and also report in writing to the DUGC, the details of the *Evaluation Scheme*, including the distribution of the weightage for each of the components, as well as the requirements for receiving a ‘U’ grade for auditing the course; within the first week of the semester in which the course is offered; so that there would be no ambiguities in this regard at the end of the semester while finalizing the grades.

G5.8 *Earned Credits*

This refers to the credits assigned to the course in which a student has obtained either ‘S’ grade, or any one of the *double-letter grades* ‘AA’, ‘AB’, ‘BB’, ‘BC’, ‘CC’, ‘CD’, ‘DD’ (but not ‘FF’ and ‘FA’).

G5.9 Cutoff Marks for 'AA' & 'FF' and the Scale-Differential:

The *minimum cutoff* marks for 'AA' grade as well as the *maximum cutoff* marks for 'FF' grade will be decided by the Course Instructor based on the specific relevant details of the Class Performance Distribution (using appropriate class performance statistics parameters, like the Class-Mean, Class-Standard-Deviation, etc). However as a general guideline approved by the Academic Council the minimum cutoff marks for 'AA' and 'DD' grade have been fixed as 70% and 20% respectively. Faculty members who intend to give a 'AA' grade to those students getting marks less than 70% and 'DD' grade for those students who get marks less than 20% are required to give justification for the same to the DUGC of their respective department.

The *Scale-Differential* is defined as the difference between the minimum cutoff marks for the 'AA' grade and the maximum cutoff marks for the 'FF' grade (normally expressed as a multiple of the class-standard-deviation parameter).

An appropriate value for the *Scale-Differential* shall be decided by the Course Instructor after having studied the specific relevant details of the Class Performance Distribution.

The *minimum/maximum cutoff* marks for the intermediate grades are determined by appropriate *partitioning/clustering method* based on the specific relevant details of the Class Performance Distribution.

G5.10 Description of Grades:

AA Grade:

An 'AA' grade stands for outstanding achievement, relative to the class, and the Course Instructor is supposed to take *utmost care* in awarding of this highest double-letter grade.

DD Grade:

The 'DD' grade stands for marginal performance and is the minimum passing double-letter grade.

FF and FA Grades:

The 'FF' grade denotes very poor performance, i.e. *failure* in a course due to poor performance and FA grade denotes poor attendance i.e. failure in a course due to attendance shortage and the Course Instructor is supposed to take *utmost care* while awarding these lowest double-letter grades.

The students who have been awarded 'FF' grade in a course in any semester may be allowed to appear for a make-up end-semester examination. The make-up end-semester examination will be conducted possibly along with that arranged for those students who were awarded the 'I' grade, within the date stipulated/announced by DUGC. If after considering make-up end-semester examination a student passes, then a minimum passing grade of 'DD' only be awarded, and if a student fails than a 'FF' grade will be awarded and the student is required to appear for the make-up end semester examination in the next/ subsequent semesters whenever the course is offered. However, if a student is willing then he/she will have the option to re-register for the course instead of appearing for the make-up end-semester examination and the student will be awarded the regular grade as per the performance and the class distribution. All the 'FF' (other than the courses for which 'DD' grade is obtained by the student in the make-up end-semester examinations conducted prior to the starting of next semester) and 'FA' grades secured in any course stay permanently on the grade card.

A student who obtains 'FA' grade in any course has to necessarily re-register for the course in the subsequent semesters/sessions whenever the course is offered until a passing grade is obtained. However, for an elective course in which 'FA' grade has been obtained, the student may either repeat the same course or register for any other elective course.

The students of first and final year who obtain 'FA' grade in any course may be allowed to register only for the first year and final year courses respectively to be offered during the summer term.

I Grade:

An 'I' grade denotes incomplete performance in any course due to absence at the end semester examination (see also Clause No: G7.3). When the 'I' grade is converted to a regular double-letter grade, a penalty of ONE Grade-Point is imposed, by awarding the double-letter grade that is immediately below the one that the student would have otherwise received.

U Grade:

This grade is awarded in a course that the student opts to register for audit. It is not mandatory for the student to go through the entire regular process of evaluation in an audit course. However, the student has to go through some process of minimal level of evaluation and also the minimum attendance requirement, as stipulated by the Course Instructor and approved by the corresponding DUGC, for getting the "U" grade awarded in a course, failing which that course will not be listed in the Grade Card.

W Grade:

A 'W' grade is awarded when the student withdraws from the course. Withdrawal from a course is permitted only under extremely exceptional circumstances (like medical emergencies, family tragedies and/or other unavoidable contingencies) and has to be recommended by the DUGC and approved by the Dean (Academic). However, no withdrawal is permitted after the finalization of the grades in the semester. Also, the 'W' grade once recorded remains permanently in the Grade Card.

S and N grades:

These grades are awarded for the Mandatory Learning Courses. The 'S' grade denotes satisfactory performance and completion of a course. The 'N' grade is awarded for non-completion of course requirements and the student will have to register for the course until he obtains the 'S' grade. The 'N' grade secured in a course stays permanently on the Grade Card.

G5.11 *Evaluation of Performance:*

The overall performance of a student will be indicated by two indices: SGPA which is the Semester Grade Point Average and CGPA which is the Cumulative Grade Point Average.

SGPA for a semester is computed as follows:

$$SGPA = \frac{[\sum (\text{Course credits}) \times (\text{Grade Point})] \text{ for all courses with double-letter grades, including 'FF' and 'FA' (in that semester).}{[\sum (\text{Course credits})] \text{ for all courses with double-letter grades, including 'FF' and 'FA' (in that semester).}}$$

CGPA is computed as follows:

$$CGPA = \frac{[\sum (\text{Course credits}) \times (\text{Grade Point})] \text{ for all courses with double-letter grades, including all 'FF' and 'FA' grades.}{[\sum (\text{Course credits})^*] \text{ for all courses with double-letter grades, including all 'FF' and 'FA' grades.}}$$

- * Whenever a student reappears for a course in which he / she has been awarded 'FF' or 'FA' grade, the CGPA computations will not once again include the course credits for the failed courses in the denominator.

G5.12 Report of Marks, Grades and Class Performance Statistics:

- (a) The final grades shall be displayed for at least *ONE* teaching-day, during which period a student can approach the concerned course instructor(s) for any clarification. The process of evaluation shall be transparent and the students shall be made aware of all the factors included in the evaluation. In case of any correction, the course instructor shall have to incorporate the same before finalization of the grades.
- (b) The course instructors shall submit the Report of Marks & Grades for each of the students in his course, along with the Summary Report of Marks & Grades containing the Class Performance Statistics, in the prescribed format, to the chairman, DUGC by the stipulated date, for possible moderation (if and only when found necessary) and approval.
- (c) The DUGC shall submit the final approved Report of Marks & Grades along with Summary Report of Marks & Grades containing the class performance statistics, in the prescribed format, to the Academic Section of the Dean (Academic) within the stipulated date.
- (d) The Student Progress Report shall contain the Letter-Grade for each course; along with the SGPA, and the CGPA.

G5.13 Appeal for review of Grades:

- (a) The entire process of evaluation shall be made transparent, and the course instructor shall explain to a student why he gets whatever grade he is awarded, if and when required. A mechanism for review of grades is incorporated in the evaluation system. However, before appealing for such review, a student shall first approach the concerned Course Instructor and then the concerned DUGC, with the request to do the needful; and only in situations where satisfactory remedial measures have not been taken, the student may then appeal to the Departmental Academic Appeals Board (DAAB).
- (b) In case of any such grievances about the grades, the student may appeal for review of grades to the Departmental Academic Appeals Board (DAAB) before the date specified in Academic Calendar.
- (c) The fee for such an appeal will be decided by the Academic Council from time to time. If the appeal is upheld by DAAB, then the fee amount will be refunded to the student.

G6. ADD / DROP / cU -options:

G6.1 ADD-option:

A student has the option to ADD courses for registration till the date specified for late registration in the Academic Calendar.

G6.2 DROP-option:

On recommendation of the Teaching Department as well as the Parent Department, a student has the option to DROP courses from registration *until 2 weeks after the commencement of the classes in the semester*, as indicated in the Academic Calendar.

G6.3 cU-option:

A student can register for auditing a course, or a course can even be converted from credit to audit or from audit to credit, with the consent of the Faculty Advisor and Course Instructor until 2 weeks after the commencement of the classes in the semester as indicated in the Academic Calendar. However, CORE Courses shall not be made available for audit.

G7. ABSENCE DURING THE SEMESTER:

G7.1 *Leave of Absence:*

- (a) If the period of leave is more than two days and less than two weeks, prior application for leave shall have to be submitted to the HOD concerned, with the recommendation of the Faculty-Advisor/Research-Guide stating fully the reasons for the leave requested, along with supporting documents.
- (b) If the period of leave is two weeks or more, prior application for leave shall have to be made to the Dean (Academic) with the recommendations of the Faculty-Advisor, HOD concerned stating fully the reasons for the leave requested, along with supporting documents. The Dean (Academic) may, on receipt of such application, grant leave or also decide whether the student be asked to withdraw from the course for that particular semester because of long absence.
- (c) It will be the responsibility of the student to intimate the Course Instructors, and also the Dean (Students Welfare) as well as the Chief Warden of the hostel, regarding his absence before availing leave.

G7.2 *Absence during Mid-Semester Examination:*

A student who has been absent from a Mid-Sem Exam due to illness and other contingencies may give a request for make-up examination within two weeks after the Mid-Sem Exam to the HOD with necessary supporting documents and certifications from authorized personnel. The HOD may consider such requests depending on the merits of the case, and after consultation with the course instructor, may permit the make up Mid-Sem Exam for the concerned student.

G7.3 *Absence during End-Semester Examination:*

In case of absence for an End-Sem Exam, on medical grounds or other special circumstances, the student can apply for 'I' grade in that course with necessary supporting documents and certifications by authorized personnel to the HOD. The HOD may consider the request, depending on the merits of the case, and after consultation with the course instructor, permit the make up end-semester examination for the concerned student (possibly arranged along with those students who were awarded the 'FF' grade). The student may subsequently complete all course requirements within the date stipulated by DUGC (which may possibly be extended till first week of next semester under special circumstances) and 'I' grade will then be converted to an appropriate Double-letter grade, as per Clause No: G5.11 (Description of Grades: "I" Grade, above). All the particulars of such a decision with date of finalizing the grade shall be communicated to Dean (Academic). If such an application for the 'I' grade is not made by the student then a double-letter grade will be awarded based on his in-semester performance.

G8. WITHDRAWAL FROM THE PROGRAMME:

G8.1 *Temporary Withdrawal:*

- (a) A student who has been admitted to a degree programme of the Institute may be permitted to withdraw temporarily, for a period of one semester or more, on the grounds of prolonged illness or grave calamity in the family, etc., provided:
 - (i) He applies to the Institute stating fully the reasons for withdrawal together with supporting documents and endorsement from his parent/guardian;
 - (ii) The Institute is satisfied that, without counting the period of withdrawal, the student is likely to complete his requirements of the degree within the time specified (refer: "Degree Requirements") ;
 - (iii) There are no outstanding dues or demands, with the Departments / Institute / Hostels / Library / etc.;
 - (iv) Scholarship holders are bound by the appropriate Rules applicable to them.

- (v) The decision of the Director of the Institute regarding withdrawal of a student is final and binding.
- (b) Normally, a student will be permitted only one such temporary withdrawal during his tenure as a student and this withdrawal will not be counted for computing the duration of study.

G8.2 Permanent Withdrawal:

Any student who withdraws admission before the closing date of admission for the Academic Session is eligible for the refund of the all the fees and deposits, after a deduction of a processing fee of Rs.1,000/- (Rupees One thousand only)

Once the admission for the year is closed, the following conditions govern withdrawal of admissions:

- (a) A student who wants to leave the institute for good, will be permitted to do so (and take Transfer Certificate from the Institute, if needed), only after clearing all the dues, if any. Also, all the fees and charges already paid will not be refunded on any account.
- (b) Those Students who have received any scholarship, stipend or other forms of assistance from the Institute shall repay all such amounts in addition to those mentioned in Clause No: G8.2(a) above.
- (c) The decision of the Director of the Institute regarding all aspects of withdrawal of a student shall be final and binding.

G9. CONDUCT AND DISCIPLINE:

- G9.1 Students shall conduct themselves within and outside the premises of the Institute in a manner befitting the students of an Institution of National Importance.
- G9.2 As per the order of Honourable Supreme Court of India, ragging in any form is considered as a criminal offence and is banned. Any form of ragging will be severely dealt with.
- G9.3 The following acts of omission and/or commission shall constitute gross violation of the code of conduct and are liable to invoke disciplinary measures:
 - (a) Ragging.
 - (b) Lack of courtesy and decorum; indecent behaviour anywhere within or outside the campus.
 - (c) Willful damage or stealthy removal of any property/belongings of the Institute/Hostel or of fellow students/citizens.
 - (d) Possession, consumption or distribution of alcoholic drinks or any kind of narcotics or hallucinogenic drugs.
 - (e) Mutilation or unauthorized possession of library books.
 - (f) Noisy and unseemly behaviour, disturbing studies of fellow students.
 - (g) Hacking in computer systems (such as entering into other person's area without prior permission, manipulation and /or damage of computer hardware and software or any other cyber crime etc.)
 - (h) Plagiarism of any nature.
 - (i) Any other act of gross indiscipline as decided by the Senate from time to time.

Commensurate with the gravity of offense, the punishment may be: reprimand, fine, expulsion from the hostel, debarment from an examination, disallowing the use of certain facilities of the Institute, rustication for a specified period or even outright expulsion from the Institute, or even handing over the case to appropriate law enforcement authorities or the judiciary, as required by the circumstances.

- G9.4 For an offence committed in (i) a hostel (ii) a department or in a class room and (iii) elsewhere, the Chief Warden, the Head of the Department and the Dean (Students Welfare), respectively, shall have the authority to reprimand or impose fine.
- G9.5 Cases of adoption of unfair means and/or any malpractice in an examination shall be reported to the Dean (Academic) for taking appropriate action.
- G9.6 All cases of serious offence, possibly requiring punishment other than reprimand, shall be reported to the Director.
- G9.7 The Institute Level Standing Disciplinary Action Committee constituted by the Director, shall be the authority to investigate the details of the offence, and recommend disciplinary action based on the nature and extent of the offence committed.

G10. RESIDENCE:

- G10.1 Institute is wholly residential and all full-time students shall be required to reside in the hostels.
- G10.2 Under special circumstances, the Dean (Students Welfare) may permit a student to reside with his parent/guardian in the Institute campus or within a reasonable distance from the Institute.
- G10.3 Students shall be required to abide by the Rules and Regulations of the NITG Hostels as established by the Board of NITG Hostels Management.

G11. GRADUATION REQUIREMENTS AND CONVOCATION:

- G11.1 A student shall be declared to be eligible for the award of the degree if he has:
- (a) Fulfilled Degree Requirements
 - (b) No dues to the Institute, Departments, Hostels, Library, CCC, and any other centers
 - (c) No disciplinary action pending against him.
- G11.2 The award of the degree must be recommended by the concerned Departmental/Programme Academic Committee (DUGC) to the Academic Council, for approval and for further recommendation to the BOG.

G11.3 Convocation:

Degrees will be awarded in person for the students who have graduated during the preceding academic year. Degrees will be awarded in absentia to such students who are unable to attend the Convocation. Students are required to apply for the Convocation along with the prescribed fee, after having satisfactorily completed all the degree requirements (refer "Degree Requirements") within the specified date in order to arrange for the award of the degree during convocation.

G12. COMMITTEES / FUNCTIONARIES:

The following committees shall be constituted common for the various degree programmes:

G12.1 Departmental Academic Appeals Board (DAAB):

Constitution:

- | | | | |
|-----|---|-----|-----------|
| (a) | Chairperson of the Division | ... | Chairman |
| (b) | H.O.D. of the teaching/parent Dept | ... | Member |
| (c) | Three faculty members (1P+1ASP+1AP) | ... | Members |
| (d) | One Professor from outside the Department
nominated by Dean (Academic) | ... | Member |
| (e) | Faculty Advisor(s) of the Class from where the
Appeal originates | ... | Member(s) |

Note:

- There shall be one DAAB for every department.
- The Chairman may co-opt and/or invite more members.
- Depending on the prevailing circumstances, the H.O.D or Senior Professor of the Department, nominated by the Dean (Academic), shall act as Chairman instead of Chairperson.
- If the concerned instructor is a member of DAAB then he shall keep himself out of the board during deliberations.

Functions (Highlights):

- i. To receive grievance/ complaints in writing from the students regarding anomaly in award of grades due to bias, victimization, erratic evaluation, etc. and redress the complaints.
- ii. To interact with the concerned course instructor and the student separately before taking the decision.
- iii. The decision of the DAAB will be based on simple majority.
- iv. The recommendations of the DAAB shall be communicated to the Dean (Academic) for further appropriate action as required.

G12.2 Class/Course Committee:

Every Class (group of students registered for a course) of the Degree Programme shall have a Class/Course Committee, consisting of Faculty and Students.

Constitution:

- | | | |
|--|-----|------------------|
| (a) One Faculty of the Parent/Teaching Department, not associated with the class; nominated by the HOD. | ... | Chairman |
| (b) Faculty Advisor(s) for the Class | ... | Member-Secretary |
| (c) Course Instructor(s) | ... | Member(s) |
| (d) <i>FOUR</i> to <i>SIX</i> students from the Class/Course to be chosen by the students amongst themselves | ... | Members |

Functions (Highlights):

- i. The basic responsibilities of the Class/Course Committees are to review periodically the progress of the classes, to discuss problems concerning curriculum and syllabi and the conduct of the classes.
- ii. Each class/course committee will communicate its recommendations to the HOD of the Parent/Teaching Department.
- iii. There shall be minimum one class committee meeting at the middle of every semester as indicated in the academic calendar. However additional class committee meetings may be convened as decided by DUG/Course Instructor.
- iv. During beginning of the semester, the Course Instructors shall present the method of evaluation and distribution of weight ages for the various components.
- v. The minutes of each class/course committee meeting shall be recorded in a separate minutes register maintained in the Parent/Teaching Department.
- vi. Any appropriate responsibility or function assigned by the DUGC or the Chairman of the DUGC.

G12.3 Faculty Advisor(s):

The Faculty Advisor(s) will be appointed by the H.O.D. of the parent department, who will be assigned a specific group (admission-batch) of students of the concerned parent department, and will be valid throughout their duration of study.

Functions (Highlights):

- i. To help the students in planning their courses and related activities during their study period.
- ii. To monitor, guide, advise and counsel the students on all academic matters.

To coordinate the activities regarding mandatory learning courses.

G12.4 Course Instructor:

Functions (Highlights):

- i. He shall follow all the Regulations related to teaching of a course and evaluation of students.
- ii. He shall be responsible for all the records (i.e., course registration, answer books, attendance, etc.) of the students registered for the course.
- iii. He shall conduct classes as prescribed in the Academic Calendar and as per the teaching assignment time table issued by the H.O.D.
- iv. He will arrange to distribute a teaching plan and the evaluation plan together with the course objectives, background materials to all the students within the first week of each semester.
- v. He will prepare an evaluation plan showing details of how the student's performance will be evaluated in the course.
- iii. He will properly document the students' performance and announce to the students (including on the notice board) as stipulated in the Regulations.
- iv. He will report to the HOD on a periodic (*monthly*) basis, the potential cases of very poor academic performance as well as those of low attendance that would possibly result in a 'FF' or 'FA' grade at the end of the semester.

G12.5 Departmental/Programme Academic Committee(s):

Constitution:

The departmental/programme academic committees are specific academic committees for each of the programmes/departments, like DUGC as given in the Regulations specific to such programmes/departments.

Functions (Highlights):

- i. Specific functions as given in the Regulations specific to the concerned academic programme.
- ii. Recommend to the Academic Council, appropriate measures to deal with the specific issues of concern, arising because of the effect of the year-to-year (periodic) refinements in the Academic Regulations & Curriculum, on the students *admitted in earlier years* (so as to ensure that *those* students are not subjected to an unfair situation whatsoever, although they are required to conform to these revised set of Regulations & Curriculum, without any undue favour or considerations) like the specific details of the credit requirements, etc., as and when such cases arise or need to be addressed, considering the nature and extent of the refinements, and implement the same with the appropriate approval of the Academic Council.
- iii. Any appropriate responsibility or function assigned by the Academic Council or the Chairman of the Academic Council or the Chairman of the BOS.

* * * * *

REGULATIONS
SPECIFIC TO
UNDER GRADUATE PROGRAMMES
B.Tech. Degree

NATIONAL INSTITUTE OF TECHNOLOGY GOA
2010 Onwards

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REGULATIONS
specific to
B.Tech. Degree Programme

{also refer: REGULATIONS (General) – Common to all Degree Programmes}

1. DEGREE PROGRAMMES:

- 1.1 Under Graduate B.Tech. Degree Programmes are offered in the following disciplines by the respective programme hosting departments listed below:
- i. Computer Science and Engineering (CSE)
 - ii. Electrical and Electronics Engineering (EEE)
 - iii. Electronics and Communication Engineering (ECE)
- 1.2 The provisions of these Regulations shall be applicable to any new disciplines that may be introduced from time to time and appended to the above list.

2. ADMISSION:

- 2.1 Admission to NIT, Goa will be made in accordance with the instructions received from MHRD from time to time. Seats are reserved for candidates belonging to Scheduled Castes and Scheduled Tribes, Other Backward Classes (OBC), Physically challenged candidates, children of defence personnel and other categories as per the guidelines issued by MHRD.
- 2.2 Admission to all courses will be made in the odd semester of each session at the first year level based on the relative performance in the All India Engineering Entrance Examination (AIEEE) as per the guidelines issued by the MHRD, New Delhi from time to time. The candidates should have successfully passed 10+2 examination with the combination of subjects prescribed by the Competent Authority.
- 2.3 A limited number of admissions is offered to Foreign Nationals and Indians living abroad in accordance with the rules applicable for such admission issued, from time to time, by MHRD.
- 2.4 In special cases the Institute may admit students to the THIRD semester of the B.Tech. programme, on transfer, only from other NITs, observing the Guidelines applicable and subject to approval from MHRD. However, any such transfer to Third Semester at NIT Goa from any other NIT shall be subject to the condition that no commitment shall be made on any Branch request, until after exhausting the chances for NIT Goa students to avail the branch change facility, and provided there are clear vacancies.
- 2.5 Student Exchange Programmes and the Transfer of Credits in such cases shall be as per the corresponding MOU approved by Competent Authority.
- 2.6 If, at any time after admission, it is found that a candidate had not in fact fulfilled all the requirements stipulated in the offer of admission, in any form whatsoever, including possible misinformation etc., the Registrar shall report the matter to the Academic Council, recommending revoking the admission of the candidate.
- 2.7 The Institute reserves the right to cancel the admissions of any student and ask him to discontinue his studies at any stage of his career on the grounds of unsatisfactory academic performance or indiscipline or any misconduct.
- 2.8 The decision of the Academic Council regarding the admissions is final and binding.
- 2.9 Candidates must fulfil the medical standards required for admission as prescribed in the Institute Information Brochure or the Prospectus.

- 2.10 Every Under Graduate student of the Institute shall be associated with *Parent Department* (Degree Awarding Department) offering the degree programme that the student undergoes, *throughout* his study period, right from the very first day of admission into the program.

3. COURSE STRUCTURE :

- 3.1 The total course package for a B.Tech Degree Programme will typically consist of the following components.

Course Structure

Category of Courses	Minimum Credits to be Earned
Foundation Courses (Fndn)	50
Program - Specific Core (PSC)	80
Program Specific Electives (PSE) & Open Electives (OE)	38
Program Major Project(PMP)	10
Mandatory Learning Courses (MLC)	02
Total	180

- 3.2 Open electives offered by any parent department are courses listed in the course structure under the open elective category and offered to students of any department other than the parent department. The students of a particular programme have to complete the total credits requirement under the elective category by earning the minimum credits prescribed under the Programme Specific Elective (PSE) by registering for courses listed under the PSE category, for the remaining credits to be earned under the elective category, the students have the option to register for courses listed either under the Open Elective (OE) category of other departments or under the Programme Specific Elective (PSE) category of the parent department itself.
- 3.3 The Department Under Graduate Committee (DUGC) will discuss and recommend the exact credits offered for the programme for the above components 'a' to 'g'; the semester-wise distribution among them, as well as the syllabi of all undergraduate courses offered by the department from time to time before sending the same to the Board of Studies (BOS). The BOS will consider the proposals from the departments and make recommendations to the Academic Council for consideration and approval.
- 3.4 **The Minimum Credit Requirement for the B.Tech Degree is 180.**
- 3.5 **Programme Major Project:**
- The Programme Major Project is a 10 credit course and can comprise of Part I and Part II, spread over 1 or 2 semesters of final year, preferably during 7th and 8th semesters (or as recommended by DUGC). The method of evaluation shall be evolved by pertinent DUGC and appropriate double-letter grade is awarded which will be considered for SGPA and CGPA calculations.

3.6 **Mandatory Learning Courses:**

These are courses that must be completed by the student during first year. The ‘S’ grade is awarded for satisfactory completion of the course and ‘N’ grade is awarded for non-completion of the course. In case ‘N’ grade is awarded, the student has to re-register for the same course wherein he has no alternative options. However, he can opt for other courses if he has been provided with multiple options. The ‘S’ and ‘N’ grades do not carry grade-points and hence not included in the SGPA, CGPA computations.

Courses that come under this category are the following:

(a) **Environmental Studies:**

This is a 1 credit course, covering the following topics:

The Multidisciplinary Nature of Environmental Studies; Natural Resources; Renewable and Non-renewable Resources; Ecosystems; Biodiversity and Its Conservation; Environmental Pollution; Social Issues and the Environment; Human Population and the Environment; Field Work. The student is required to complete this course during 1st / 2nd semester.

(b) **Professional Ethics and Human Values:**

This course is a 1 credit course covering various aspects of professional ethics and human values. Invited-Lectures / Formal-Course will be arranged and the student is required to complete this course during 1st / 2nd semester.

3.7 **Co-curricular and/or Extra curricular activities:**

These are noncredit courses, with multiple options, to be completed at student’s convenience. The student shall complete *a total of at least 2 items (with at least one from each of the two groups)* described below. On successful completion, a **certificate** regarding the activity that a student has participated in, may be issued by the Faculty in-charge of that particular activity. With the recommendation of the Faculty in-charge of Co-Curricular / Extra-Curricular Activities, the Dean (Students Welfare) may approve the **Report of Satisfactory Completion of such Co-Curricular and Extra-Curricular Activities.**

The Co-curricular/Extra-curricular Activities are compulsory degree requirements.

Group 1: Co-Curricular Activities, which includes activities in professional societies like IEEE, ISTE, IE, CSI, Department Associations, Lab Development, Participation in Paper Presentation, Model Building, etc.

Group 2: Extra-Curricular Activities, such as NSS, NCC, NSO, Community Services, Social work, Yoga, Meditation, Language Course, Health Care Services, Activities in Alumni Association, Participation in Institute cultural/technical fest Sports, Games, Various Clubs of Institute, SPICMACAY, etc.

3.8 **Lower and Upper Limits for Course Credits Registered in a Semester/Session, by a Full-Time Student of the B.Tech. Degree Programme:**

A full time student of the B.Tech. degree programme must register for a minimum of 15 credits, and up to a maximum of 30 credits. However the minimum/maximum credit limit can be relaxed by the Dean (Academic) on the recommendations of the DUGC, only under extremely exceptional circumstances. The maximum credits that a student can register in a summer session is 16.

3.9 Transfer of Credits:

The courses credited elsewhere, in Indian or Foreign University/ Institutions/ Colleges by students during their study period at NIT Goa may count towards the credit requirements for the award of degree. The credits transferred will reduce the number of courses to be registered by the student at NIT Goa. The guidelines for such transfer of credits are as follows:

- a) Student can credit courses in other institutions during 3rd and 4th year and during summer breaks.
- b) Students can undertake only those courses which are duly approved by DUGC of the concerned programmes.
- c) Credits transferred will not be used for SGPA/CGPA computations. However, credits transferred will be considered for overall credit requirements of the programmes.
- d) Students can earn external credits only from IISc/IITs/NITs/IIMs and other Indian or foreign Universities/Institute/Colleges with which NIT Goa has an MOU (and that MOU must have a specific clause for provision of credit transfer by students)
- e) Credit transfer can be considered only for the courses at the same level i.e UG, PG etc.
- f) Only if a student shows consistent performance in his studies, in his earlier semesters and earns a minimum CGPA of 7.5, shall he/she be permitted to earn the external credits.
- g) A student must provide all details (original or attested or authentic copies) such as course content, number of contact hours, course instructor/project guide and evaluation system for the course for which he is requesting a credit transfer. He shall also provide approval or acceptance letter from the other side. These details will be evaluated by the concerned Departmental academic bodies (DUGC) before giving approval. These academic bodies will then decide the number of (equivalent) credits the student will get for such course(s) in the NIT Goa system. The complete details will then be forwarded to Dean (Academic) for his approval.
- h) The maximum number of credits that can be transferred by a student shall be limited to 20.
- i) A student has to get minimum passing grades/ marks for such courses for which the credits transfer are to be made.
- j) Institute shall charge a suitable fee for credit transfer (Rs.1000 per credit).
- k) Credit transfers availed by a student shall be properly recorded on the academic record(s) of the student.

4. DEGREE REQUIREMENTS:

The degree requirements of a student for the B.Tech programme are as follows:

(a) Institute Requirements:

- (i) Minimum Earned Credit Requirement for Degree is 180
- (ii) Satisfactory completion of all Mandatory Learning Courses
- (iii) Completion of the requirements on Co-curricular and/or Extra-curricular activities

(b) Programme Requirements:

Minimum Earned Credit Requirements on all Core Courses, Elective Courses and Major Project as specified by the DUGC and conforming to Clause No: 3 (Course Structure) above.

(c) The Maximum duration for a student for complying to the Degree Requirement is EIGHT years from date of first registration for his first semester.

5. ATTENDANCE REQUIREMENTS:

- 5.1 All students must attend every lecture, tutorial and practical classes.
- 5.2 To account for approved leave of absence (eg. representing the Institute in sports, games or athletics; placement activities; NCC/NSS activities; etc.) and/or any other such contingencies like medical emergencies, etc., the attendance requirement shall be a *minimum of 75%* of the classes actually conducted.
- 5.3 A student with less than 75% attendance in a course during a semester, in lectures, tutorials and practicals taken together as applicable, shall be awarded 'FA' grade in that course, irrespective of his academic performance, and irrespective of the nature of absence.

6. TERMINATION FROM THE PROGRAMME:

A student shall be required to leave the Institute without the award of the Degree, under the following circumstances:

(a) If a student fails to earn the minimum credit specified below:

Check Point	Credit Threshold
End of FIRST year	20
End of SECOND year	50
End of THIRD year	80
End of FOURTH year	110

Note: The period of temporary withdrawal is not to be counted for the above Credit Threshold.

- (b) If a student is absent for more than 6 (Six) weeks at a stretch in a semester without sanctioned leave.
- (c) Based on disciplinary action suggested by the Academic Council, on the recommendation of the appropriate committee.

NOTE: Under any circumstances of termination, the conditions specified in Permanent Withdrawal (refer: Clause No: G8.2) shall also apply.

7. CHANGE OF BRANCH:

- 7.1 Normally a student admitted to a particular branch of the undergraduate programme will continue studying in that branch till completion. However, the Institute may permit a student admitted through AIEEE to change from one branch of studies to another after the first two semesters. Such changes will be permitted, in accordance with the provisions laid down hereinafter, by the concerned competent authority.

- 7.2 Normally, only those students will be eligible for consideration of a change of branch, after the second semester, who have –
- a) completed all the common credits required in the first two semesters of their studies, in their first attempt;
 - b) obtained a SGPA of not less than 8.00 (7.00 for SC/ST) in both the FIRST as well as the SECOND semester;
- 7.3 Application for change of branch must be made by the intending eligible students in the prescribed form and to be submitted before the last working day of the second semester as announced in the academic calendar.
- 7.4 Change of branch shall be strictly in order of merit of the applicants. For this purpose the CGPA obtained at the end of the second semester shall be considered. In case of a tie, the AIEEE rank of the applicants will be considered. The change of branch is permitted only to vacancies as per eligibility and category of admission.
- 7.5 A common CGPA List shall be prepared at the end of the second semester, category wise to consider students for branch change.
- 7.6 The applicants may be allowed a change in branch, strictly in order of *inter se* merit, subjected to the limitations as given below:
- (a) The actual number of students in the third semester in any particular branch to which the transfer is to be made, should not exceed the sanctioned strength and the actual number of students in any branch from which transfer is being sought does not fall below 75% of the total sanctioned intake.
 - (b) If a student S1 is not permitted to change from branch A to B due to the clause 7.6 (a) above, any other student S2 from any branch with CGPA less than S1 will also not be permitted to change to branch B.
- 7.7 The process of change of branch shall be completed on the first day of registration for the third semester courses.

8. COMMITTEES / FUNCTIONARIES:

The following committees shall be constituted specifically for the Under Graduate (B.Tech.) degree programme:

8.1 Board of Studies (BOS-UG):

Constitution:

(a)	Dean (Academic)	...	<i>Chairman</i>
(b)	Dean (Faculty Welfare)	...	Member
(c)	Dean (Planning & Development)	...	Member
(d)	Dean (Student's Welfare)	...	Member
(e)	Dean (Research & Consultancy)	...	Member
(f)	Chair persons of all divisions	...	Members
(g)	HOD of all Departments	...	Member
(h)	BOG members representing the faculty	...	Members
(i)	Associate Dean (UG)	...	<i>Convenor</i>
(j)	Dy. Registrar (Academic)	...	<i>Secretary</i>

Note:

- There shall be one BOS-UG for the entire Institute.
- The Chairman may co-opt and/or invite more members including outside experts.
- The quorum of each meeting will be *Eight*.

Functions (Highlights):

- i. To consider the recommendations of the DUGC on matters relating to undergraduate programme and to make suitable recommendations to the Academic Council.
- ii. To approve curriculum framed / revised by DUGC for the undergraduate courses of study.
- iii. To ensure that all norms and Regulations pertaining to undergraduate programme are strictly followed.
- iv. To make periodic review of these Regulations pertaining to undergraduate programme and to recommend to the Academic Council any modifications thereof.
- v. To review the academic performances and make suitable recommendations to the Academic Council regarding declaration of results, award of degrees etc.
- vi. To recommend to the Academic Council, the award of stipends, scholarships, medals & prizes etc.
- vii. To draw up general time table for the undergraduate course and finalise the UG academic calendar to be put up to the Academic Council for approval.
- viii. To review the cases of malpractice in examinations and to recommend to the Director the punishment in such cases.
- ix. To constitute a sub-committee for monitoring the implementation of the academic curriculum provided by the BOS and to provide guidance in curriculum assessment, evaluation process.
- x. To conduct at least one meeting each semester and send the Resolutions to the Chairman of the Academic Council, and also to maintain a record of the same in the Academic Section of the Dean (Academic).
- xi. Any appropriate responsibility or function assigned by the Academic Council or the Chairman of the Academic Council.

8.2 Departmental Under Graduate Committee (DUGC):

Constitution:

(a)	H.O.D. / Programme Co-ordinator	...	Chairman
(b)	Two Professors (by rotation for one year)	...	Members
(c)	Two Associate Professors (by rotation for one year)	...	Members
(d)	Two Assistant Professors (by rotation for one year)	...	Members

Note:

- There shall be one DUGC for every department that is involved in the teaching for the B.Tech. degree programme.
- The Secretary (DUGC) shall be nominated by the Chairman on rotation basis for a period of one year.
- The Chairman may co-opt and/or invite more members including at most three outside experts.
- The quorum for each meeting shall be five.

Functions (Highlights):

- i. To monitor the conduct of all undergraduate courses of the department.
- ii. To ensure academic standard and excellence of the courses offered by the department.
- iii. To oversee the evaluation each of the students in a class, for each of the courses.
- iv. To develop/revise the curriculum for undergraduate courses offered by the department, and recommend the same to the BOS.
- v. Moderation (only if and when found necessary) in consultation with the Course Instructor, and approval of the finalized grades, before submission of the same to the Academic Section of the Dean (Academic).
- vi. To consolidate the registration of the student and communicate to Course Instructors, and also to the Academic Section of the Dean (Academic).
- vii. To conduct performance appraisal of Course Instructors.
- viii. To provide feedback of the performance appraisal to the Course Instructor and concerned authorities.
- ix. To consider any matter related to the undergraduate programme of the department.
- x. In cases where a course is taught by more than one faculty member, or by different faculty members for different sections of students, DUGC shall co-ordinate (only in case of need) among all such faculty members regarding the teaching and evaluation of such courses.
- xi. To conduct at least two meetings each semester and send the Resolutions of the meeting to the Academic Section of the Dean (Academic), and also to maintain a record of the same in the department.
- xii. Any appropriate responsibility or function assigned by the Academic Council or the Chairman of the Academic Council or the BOS or the Chairman of the BOS.

* * * * *

COURSE STRUCTURE
(First Year Bachelor of Technology)

NATIONAL INSTITUTE OF TECHNOLOGY GOA

List of Core Course Common to all Undergraduate Programmes

Foundation Courses(Fndn)

MA100	Engineering Mathematics-I	(3-1-0)4
MA101	Engineering Mathematics –II	(3-1-0)4
PH100	Physics	(3-0-0)3
PH101	Physics Laboratory	(0-0-3)1
CY100	Chemistry	(3-0-0)3
CY101	Chemistry Laboratory	(0-0-3)1
CV100	Engineering Mechanics	(3-1-0)4
EE100	Elements of electrical Engg.	(3-1-0)4
EC100	Elements of Electronics& Communications Engg.	(3-1-0)4
ME100	Elements of Mechanical Engineering	(3-0-0)3
ME101	Engineering Graphics	(1-0-3)2
ME102	Work Shop	(0-0-3)1
CO100	Computer Programming	(3-0-0)3
CO101	Computer Programming Lab	(0-0-3)1
HU100	Professional Communication	(3-1-0)4

Mandatory Learning Courses(MLC)

MLC1	Environmental Studies	(1-0-0)1
MLC2	Professional Ethics and Human Values	(1-0-0)1

Proposed I Year Curriculum for NIT Goa
Common to all branches
Semester I

Sl. No	Course Code	Course Name	L-T-P (Credits)	Category
1	MA100	Engineering Mathematics I	3-1-0 (4)	Fndn
2	PH100/ CY100	Physics/ Chemistry	3-1-0 (4)	Fndn
3	ME100/ ME101	Elements of Mechanical Engineering/ Engineering Graphics	3-1-0 (4)/ 1-3-0 (4)	Fndn
4	EE100/ EC100	Fundamentals of Electrical Engineering/ Fundamentals of Electronics Engineering	3-1-0 (4)	Fndn
5	CV100/ CO100	Engineering Mechanics/ Fundamentals of Computer Programming	3-1-0 (4)	Fndn
6	HU100/ MLC1	Professional Communication/ Environment Studies & Professional Ethics	3-1-0 (4)/ 2-0-0 (2)	Fndn/ MLC
7	ME102/ CO101	Workshop / Computer programming Lab	0-0-2 (1)	Fndn
8	PH101/ CY101	Physics Lab Chemistry Lab	0-0-2 (1)	Fndn
			26/24	

Semester II

Sl. No	Course Code	Course Name	L-T-P (Credits)	Category
1	MA101	Engineering Mathematics II	3-1-0 (4)	Fndn
2	CY100/ PH100	Chemistry/ Physics	3-1-0 (4)	Fndn
3	ME101/ ME100	Engineering Graphics/ Elements of Mechanical Engineering /	1-3-0 (4)/ 3-1-0 (4)/	Fndn
4	EC100/ EE100	Fundamentals of Electronics Engineering / Fundamentals of Electrical Engineering	3-1-0 (4)	Fndn
5	CO100/ CV100	Fundamentals of Computer Programming/ Engineering Mechanics	3-1-0 (4)	Fndn
6	MLC1/ HU100	Environment Studies & Professional Ethics / Professional Communication	2-0-0 (2)/ 3-1-0 (4)	MLC/ Fndn
7	CO101/ ME102	Computer programming Lab/ Workshop	0-0-2 (1)	Fndn
8	CY100/ PH100	Chemistry Lab/ Physics Lab	0-0-2 (1)	Fndn
			24/26	

Course Structure

Category of Courses	Minimum Credits to be Earned
Foundation Courses (Fndn)	50
Program - Specific Core (PSC)	80
Program Specific Electives (PSE) & Open Electives (OE)	38
Program Major Project(PMP)	10
Mandatory Learning Courses (MLC)	02
Total	180

COURSE CONTENTS

MA100 ENGINEERING MATHEMATICS - I

(3-1-0) 4

Infinite series, Convergence and Divergence. Power Series, Fourier series, Half range expansions, Successive Differentiation, Polar curves, Angle between radius vector and tangent. Curvature. Mean value theorems. Functions of several variables, Partial differentiation. Taylor's theorem for a function of two variables. Extreme values. Errors and Approximations. Reduction formulas for integration, Curve tracing. Applications.

Shanti Narayan, Differential Calculus, Shyam Lal Charitable Trust, 1990.

Shanti Narayan, Integral Calculus, S. Chand, 1989.

C.B. Thomas and Finney, Calculus and Analytical Geometry, Narosa Pub., 2002.

R. Courant and F. John, Introduction to Calculus, Vols. I & II, Springer Verlag, 2005.

MA101 ENGINEERING MATHEMATICS - II

(3-1-0) 4 PREREQ: MA100

Vector Calculus, Vector differentiation and vector integration, Line, Surface and Volume integrals. Green's, Gauss Divergence and Stoke's Theorems. Multiple integrals. Jacobians. Beta and Gamma Functions, Ordinary differential equations. Partial differential equations. One dimensional heat conduction equation and wave equation. Derivation and solution.

Murray R. Spiegel : Vector Analysis , 1959 Edn, Schaum Pub.

Erwin Kreyszig: Advanced Engg. Mathematics, 8th Edn., Wiley Eastern.

E. D. Rainville and P. E. Bedient : A short course in differential equations, 6th Edn, McMillan Pub.

Shanti Narayan : Integral Calculus, 1989. Edn. Sultan Chand & Co., Delhi

R. Courant and F. John: Introduction to Calculus, Vols. I & II, Springe Verlag (Indian Edn).

PH100 PHYSICS

(3-0-0) 3

Wavemechanics: Dual nature of matter, deBroglie's hypothesis, Heisenberg's uncertainty principle. Schrodinger's wave equation –applications. Classical free electron theory Matthiessen's rule. Failure of classical free electron theory. Statistical analysis: Maxwell-Boltzman distribution function-, Bose- Einstein distribution function, Fermi-Dirac distribution function.- Quantum free electrons theory of metals. Semiconductors: Introduction, Hall effect,. P-n junction theory, Carrier injection, Minority and Majority carrier current, Forward and reverse biased junction Direct and indirect band gap semiconductors. Recombination process. Dielectric materials: Dielectric constant, Clussius Mossotti equation ferro-electric materials, Piezoelectric effect, dielectric loss. Laser and Optical fibers: -Einsteins theory of stimulated emission of radiation. Ruby and He – Ne lasers, applications. Optical fibers –transmission of light rays in fibers

Arthur Beiser, Concepts of Modern Physics, Tata Mc Graw – Hill, 1998.

B.G. Streetman, Solid State Electronic Devices, Prentice-Hall of India Ltd., 1981.

M .Ali Omar, Elements of Solid State Physics, Addison Wesley, 2000.

CY100 CHEMISTRY

(3-0-0) 3

Electrochemical Cells - Nernst Equation, Energetics of cell reaction, Types of electrodes and their applications, Concentration cells, Primary and Secondary cells, Fuel cells. Electroplating – Theory, Polarization, Decomposition potential, Overvoltage, Electroplating and Electroless plating of copper – PCB preparation. Corrosion – Types,

Theory and factors affecting corrosion, Corrosion control, Galvanic series, Measurements of corrosion rate. Water Technology – Hardness of water, Boiler troubles, Internal and external treatments, Desalination. Energy: Fuels, Classification, Calorific value and its Determination, Coal and its analysis, Petroleum, Catalytic cracking, Diesel and petrol knocking, Reforming of gasoline, Synthetic petrol, Power alcohol, Biodiesel, hydrogen as a source of energy. High Polymers: Addition, Condensation and Coordination polymerization, Copolymerisation, Molecular weights and their determinations, Methods of Polymerization, T_g & T_m and factors affecting them, Teflon, PMMA and UF: Elastomers – Compounding, SBR and silicone rubbers, Conducting, Biodegradable, Liquid crystal polymers. Instrumental methods of analysis: Colorimetry and spectrophotometry, Qualitative and quantitative analysis; Conductometry and Potentiometry. Semiconductor chemistry: Preparation of pure semiconductors, doping techniques. Chemistry of Nano – materials - Nanocarbons, ZnO and TiO₂.

Puri B.R. Sharma L.R. and Madan S Pathania, Principles of Physical Chemistry, Vishal Publishing Co., 41st Edition 2004

Jain P.C. & Monika Jain, Engineering Chemistry, Dhanpat Rai & Sons, Delhi, Revised 14th Edition 2004.

Kuriacose, J.C and Rajaram, J, Engineering Chemistry, Volume I/II, Tata McGraw – Hill Publishing Co. Ltd. New Delhi, 2000

Gowariker et al., Polymer Science and Technology, Prentice Hall of India Pvt. Ltd., New Delhi, 2004.

Chatwal. G. and Anand, S., Instrumental Methods of Chemical Analysis, S. D. Himalaya Publishing House, 2003.

Mars G. Fontana, Corrosion Engineering, McGraw Hill Book Company, 1986.

Rao, C. N.R. Chemistry of Nanomaterials, Volume I and II, Wiley Publication, 2004.

Gandhi, S. K., VLSI Fabrication Principles, Wiley Interscience, 2nd Edn. 1994

ME100 ELEMENTS OF MECHANICAL ENGINEERING (3-0-0) 3

Boilers, mountings and accessories, IC Engines, Turbines and pumps, Introduction to Refrigeration and Air-conditioning, Power Transmission and Lubrication. Metal casting and forming processes, Welding, Brazing and Soldering. Introduction to Machine Tools Lathe and Drilling Machines

Gopalkrishna K.R., Mechanical Engineering Sciences, Subhas Publications, 1999.

Prabhu T. J., Mechanical Engineering, Scitech, 2008.

Gupta, P.N., and Poona, M.P., Elements of Mechanical Engineering, Std Publications Ltd.,

Roy and Choudhary, Elements of Mechanical Engineering,

ME101 ENGINEERING GRAPHICS (1-0-3) 2

Orthographics Projections, Straight lines, Planes, Solids (Auxiliary Plane Method and Change of position method). Isometric Projections. Hands on practice using Computer aided drafting tools

Gopalkrishna K R, Engineering Graphics (Ist angle projection), Subhas Publication, 2002.

Bhat N D., Engineering Drawing, Charotar Publication, 2006.

EE100 ELEMENTS OF ELECTRICAL ENGINEERING (3-1-0) 4

DC circuit analysis: Review of circuit elements, Voltage sources, Current sources, Source transformation, Mesh current and node voltage analysis of DC circuits; Network reduction techniques, Star-Delta Transformation, Magnetic circuit analysis: Self and mutual inductances, Time domain analysis (RC, RL, RLC with DC excitation), AC circuit analysis, Power factor improvement, Circuits with variable elements, Network Theorems, Analysis of three-phase systems and measurement of three-phase power, Transformers: Construction and principle of operation of single-phase transformers, Autotransformers. Three-phase induction motor: Types, Construction, Principle of operation, Characteristics, Starters, Applications. Single-phase induction motors, Stepper motors and other special machines.

Fitzgerald, D.E. Higginbotham, A. Grabel, Basic Electrical Engineering, Tata McGraw-Hill, 2009.

William H. Hayt Jr., Jack E. Kemmerly, Steven M. Durbin, Engineering Circuit Analysis, TMH, 2002.

Olle I. Elgerd, Basic Electric Power Engineering, Addison-Wesley, 1977.

Edward Hughes, Electrical Technology, Longman, 1995.

Del Toro, Electrical Engineering Fundamentals, Pearson Education, 2002.

H. Cotton, Advanced Electrical Technology, Wheeler, 1983.

D.P. Kothari & I J Nagrath, Basic Electrical Engineering, Tata McGraw Hill, 2nd Edition, 2002.

EC100 ELEMENTS OF ELECTRONICS & COMMUNICATION ENGINEERING (3-1-0) 4

Device construction and characteristics - Diode, Transistor and MOSFET. Two port network – z, y, h and ABCD parameters. MOSFET amplifier – Basic amplifier configuration (CS, CG, CD), Transistor biasing, load-line analysis, small signal analysis. MOSFET as a Resistor, and Capacitor, MOSFET as active load, CMOS. Current Mirrors. BJT amplifier configuration, biasing and analysis. Frequency response characteristics, gain bandwidth product. Distortion in amplifiers, multistage amplifiers. Operational Amplifiers, Ideal characteristics, Linear and nonlinear applications (Inverting & Noninverting amplifier, Voltage Follower, Adder, Differential Amplifier, ZCD, square wave generator). DAC – Current steering, R-2R. ADC- Flash, SAR. Half wave, Full wave rectifier, Unregulated power supply, Zener and linear regulator, principle of SMPS. Desirable: Exposure to VLSI fabrication process-through java applets/flash movies-Resources form Internet.

A.S. Sedra & K.C. Smith, Microelectronic Circuits, Oxford Univ. Press, 1999.

Thomas L. Floyd, Electronic devices, Pearson Education, 2002.

P. Boylestead & L. Nashelsky, Electronic Devices and Circuit Theory, PHI, 1998.

R R. Spencer & M S. Ghousi, Introduction to Electronic Circuit Design, Pearson, 2003.

Ramakanth A Gayakwad, OP_AMPS and Linear Integrated Circuits, Prentice-Hall, 1999.

Coughlin, Driscoll, OP-AMPS and Linear Integrated Circuits, Prentice Hall, 2001.

CV100 ENGINEERING MECHANICS (3-1-0) 4

Fundamentals of force system, Concept of Rigid body and deformable bodies, Free body diagrams. Centroid and Moment of Inertia of plane areas, Analysis of Trusses, Frames

and Machines, Support Reactions- Determinate and Indeterminate structures. Shear force and Bending moment diagrams. Simple stress and strain, Hooke's Law, Mechanical properties of Materials, Elastic Constants, Compound Bars, temperature stresses.

Timoshenko, S.P., Young, D.H., Rao, J. V. Engineering Mechanics, McGraw-Hill, 2006.

Merian, J.L, Kraige, L.G. Engineering Mechanics – Statics, Wiley Publishers, 2002.

Beer & Johnston, Mechanics for Engineers, McGraw – Hill, 2009.

Singer, F. L. Strength of Materials, Harper and Row Publishers, 2001.

Hearn, E. J., Mechanics of Materials, Elsevier, 2008.

CO100 COMPUTER PROGRAMMING

(3-0-0) 3

Basic Programming Concepts, Taxonomy and History of Computer Programming, Computer Problem solving, Fundamentals of algorithms, programming strategies and paradigms, software development lifecycle. Operating systems and Program Execution Basics. C programming language: C fundamentals, Operators and Expressions, Data input and output, Control statements, Functions, Arrays, Pointers, Dynamic memory allocations, Structure and unions, Files, Low- level Programming and Macros.

Brian W. Kernighan & Dennis M. Ritchie, The C Programming Language, Prentice Hall Inc., 2001.

Dromey, How to Solve it by Computer, Pearson Education, 2006.

Byron S. Gottfried, Program with C, Schaum's Outline series, 2001.

Yashavanth Kanetkar, Let us C , BPB Publications, 2002.

Balagurusamy, C Programming, TMH, 2002.

Joyce Farrell, A guide to Programming Logic & Design, Course Technology, Thomson learning, 2003.

HU100 PROFESSIONAL COMMUNICATION

(3-1-0) 4

Oral Communication: Aims at improving the oral communication skills. Public speaking skills, features of effective speech – verbal – non-verbal, Presentation skills, Group discussion, Mock Interviews, Exposure to and Exercises with language Laboratory. **Written Communication:** Focuses on improving the writing skills. A Review of grammar, reading comprehension; Précis-writing, skills to Express Ideas through Essays; business correspondence, Business Reports, CVs/resumes, Notices, Agenda, Minutes and Memos, Case Analysis. **Organization Communication:** Attempts to Acquaint Students with the Process and Requirements of Communication in organizations. It includes the objectives of communication, Channels of communication, Barriers in Communication, Non-verbal & Cross-cultural communication, Meetings, Conferences, Press Conference and Press release. **Business Communication Technology:** Audio-Visual Aids, Internet, e-mail.

Meenakshi Raman and Sangeeta Sharma, Technical Communication: Principles and Practice, Oxford University Press, 2004.

Matthukutty M. Monippally, Business Communication Strategies, Tata McGraw-Hill Publishing Co. Ltd., New Delhi, 2004.

Michael Swan, Practical English Usage, Oxford University press, New Delhi, 2008.

Wren & Martin., English Grammar, S.Chand, 2008.

PH101 PHYSICS LABORATORY (0-0-3) 1

Experiments on Zener Diode Characteristics, Newton's rings, Series Resonance / Parallel Resonance, Helmholtz Resonator, Rectifier & Filter Circuits, Photoelectric effect, Transistor Characteristics, Hall Effect.

Arthur Beiser, Concepts of Modern Physics (Sixth Edition), Tata McGraw Hill publication, 1998.

Kenneth.S. Krane, Modern Physics (Second Edition), Wiley International Edition, 1998. Practical work book for I/II sem B.Tech Students.

Chauhan & Singh, A Text book of Advanced Practical Physics, Pragati Prakasan.

CY101 CHEMISTRY LABORATORY (0-0-3) 1

Volumetric estimations involving metal-ion, redox, self and precipitation type indicators – analysis of water (hardness and chlorides), ores (haematite and pyrolusite); Instrumental methods of analysis – potentiometry, Colorimetry, conductometry, refractometry and viscometry; Analysis of polymers, metals, alloys and related Engineering materials.

Engineering Chemistry Lab manual, Written by Faculty, Dept of Chemistry, NITK Surathkal.

A I Vogel, Text book of Quantitative Chemical Analysis, Prentice Hall, 2000.

CO101 COMPUTER PROGRAMMING LAB (0-0-3) 1

Introduction to fundamentals of DOS and Windows, C Programming exercise on simple statements, Control structures, Arrays, Matrices, Strings, Functions and Recursions, Structures and Unions, Bit Operations, Pointers, Dynamic Memory allocation, Files and Macros.

Brian W. Kernighan & Dennis M. Ritchie, The C Programming Language, Prentice Hall Inc., 2001.

Byron S. Gottfried, Program with C, Schaum's Outline series, 2001.

Yashavant Kanetkar, Let us C, BPB Publications, 2002.

Balagurusamy, C Programming, TMH, 2002.

ME102 WORKSHOP (0-0-3) 1

Carpentry, Sheet metal, Demo of lathe, Use of power tools
Wiring, Winding, PCB making, Soldering

MLC1 ENVIRONMENTAL STUDIES (1-0-0) 1

Definition, scope and importance of Environmental Studies, Need for public awareness. Natural Resources Renewable and Non-renewable Resources. Natural resources and associated problems. Concept and function of an ecosystem, Biodiversity and Its Conservation, Environmental Pollution: Pollution case studies. Disaster management, Social Issues and the Environment, Environmental ethics, Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Wasteland reclamation, Consumerism and waste products, Acts related to Environment Protection.

R. Rajagopalan, Environmental Studies from Crisis to Cure, Oxford IBH Pub., 2005.
Benny Joseph, Environmental Science and Engineering, Tata McGraw Hill, 2006.
Erach Bharucha, Text Book for Environmental Studies, Pub., Universities Press, 2005.
Masters, Gilbert M., Introduction to Environmental Engineering and Sciences, Prentice Hall India, 1991.

MLC2 PROFESSIONAL ETHICS & VALUE EDUCATION
(1-0-0)1

Professional ethics, Personal ethics, Compliance with law, Service to community, Science and Spirituality, Case Studies, Field visits.

Charles E. Harris et al., Engineering Ethics: Concepts and Cases, Wadsworth, 2004