

PART II
EDUCATIONAL PROCESS
AND
PROGRAMMES OF STUDIES

EDUCATIONAL PROCESS

The mission of BITS is to prepare young men and women to act as leaders for the promotion of the economic and industrial development of the country and to play a creative role in society. It has the reputation of a highly purposive and innovative university often setting the pace for workable reforms in higher education, suitable and relevant for the Indian cultural milieu.

BITS has been following semester system with continuous and internal evaluation since its inception. The educational programmes are modular and flexible. Through its Practice School programme, BITS has established purposeful linkages with industries. The Institute has evolved a direction for Research which makes research relevant to the national development and social needs. It has developed and adopted a unique academic administrative structure which makes all its innovations possible and workable.

The Institute operates educational programmes at three tiers of education, namely, the Integrated First Degree programmes, Higher Degree programmes and the Doctoral programmes. All programmes in the Institute are designed to allow as many components of science and applied science as are necessary for the graduates of the programmes to function effectively and efficiently in the technological society. All programmes contain certain structural commonality and the common courses are invariably operated together irrespective of the clientele who are required to take the courses. Similarly, irrespective of the ultimate degree for which a student qualifies, the large factor of this commonality between all students creates an educational basis which provides easy professional linkage, communication and group activity among students graduating in different degrees. This similarity among different students graduating with different degrees is further welded in a stronger professional bond when they work as internees in the Practice School stations or as members in a team working on mission-oriented time-bound

research and development projects.

The various structural flexibilities provide not only scope for multiple point entries but also enable the system to accommodate many legitimate educational and operational needs of students. Some of these aspects are described in various sections that follow.

PROGRAMMES OF STUDIES

All programmes of studies are based on the principle that a series of courses make up the hierarchy of the structure where each course is self-contained but nevertheless acts as a bridge between what precedes and what comes after. A formal contact hour is such that a student is invariably required to spend several times of these hours towards self-study. Attempt here is to awaken curiosity in the mind of the student and train him to think rationally and scientifically and enable him to face the unfamiliar. Through the Practice School option, the flavour of the professional world is sought to be imbibed by the student as well as the teacher. Even many co-curricular activities are converted into a learning situation whereby the growth of a student becomes a continuing operation.

The Institute also conducts Off-campus Work-Integrated degree programmes as a means of continuing education for employed professionals as part of the human resource development programmes of specific organizations at the various off-campus centres. In all these programmes, emphasis is on self-learning and the pedagogy attempts to incorporate as many modern technologies as desirable. While each one of these programmes requires collaboration of an organization, some programmes have a highly structured collaboration with planned classroom activities and some programmes may have less structured planning. While a number of degrees are offered through structured collaboration with many collaborating organizations, there are also degrees, which are available in an open manner for a large number of organizations, each of which may sponsor only few students. For all these programmes, faculty/resource persons are drawn from the

Institute and the participating organizations as well as other Institutions.

The Three Tier Structure shown on page II-3 gives all the programmes offered by the Institute.

Integrated First Degree Programmes

The Integrated First Degree Programmes are offered at the first tier with nomenclatures like B.E., B.Pharm. and M.Sc.. These are all level wise equivalent degrees. These are called integrated degrees for two reasons: (i) there are several common courses amongst these degrees, and (ii) no intermediate degrees, like, B.Sc. etc. are awarded. These degrees are based on a modular structure and their academic requirements are spelt out in respect of the number of courses and units rather than the number of years. All these programmes are structured in such a way that normally a student will be able to finish a programme in eight semesters. Of course, the flexibility of the Institute allows a student to do his programme at a faster pace and finish it earlier than 8 semesters or at a slower pace to finish it later than 8 semesters.

(a) B.E.

These programmes in engineering are mathematics and hard science based and incorporate many up-to-date techniques of analysis and synthesis.

(b) B. Pharm.

This programme has been so structured that it not only meets the requirements of the Pharmacy Council of India but also has additional courses which give a shape and flavour of both engineering and fundamental sciences to the programme.

(c) M.Sc. (Programmes under Group B)

These are integrated degree programmes without any intermediate B.Sc. degree. While these programmes ensure the required science component in any comparable postgraduate science degrees of other universities, they also incorporate many courses which have been notionally considered to be the preserves of

engineers. The integrated nature of the programmes and their analytical and engineering science contents give them a professional character and enable students to participate usefully in industrial jobs. While a good 10+2 input may be able to complete these programmes in four years, any person coming from 10+2+3 system with a B.Sc. degree admitted on advanced standing basis will require two to three years to finish the programme. Almost all students who are admitted for these degrees also aspire and work for a second degree from B.E. and B.Pharm. degrees under the dual degree scheme.

(d) M.Sc. (Programmes under Group C)

These programmes are basically multi-disciplinary and technological in character and are designed to meet the requirements of newly emerging professional activities. The areas which are currently incorporated in these degree programmes are Information Systems, Finance and General Studies.

The programme on Information Systems gives among other things a good exposure to the students on computer software and software engineering techniques, both at the conceptual and application levels. The Finance degree has been designed to meet the manpower needs arising due to the new thrust given to growth patterns in the economy. The courses planned for this programme are of such a nature that they fulfil the requirements of financial institutions as well as financial management needs of any industry. This programme is complementary to the M.Sc. Economics programme.

**Details of Work Integrated Learning Programmes are given in Part V.
Birla Institute of Technology & Science, Pilani
Three Tier Structure of Education**

Ph. D. Degrees	
Higher Degrees	
On-campus programmes	Work-Integrated Learning Programmes
<p>M.E.</p> <p>Biotechnology, Chemical, Civil with specialization in Structural Engineering, Civil with specialization in Infrastructure Engineering & Management, Civil with specialization in Transportation Engineering, Communication Engineering, Design Engineering, Embedded Systems, Manufacturing Systems Engineering, Mechanical, Mechanical with specialization in Thermal Engineering, Microelectronics, Software Systems, Sanitation Science, Technology and Management</p> <p><i>**Chemical with specialization in Petroleum Engineering, Chemical with specialization in Nuclear Engineering,</i></p> <p><i>Civil with specialization in Water Resources Engineering, Computer Science, Computer Science with specialization in Information Security, Electrical with specialization in Power Electronics & Drives,</i></p> <p>M. Pharm.</p> <p>M.Pharm., M.Pharm. with specialization in Pharmaceutics, M.Pharm. with specialization in Pharmaceutical Chemistry</p> <p>M. Phil.</p> <p>Biological Sciences, Chemistry, Economics, English, Management, Mathematics, Physics, Liberal Studies</p> <p>Master of Business Administration (MBA)</p> <p>Engineering & Technology Management, IT Enabled Services Management, Finance, Marketing</p>	<p>M.B.A.</p> <p>Consultancy Management, Finance, Hospital and Health Systems Management, Manufacturing Management, Quality Management.</p> <p>M. Tech.</p> <p>Automotive Engineering, Computing Systems and Infrastructure, Data Science and Engineering, Design Engineering, Embedded Systems, Environmental Engineering, Manufacturing Management, Microelectronics, Pharmaceutical Operations and Management, Quality Management, Software Engineering, Software Systems, Systems Engineering, Telecommunications and Software Engineering, Transportation Engineering</p>

Integrated First Degrees			
On-campus programmes			Work-Integrated Learning Programmes
Group A B.E. Biotechnology, Chemical, Civil, Computer Science, Electrical & Electronics, Electronics & Communication, Electronics & Instrumentation, Manufacturing, Mechanical B. Pharm.	Group B M.Sc. Biological Sciences, Chemistry, Economics, Mathematics, Physics	Group C M.Sc. General Studies, **Information Systems, **Finance	M.Sc. Business Analytics, Information Systems B.Tech. Engineering Design, Engineering Technology, Information Systems, Manufacturing Technology, Power Engineering, Process Engineering.

****These programmes are not offered during academic year 2020-21**

Minor programs
Minor programs are being offered in certain areas as options for integrated first degree students with the intent of encouraging them to add focus to their supplemental learning (outside a major area) as well as recognizing and certifying the knowledge obtained in an area that is outside of their major area. A minor would allow a Department (or multiple Departments) to offer a package of courses in an area/sub-area to students for whom this area/sub-area would not be part of their (major) program (e.g. a minor in Finance for students who are not pursuing a program in Finance). A minor will be recognized by means of a separate certificate. The details of minor programs are described in Part IV.

For Admission to on-campus programmes	
Integrated First Degree :	Higher Degree :
For admission to all the programmes: Candidates should have passed the 12th examination of 10+2 system from a recognized Central or State board or its equivalent with adequate proficiency in English. Except for admission to B. Pharm., the candidates should have Physics, Chemistry, and Mathematics as subjects. For admission to B. Pharm. , candidates should have Physics, Chemistry, and either Biology or Mathematics as subjects.	Normal input: Integrated First Degree of BITS or its equivalent. Ph.D. Degree: Normal Input: Higher Degree of BITS or its equivalent.

The General Studies programme aims at providing an opportunity to the students to acquire specific skills to meet varied career objectives through judicious use of electives and project oriented courses. Students are given opportunities to take two different streams, namely Communications and Media Studies or Developmental Studies by choosing courses of specific streams. Further, the requirements of mathematics, science and applied science, etc. are normally different from Group A and Group B Programmes. Candidates admitted to this programme have to take humanities courses as well as certain general science and technology courses.

All the Integrated First Degree programmes described above have a Practice School option which consists of two courses, Practice School I and Practice School II. A student goes to Practice

School I of two months' duration during the summer following second year and to Practice School II of five and a half months' duration during the final year. The curriculum, through Practice School, finds a formal method of bringing the reality of professional environment into the educational process.

For the various programmes in all the three tiers of education, the admission policy and the educational process at BITS take care of multiple entry into the programmes and allow several other flexibilities. The on-campus integrated first degree programmes are divided into Groups A, B and C. The following table provides a tabular condensation of the information.

INTEGRATED FIRST DEGREE PROGRAMMES

Name of the Programme	Normal Input	Special features
<p>Group A programmes: B.E. : Biotechnology : Chemical : Civil : Computer Science : Electrical & Electronics : Electronics & Instrumentation : Electronics & Communication : Manufacturing : Mechanical B.Pharm.</p> <p>Group B Programmes: M.Sc. : Biological Sciences : Chemistry : Economics : Mathematics : Physics</p> <p>Group C Programmes: M.Sc. : General Studies</p>	<p>For admission to all the programmes: Candidates should have passed the 12th examination of 10+2 system from a recognized Central or State board or its equivalent with adequate proficiency in English. Except for admission to B. Pharm., the candidates should have Physics, Chemistry, and Mathematics as subjects. For admission to B. Pharm., candidates should have Physics, Chemistry, and either Biology or Mathematics as subjects.</p> <p>Admission to all the programmes is subject to the conditions given below:</p> <p>Admissions will be made purely on merit. The merit position of the candidate will be based on the score obtained by the candidate in a Computer based Online Test (BITSAT) conducted by BITS, Pilani.</p> <p>The candidate should have obtained a minimum of aggregate 75% marks in Physics, Chemistry and Mathematics subjects (if he/she has taken Mathematics in BITSAT) or a minimum of aggregate 75% marks in Physics, Chemistry and Biology subjects (if he/she has taken Biology in BITSAT) in 12th examination, with at least 60% marks in each of the Physics, Chemistry, and Mathematics / Biology subjects.</p>	<p>Duration: Planning has been made such that a student will be able to finish any of the integrated first degrees in 4 years (8 semesters). However, the flexibilities available and the modular structure of the system will allow individual student to have variation in the duration of his degrees. Some can finish earlier than 4 years and some may take more than 4 years. Students who take two degrees simultaneously under dual degree scheme will spend about 5 to 5½ years (10 to 11 semesters).</p> <p>Practice School: All the integrated first degree programmes have Practice School options.</p> <p>Dual Degree: Institute offers dual degree facility to number of students who are admitted. The features of dual degree scheme are described later in this part under the section 'Flexibilities'.</p> <p>Electives: A student is required to complete at least 12 elective courses under the categories of Humanities electives, Discipline electives and Open electives. By judicious choice of these courses a student can obtain depth in his/her discipline and/or expand his/her horizon to gain exposure to one or more other areas of study.</p>
<p>For Details of Admission policy to Work Integrated Learning Programmes Refer to Part V.</p>		

HIGHER DEGREE PROGRAMMES

M.E./M.Pharm./M.Phil.

The requirements of these programmes are described in terms of the total number of units which a student is required to complete rather than the duration. However, a normal student may be able to complete such a programme in four semesters, wherein the last semester may be spent for either of the two available alternatives, namely, Dissertation and Practice School. The programmes are intended to give a

penetrating professional experience and an opportunity to acquire further competence either in one's own discipline or in many other traditional areas of Engineering, Pharmacy as well as interdisciplinary areas, like, Embedded Systems, Microelectronics, Software Systems, Biotechnology, Manufacturing Systems, Design Engineering, Transportation Engineering, etc.

Following is the exhaustive list of all the higher degree programmes approved by the Senate.

Name of the programme	Input
M.E.	Normal input
: Chemical	
: Chemical with Specialization in <ul style="list-style-type: none"> • Petroleum Engineering • Nuclear Engineering 	Integrated first degree of BITS in the same discipline or its equivalent.
: Civil with Specialization in <ul style="list-style-type: none"> • Infrastructure Engineering & Management • Structural Engineering • Transportation Engineering • Water Resources Engineering 	
: Computer Science : Mechanical : Mechanical with specialization in Thermal Engineering	
: Communication Engineering : Electrical with specialization in Power Electronics and Drives	Integrated first degree of BITS in Electrical & Electronics or in Electronics & Instrumentation or its equivalent
: Embedded Systems	Integrated first degree of BITS in Electrical & Electronics or Electronics & Instrumentation or Computer Science or its equivalent.
: Design Engineering : Manufacturing Systems Engineering	Integrated first degree of BITS in Mechanical or its equivalent. Any other Integrated first degree of A & B groups or M. Sc. Engineering Technology of BITS or its equivalent with the requirement of taking certain additional courses.
: Microelectronics	Integrated first degree of BITS in Electrical & Electronics or Electronics & Instrumentation or Computer Science or Physics or its equivalent.
: Software Systems : Sanitation Science, Technology and Management	Any first degree of the Institute, provided the minimum component of MATH, TA, Science, ENGG, prescribed in each of the groups A, B and C through compulsory requirements or conventional options. Other inputs: (a) For those Integrated first degree programmes under Work Integrated Learning Programmes which have no counterpart in Groups A, B and C, the minimum requirement should be at least what is prescribed in Group C. (b) Any equivalent degree from other University with preparation indicated above.
: Biotechnology	Any Integrated first degree of BITS or its equivalent with adequate preparation in Bio-Chemistry and Microbiology.
M.Pharm.	Integrated first degree of BITS in Pharmacy or its equivalent.
: M.Pharm.	
: M.Pharm. with Specialisation in Pharmaceutics	
: M.Pharm. with Specialization in Pharmaceutical Chemistry	
M.Phil.	Any Integrated first degree of BITS or its equivalent in respective discipline.

Name of the programme	Input
Liberal Studies	

Special features of Admissions to any M.E. programme:

Students coming with integrated first degree of BITS in A & B groups may be considered for admission to any M.E. Programme with the requirement of taking additional courses. The

duration in these cases may be more than the normal duration and will be determined on a case by case basis. Similar dispensation may also be possible for students coming with an engineering degree from IITs and other reputed institutions.

Note: While no direct admissions are planned for M.Phil. degree, students who are admitted to Ph.D. may be asked whenever necessary, to register for this degree.

Master of Business Administration

The Institute is running an MBA programme with input requirement as first degree of BITS or its equivalent. The programme endeavors to create manpower who have scientific and engineering approach to business administration. Students will also have a reasonable exposure to certain modern technologies. The programme is designed to have many flexibilities and a very strong component of industry project experience. The input for the programme may have multiple entry points. While principal input will be students already possessing an engineering degree, those who have other

qualifications like B.Sc., B.A., B.Com. may also apply provided they have aptitude towards having training in science, mathematics and technology as well. The requirements of the programme will necessitate such students to spend additional time which may vary from 1 to 4 semesters depending upon their qualifications. For students not having an engineering degree, the course requirement will be worked out, looking at the earlier training on a case-by-case basis at the time of admission. However, for the current year, admissions are planned for an input with engineering degree only in which case the normal duration is 4 semester.

Master of Business Administration (MBA) in	Input
(i) Engineering & Technology Management (ii) IT enabled Services Management (iii) Finance (iv) Marketing	B.E./B.Tech in Engineering or a Masters degree in any discipline from any recognized university or any Integrated first degree of BITS.

DOCTORAL PROGRAMMES

The Institute's Ph.D. programme is structured on the basis of a preferred input of those who have completed one of the Institute's higher degrees. It requires each student to finally qualify for formal acceptance in the programme only after passing a qualifying examination.

The Institute also offers a unique opportunity for working professionals to work for Ph.D. in the settings of their own work environments through part-time, Off-campus Ph.D. scheme.

Ph.D.	<p>Normal input Any Higher degree of BITS or its equivalent.</p> <p>Other inputs</p> <p>a) Integrated First Degree of BITS or its equivalent.</p> <p>b) Any preparation between the above described first degree and higher degree.</p> <p>c) High professional standing and proven competence even without a formal degree.</p> <p>Note: Each case of other inputs will be decided on</p>	<p>Structure: Qualifying examination, Research Methodology, Teaching practice, Foreign language when required, Thesis and Seminar. Course work as specified for various input and prior preparation.</p> <p>Locale: Normally any of the BITS campuses and other off-campus locations with prior approval.</p> <p>Ph.D. Aspirant: To help in the development of professionals at large, provision exists for taking directly the</p>
--------------	--	--

<p>a case by case basis regarding admission and with the requirement of doing higher degree courses before taking qualifying examination. In the case of inputs with qualification like B.E., M.Sc., etc. the selected candidates will be required to do course work.</p>	<p>qualifying examination as a 'Ph.D. Aspirant' even before seeking admission to the Ph.D. Programme. The Aspirants can work in the settings of their own work environment with the approval of Research Board.</p>
---	---

PROGRAMMES OFFERED AT BITS PILANI – PILANI CAMPUS

Integrated First Degree Programmes

- B.E. Chemical
- B.E. Civil
- B.E. Computer Science
- B.E. Electrical & Electronics
- B.E. Electronics & Instrumentation
- B.E. Manufacturing
- B.E. Mechanical
- B.Pharm.
- M.Sc. Biological Sciences
- M.Sc. Chemistry
- M.Sc. Economics
- M.Sc. Mathematics
- M.Sc. Physics
- M.Sc. General Studies

Higher Degree Programmes

M.E.:

- Biotechnology
- Chemical
- Civil with specialization in Structural Engineering
- Civil with specialization in Infrastructure Engineering & Management
- Civil with specialization in Transportation Engineering
- Communication Engineering
- Computer Science
- Design Engineering
- Embedded Systems
- Manufacturing Systems Engineering
- Mechanical
- Microelectronics
- Software Systems

M.Pharm:

- M.Pharm.
- M.Pharm. with specialization in Pharmaceutics

- M.Pharm. with specialization in Pharmaceutical Chemistry

Master of Business Administration (MBA)

Doctoral Programme

- Doctor of Philosophy (Ph.D.)

PROGRAMMES OFFERED AT BITS PILANI – K.K. BIRLA GOA CAMPUS

Integrated First Degree Programmes

- B.E. Chemical
- B.E. Computer Science
- B.E. Electrical & Electronics
- B.E. Electronics & Communication
- B.E. Electronics & Instrumentation
- B.E. Mechanical
- M.Sc. Biological Sciences
- M.Sc. Chemistry
- M.Sc. Economics
- M.Sc. Mathematics
- M.Sc. Physics

Higher Degree Programmes

M.E.:

- Biotechnology
- Chemical
- Computer Science
- Design Engineering
- Embedded Systems
- Mechanical
- Microelectronics
- Sanitation Science Technology and Management

M.Phil

- Liberal Studies

Doctoral Programme

- Doctor of Philosophy (Ph.D.)

All these programmes have the same

educational process, syllabus, evaluation method and academic flexibilities like transfer, dual degree etc. as followed at BITS, Pilani – Pilani Campus.

PROGRAMMES OFFERED AT BITS PILANI – HYDERABAD CAMPUS

Integrated First Degree Programmes

B.E. Chemical
B.E. Civil
B.E. Computer Science
B.E. Electrical & Electronics
B.E. Electronics & Communication
B.E. Electronics & Instrumentation
B.E. Mechanical
B. Pharm.
M.Sc. Biological Sciences
M.Sc. Chemistry
M.Sc. Economics
M.Sc. Mathematics
M.Sc. Physics

Higher Degree Programmes

Biotechnology
Chemical Engineering
Civil with specialization in Structural Engineering
Civil with specialization in Transportation Engineering
Communication Engineering
Computer Science
Design Engineering
Embedded Systems
Mechanical
Mechanical with specialization in Thermal Engineering
Microelectronics

M.Pharm:

M.Pharm. with specialization in Pharmaceutics
All these programmes have the same educational process, syllabus, evaluation method and academic flexibilities like transfer, dual degree etc. as followed at BITS, Pilani – Pilani Campus.

Doctoral Programme

Doctor of Philosophy (Ph.D.)

All these programmes have the same educational process, syllabus, evaluation method and academic flexibilities like transfer, dual degree etc. as followed at BITS, Pilani – Pilani Campus.

PROGRAMMES OFFERED AT BITS PILANI – DUBAI CAMPUS

First Degree Programmes

- B.E. Chemical Engineering
- B.E. Civil Engineering
- B.E. Electrical & Electronics Engineering
- B.E. Mechanical Engineering
- B.E. Computer Science
- B.E. Biotechnology
- B.E. Electronics & Communication Engineering

Higher Degree Programmes

M.E.:

- M.E. Software Systems
- M.E. Microelectronics
- M.E. Electrical
- M.E. Design Engineering

M.B.A. (Master of Business Administration)

Doctoral Programme

Doctor of Philosophy (Ph.D.)

TEACHING-LEARNING PROCESS

The objective of class room education is to awaken the curiosity of the student, generate habits of rational thinking in him/her, gear his/her mind to face the unfamiliar and train him/her to be able to stand on his/her own. With its team of committed and dedicated faculty, BITS aims at maximizing the learning through teaching. Through their innovative teaching, the teachers enable the student search for knowledge on his/her own and motivate him/her to use the facilities like the library, laboratory and the environment to optimize his/her learning process. Self-study by the student is therefore an important factor in the planning of teaching and evaluation and in this environment the student exhibits interest and responds to this challenge. Teaching and evaluation form a unity of function and operate in a climate of mutual understanding and trust.

Every course whether single section or multi-section is conducted by a member of the faculty called instructor-in-charge, with the assistance, where necessary, of the required number of instructors – who will be partners with him in meeting the full academic perceptions and organizational needs of teaching the course and evaluating the students.

Within one week of the beginning of class work, the instructor-in-charge/ instructor announces to his class/section through a hand-out, the necessary information in respect of (i) the operations of the course (its pace, coverage and level of treatment, textbooks and other reading assignments, home tasks etc.); (ii) various components of evaluation, such as tutorials, laboratory exercises, home assignment, project, several quizzes/ tests/ examinations (announced or unannounced, open book or closed book), regularity of attendance, etc., (iii) the frequency, duration, tentative schedule, relative weightage etc. of these various components; (iv) the broad policy which governs decisions about make-up; (v) mid-semester grading; (vi) grading procedure (overall basis, review of border line cases, effect of class average, etc.) and (vii) other matters found desirable and relevant.

EVALUATION

All courses are conducted and evaluated in a continuous & internal manner by the faculty who teach these courses. The student registers for a certain number of courses each semester; the year being divided into two semesters, and a summer term, whenever offered. A faculty member, as registration advisor, helps a student to draw up his programme, suitable to his pace and needs, which is made possible by the course wise time-table of the Institute. Every student gets, incidentally, a training in decision-making through (i) choice of load, i.e. number of courses per semester to suit his/her pace, (ii) selection of his/her own time-table to suit his/her convenience, and (iii) picking up courses as electives to meet his/her own aspirations. It is the responsibility of the student to attend classes regularly and to maintain a required level of scholastic standing.

The performance of a student in each course is assessed by the teacher by means of continuous evaluation throughout the semester in

classwork, periodical quizzes (sometimes unannounced), tests (both open and closed book), tutorials, laboratory work, home work, seminars, group discussions, project, etc., and a comprehensive examination at the end of the semester. The student is thereby given a large number of opportunities to carry out various academic assignments and be evaluated. Besides encouraging and rewarding continuous and systematic study, the system provides a constant feedback to the student as to where he/she stands, thus enabling him/her to cultivate regular habits of studying and preparing himself/herself for the future.

The system discards the conventional emphasis on a single final examination and numerical marks as the only absolute indication of the quality of student's performance. Thus, at the end of the semester the teacher of the course awards letter grades **A, A⁻, B, B⁻, C, C⁻, D, E** to the student based on the total performance of the student and it is relative to the performance of others taking the same course. These letter grades stand for quality of performance: A (Excellent), A⁻ (Very Good), B (Good), B⁻ (Above Average), C (Average), C⁻ (Below Average), D (Poor) and E (Exposed). Further, these letter grades have points associated with them in a quantified hierarchy: a maximum of 10 (for an A) to a minimum of 2 (for an E). There are also courses in which the teacher awards non-letter grades which have only a qualitative hierarchy. The teacher may also pronounce the performance of a student in a course in terms of certain reports which should not be misconstrued as grades.

Although BITS does not stipulate a minimum percentage of attendance before a student is permitted to appear in any test/examination, the Institute, being a fully residential university with internal and continuous evaluation system, expects every student to be responsible for regularity of his/her attendance in classrooms and laboratories, to appear in scheduled tests and examinations and to fulfill all other tasks assigned to him/her in every course. The system has adequate resilience to accommodate unforeseen situations through withdrawal from a course, make-up test, feedback from examinations and interaction with teachers. In spite of all these facilities when a student fails to cooperate with the teacher in the discharge of

his/her part of the contract to such an extent that the teacher is unable to award any grade, the teacher is authorized to give a "Not Cleared" (NC) report.

A student is deemed to have cleared a course if he/she obtains a grade in the course. However, the educational philosophy of the Institute interlinks and at the same time distinguishes between the performance of a student in a single course and his/her overall cumulative performance. The overall performance of a student is indicated by an index known as the "Cumulative Grade Point Average" (CGPA). It is the weighted average of the grade points of all the letter grades received by the student since his/her entry into the Institute and is expressed on a 10-point scale. In the case of Integrated First Degree programmes the final division for the degree is decided on the basis of CGPA and there are three classifications, namely Distinction, First Division and Second Division. However, in the case of Higher Degree and the Doctoral programmes no division is awarded.

During the student's stay in the Institute, the Institute expects him/her to show a certain minimum performance and progress. The minimum academic requirements regarding the performance and progress for the Integrated First Degrees and Higher Degrees are:

- (i) A CGPA of at least 4.5 at the end of every semester for integrated first degree students and 5.5 for higher degree/Ph.D. students.
- (ii) Not more than one E grade in a semester for integrated first degree programmes and no E grade in the higher degree programmes.
- (iii) The pace of progress of a student should be such that at any stage of reckoning he/she should not have spent more than 50% extra time than what is prescribed for him/her upto that stage in his/her programme.

The Institute's Academic Regulations must be consulted regarding the minimum academic requirements for the pursuit of the Ph.D. programme and also for off-campus programmes.

Students who fail to meet the minimum academic requirements stipulated above are put under an appropriate committee which monitors their programmes and give guidance so that they are properly rehabilitated at the earliest. In case

of Ph.D., this is done by the Departmental Research Committee (DRC) and Doctoral Counselling Committee and in the case of higher degrees and integrated first degrees this is done by Academic Counselling Board (ACB). These Committees are appointed by the Senate and are given authority to take appropriate action including discontinuance of the student or transfer to other programme.

FLEXIBILITIES

The admission policy and the educational process at BITS take care of multiple entry into the programmes and allow several other flexibilities.

Wherever a flexibility is possible according to the Academic Regulations of the Institute, the implementation of the decision invariably takes place along with registration at the beginning of a semester for the continuing students. As in the admission process, the decision is guided by the principle of merit, preferences and facilities available.

It is obvious that CGPA cannot serve as the only measure of merit when the total number of courses/units is different between two competing candidates. To normalise all competing candidates, generally the Institute uses a Progressive Branching Index (PBI).

Admissions in both the Semesters

The structural flexibilities available in the Institute make it possible to admit students in both the semesters. However, in the case of both first degree and higher degree programmes most of the admissions are made during the first semester itself. In the case of Ph.D. and off-campus degree programmes, admissions are planned in both the semesters. However, a separate advertisement is given for the second semester admissions and applications for the same are made available only after an advertisement is issued.

Admission with Marginal Deficiency

While the academic preparation required for the admission to each degree has been clearly spelt out there is a provision in the Institute Academic Regulations whereby brilliant students whose prior preparation has been marginally deficient in terms of stated courses/subjects may also be admitted with the condition that they are required to do additional courses over and above those

prescribed for a student with normal preparation and the sequence is determined by the institute. This flexibility is invariably used in the case of higher degree programmes where students may come without sufficient exposure to courses like computer programming.

Admission with Advanced Standing

When a candidate for any programme in the three tiers of education of the Institute comes with a preparation beyond the minimum requirement for admission in that programme, the admission of such a candidate is handled under what is known as admission with advanced standing. While such admission is not available as a matter of right, at the time of admission the Institute would spell out in detail the advanced credit it proposes to give to the candidate and the matter would be handled within the framework of the Institute's operation for normal students. Essentially the guiding principle is two-fold : the courses the candidate has already done before entering the Institute cannot be repeated and also that the time spent elsewhere is not wasted. Such an open-ended situation is handled on a case by case basis. It is important that the candidate supplies all the pertinent data in respect of syllabus of courses taken by him/her, examinations passed, question papers of the examinations and the grades/marks obtained by him/her in different subjects. A candidate who is shortlisted for such admissions would be asked to come to Pilani and explore a workable programme that would be appropriate for him/her before admission is completed. If required, the candidate may have to take certain examinations in various subjects that he/she has completed before a prescribed programme is pronounced for him/her there onwards.

However, there are certain situations which cannot be treated as advanced standing. In view of the uncertainty of the level to which some of the courses of the First Degree programmes is treated as optional subjects in the 10+2 system, to be consistent with the past tradition, no student is allowed to register in a course if he/she is considered to be overprepared in relation to the content of the course. Some examples of such courses are: General Biology, Engineering Graphics and Workshop Practice. Such an overprepared student is required to take an appropriate higher level course, as determined by the Associate Dean, Academic,

Undergraduate Studies.

Dual Degree Scheme

The Institute has created facility by which any student who is admitted to M.Sc. programmes (offered under Group B) is offered a second degree in B.E programmes under dual degree scheme. This assignment is made on the basis of **Progressive Branching Index (PBI)** at BITS at the end of the first year, separately in Pilani, Goa and Hyderabad campuses

Number of dual degree seats in any particular branch of engineering is decided by using following formula:

$$A = \frac{P \times Q}{R}$$

A: Number of dual degree seats in an engineering branch

P: Total Number of students eligible for dual degree in science

Q: No of engineering Students admitted in an Engineering Branch in which number of dual degree seats need to be calculated.

R: Total number of students admitted in Engineering on the day of admission.

If any student is under the purview of ACB, his/her pursuit of the Dual Degree will be governed by the clause 7.02 of the Academic Regulations. He/She is required to maintain a minimum CGPA of 4.5 at the end of the fourth Semester failing which ACB may recommend withdrawal of the dual degree offer made to him/her.

Students in any other group seeking a second degree from amongst the programmes in the same group or another group will also be considered under 'other' priorities.

Transfer

(i) *Within the same tier*

It is possible for a student to seek transfer from one programme to another in the middle of a programme without starting from the beginning. This is possible because he/she is given credit for what he/she has done till then towards the requirements of the programme to which he/she seeks the transfer. Details have to be seen in the Academic Regulations. Transfer is possible from M.E. (all branches) and M.Pharm. to M.Phil. On the other hand, very restricted and tutored

transfer would be possible from M.Phil. to M.E./ M.Pharm.

Since admission to a programme is done on assigned and competitive basis, there cannot be any scope of undoing the fact of an assigned admission through transfer. Thus only exceptionally meritorious students in a limited number of cases can expect to compete for transfer to a more sought-after programme. On the other hand, transfer to a less sought-after programme for a student who is unable to cope with the rigours of the programme in which he/she has been admitted would be readily used to rehabilitate him/her without much loss of time. In any event, transfer must be treated as an admission process.

(ii) *From first degree to higher degree / Ph.D. degree:*

In the case of bright and promising student of the Integrated First degree programmes a transfer to Higher Degree and/or Ph.D. degree may also be provided.

(iii) *Between Ph.D. and higher degree programmes:*

Under special situations a transfer between Ph.D. and higher degree programmes may be permitted. Movement in either direction is theoretically possible. The Institute's Academic Regulations must be consulted for details.

Audit

The facility of taking a course on audit is principally conceived to give an opportunity to a student to update his/her knowledge in selected courses. It is expected to meet primarily the needs of casual students (not enrolled for degree). No degree of the Institute can be acquired by merely taking courses on audit.

There are certain courses like Foreign Languages, Music, etc. which are neither part of a degree programme nor are available through electives. Any student who wishes to take such courses can take them only on audit basis and also on payment of additional fees.

Other Flexibilities

The structure of degree programmes and the Academic Regulations also provide certain other flexibilities like choice of electives, number of electives, repetition of courses, departure from normal pace, withdrawal from or substitution of course(s) etc.

Academic Regulations

The operations described above are not exhaustive. For precise rules, Academic Regulations of the Institute may be consulted.