PREFACE

Dear Students,

Since it started in the year 1946, NIE is promoting excellence in education through highly qualified faculty members and modern infrastructure. The Board of Directors believes in continuous improvement in delivery of technical education. Thanks to Karnataka government that designed and developed a seamless admission process through CET, many highly meritorious pre-university passed students are joining NIE, which has become a brand name among hundreds of colleges in the country. In fact, NIE is one of the top ten preferred colleges where all the seats got filled-up in the first round of 2016 admissions.

The concerted efforts of stake holders at NIE have made it get autonomous status, prestigious TEQIP-I & II. We are in the process of getting renewal of accreditation from National Board of Accreditation, New Delhi. NIE has been granted permanent affiliation by VTU to all its courses.

Today NIE has of 7 UG, 13 PG and 5 Post-graduate Diploma programmes and 13 Centres of Excellence with overall student strength of over 3500. NIE's journey to excellence, with the main objective of continuous improvements of administrative and academic competence, is envisioned through three major pillars: intellectual infrastructure, courses/services offerings and institution building.

Our curriculum is designed to develop problem-solving skill in students and build good academic knowledge.

Dr. G.L. Shekar July 2016
Principal

Dear Student

It gives me great pleasure to welcome you to the National Institute of Engineering (NIE) where academics and activities never cease as students are groomed in the fields of engineering and technology. Our dedicated team of highly talented faculty members are always trying to strive for academic excellence and overall personality development. The major emphasis of imparting training at NIE is to encourage enquiry and innovation among our students and lay the strong foundation for a future where they are able to face global challenges in a rapidly-changing scenario. Efforts are being made to design the curriculum based on Bloom's Taxonomy framework, to meet the challenges of the current technical education.

NIE is making sincere efforts in meeting the global standards through new formats of National Board of Accreditation, New Delhi and timely World Bank-MHRD initiative TEQIP (Technical Education Quality Improvement Program).

We will make a genuine attempt in assisting you during the times of your trials and tribulations. We have set up a Student Mentoring Programme (SMP) from this year, through the voluntary efforts of the 3rd year students of your branch and our faculty members. You can approach them at any time during your stay at the NIE campus to address any of your concerns regarding either academic matters or life in the campus. In case of special needs, You are also welcome to seek the help of the Student Welfare Officer or me.

I sincerely hope that your academic pursuit in NIE will be fruitful and enjoyable in every aspect **Wishing you the very best.**

Dr. G. S. Suresh July 2016
Dean (Academic Affairs)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

VISION

The Department will offer, through best-in-class faculty and infrastructure, globally acceptable education in computer science and produce highly competent and value-based computer engineers'.

MISSION

- To evolve into an outstanding department contributing significantly to teaching, research and consultancy in computer science in an integrated manner.
- To develop state-of-the art infrastructure and advanced computing facility in tune with requirement of industry and national projects.
- To promote innovation and entrepreneurship to enhance competence of graduates of computer science.

PROGRAM OUTCOMES

Engineering Graduates will be able to:

1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME EDUCATIONAL OBJECTIVES

PEO-1: Our graduates will acquire the necessary mathematical and scientific knowledge as well as basic managerial and financial procedures to analyze and solve real world problems within their work domain.

PEO-2: Our graduates will acquire the state-of-art knowledge in major areas of computing science like programming, networking, information security and algorithm development as well as technology solutions like cloud, database systems and mobile applications to enable them to succeed in pursuit of higher studies/Industry/R&D activity.

PEO-3: Our graduates will have the ability and the mindset to continuously update and innovate.

PEO-4: Our graduates will have the necessary communication skills to be able to effectively communicate with technical experts and also non- technical end users.

PROGRAMME SPECIFIC OUTCOMES

A graduate of the Computer Science and Engineering Program will demonstrate:

PSO1: The ability to understand, analyze and develop software in the emerging areas for efficient use of computer-based systems of varying complexity.

PSO2: The ability to think logically and apply standard practices and strategies in software project development using open-ended programming environments to deliver a quality product.

BLUEPRINT OF SYLLABUS STRUCTURE AND QUESTION PAPER PATTERN

Blue Print of Syllabus Structure

1. Complete syllabus is prescribed in SIX units as Unit 1, Unit 2, etc.
2. In each unit there is one topic under the heading **"Self Learning Exercises" (SLE)**. These are the topics to be learnt by the student on their own under the guidance of the course instructors. Course instructors will inform the students about the depth to which SLE components are to be studied. Thus there will be six topics in the complete syllabus which will carry questions with a weightage of 10% in SEE only. No questions will be asked on SLE components in CIE.

Blue Print of Question Paper

1. Question paper will have **SEVEN** full questions.

   One full question each of 15 marks (Question No 1, 2, 3, 4, 5 and 6) will be set from each unit of the syllabus. Out of these six questions, two questions will have internal choice from the same unit. The unit from which choices are to be given is left to the discretion of the course instructor.
2. Question No 7 will be set for 10 marks only on those topics prescribed as **"Self Learning Exercises".**

ACADEMIC REGULATIONS

1.0. TITLE AND COMMENCEMENT:

1.1. These Regulations shall be called "The National Institute of Engineering, Mysuru, (NIE) Regulations under Visvesvaraya Technological University, Belagavi, Autonomous College Statutes - 2006 for Academic Autonomy - 2016" for UG programmes.

1.2. This set of Regulations, on approval by the Governing Body, shall supercede all the corresponding earlier sets of regulations of the BE Degree programmes of VTU along with all the amendments thereto, and shall be binding on all students undergoing the Graduate Degree Programme(s) (Credit System) at NIE, Mysuru. This set of Regulations, may evolve and get refined or updated or amended or modified or changed through appropriate approvals from the Academic Council and/or Governing Body from time to time, and shall be binding on all parties concerned, including the Students, Faculty and the Staff of Departments. The decision of the Governing Body shall be final and binding.

1.3. The provisions contained in this set of Regulations govern the policies and procedures on the Registration of students, imparting instructions of course, conduct of the examination and evaluation and certification of students' performance and all amendments there to leading to the award of the said Degree(s).

1.4. The Regulations shall come into effect from the date of obtaining approval from the Governing Body of the College.

2.0. ABBREVIATIONS:

a) "Academic Autonomy" means freedom to the College in all aspects of conducting its academic programmes, granted by the University for promoting excellence.

b) "Autonomous College" means The National Institute of Engineering, Mysuru, designated as an autonomous college by the University, as per the VTU Autonomous College Statute - 2006.

c) "Commission" means University Grants Commission (UGC).

d) "Council" means All India Council for Technical Education (AICTE).

e) "Statute" means VTU Autonomous College Statute - 2006.

f) "University" means Visvesvaraya Technological University (VTU), Belagavi.

g) "Institute" or "College" means The National Institute of Engineering, Mysuru (NIE).

3.0. ACADEMIC CALENDAR:

3.1. The total duration of an academic programme shall be the same as that followed by the University. i.e., four years for B.E. The maximum period which a student can take to complete a full time academic programme shall also be similar to that prescribed by the University, viz., double the nominal duration prescribed for the programme, i.e., eight years for B.E. For students being admitted to 3rd semester B.E. degree course under the lateral entry scheme, the maximum duration to complete the course shall be six years from the date of admission.

3.2. Each academic year is split into two semesters. The term of the semester for teaching B.E. is 16 weeks. Generally each semester is of 20 weeks duration which will include the period for teaching, examination and announcement of results. Typically, odd semester is from August to December and even semester is from January to May. In case of requirement under special circumstances, a Makeup Term of required duration as approved by the Academic Council may be offered in between even and odd semesters. The Summer term, whenever offered, may be limited only to teach value added/add-on courses and or courses as approved by the Principal.

3.3. In general, the academic schedule of a semester includes the following:

- Date of starting of a semester.
- Course registration period.
- Date of events of Continuous Internal Evaluation (CIE).
- Date of beginning of Semester End Examination (SEE).
- Date of Announcement of results.
- Inter semester vacation period, if provided.

This academic schedule, shall be prepared by the Dean (Academic Affairs) in consultation with the Principal, approved by the Academic Council (AC) and shall be announced at least one week before the beginning of the semester.

3.4. In case of an eventuality of losing a teaching day due to unavoidable reasons, such a loss shall be made up by having a teaching / laboratory / tutorial sessions on a suitable holiday by adhering to the time table of the day which was lost.

4.0. ELIGIBILITY FOR ADMISSION:

4.1. Admission to First year, First semester Bachelor's Degree in Engineering (B.E.) shall be open to the candidates who have passed the Second year Pre-University or XII standard or equivalent examination recognized by the University.
In addition to the above, the candidate shall have secured not less than forty five percent (45%) marks in the aggregate with Physics and Mathematics as compulsory subjects, along with one of the following subjects:- Chemistry, Bio-Technology, Computer Science, Biology and Electronics. Provided that, the minimum marks for the purpose of eligibility shall be forty percent (40%) in optional subjects in case of candidates belonging to SC/ST and OBC. Provided that, the candidate shall have studied and passed English as one of the subjects.

4.2. Admission to II year, III semester Bachelor Degree in Engineering/Technology (Lateral Entry) shall be open to the candidates who have passed a Diploma or equivalent examination, as recognized by the University. Provided that the candidate has secured not less than forty percent (40%) marks, in the final year examination (fifth and sixth semesters) in respect of candidates belonging to SC/ST and OBC and not less than forty five percent (45%) marks in case of other candidates in the appropriate branch of engineering specified in relevant Government order issued from time to time. Such a candidate shall clear prescribed bridge courses as specified by the college.

4.3. Those candidates who have passed a qualifying examination other than the II year PUC examination of the Pre-University Education Board of Karnataka or Engineering Diploma Examinations of the Board of Technical Education of Karnataka have to obtain eligibility certificate for seeking admission to B.E. Degree course from the University.

4.4. Relevant Government/University orders issued from time to time in this regard shall prevail.

5.0. ADMISSION and FEES:

5.1. Admission shall be made in accordance with the policy guidelines issued from the Ministry of Higher Education, Council, Government of Karnataka and University from time to time. Seats are reserved for candidates belonging to Scheduled Castes and Scheduled Tribes, Physically challenged candidates, children of defense personnel and other categories as per the orders issued by the Govt. of Karnataka.

5.2. Admission to all programmes shall be made in the odd semester of each session at the first year level based on the relative performance in the Entrance Examination (CET/COMEDK) as per the orders issued by the Govt. of Karnataka from time to time. The candidates should have successfully passed 10+2 examination with the combination of subjects prescribed by Govt. of Karnataka.

5.3. A limited number of admissions are offered to NRI and Management candidates in accordance with the rules applicable for such admission, issued from time to time by Govt. of Karnataka/Council.

5.4. The College may admit students to the 3rd semester of the B.E. Programme directly under Lateral entry Scheme as per Govt. rules or on transfer from other Colleges observing the Gudelines applicable and subject to approval from the University.

5.5. Student Exchange Programme and consequent Transfer of Credits in such cases shall be as per the decision and approval by the Competent Authorities such as the Departmental Council (DC), Board of Studies (BOS) and Academic Council (AC).

5.6. After admission of a candidate to a programme, if it is found that He/she had in fact not fulfilled all the requirements stipulated in the offer of admission, in any form whatsoever, including possible misinformation etc., the Principal is authorized to cancel the admission of the candidate.

5.7. The College reserves the right to cancel the admission of any student and ask him/her to discontinue the studies at any stage of their career on the grounds of unsatisfactory academic performance or indiscipline or any misconduct.

5.8. The decision of the Academic Council regarding the admissions is final and binding.

5.9. Candidates must fulfill the medical standards required for admission.

5.10. Every student of the College shall be associated with the Parent Department offering the degree programme that the student undergoes throughout his/her study period.

5.11. The fee structure as stipulated by Govt. of Karnataka from time to time shall be applicable for all the admitted students.

6.0. PROGRAMME STRUCTURE:

6.1. The structure for a BE Degree programme typically consist of the following components:

a) Basic Science Core Courses.

b) Engineering Science Core courses (Engineering Foundation courses).

c) Humanities and Social Science Core courses.

d) General core, Fundamental core courses.

e) Elective courses:

An elective course can be any of the following:

General elective, Fundamental Elective, Open Elective.

f) Seminar, Mini Project, Internship, Major Project

g) Mandatory Learning Courses

6.2. Departmental Council (DC) shall 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(AC) for consideration and approval.

6.3. The Credit Requirement for the B.E. Degree is 200.

6.4. The credit requirement for the lateral entry students for award of the B.E. Degree is 150. In addition, they shall also complete satisfactorily the mandatory learning courses, Humanities & Social Science courses and Bridge courses as specified from time to time.

6.5. SEMINAR AND PROJECT:

a) Seminar topic shall be selected from the emerging technical areas only. Each candidate has to give atleast one seminar satisfactorily.

b) Project work at 8th semester shall be completed batch wise and the batch shall normally consist of 2 to 4 candidates.

c) Project viva-voce examination shall be conducted individually.

7.0. REGISTRATION:

Each student after consulting his/her faculty advisor shall pre- register for the courses in every semester on the days specified for registration.

7.1. Mandatory Pre-registration for higher semester: To ensure proper planning of the academic activity, it is mandatory for all the students to undertake a pre-registration process well in advance before actual start of the next academic session. Typically, this pre-registration has to be completed during the last two weeks of the current semester for the following academic session except for minor modification during the 1st week of the ensuing semester

7.2. A student has to register for a minimum of 20 credits in each semester. The maximum number of credits a student can take in a semester is 31. However, the minimum/ maximum credit limit can be relaxed by the Principal, on specific recommendations of Departmental Council only under exceptional circumstances.

7.3. For a student to register for some courses he/she may be required to have adequate knowledge about one or many courses which are declared as pre-requisite courses in the earlier semesters. The student is deemed to have satisfied this requirement by satisfying the Clause of minimum attendance (Cl.11.11) in the course(s) which is/are declared as pre-requisite(s). The details of the pre-requisites will be announced by the Departmental Council as a part of the programme curriculum.

7.4. Late registration up to a cut off date mentioned in the academic calendar is allowed on payment of a penal fee.

7.5. A student will be allowed to register for the next semester only when he/she fulfils the following conditions:

a) Cleared the entire previous semester fees due, if any, to the institute, hostel and library and also has paid all advance deposits of the Institute and hostel for the semester for which he/she is registering.

b) Satisfies all academic requirements, namely the credits earned and minimum CGPA, to continue with the programme. (Clause 11.10)

c) Not restrained from registering due to any specific reason by the college.

7.6. REGISTRATION IN ABSENTIA will be allowed only in exceptional cases at the discretion of Principal after the recommendation of the Departmental Council through the authorized representative of the student.

7.7. DROP-option: A student has the option to DROP courses from registration until one week after the second event of CIE in consultation with his/her faculty advisor. However, the number of credits after dropping one or more courses shall satisfy Clause 7.2.

8.0. WITHDRAWAL FROM THE PROGRAMME:

8.1. Temporary Withdrawal:

a) A student who has been admitted to a degree programme of the college may be permitted to withdraw temporarily, for a period which is an integral multiple of a semester on the grounds of prolonged illness or grave calamity in the family or employment etc., provided that:

i) The student applies to the College within at least 6 weeks of the commencement of the semester or from the date he/she last attended the classes, whichever is later, stating fully the reasons for such withdrawal together with supporting documents and endorsement of his/her parent/guardian.

ii) The College is satisfied that, even after counting the expected period of withdrawal, the student has the possibility to complete his/her requirements of the degree within the time limits specified by the University.

iii) There are no outstanding dues or demands, with the Department/ College/ Hostel/Library, etc.,

iv) The tuition fees for all the subsequent semesters may be collected in advance before giving approval for such Temporary Withdrawal, until such time his/her name appears in the student's roll list. However, the fees/charges once paid would not be refunded.

v) Scholarship holders are bound by the appropriate rules applicable to them.

vi) The decision of the Principal of the College regarding withdrawal of a student is final and binding.

b) Normally, a student would be permitted to avail of the temporary withdrawal facility as a special case only once during his/her tenure as a student and this withdrawal period shall also be counted for computing the duration of study as specified by the University.

c) If a student has withdrawn from the programme for reasons of employment, when rejoining the programme, he/she should obtain the necessary permission from his/her employer for rejoining. This permission letter has to be submitted at the time of rejoining.

8.2. Permanent Withdrawal:

Any student who withdraws admission before the closing date of admission for the academic session is eligible for the refund of the deposits only. Fees once paid will not be refunded on any account.

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

a) A student who wants to leave the College for good, will be permitted to do so (and take Transfer Certificate from the College, if needed), only after remitting the tuition fees as applicable for all the remaining semesters and clearing all other dues, if any.

b) Those students who have received any scholarship, stipend or other forms of assistance from the College shall repay all such amounts.

c) The decision of the Principal of the College regarding withdrawal of a student is final and binding.

9.0. CHANGE OF BRANCH:

9.1. Normally a student admitted to a particular branch of the undergraduate programme will continue studying in that branch till completion.

9.2. However, in special cases the college may permit a student admitted 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 by the concerned competent authority.

9.3. Normally, only those students who have completed in their first attempt all the common credits registered in the first two semesters of their studies will be eligible for consideration of change of branch after the second semester.

9.4. Application for change of branch shall be made by the intending eligible students in the prescribed form.

9.5. A common CGPA list shall be prepared at the end of the second semester to consider students for branch change.

9.6. Change of branch shall be strictly in the 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 marks obtained in the qualifying examination of the applicants will be considered.

9.7. The applicants may be allowed a change in branch, strictly in order of inter merit as stipulated by the competent authority from time to time. The number of vacant seats available in a particular branch is determined by the maximum sanctioned intake relative to the actual number of students present in the beginning of the third semester before implementation of the branch change process.

9.8. The Branch Change process shall be completed within the first week of commencement of the third semester term.

9.9. In this regard, the decision of the Principal is final and binding.

10.0. TRANSFER OF STUDENTS:

10.1. Transfer of students from one College to another College within Karnataka State is permitted only at the beginning of odd semester, subject to availability of seats within the permitted intake.

10.2. The candidate seeking admission shall apply for establishment of equivalence with prescribed fees as notified by the College.

10.3. The students transferred from other colleges shall take additional courses, if required, as specified by the respective Departmental Council to meet the academic requirements of the College.

10.4. In all transferred cases, the equivalent SGPA and CGPA will be computed on the basis of the norms followed in the college. The decision taken in this regard by the Principal is final which shall be ratified in the Academic Council (AC).

11.0. EVALUATION SYSTEM:

11.1. Each course has its Lecture – Tutorial – Practical (L-T-P) schedule. The credit for each course is based on following:

Lecture: one hour/week is given one credit.

Tutorial/Practical/ Project work: Two hours/ week is given one credit.

11.2. The evaluation of academic performance of a student is done as per Letter grading system.

A ten point Letter grading system is adopted which denotes the level of academic performance. The grade awarded to a student in a theory course shall be based on his /her performance in Tests, assignments, quizzes, tutorials, etc. in addition Semester End Examination (SEE). The weightage of these components shall be as follows:

Continuous Internal Evaluation (CIE)	Quizzes, Assignments, Tutorials, Tests (as per Clause 11.5)	50%
Semester End Examination (SEE)	Written or online or practical	50%

11.3. Grades and Grade Points:

Absolute grading system shall be adopted as follows:

Level	Out Standing	Excellent	Very Good	Good	Average	Fail
Grade	S	A	B	C	D	F
Grade points	10	09	08	07	05	0
Score (%)	90 & Above	75-89	60-74	50-59	45-49	< 45

a) A minimum of 50% of marks has to be secured in CIE for appearing for a theory examination.

b) A minimum of 40% of marks has to be scored in SEE for passing a theory course.

c) A minimum of 45% of marks shall be obtained in (CIE+SEE) for passing a theory course.

d) In a practical course, the candidate should secure a minimum of 45% overall for passing.

e) A candidate who does not secure minimum marks in CIE shall be awarded 'W' grade. The candidate shall repeat those courses wherein he/she has secured 'W' grade when the course is offered again in any subsequent semester.

11.4. The letter grade awarded to a student in a practical course is based on a suitable continuous evaluation scheme which the Course Instructor should evolve with the approval of Departmental Council. The student's performance in every Practical / Drawing class shall be evaluated and this shall have a weightage of 50%. He/she shall be evaluated further by conducting periodical tests and/or Semester End Test (SET) Which shall have another 50% weightage. The grades shall be awarded based on these two evaluation components. The minimum passing marks for Practical/Drawing course is 45%.

11.5. The Course Instructor shall make an announcement within one week of the beginning of the semester about Blown up syllabus, details of the evaluation scheme which includes distribution amongst various components. This announcement shall be made in both theory and practical courses. A copy of this announcement should reach the office of Controller of Examinations (CoE) within ten days of the beginning of the semester.

11.6. Description of Grades:

S grade: This grade stands for Superlative grade which indicates outstanding achievement by the student.

A grade: This grade stands for Excellent performance.

B grade: This grade stands for Very Good performance.

C grade: This grade stands for Good performance.

D grade: This grade stands for Average performance and is the minimum passing grade.

F grade: This grade denotes failure and hence very poor performance. A student who obtains 'F' grade in a course shall repeat that course in subsequent semester or makeup term when it is offered. However, if a student gets 'F' grade in an elective theory course, he can register for the same elective or an alternative elective, as recommended by the Faculty Advisor and approved by the Departmental Council to satisfy the course requirement in subsequent semesters.

I grade: This grade is a transitional grade which denotes incomplete grade. A student having satisfactory attendance and meeting the passing standard of CIE, but remained absent from SEE due to illness/ accident/ calamity in the family at the time of Semester End Examination for a course will be awarded this grade. The DC can consider the request of any such student for a make up examination and depending on the merit of the case and in consultation with the course instructor permit him/her to appear for make up examination. The 'I' grade would be converted into one or the other of the letter grades (S/A/B/C/D/F) after the student completes the course requirements. If the student fails to get the minimum passing grade in make up examination, he/she shall repeat the course in a subsequent semester when it is offered.

X grade: This grade is a transitional grade which denotes incomplete grade. A student having satisfactory attendance and having high CIE rating (>=90%) in a course, but SEE performance is poor, which could result in an overall 'F' grade in the course, will be awarded this grade. The DC can consider the request of any such student for a make up examination and depending on the merit of the case and in consultation with the course instructor permit him/her to appear for make up examination. The 'X' grade would be converted into one or the other of the letter grades (S/A/B/C/D/F) after the student completes the course requirements.

If the student fails to get at least the minimum pass grade in make up examination, he/she shall repeat the course in a subsequent semester when it is offered.

W grade: This grade is awarded to a student having satisfactory attendance, but withdrawing from a course before the prescribed date in a semester under the advice of the Faculty Advisor. Withdrawal from a course shall be allowed only under exceptional circumstances and has to be recommended by the DC. No withdrawal is permitted after the grades are announced. Further, a candidate having shortage of attendance and/or fail to achieve the minimum requirements in CIE shall also be awarded this grade.

Calculation of SGPA and CGPA:

$$\text{SGPA} = \frac{\sum [(\text{course credits}) \text{ X } (\text{Grade points})] \text{ for all courses with Letter grades, including F (in that semester)}}{\sum [(\text{course credits})] \text{ for all courses with letter grades, including F (in that semester)}}$$

$$\text{CGPA} = \frac{\sum [(\text{course credits}) \text{ X } (\text{Grade points})] \text{ for all courses with Letter grades, excluding F (until that semester)}}{\sum [(\text{course credits})] \text{ for all courses with Letter grades, excluding F (until that semester)}}$$

11.7. Process of Evaluation, Announcement and Review of Grades:

a) The evaluation procedure to be adopted by a course instructor shall be announced at the beginning of the semester, so that this procedure will be made known to all the registered students. A copy of this procedure shall be submitted within one week of the commencement of the semester to the Chairman of the DC and upon subsequent approval by the DC, it should reach the office of Controller of Examinations (CoE).

b) After the Semester End Examination, the papers will be evaluated and provisional results are announced. Then, as per the announcement made by Controller of Examinations (CoE) process of "paper seeing" will be arranged. During paper seeing, those students who wish to see their evaluated papers can meet the concerned Course Instructor and get clarification from him/her about the marks. The results are finalised after the event of paper seeing.

c) In case, a student has a grievance even after obtaining clarification from the Course Instructor during paper seeing, he / she can make a written appeal to the respective Chairman of the Departmental Council and request for a review of the marks. The DC shall look into the details and make a recommendation. The recommendation of the DC shall then be sent to the office of CoE for further processing as per "Examination Manual" of the college. The processing fee for such an appeal will be decided by the Academic Council. If the appeal of the student is upheld, the fee shall be refunded.

11.8. Make-up Term:

The "Make-up Term" may be offered during even-odd Semester Vacation, to provide an opportunity for the failed Students to clear the Course.The details are as follows:

a) A Student who has failed in a SEE in the current academic year may register for the "Make-up Term".

b) The Student should have obtained the minimum stipulated marks in CIE in the course(s) for which he/she wishes to register in the "Make-up term'

c) The Student should have obtained minimum required attendance for the corresponding course earlier.

d) The normal duration of the "Make–up Term" is 4 weeks at the end of Even Semester immediately after the announcement of the Even Semester results.

e) First two weeks of the "Make-up Term" are to be utilized by the Student for studying, getting clarifications by meeting the Course Instructor and get prepared for the Examination.

f) Remaining two weeks of the "Make-up Term" are scheduled for conducting the Examinations, evaluation and announcement of the result.

g) A Student can utilize the "Make-Up Term" only once to pass a course. A Student failing in the "Make-Up Term" Examination shall re-register for that course in a subsequent semester as and when the course is offered.

h) The Student shall pay the specified amount of Registration/ Examination fees to appear for the "Make-Up Term" Examination.

i) The necessary Academic Staff shall be available for Teaching, Counseling and Conducting the Examinations.

j) The Make-up Term facility is not applicable for practical courses except CAED and CAMD.

11.9. Make-up Examination:

The Make Up Examination facility would be available to students who may have missed to attend the SEE of one or more courses in a semester for valid reasons and given the 'I' grade; Also, students having the 'X' grade shall also be eligible. This facility can be availed by UG students only twice during their programme. The make up examination would be held as per dates notified by the CoE. Make up examination could be held at any time in the

semester with the approval of the Principal. In all these cases, the standard of SEE would be the same as the regular SEE.

All the 'I' and 'X' grades awarded to the students would be converted within two days of the respective make-up examinations to appropriate letter grades. Any outstanding 'I' and 'X' grades two days after the last scheduled make-up examination shall be automatically converted to 'F' grade.

11.10. Vertical Mobility Requirements (UG):

a) A student shall register for a minimum of 20 credits in each semester. This rule is relaxed only for makeup term when it is offered.

b) Earned credits mean those credits for which the student would have obtained S/A/B/C/D grade.

c) The regular semester load is declared by the Departments for each programme at the beginning of every semester. Hence the yearly academic load is the sum of the regular semester loads of odd and even semester. Then the shortfall of credits= Yearly academic load – Number of Earned credits in that year. The threshold details at the end of every year are as follows:

Shortfall = 0 (All credits Earned)	shortfall of < =16 credits	Shortfall of credits >16
Eligible to move to next year.	Should complete the shortfall in credits by repeating only those courses for which 'F' or 'W' grade is obtained and move to the next Year.	Not eligible to move to the next year. Should repeat only those courses wherein he/she has Obtained 'F' or 'W' grade. Hence in this case he/she is permitted to register for less than 20 credits in a semester overriding the Provisions of 11.10 (a).

When a student has to move from 2nd year to 3rd year, he/she Should have completed yearly academic load of 1st year and likewise, to move from 3rd year to 4th year, he/she should have completed yearly academic load of 1st year and 2nd year except as per the following in (d).

d) A candidate is allowed to move to 3rd year if he/she has a maximum of two 'W' or 'F' grades in 1st and 2nd year put together with not more than one 'W' or 'F' grade in a semester during these years. Likewise, this provision is applicable for vertical mobility of a candidate to move to 4th year provided he/she has obtained at least the minimum pass grade in all courses registered in 1st year.

e) The minimum and maximum duration of the Programme is as specified in Clause 3.1. If a student cannot complete the Programme in corresponding maximum duration, he/she shall leave the college without a degree. If a student is not able to pass a credit course

even after 5 (five) consecutive attempts he/she shall also leave the college without a degree. For this purpose, an attempt is defined as registration in a regular semester.

11.11. Attendance requirements:

a) Each student must attend every theory class, tutorial and practical sessions for which he/she has registered.

b) To account for approved leave of absence (e.g. Representing the college in Sports/ Extra curricular / Placement / NCC or NSS activities), the attendance requirement shall be a minimum of 85% of the classes actually held. Further condonation by the Principal for a maximum of 10% attendance will be allowed to account for any exigencies like illness / medical emergency / death of a relative. with a specific recommendation by the HoD

c) If a student has less than 75% attendance in any course, he/she shall be awarded 'W' grade in that course irrespective of his/her academic performance.

d) In a practical course, if a student misses four consecutive weeks of class without any prior permission, he / She shall be awarded 'W' grade in that course irrespective of his academic performance.

11.12. Summer Term:

The **'Summer Term'** may be offered during **Even – Odd** semester vacation to provide an opportunity for the students of UG programme to complete all the requirements for award of the degree **as per Clause 15.1**. The courses offered during this **'Summer Term'** shall be decided by the respective **Departmental Council.** The details are as follows:

a) A student who is currently in the final year of UG Programme may register for the **'Summer Term'** provided he/she fulfills the following stipulations:

i) He / She should have a maximum of **two 'W'** grades in the registered courses of the current year. For example, the candidate during the odd semester would have registered for courses of 7^{th}, 5^{th} & 3^{rd} Semester and similarly in the even semester he/she would have register for courses of 8^{th}, 6^{th} & 4^{th} semester. Amongst all these registered courses in that academic year he/she should have a maximum of two 'W' grades.

ii) On registering for these courses in 'Summer Term' and on satisfactory completion of these courses he/she should satisfy all the requirements for award of the degree (as **per Clause 15.1**)

b) The normal duration of 'Summer Term' is **up to 8 weeks** which shall include classes, provision to conduct CIE and SEE. The rigor and standards of CIE and SEE shall be the same as that of a regular semester.

c) The classes will be conducted as per the scheduled time table. The departments have to schedule the classes such that the entire syllabus is completed with in the stipulated time. The attendance requirements are as per Clause 11.11.

d) The student shall register for 'Summer Term' by paying the specified fees as per the details announced by the College.

e) The academic staff for teaching the course in 'Summer Term' shall be made available by the Head of the Department.

f) The **Academic and Examination Cell** shall make all the necessary arrangements for conducting the events of evaluation process.

g) In the event that a student is not able to satisfactorily complete the courses registered in Summer Term, he/she shall register for these courses during regular semester when they are offered again.

12.0 TERMINATION FROM THE PROGRAMME:

12.1. A student who is not performing well in terms of obtaining requisite grades and/ or is abstaining from the classes regularly, shall be warned of the consequences and the same shall also be communicated to his/her parents.

12.2. A student may be required to withdraw from the programme and leave the College on any of the following grounds:

a) Obtaining F Grade and hence not passing a course, in spite of five successive attempts;

b) A student failing to secure CGPA >= 5.0 on three consecutive semesters;

c) Absence from classes for more than six weeks at a time in a semester without leave of absence being granted by competent authorities;

d) Failure to meet the standards of discipline as prescribed by the College from time to time.

12.3. Conduct and Discipline:

Students shall conduct themselves within and outside the premises of the College, in a manner befitting the students of an Institution of National Importance. As per the order of Honorable 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.

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 behavior anywhere with in or out side the campus.

c) Willful damage or stealthy removal of any property/belongings of the College/ Hostel or of fellow students/citizens.

d) Possession, consumption or distribution of alcoholic drinks or any kind of hallucinogenic drugs.

e) Mutilation or unauthorized possession of Library books.

f) Noisy and unseemly behavior, 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

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

For an offence committed in (i) a hostel (ii) a department or in a class Room and (iii) elsewhere with in the college campus, the Chief Warden, the Head of the Department and the Student Welfare Officer shall meet as a Committee and recommend for reprimanding or imposition of fine. Such recommendations shall be reported to the Principal for further action.

Cases of adoption of unfair means and/or any malpractice in an examination shall be reported to the Principal for taking appropriate action.

13.0. STUDENTS' FEEDBACK:

a) It is recommended by the university that Autonomous Colleges obtain feedback from students on their course work and various academic activities conducted under the credit system. For this purpose, suitable feedback forms shall be devised by the College and the feedback obtained from the students regularly in confidence, by administering the feedback form in print or on-line.

b) The feedback received from the students shall be discussed at various levels of decision making at the College and the suggested changes/ improvements, if any, could be given due consideration for being implemented at the College level.

14.0. ACADEMIC COMMITTEES:

14.1. Departmental Council (DC):

Constitution:
There shall be one DC for every department that is involved in the teaching for the all the programme. The constitution shall be:

1. Chairman	**:**	Head of the Department
2-4. Members (3)	**:**	One each from Professor, Associate Professor and Assistant professor cadre based on seniority and by rotation for 1 year
5. Member Secretary	**:**	H O D's nominee

The Chairman may co-opt and/or invite more members including utmost three outside experts.

Functions:

a) To monitor the conduct of all undergraduate courses of the department.

b) To ensure academic standard and excellence of the courses offered by the department.

c) To oversee the evaluation of the students in a class, for each of the courses.

d) To develop the curriculum for undergraduate courses offered by the department and recommend the same to the BOS.

e) 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 office of the Principal.

f) To consolidate the registration of the students and communicate the same to the course Instructors and Principal.

g) To conduct performance appraisal of course instructors.

h) To provide feedback of the performance appraisal to the course Instructor and concerned authorities.

i) To consider any matter related to the undergraduate programme of the Department.

j) In cases where a course is taught by more than one faculty member, or by different faculty members for different sections of students, DC shall coordinate (only in case of need) among all such faculty members regarding the teaching and evaluation of such courses.

k) To conduct at least two meetings each semester and send the resolutions of the meeting to Principal, and also to maintain a record of the same in the department.

l) To attend to the appeals as follows:

i) To receive grievance/complaints in writing from the students regarding anomaly in award of grades

ii) To interact with the concerned course instructor and the student separately before taking the decision.

iii) The recommendations of the DC shall be communicated to the CoE for further appropriate action as required.

iv) To recommend for suitable action against the concerned course instructor, if necessary.

m) 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.

14.2 Examination Malpractice Enquiry Committee:

Constitution:

1. Dean (Academic Affairs)-Chairman
2. Controller of Examinations - Member
3. Head of the Concerned Dept.- Member

4. Concerned DCI of that Session- Member
5. Member Sec., Academic Council- Member Convener

Functions:

a) This committee shall meet and recommend penal action depending on the severity of the malpractice in examination related cases as per the provisions of "Examination Manual" of the college.

b) The Principal shall take immediate action as per the approved Rules and the same shall be reported to the Academic Council / Governing Body.

14.3 Faculty Advisor:

The Faculty Advisor, appointed by the HOD, shall be assigned a specific number of students of the department that is offering the degree Programme and such students shall continue to be attached to the same faculty throughout their duration of study.

Functions (Highlights):

a) To help the students in planning their courses and activities during study.

b) To guide, advise and counsel the students on academic programme.

14.4 Course Instructor:

Functions (Highlights):

a) He /She shall announce the blown up syllabus, Abridged Lesson plan and details of evaluation pattern which includes distribution amongst various components of CIE with one week of beginning of semester.

b) He/she shall follow all the Regulations related to teaching of a course and valuation of students.

c) He/she shall be responsible for all the records (answer books, attendance etc.,) of the students registered for the course.

d) He/she shall conduct classes as prescribed in the Academic calendar and as per the teaching assignment time table issued by the HOD.

e) He/she 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.

f) He/she will prepare an evaluation plan showing details of evaluation of the student's performance in the course.

g) He/she will properly document the students' performance and announce to the students the details of evaluation pattern in the beginning of the semester and submit a copy to the DC.

15.0. GRADUATION CEREMONY:

15.1. Graduation Requirements:

a) A student shall be declared to be eligible for the award of the degree if he/she has

i) Fulfilled Degree Requirements in terms of earned credits.

ii) Completed satisfactorily mandatory learning and Humanity & Social Science Courses, bridge courses wherever applicable.

iii) No Dues to the College, Department, Hostel, Library Central Computer Centre and any other college facilities.

iv) No disciplinary action pending against him/her.

b) The award of the degree must be recommended by the Academic Council and Governing Council.

15.2 Graduation

a) Each Autonomous College may have its own annual Graduation Ceremony for the award of Degree to students completing the prescribed requirements of Academic programmes in each case, in consultation with the University and by following the provisions in the Statute. For the award of Prizes and Medals, the conditions stipulated by the Donor may be considered as per the statutes framed by the College for such awards.

b) Autonomous Colleges may also institute Prizes and Awards to meritorious students, for being given away annually at the Graduation Ceremony. This would greatly encourage the students to strive for excellence in their academic work.

LIST OF COURSES

Basic Science Core (BSC)

MA0401	Engineering Mathematics-I	(4-0-0)4
PH0401	Engineering Physics	(4-0-0)4
PH0101	Engineering Physics Lab	(0-0-3)1.5
MA0402	Engineering Mathematics-II	(4-0-0)4
CH0401	Engineering Chemistry	(4-0-0)4
CH0101	Engineering Chemistry Lab	(0-0-3)1.5
MA0407	Engineering Mathematics-III	(4-0-0)4
MA0410	Engineering Mathematics-IV	(4-0-0)4

Engineering Science Core (ESC)

EE0401	Basic Electrical Engineering	(4-0-0)4
ME0401	Mechanical Engineering Sciences	(4-0-0)4
CS0401	Computer Concepts & C Programming	(4-0-0)4
Cs0101	Computer Programming Lab	(0-0-3)1.5
EC0401	Electronics Fundamentals	(4-0-0)4
CV0401	Engineering Mechanics	(4-0-0)4
ME0402	Computer Aided Engineering Drawing	(2-0-6)4
ME0101	General Engineering Practice	(0-0-3)1.5

Humanities and Social Science Core (HSC)

AD0201	Introduction to Engineering Design	(2-0-0)2

Programme Core (PC)

CS0404	Data Structures with C	(4-0-0)4
CS0448	Analog and Digital Electronics	(4-0-0)4
CS0409	Computer Organization & Architecture	(4-0-0)4
CS0406	Discrete Mathematical Structures	(4-0-0)4
CS0331	Unix and Shell Programming	(3-0-0)3
CS0102	Data Structures Lab	(0-0-3)1.5
CS0111	Analog and Digital Electronics Lab	(0-0-3)1.5
CS0408	Analysis and Design of Algorithms	(4-0-0)4
CS0449	Microprocessor and Interfacing	(3-2-0)5
CS0405	Object Oriented Programming with C++	(4-0-0)4
CS0411	Formal Languages and Automata Theory	(4-0-0)4
CS0332	Software Engineering	(3-0-0)3
CS0105	Algorithms Lab	(0-0-3)1.5
CS0103	Object Oriented Programming with C++ Lab	(0-0-3)1.5
CS0407	Data Communication and Network	(4-0-0)4
CS0413	Operating Systems	(4-0-0)4
CS0414	Database Management Systems	(4-0-0)4
CS0512	System Software	(4-2-0)5
CS0424	Management and Entrepreneurship	(4-0-0)4
CS0106	Microprocessor and Interfacing Laboratory	(0-0-3)1.5
CS0107	Database Laboratory	(0-0-3)1.5
CS0418	Computer Networks	(4-0-0)4
CS0523	Object Oriented Modeling and Design	(4-2-0)5
CS0425	Compiler Design	(4-0-0)4
CS0450	Web Technologies and Applications	(4-0-0)4
CS0112	Web Technologies and Application laboratory	(0-0-3)1.5
CS0109	Computer Networking Laboratory	(0-0-3)1.5
CS0445	Distributed Operating System	(4-0-0)4
CS0521	Cryptography and Network Security	(4-2-0)5
CS0422	Parallel Processing Architecture and Algorithms	(4-0-0)4
CS0501	Cloud Computing	(4-0-2)5

Programme Specific Electives (PSE)

CS0306	Parallel Algorithms	(3:0:0)3
CS0307	Computer Graphics And Visualization	(3:0:0)3
CS0303	Pervasive Computing	(3:0:0)3
CS0310	Game Theory	(3:0:0)3
CS0304	Decision Support System	(3:0:0)3
CS0312	Introduction to C# Programming And .Net Concepts	(3:0:0)3
CS0314	Web Programming	(3:0:0)3
CS0315	Python Programming	(3:0:0)3
CS0316	Advanced java	(3:0:0)3
CS0317	Real Time Systems	(3:0:0)3
CS0318	Linux Internals	(3:0:0)3
CS0319	Concurrent Programming	(3:0:0)3
CS0320	Design of Unix Operating System	(3:0:0)3
CS0321	Client-Server Programming	(3:0:0)3
CS0322	Unix system programming	(2:0:2)3
CS0323	Advanced Algorithms	(3:0:0)3
CS0326	Storage Area Networks	(3:0:0)3
CS0328	Ad hoc Networks	(3:0:0)3
CS0305	Wireless Communication Networks	(3:0:0)3
CS0329	QoS in Ad Hoc Networks	(3:0:0)3
CS0330	Wireless and Mobile Networks	(3:0:0)3

Open Electives (OE)

CS0308	Multimedia Computing	(3:0:0)3
CS0311	Operation Research	(3:0:0)3
CS0313	Introduction to Android Programming	(3:0:0)3
CS0324	Big Data Analytics	(2:0:2)3
CS0325	Introduction to Data Mining	(3:0:0)3
CS0327	Protocol Engineering	(3:0:0)3
CS0331	Embedded Systems	(3:0:0)3

Project (MP)

CS0205	Project Phase 1	(0-0-4)2
CS0602	Project Phase II	(0-0-12)6
CS0113	Paper presentation in Journal/Conferences	(0-0-2)1

Mandatory Learning Courses (MLC)

CS0110	Seminar	(0-0-2)1
HS0001	Constitution of India and Professional Ethics	(1-0-0)1
HS0102	Environmental Studies	(1-0-0)1
EN0201	English Enhancement Course	(2-0-0)2
KA0001	Kannada Kali	(2-0-0)0

SUGGESTED PLAN OF STUDY FOR REGULAR STUDENTS

Semester / Sl. No.	I	II	III	IV	V	VI	VII	VIII
1	MA0401	MA0402	MA0407	MA0410	CS0407	CS0418	CS0445	CS0501
2	PH0401	CH0401	CS0404	CS0408	CS0413	CS0523	CS0521	CS---
3	CV0401	CS0401	CS0448	CS0449	CS0414	CS0425	CS0422	CS---
4	ME0401	EC0401	CS0409	CS0405	CS0512	CS0450	CS---	CS0110
5	EE0401	ME0402	CS0406	CS0411	CS0424	CS----	CS----	CS0602
6	PH0101	CH0101	CS0331	CS0332	CS----	CS----	CS---	CS0113
7	ME0101	CS0101	CS0102	CS0105	CS0106	CS0112	CS0205	
8	AD0201	EN0201	CS0111	CS0103	CS0107	CS0109		
9			HS0001	HS0102				
Total Cr.	**25**	**25**	**27**	**27**	**27**	**26**	**24**	**19**

SUGGESTED PLAN OF STUDY FOR LATERAL ENTRY STUDENTS

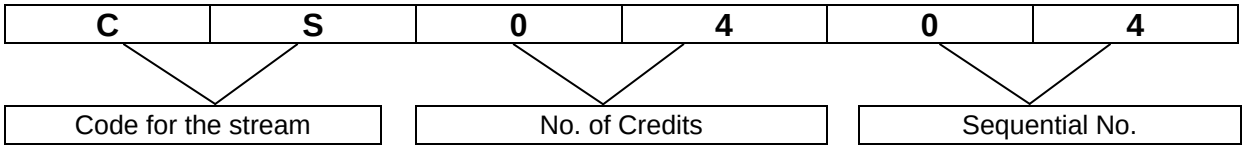
Semester / Sl. No.	III	IV	V	VI	VII	VIII
1	MA0407	MA0410	CS0407	CS0418	CS0445	CS0501
2	CS0404	CS0408	CS0413	CS0523	CS0521	CS---
3	CS0448	CS0449	CS0414	CS0425	CS0422	CS0110
4	CS0409	CS0405	CS0512	CS0450	CS---	CS0602
5	CS0406	CS0411	CS0424	CS----	CS----	CS0113
6	CS0331	CS0332	CS----	CS----	CS---	
7	CS0102	CS0105	CS0106	CS0112	CS0205	
8	CS0111	CS0103	CS0107	CS0109		
9	HS0001	HS0102				
10	MA0201	MA0202				
Total Cr.	**29**	**29**	**27**	**26**	**24**	**15**

1 Hour of L = 1 Credit
1 Hour of T/P = 0.5 Credit
CS---- = Elective subject

TOTAL CREDITS TO BE EARNED BY A STUDENT

Semester	Credits to be Earned	
	Regular Students	Lateral Entry Students
I	25	-
II	25	-
III	27	29
IV	27	29
V	27	27
VI	26	26
VII	24	24
VIII	19	15
Total	**200**	**150**

COURSE NUMBERING SCHEME



I SEMESTER: PHYSICS CYCLE

Sl.No.	Code	Subject	Dept/Board	Category	Hrs/week			Credits
					L	T	P	
1	MA0401	Engineering Mathematics-I	Mathematics	GC	4	0	0	4
2	PH0401	Engineering Physics	Physics	GC	4	0	0	4
3	CV0401	Engineering Mechanics	Civil Engg	GC	4	0	0	4
4	ME0401	Mechanical Engg. Sciences	Mech. / I &P. Engg.	GC	4	0	0	4
5	EE0401	Basic Electrical Engg.	E & E Engg.	GC	4	0	0	4
6	PH0101	Engineering Physics Lab	Physics	GC	0	0	3	1.5
7	ME0101	General Engg. Practice	Mech. Engg.	GC	0	0	3	1.5
8	AD0201	Introduction to Engg. Design	Respective Engg. Departments.	GC	2	0	0	2
9	KA0001	Kannada Kali	Humanities	GC	2	0	0	----
Total					**30**			**25**

Index for Notations used for Category

GC	General Core

I SEMESTER: CHEMISTRY CYCLE

Sl.No.	Code	Subject	Dept/Board	Category	Hrs/week			Credits
					L	T	P	
1	MA0401	Engineering Mathematics-I	Mathematics	GC	4	0	0	4
2	CH0401	Engineering Chemistry	Chemistry	GC	4	0	0	4
3	CS0401	Computer concepts and C programming	C.Sc. Engg.	GC	4	0	0	4
4	EC0401	Electronics Fundamentals	E & C Engg.	GC	4	0	0	4
5	ME0402	Computer aided Engg. Drawing	Mech. / I.P. Engg.	C	2	0	4	4
6	CH0101	Engineering Chemistry Lab	Chemistry	GC	0	0	3	1.5
7	CS0101	Computer Programming Lab	C.Sc. Engg.	GC	0	0	3	1.5
8	EN0201	English Enhancement Course	Humanities	GC	2	0	0	2
Total					**30**			**25**

Index for Notations used for Category

GC	General Core

II SEMESTER: PHYSICS CYCLE

Sl.No.	Code	Subject	Dept/Board	Category	Hrs/week			Credits
					L	T	P	
1	MA0402	Engineering Mathematics-II	Mathematics	GC	4	0	0	4
2	PH0401	Engineering Physics	Physics	GC	4	0	0	4
3	CV0401	Engineering Mechanics	Civil Engg	GC	4	0	0	4
4	ME0401	Mechanical Engg. Sciences	Mech. / I &P. Engg.	GC	4	0	0	4
5	EE0401	Basic Electrical Engg.	E & E Engg.	GC	4	0	0	4
6	PH0101	Engineering Physics Lab	Physics	GC	0	0	3	1.5
7	ME0101	General Engg. Practice	Mech. Engg.	GC	0	0	3	1.5
8	AD0201	Introduction to Engg. Design	Respective Engg. Departments.	GC	2	0	0	2
9	KA0001	Kannada Kali	Humanities	GC	2	0	0	----
Total					**30**			**25**

Index for Notations used for Category

GC	General Core

II SEMESTER: CHEMISTRY CYCLE

Sl.No.	Code	Subject	Dept/Board	Category	Hrs/week			Credits
					L	T	P	
1	MA0402	Engineering Mathematics-II	Mathematics	GC	4	0	0	4
2	CH0401	Engineering Chemistry	Chemistry	GC	4	0	0	4
3	CS0401	Computer concepts and C programming	C.Sc. Engg.	GC	4	0	0	4
4	EC0401	Electronics Fundamentals	E & C Engg.	GC	4	0	0	4
5	ME0402	Computer aided Engg. Drawing	Mech. / I.P. Engg.	GC	2	0	4	4
6	CH0101	Engineering Chemistry Lab	Chemistry	GC	0	0	3	1.5
7	CS0101	Computer Programming Lab	C.Sc. Engg.	GC	0	0	3	1.5
8	EN0201	English Enhancement Course	Humanities	GC	2	0	0	2
Total					**30**			**25**

Index for Notations used for Category

GC	General Core

1st YEAR – CONCISE SYLLABUS

MA0401 ENGINEERING MATHEMATICS – I 4:0:0
(Common to all branches)

Differential Calculus–1: Successive differentiation, Indeterminate forms, Taylor's and Maclaurin's expansions, Polar curves.

Differential Calculus – 2: Curvature and Radius of Curvature, Partial differentiation.

Statistics: Measures of central tendency and dispersion.

Integral Calculus: Differentiation under the integral sign, Reduction formulae, Tracing of curves, Applications.

Linear Algebra: Rank of a matrix, Consistency of a system of linear algebraic equations, Eigen values and eigen vectors, Diagonalisation of a square matrix.

Differential Equations: Solution of first order differential equations, Orthogonal trajectories, Differential equations of first order and higher degree, Applications.

Reference Books:

1. Higher Engineering Mathematics – B.S. Grewal, 42nd edition, Khanna Publications.
2. Advanced Engineering Mathematics – Erwin Kreyszig, vol I &II ,wiley publications, 10th edition.
3. Advanced Engg. Mathematics – H. K. Dass, Chand Publications.
4. Higher Engg. Mathematics – B. V. Ramanna, Tata McGraw-Hill Publications.
5. Advanced Engineering Mathematics – Peter O Neil; Thomas, Broks/ Cole, 7th edition – 2011.

PHYSICS CYCLE

PH0401 ENGINEERING PHYSICS 4:0:0

Particle nature of radiation: Photo-electric effect, Compton effect. Wave nature of particle: de Broglie hypothesis Davisson and Germer Experiment, matter waves and their properties, Heisenberg's uncertainty principle: Its physical significance, application. Quantum Mechanics: Wave function and its properties, time independent Schrödinger wave equation, application of Schrödinger wave equation, Free electron Theory: Failure of classical free-electron theory, quantum free electron theory, Fermi energy, Fermi factor, Density of states, Merits of Quantum free electron theory. Theory of vibration: Damped, forced vibrations, Theory of relativity, Lasers: Einstein's coefficients, expression for energy density, Ruby, He-Ne, semiconductor lasers, applications, Optical fiber and its applications, Crystal structure: Basic concepts, Miller indices, inter-planar spacing. Crystal structures of NaCl and CsCl, Continuous and Characteristic X-rays, Mosleys law, Bragg's Law, Bragg's x-ray spectrometer, Dielectric materials: polarizations, internal field, superconducting materials: concepts and applications, nano materials.

Text Books:

1. Concepts of Modern Physics (Sixth Edition) – By Arthur Beiser, Tata Mc Graw – Hill Publication, 1998
2. Solid State Physics(Fifth Edition) –By S O Pillai, New Age International
3. Waves and Oscillations – By N Subramanyam and Brijlal, Vikas Publishing house Pvt. Ltd.
4. Introduction to optoelectronics: Wilson & Hawkes

CV0401 ENGINEERING MECHANICS 4:0:0

Introduction to statics, force and coplanar force systems, resultant, equilibrium conditions, free body diagrams. Support reactions, Centroid and moment of inertia for plane areas. Friction, laws of friction, concepts of ladder, wedge, block friction. Analysis of plane trusses by the method of joints and sections. Introduction to dynamics. Kinetics, Dynamic equilibrium, rectilinear motion of rigid bodies, work, power and energy.

Text books

1. P.N. Chandra Mouli "**Engineering Mechanics"** PHI Learning – 2011

Reference Books

1. Rajashekharan S. and Sankarsubramanian. G "Engineering Mechanics –Statics and Dynamics"- Vikas Publishing House – 3rd Edition, 2005, Reprint 2011
2. Stephen Timoshenko, D. Young, J Rao " Engineering Mechanics" , Tata-McGraw Hill, Special Indian edition, 2006

ME0401 MECHANICAL ENGINEERING SCIENCES (4-0-0)4

Role of Mechanical Engineering Science in Technology, Description of Source of Energy and their conversion system, Prime Movers, Classification, Internal Combustion Engines, Turbines, Steam turbine, Gas turbine, Hydraulic turbine, Refrigeration & Air-conditioning, Power Transmission, Belt Drives, Gear Drives, Manufacturing Processes, Forging, Rolling, Machine Tools, Drilling Machine, Grinding Machine, Metal Joining Processes, Lubrication and Bearing, Lubrication, Bearing,

Elements of Mechanical Engineering by K.P. Roy, S K Hajra Choudhury, A K Hajra Choudhury, Media Promoters, 2012
Elements of Mechanical Engineering by K R Gopalakrishna, Subhash Publishers, Bangalore

EE0401 BASIC ELECTRICAL ENGINEERING (4-0-0)4

D. C. Circuits, Electromagnetism, Single-phase A.C. Circuits, Three Phase Circuits DC Machines, Transformers, Synchronous Generators , Three Phase Induction Motors Measuring Instruments: Moving coil, Moving iron and electro dynamometer type wattmeter Wiring and protection devices.

Text books:

1. K. Uma Rao, **"Elements of Electrical Engineering",** I.K. International Publishing House. Pvt.Ltd.
2. M.V.Rao . **" Basic Electrical Engineering",** Subhas Stores, 2014

REFERENCES:

1. Vincent Del Toro**, "Electrical Engineering Fundamentals"** , Prentice Hall Publications.
2. H Cotton, **"Electrical Technology",** CBS Publishers & Distributors, 2004.
3. Dr. K Uma Rao and A Jayalakshmi, **"Basic Electrical Engineering",** Sanguine publishers.
4. nptel.ac.in/courses/108108076/
5. www.youtube.com/watch?v=LISEfA-yuvg

PH0101 ENGINEERING PHYSICS LABORATORY (0:0:3)1.5

Experiments on series and parallel resonance, charging and discharging of capacitor, band gap of semiconductor, GM counter, diffraction grating, LED, Stefan's law, torsional, pendulum, cantilever, optical fiber, Newton's ring, Biprism

Text books:

1. Laboratory manual for Engineering Physics Lab.
2. Engineering Physics Lab manual-B N Subbarao, Suhas Publication
3. PHYWE-A laboratory experiments in Physics.

ME0101 GENERAL ENGINEERING PRACTICE (0-0-3)1.5

The use of basic hand tools such as spanners, Pliers, screw drivers, Allen keys and punches. Carry out in a scientific manner, basic workshop practices such as filing, marking, punching, drilling, tapping & welding. Develop the basic models using fitting, welding& sheet metal operations. Identify simple electrical problems in house hold appliances and carry out repair/maintenance. Select appropriate fire extinguishers.

AD0201 INTRODUCTION TO ENGINEERING DESIGN (2-0-0)2

Definition of Engineering and Engineer, Engineering analysis and system of units, Introduction to Engineering Design, Problem Definition, Creativity and Concept generation, Concept Evaluation and Selection, Embodiment Design, Modeling and Analysis, Detail Design, Manufacture and Testing, Design report, Design Management

Text books:

1. Engineering Design Principles by Kenneth Hurst, Elsevier, Indian reprint ISBN 978-93-80501-35-2, 2010.

Exploring Engineering- An Introduction to Engineering and Design, Philip Kosky, George Wise, Robert Balmer, William Keat, Academic press, Elsevier, Indian reprint ISBN 978-93-80501-33-8, 2nd edition, 2010.

KANNADA KALI

(MANDATORY LEARING COURSE)

Personal Pronouns, Possessive forms, Interrogative words. Personal Pronouns, Possessive forms, Yes/No Type. Interrogation. About Ramayana. Possessive forms of nouns, dubitive questions, Relative nouns. Enquiring about a room for rent. Qualitative and quantitative adjectives. Enquiring about the college. Predicative forms, locative case. In a hotel. Dative case defective verbs. Vegetable market. Numeral plurals. Planning for a picnic. Imperative, Permissive, hortative. Conversation between Doctor and the patient. Verb-iru, egation – illa, non – pasttense. Doctors advise to Patient. Potential forms, no – past continuous. Discussing about a film. Past tense, negation. About Brindavan Garden. Past tense negation. About routine activities of a student. Verbal Participle, reflexive form, negation. Telephone conversation. Past and present perfect past continuous and their negation. About Halebid, Belur. Relative participle, negation. Discussing about examination and future plan. Simple conditional and negative. Karnataka. Kannada Bhaashe. Beku Bedagalu.

CHEMISTRY CYCLE

CH0401 ENGINEERING CHEMISTRY 4-0-0

Battery Technology:Importance, characteristics, classification, construction and explanation of commercial batteries, Fuel cells, classification, construction and explanation. Corrosion and its Control: Theory, factors, types and control. Metal finishing:Technological importance, electroplating, factors and electroless plating. Instrumental Methods of Analysis:Electroanalytical methods - conductometry, potentiometry, dissociation constant of weak electrolyte, reference and ion selective electrodes, spectroanalytical methods – colorimetry. Chemical fuels:Classification, calorific value, cracking, reformation of petrol, knocking, synthetic petrol, power alcohol, Solar energy – PV cells, importance, solar grade silicon. Water technology:Impurities, water analysis, boiler scales and prevention, desalination, sewage treatment. High polymers: Classification, methods of polymerization, synthesis, determination of molecular weights, glass transition temperature (T_g) – factors and significance, conducting polymers.

Text Books:

1. A text book of Engineering Chemistry 15th edition by P.C.Jain and Monica Jain, Dhanpat Rai Publishing Co (P) Ltd., New Delhi.
2. Text book of Engineering Chemistry by Dr. K.Pushpalatha, Wiley Publications, 2nd edition.
3. Text book of Engineering Chemistry by S.S. Dara, published by Chand and Co.
4. Principles of Physical Chemistry by B.R.Puri, L.R.Sharma and M.S.Pathania, S.Nagin Chand and Co.
5. Text book of Physical Chemistry by Soni and Dharmatha, S.Chand& Sons.
6. Text book of Polymer Science by Gowarikar and Vishwanathan.
7. Corrosion Engineering by M.G.Fontana, Mc Graw Hill Publications.

CS0401 COMPUTER CONCEPTS AND 'C' PROGRAMMING 4:0:0

Introducing Computer Systems, Interacting with Computer, Processing Data, Storing Data, Using Operating Systems, Networks and the Internet, Algorithms and Flowcharts, Introduction to C-Constants, Variables, and Data types, Operators and Expressions, Managing Input and Output Operations, Decision making and Branching, Decision making and Looping, Arrays, Strings, Structures, User-defined Functions, Pointers, File Management in C.

TEXT BOOKS:

1. **Introduction to Computers**, Peter Norton, 6th Edition.
2. **Programming in ANSI C,** E Balaguruswamy, 3rd Edition.

EC0401 ELECTRONICS FUNDAMENTALS 4:0:0

Semiconductor Diodes and Applications, Transistor, Amplifiers, Oscillators, Introduction to Digital Electronics, Communication Systems,Devices & Media

Text Books:

1. **"Electronic Devices and Circuits Theory", '**Robert L Boylestad', PHI, 6th Edition.
2. **"Electronic Devices and Circuits",** S. Salivahanan, Tata McGraw-Hill, 2nd Edition, 2008.
3. **"Basic Electronics",** D.P. Kothari, I. J. Nagrath, McGraw Hill Education (India) Private Limited, 2014.

Reference Book:

1. **"Electronic Devices and Circuits",** David. A. Bell, PHI, New Delhi, 2004.
2. '**Multimedia Communications: Applications, Networks, Protocols and Standards'**, 'Fred Halsall', Pearson Education, Asia, Second Indian reprint 2002.
3. **'Wireless Cellular Communications'**, 'Sanjay Sharma', KATSON books, 2nd Edition 2007.

ME0402 COMPUTER AIDED ENGINEERING DRAWING (2-0-4)4

Introduction to Computer Aided Sketching, Orthographic Projections, Orthographic Projections of Plane Surfaces, Projections of Solids, Development of Surfaces, Isometric Projection.

Engineering Drawing by N.D. Bhatt & V.M. Panchal, 48th edition, 2005-Charotar Publishing House, Gujarat.

Engineering Graphics by K.R. Gopalakrishna, 32nd edition, 2005- Subash Publishers Bangalore. Bangalore.

Reference Books:

1. A Primer on Computer Aided Engineering Drawing-2006, Published by VTU, Belgaum.
2. Fundamentals of Engineering Drawing with an Introduction to Interactive Computer Graphics for Design and Production- by Luzadder Warren J., Duff John M., Eastern Economy Edition, 2005- Prentice Hall of India Pvt. Ltd., New Delhi.

CH0101 CHEMISTRY LABORATORY 0-0-3

Volumetric estimations: hardness of water, CaO in cement solution, COD, hypo, alloy (brass), ore solution (hematite); Instrumental analysis: potentiometry, conductometry, colorimetry and viscometry.

Text Books:

1. Vogels textbook of quantitative inorganic analysis, revised by J.Bassett, R.C.Denny, G.H.Jeffery, 4th Ed.

CS0101 COMPUTER PROGRAMMING LABORATORY 0:0:3

Introduction to fundamentals of DOS and Microsoft Office (Word, Excel and PowerPoint), C Programming exercise on simple statements, Decision making and branching, Looping statements, Arrays, Matrices, Strings, Functions (in-built and user-defined), Structures, Pointers and Files.

TEXT BOOKS:

1. Introduction to Computers, Peter Norton, 6th Edition.
2. Program**ming in ANSI C,** E Balaguruswamy, 3rd Edition.

EN0201 ENGLISH ENHANCEMENT COURSE 2:0:0

S-T-A-R – Basics of communication, its barriers, preparing a good introduction, using comprehensible accent and using proper grammar. Grammar concepts through common errors. Listening skills: listen to different accents and directions. Alternately – Recollect from the visual words, speech and visuals. Face to Face and back to back communication. Email etiquette, conveying messages like acceptance or rejection of job offers, Requesting information of product or service or follow ups to earlier correspondence, agreement and disagreement etc. Group Discussion – Seek information on the given topic, assimilate and present / share opinions, facts, ideas etc within the given parameters. Topics will pertain to current issues for eg. Occupational disease and role of engineers to combat it (shop floor, operations area, silicosis etc), Elections in India – the new circus, Does India enjoy demographic advantage given its youth population, Start ups – the new employment agency.

TEXT BOOKS:

1. A Mirror of Common Errors by Ashok Kumar Singh, Publisher – Students' Friends
2. English Grammar by Wren and Martin

REFERENCES:

1. King's English – The first encyclopedia of English Language, Publishers – Addone
2. Internet sources

MA0402 ENGINEERING MATHEMATICS – II 4:0:0

(Common to all branches)

Differential Equations - 1: Linear differential equations of second and higher order. Applications to solve initial and boundary value problems.

Differential Equations-2: Legendre's differential equation, Method of variation of parameters, Series solution of a differential equation.

Integral Calculus: Multiple integrals, Applications. Beta and Gamma functions.

Vector Calculus: Vector differentiation, Vector Integration.

Laplace Transforms–1: Laplace transform of standard functions and special type of functions.

Laplace Transforms–2: Inverse Laplace transforms, solution of differential equations.

Reference Books:

1. Higher Engineering Mathematics – Dr. B.S. Grewal, 40th edition, Khanna Publications.
2. Advanced Engineering Mathematics – Erwin Kreyszig, vol I &II ,wiley publications, 10th edition.
3. Advanced Engg. Mathematics – H. K. Dass, Chand Publications.
4. Higher Engg. Mathematics – B. V. Ramanna, Tata McGraw-Hill Publications.
5. Advanced Engineering Mathematics – Peter V. O' Neil; Thomas, Broks/ Cole, 7th edition – 2011.
6. Engineering Mathematics (First year) – T.Veerarajan, 2nd edition, Tata McGraw – Hill publications.

SCHEME OF TEACHING AND EXAMINATION

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

THIRD SEMESTER B. E. (AUTONOMOUS SCHEME)

Sl.No	Subject Code	Course Title	Teaching Dept	Category	Contact Hours / Week				Credits
					L	T*	P*	Total	
1	MA0407	Engineering Mathematics – III	MATHS	GC	4	0	0	4	4
2	CS0404	Data Structures with C	CS & E	FCP	4	0	0	4	4
3	CS0448	Analog and Digital Electronics	CS & E	GC	4	0	0	4	4
4	CS0409	Computer Organization and Architecture	CS & E	GC	4	0	0	4	4
5	CS0406	Discrete Mathematical Structures	CS & E	GC	4	0	0	4	4
6	CS0331	Unix and Shell Programming	CS & E	FCS	3	0	0	3	3
7	CS0102	Data Structures Lab	CS & E	FCP	0	0	3	3	1.5
8	CS0111	Analog and Digital Electronics Lab	CS & E	GC	0	0	3	3	1.5
9	HS0001	Constitution of India and Professional Ethics	CS & E	GC	2	0	0	2	1
10	MA0201	Bridge Mathematics-I**	Maths	GC	2	0	0	2	2
			TOTAL					33	27/29

****only for lateral entry students**
*** 1 Hour = 0.5 Credits**

GC	General Core
FCP	Foundation Core - Programming
FCS	Foundation Core - Systems
FCA	Foundation Core - Application
FCN	Foundation Core - Network

GE	General Elective
FEP	Foundation Elective - Programming
FES	Foundation Elective - Systems
FEA	Foundation Elective - Application
FEN	Foundation Elective - Network

SCHEME OF TEACHING AND EXAMINATION

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

FOURTH SEMESTER B. E. (AUTONOMOUS SCHEME)

Sl.No	Subject Code	Course Title	Teaching Dept	Category	Contact Hours / Week				Credits
					L	T*	P*	Total	
1	MA0410	Engineering Mathematics – IV	MATHS	GC	4	0	0	4	4
2	CS0408	Analysis and Design of Algorithms	CS & E	FCA	4	0	0	4	4
3	CS0449	Microprocessor and Interfacing	CS & E	GC	3	2	0	5	4
4	CS0405	Object Oriented Programming with C++	CS & E	FCP	4	0	0	4	4
5	CS0411	Formal Languages and Automata Theory	CS & E	FCS	4	0	0	4	4
6	CS0332	Software Engineering	CS & E	FCA	3	0	0	3	3
7	CS0105	Algorithms Lab	CS & E	FCA	0	0	3	3	1.5
8	CS0103	Object Oriented Programming with C++ Lab	CS & E	FCP	0	0	3	3	1.5
9	HS0102	Environmental Studies	CIVIL	GC	2	0	0	2	1
10	MA0202	Bridge Mathematics-II**	Maths	GC	2	0	0	2	2
		TOTAL						**34**	**27/29**

****only for lateral entry students**
*** 1 Hour = 0.5 Credits**

GC	General Core
FCP	Foundation Core - Programming
FCS	Foundation Core - Systems
FCA	Foundation Core - Application
FCN	Foundation Core - Network

GE	General Elective
FEP	Foundation Elective - Programming
FES	Foundation Elective - Systems
FEA	Foundation Elective - Application
FEN	Foundation Elective - Network

SCHEME OF TEACHING AND EXAMINATION

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

FIFTH SEMESTER B. E. (AUTONOMOUS SCHEME)

Sl.No	Subject Code	Course Title	Teaching Dept	Category	Contact Hours / Week				Credits
					L	T*	P*	Total	
1	CS0407	Data Communication Network	CS & E	FCN	4	0	0	4	4
2	CS0413	Operating Systems	CS & E	FCS	4	0	0	4	4
3	CS0414	Database Management Systems	CS & E	FCA	4	0	0	4	4
4	CS0512	System Software	CS & E	FCS	4	2	0	6	5
4	CS0424	Management and Entrepreneurship	CS & E	GC	4	0	0	4	4
5	CS-----	Elective – I	CS & E	GE	3	0	0	3	3
7	CS0106	Microprocessor and Interfacing Laboratory	CS & E	GC	0	0	3	3	1.5
8	CS0107	Database Laboratory	CS & E	FCA	0	0	3	3	1.5
		TOTAL						31	27

* 1 Hour = 0.5 Credits

GC	General Core
FCP	Foundation Core - Programming
FCS	Foundation Core - Systems
FCA	Foundation Core - Application
FCN	Foundation Core - Network

GE	General Elective
FEP	Foundation Elective - Programming
FES	Foundation Elective - Systems
FEA	Foundation Elective - Application
FEN	Foundation Elective - Network

SCHEME OF TEACHING AND EXAMINATION

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SIXTH SEMESTER – B.E (AUTONOMOUS SCHEME)

Sl.No	Subject Code	Course Title	Teaching Dept	Category	Contact Hours / Week				Credits
					L	T*	P*	Total	
1	CS0418	Computer Networks	CS & E	FCN	4	0	0	4	4
2	CS0523	Object Oriented Modeling and Design	CS & E	FCA	4	2	0	6	5
3	CS0425	Compiler Design	CS & E	FCS	4	0	0	4	4
4	CS0450	Web Technologies and Applications	CS & E	FCP	4	0	0	4	4
5	CS------	Elective – II	CS & E	FEP	3	0	0	3	3
6	CS------	Elective – III	CS & E	FES	3	0	0	3	3
7	CS0112	Web Technologies and Application laboratory	CS & E	FCP	0	0	3	3	1.5
8	CS0109	Computer Networking Laboratory	CS & E	FCN	0	0	3	3	1.5
			TOTAL					**30**	**26**

* 1 Hour = 0.5 Credits

GC	General Core
FCP	Foundation Core - Programming
FCS	Foundation Core - Systems
FCA	Foundation Core - Application
FCN	Foundation Core - Network

GE	General Elective
FEP	Foundation Elective - Programming
FES	Foundation Elective - Systems
FEA	Foundation Elective - Application
FEN	Foundation Elective - Network

SCHEME OF TEACHING AND EXAMINATION

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SEVENTH SEMESTER – B.E (AUTONOMOUS SCHEME)

Sl.No	Subject Code	Course Title	Teaching Dept	Category	Contact Hours / Week				Credits
					L	T*	P*	Total	
1	CS0445	Distributed Operating System	CS & E	FCS	4	0	0	4	4
2	CS0521	Cryptography and Network Security	CS & E	FCN	4	2	0	6	5
3	CS0422	Parallel Processing Architecture and Algorithms	CS & E	GC	4	0	0	4	4
4	CS-----	Elective – IV	CS & E	GE	3	0	0	3	3
5	CS------	Elective – V	CS & E	FEN	3	0	0	3	3
6	CS-----	Elective - VI	CS & E	FEA	3	0	0	3	3
7	CS0205	Project Phase - I	CS & E	GC	0	0	4	4	2
			TOTAL					**27**	**24**

*** 1 Hour = 0.5 Credits**

GC	General Core
FCP	Foundation Core - Programming
FCS	Foundation Core - Systems
FCA	Foundation Core - Application
FCN	Foundation Core - Network

GE	General Elective
FEP	Foundation Elective - Programming
FES	Foundation Elective - Systems
FEA	Foundation Elective - Application
FEN	Foundation Elective - Network

SCHEME OF TEACHING AND EXAMINATION
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
EIGHTH SEMESTER – B.E. (AUTONOMOUS SCHEME)

Sl.No	Subject Code	Course Title	Teaching Dept	Category	Contact Hours / Week				Credits
					L	T*	P*	Total	
1	CS0501	Cloud Computing	CS & E	FCN	4	0	2	6	5
2	CS-----	Elective –VII	CS & E	FES	3	0	0	3	3
3	CS-----	Elective – VIII	CS & E	FEN	3	0	0	3	3
4	CS0110	Seminar	CS & E	GC	0	0	2	2	1
5	CS0602	Project Phase – II	CS & E	GC	0	0	12	12	6
6	CS0113	Journal/ Publication #	CS & E	GC	0	0	2	2	1
			TOTAL					**30**	**19 / 15**

*** 1 Hour = 0.5 Credits, # Non credit course for Lateral entry students , Lateral entry students shall drop one elective.**

GC	General Core
FCP	Foundation Core - Programming
FCS	Foundation Core - Systems
FCA	Foundation Core - Application
FCN	Foundation Core - Network

GE	General Elective
FEP	Foundation Elective - Programming
FES	Foundation Elective - Systems
FEA	Foundation Elective - Application
FEN	Foundation Elective - Network

CONCISE SYLLABUS OF CS & E
HIGHER SEMESTER

III SEMESTER

ENGINEERING MATHEMATICS III (MA0407) (4:0:0)

Fourier Series: Fourier series of period 2*l*, half range series, Practical harmonic analysis.

Partial Differential Equations: Formation and solution of PDE, Solution of Lagrange's linear PDE, D'Alembert's solution of wave equation.

Application of PDE and Fourier Transforms: Application of PDE – solution of boundary value problems associated with wave equation, Laplace's equation. Fourier Transforms.

Numerical Methods – 1: Numerical solution of a system of linear algebraic equations and transcendental equations, computation of eigen values.

Numerical Methods – 2: Interpolation formule for equal and unequal intervals, Numerical Integration.

Number Theory: Euclidean Algorithm, Generalized Chinese Remainder theorem, Primality Testing.

REFERENCE BOOKS:

1. Higher Engineering Mathematics – B.S. Grewal, 42nd edition, Khanna Publications.
2. Advanced Engineering Mathematics - Erwin Kreyszig, wiley publications, 10th edition.
3. Advanced Engg. Mathematics – H. K. Dass, Chand Publications.
4. Higher Engg. Mathematics – B. V. Ramanna, Tata McGraw-Hill Publications.
5. Advanced Engineering Mathematics- Peter O Neil; Thomas, Broks/ Cole , 7th Edition.
6. "Elementary Number Theory With Applications", Thomas Koshy , ISBN-13:9788131218594, 2008, Reed Elsevier India Pvt.Ltd.

DATA STRUCTURES WITH 'C' (CS0404) (4:0:0)

Pointers – Dynamic Memory Management, Abstract Data Types: Stacks Representation and Applications, Recursion definition, process and programs, Queues Representation and Applications, Linked Lists List as Stack, Queue, Circular lists, Doubly linked lists, Trees binary trees, traversals, AVL trees, representation and applications, Sorting Techniques Heap sort, binary tree sort, insertion sort, shell sort, Searching Hashing.

TEXT BOOKS:

1. E Balagurusamy, "Programming in ANSI C", Fifth Edition, 2011, Tata McGraw-Hill.
2. Aaron M Tenenbaum, Yedidyah Langsam and Moshe J Augenstein, "Data Structures using C", 2009, Pearson education, low price edition.
3. Richar F Gilberg and Behronz A Forouzan, "Data Structures, A Pseudocode Approach with C", Thomson, 2005.

ANALOG AND DIGITAL ELECTRONICS (CS0448) (4:0:0)

Diode applications, Op-AMP applications, Boolean Algebra, Simplification of Boolean Functions, Combinational Logic with MSI And LSI, Sequential Logic, Registers, Counters, FET Biasing and Linear Digital ICs.

TEXT BOOKS:

1. Electronic Devices and Circuit Theory, Robert L. Boylestad, Louis Nashelsky,PHI/Pearson Eduction,10th Edition,2006.
2. Digital Logic and Computer Design: M. Morris Mano, Pearson (1979)

COMPUTER ORGANIZATION AND ARCHITECTURE (CS0409) (4:0:0)

Computer System Organization, Primary Memory, Secondary Memory, the Digital logic level, Memory, I/O Interfacing, the Micro architectural level, mic 1, data path, micro instruction sets, example implementations, design of micro architecture level, IFU, A design with pre-fetching, mic-2, data path for mic-2, improving performance, types of cache memory, Instruction Set Architecture Level, Addressing modes

TEXT BOOKS:

Structured Computer Organization: Andrew S. Tannenbaum, 5thedition. 5thedition isavailable in Indian reprint Pearson/Prentice hall publication

DISCRETE MATHEMATICAL STRUCTURES (CS0406)(4:0:0)

Fundamental Principles of Counting, Permutations, Combinations – The Binomial Theorem, Combinations with Repetition. Fundamentals of Logic: Logic Equivalence – The Laws of Logic, Logical Implication – Rules of Inference. The Use of Quantifiers . Cartesian Products and Relations, Functions –Plain and One-to-One, Onto Functions, The Pigeonhole Principle Function Composition and Inverse Functions. Properties of Relations, Computer Recognition – Zero-One Matrices and Directed Graphs, Partial Orders – Hasse Diagrams. Graph Theory and Applications: Definitions and Examples, Sub graphs, Complements, and Graph Isomorphism, Vertex Degree, Euler Trails and Circuits, Planar Graphs, Hamilton Paths and Cycles, Graph Coloring, and Chromatic Polynomials. Trees: Definitions, Properties, and Examples, Routed Trees, Trees and Sorting, Weighted Trees and Prefix Codes .

TEXT BOOKS:

1. Discrete and Combinatorial Mathematics**,** Ralph P. Grimaldi, 5th Edition, PHI/Pearson Education, 2004.
2. Handbook of discrete and combinatorial mathematics, Kenneth H.Rosen, John G.Michels.
3. Mathematics of Computer Science,prof.Albert R.Meyer, MIT Open Course Ware.

4. Concrete Mathematics:A foundation for computer science,Ronald L.Graham,DonaldErvin Knuth,Oren Patashnik

UNIX AND SHELL PROGRAMMING (CS0331) (3:0:0)

Background and Basic Commands, File Systems, Security and File Permission, Administration Commands, Introduction to Shell, Filters, Communications, Regular Expressions and grep, sed, awk, SHELL Scripting, Advanced Programming, PERL Programming

TEXT BOOKS:

1. UNIX and Shell Programming – A Textbook by Behrouz A Forouzan, Richard F Gilberg, Cengage Learning, I Edition, 2003.
2. Learning Perl by Randal L Schwartz, Brian D Foy and Tom Phoenix, O'Reilly Publications, VI Edition, 2011.

DATA STRUCTURES LAB (CS0102) (0:0:3)

Searching/Sorting in arrays using Pointers, Implementation of Stack using Arrays/Structures, Application of Stack, Recursion – Tower of Hanoi, Implementation of Queue using Arrays/Structures, Implementation of Stack Linked List, doubly linked list, Implementation of Binary Search Trees, Tree Traversals, Hashing.

ANALOG AND DIGITAL ELECTRONICS LAB (CS0111) (0:0:3)

Diode applications. Op-Amp Applications, Timer IC unit operation, Basic and Universal gates, Adders, Subtractors, Flip-flop, Registers and Counters

CONSTITUTION OF INDIA AND PROFESSIONAL ETHICS (HS0001) (2:0:0)

Preamble , Fundamental rights, limitations with leading cases. Directive principles of State Policy and fundamental duties. Union Executive, including Supreme Court of India. State Executive including High Court. Special Constitutional provision for SCs / STs/ OBCs and women & children, Emergency provisions. Electoral process, major Constitutional Amendments. Scope and aims of Engineering Ethics including responsibility and impediments. Honesty, integrity and reliability, risk, safety and liability in Engineering.

TEXT BOOKS:

1. Durga Das Basu: " Introduction to the Constituion of India" (student edition) Prentice Hall EEE. 19th /20th Edition, 2001.
2. "Engineering Ethics" by M.Govindarajan, S.Natarajan, V.S. Senthikumar. Prentice Hall of India Pvt.Ltd., New Delhi 2004.

BRIDGE COURSE MATHEMATICS – I (MA0201) (2:0:0)

Differential Calculus-1: Successive differentiation, Taylor's and Maclaurin's expansions.

Differential Calculus -2: Indeterminate forms, Partial differentiation.

Statistics: Measures of central tendency and dispersion.

Integral Calculus: Integration of definite integrals, Bernoulli's rule of integration, reduction formulae.

Logarithm and Progression: Logarithm, Arithmetic and Geometric Progression.

Differential Equations: Solution of higher order homogeneous and non homogeneous differential equations.

TEXT/REFERENCE BOOKS:

1. Higher Engineering Mathematics by Dr. B.S. Grewal, 42nd edition, Khanna publications.
2. Higher Engineering Mathematics by H.K.Dass , (2008 edition), Chand Publications.

IV SEMESTER

ENGINEERING MATHEMATICS –IV (MA0410) (4:0:0)

Numerical Methods: Numerical solution of ordinary differential equations, Simultaneous differential equations. Complex Variables – 1: Analytic functions, Properties and construction of analytic functions - Applications, Conformal mapping.

Complex Variables – 2: Bilinear transformations, Complex line integration.

Statistics: Curve fitting, Multiple correlation and Regression Analysis.

Probability – I: Discrete and Continuous probability distributions.

Probability – II: Joint probability distribution (discrete), Markov chains, Concept of queuing.

REFERENCE BOOKS:

1. Higher Engineering Mathematics – B.S. Grewal, 42nd edition, Khanna Publications.
2. Advanced Engineering Mathematics - Erwin Kreyszig, wiley publications, 10th edition.
3. Advanced Engg. Mathematics – H. K. Dass (2008 edition), Chand Publications.
4. Higher Engg. Mathematics – B. V. Ramanna (2010 edition), Tata McGraw-Hill Publications.
5. Probability, Statistics and Random Processes- 3rd edition Tata McGraw-Hill Publications – T. Veerarajan.

ANALYSIS AND DESIGN OF ALGORITHMS (CS0408) (4:0:0)

Algorithm Performance Analysis, Divide and Conquer technique with examples, The Greedy Method with examples, Dynamic Programming with examples, Back Tracking with examples, NP- Complete Problems with examples.

TEXT BOOKS:

1. Computer Algorithms – Introduction to Design and Analysis, Sara Baase, AllenVan Gelder, Pearson Education, 3rd Edition.

2. Data Structures, Algorithms and Applications in C++, Sartaj Sahni, UniversitiesPress, 2nd Edition, 2005.

3. The Design and Analysis of Computer Algorithms, Alfred V Aho, John EHopcroft, Jeffrey D Ullman, Pearson Education, 1st Edition.

4. Introduction to Algorithms, Cormen Et Al. PHI, 3rdEdition.

5. Algorithms:S. Dasgupta, C. H. Papadimitriou, and U. V. Vazirani, McGraw HillScience/Engineering/Math,1st edition 2006

MICROPROCESSOR AND INTERFACING (CS0449) (3:2:0)

The Microprocessor and its Architecture, Addressing modes, Data Movement Instructions, Assembler Details. Arithmetic and Logic Instructions, Compare Instructions, Shift and Rotate, String Comparisons. Program Control Instructions: The Jump Group, Procedures, Interrupts Modular Programming, 8086/88 pin functions, System Bus Structure, System Bus Timing, Memory Interface, I/O Interface

TEXT BOOKS:

1. The Intel Microprocessors, Barry.B.Brey, PHI Publication, 8th edition, 2009.

OBJECT ORIENTED PROGRAMMING WITH C++ (CS0405) (4:0:0)

Principles of Object-Oriented Programming: Comparison Procedure-Oriented Programming with-Oriented Programming, Introduction to C++, Tokens, Expressions and Control Structures, Classes and Objects, References, Dynamic Allocation Operators, Function Overloading, Copy Constructors, and Default Arguments, Operator Overloading, Inheritance, Virtual Functions and Polymorphism, Templates: Function Template, class Templates, Exception Handling, C++ I/O Basics, C++ File I/O.

TEXT BOOKS:

1. C++ The Complete Reference, Herbert Schildt, TMH, 4th Edition.
2. Object Oriented Programming with C++, E Balagurusamy, 3rd Edition.

FORMAL LANGUAGES AND AUTOMATA THEORY (CS0411) (4:0:0)

Introduction to Finite Automata; Deterministic finite automata; Nondeterministic finite automata. An application of finite automata Regular Expressions and Languages Properties of Regular Languages: Regular languages; Equivalence and minimization of automata. Context-Free Grammars And Languages; Context –free grammars; Parse trees; Ambiguity in grammars and Languages. Pushdown Automata; The languages of PDA; Pushdown Automata, Properties Of Context-Free Languages; Equivalence of PDAs and CFGs; The pumping lemma for CFG's; Introduction To Turing Machine: Undecidability; A Language that is not recursively

TEXT BOOKS:

1. Introduction to Automata Theory, Languages and Computation: John E. Hopcroft, RajeevMotwani, Jeffrey D.Ullman:, Pearson education, 3 rd Edition, 2007.

SOFTWARE ENGINEERING (CS0332) (3:0:0)

Introduction To Software Engineering, The Software Process, Process Models, Agile View of Process, System Engineering, Requirement Engineering, Building the Analysis Model, Design Engineering, Creating an Architectural Design, Testing Strategies, Testing Tactics, Project Management, Estimation.

TEXT BOOKS:

1. Software Engineering: A Practitioners Approach - Roger S. Pressman, 6th Edition. McGraw-Hill, 2007.

ALGORITHMS LAB (CS0105) (0:0:3)

Linear search, binary search, Divide and Conquer- Merge sort, quick sort, Insertion sort, The Greedy Method: Topological Sorting, Single Source Shortest Paths, Minimum Cost Spanning Trees. Dynamic Programming- 0/1 Knapsack Problem, Binomial coefficient, Back Tracking- n-Queens Problem, BFS, DFS

OBJECT ORIENTED PROGRAMMING WITH C++ LAB (CS0103) (0:0:3)

Lab Programs to practice the following OOPS and C++ concepts: Classes, Objects, References, Dynamic Allocation, Copy Constructors, and Default Arguments, Function Overloading, Operator Overloading, Inheritance, Virtual Functions and Polymorphism, Templates, Exception Handling.

ENVIRONMENTAL STUDIES (HS0102) (2:0:0)

Introduction, man - environment interaction, eco systems, pond as an eco-system, natural resources, renewable and non-renewable energy, water and air pollution, global environmental issues, impact assessment, auditing, environmental legislations and acts, rainwater harvesting.

Text Book

1. Benny Joseph "Environmental Science and Engineering" Tata McGew-Hill Publishing Company Limited.

Reference Books

1. Gilbert M. Masters **"Introduction to Environmental Engineering and Science"** Prentice- Hall of India Pvt. Limited.
2. Edward J. Kormondy **"Concepts of Ecology"** Prentice- Hall of India Pvt. Limited.

BRIDGE COURSE MATHEMATICS – II (2:0:0) (MA0202)

Integral Calculus-I: Double and Triple integrals. Evaluation of double integral over a region.
Integral Calculus-II: Beta and Gamma functions - simple problems.
Vector Calculus-I: Differentiation of vectors, components of velocity and acceleration.
Vector Calculus-II: Gradient, Divergence, Curl, Laplacian.
Laplace Transforms: Laplace transform of standard functions, properties, Unit step function.
Inverse Laplace Transforms: Inverse transform, solution of ordinary differential equations.

TEXT/REFERENCE BOOKS

1. Higher Engineering Mathematics by Dr. B. S. Grewal, 42nd edition, Khanna publications.
2. Higher Engineering Mathematics by H. K. Dass, (2008 edition), Chand Publications.

V SEMESTER

DATA COMMUNICATIONS AND NETWORKING (CS0407) (4:0:0)

Introduction, Network Models, Introduction to Physical Layer, Digital Transmission, Bandwidth utilization, Transmission Media, Introduction to Data Link Layer, Error Detection and Correction, Data Link Control, Media Access Control, Wired LANs, Wireless LANs, Other Wireless Networks, Connection Of LANs.

TEXT BOOK:

1. DATA COMMUNICATIONS AND NETWORKING by BehrouzForouzan, Fifth Edition, McGraw Hill Education (India) Pvt. Ltd., 2013.

OPERATING SYSTEMS (CS0413) (4:0:0)

Introduction, processes and threads; processes and Threads scheduling interprocess communication; classical ipc problems; memory management memory management, page replacement algorithms & design issues swapping; virtual memory; tlbspage replacement algorithms; modeling page replacement algorithms design issues for paging systems implementation issues; Segmentation input/output i/o software layers; file systems directories; file system implementation. deadlocks introduction to deadlocks; The ostrich algorithm, deadlock detection and recovery deadlock avoidance; deadlock prevention:

TEXT BOOKS:

1. Modern operating systems, 2/E, Tanenbaum, A., PHI / Pearson Edition Asia, 2001.
2. Operating system - Design and Implementation 2/E, Tanenbaum, A.S..,Woodhull Albert SPrentice Hall, India

DATABASE MANAGEMENT SYSTEMS (CS0414) (4:0:0)

Introduction to Database and DBMS, Three-schema architecture and Data independence, The Everest Books Database, Relational Databases, Manipulating the Database, Relational Algebra, The Entity-Relationship Model, Notations, Modeling Everest Books' Database, Functional Dependencies and Normal Forms, SQL, Transactions, Constraints, Triggers, Objects, Indexes, Views and its implementation, Spatial Databases and Logs and Recovery.

TEXT BOOKS:

1. The Database Book: Principles and Practice using MySQL, Narain Gehani, UniversitiesPress (India) Private Limited 2008.
2. Fundamentals of Database Systems, Elmasri and Navathe, Addison-Wesley, 5thEdition,2007. (1.1, 1.6, 2.2, 3.3, 3.4.3, 3.5, 3.7.1, 10.2.1, 10.3, 10.5)

SYSTEM SOFTWARE (CS0512) (4:2:0)

Introduction, Machine Architecture, Assemblers- Basic Assembler Function, Machine Dependent Assembler Features, Machine Independent Assembler Features, Assemblers Design Options, Loaders and Linkers- Basic loader functions, Machine dependent Loader Features, Loader Design Options, Macro Processor, LEX and YACC.

TEXT BOOKS:

1. System Software**,** Leland L Beck, 3rd Edition, Addison-Wesley Reprint 2010.
2. Lex and Ycc – John R Levine Mason and Doug Brown, O'Reilly, SPD, 1998

MANAGEMENT AND ENTREPRENEURSHIP (CS0424) (4:0:0)

Management: Introduction, Planning, Staffing, Nature and importance, Entrepreneur, evolution, Stages in entrepreneurial process, Small scale industry, Development in India, privatization and globalization, government support, preparation of a project

TEXT BOOK:

1. Management and Entrepreneurship, NVR Naidu, T Krishna Rao.

MICROPROCESSOR AND INTERFACING LABORATORY (CS0106) (0:0:3)

Assembly Language program of 8086 for Searching/Sorting in arrays, Displaying Ascii character, Macros, Strings, Decimal UpCounter, Logic Controller Interface, Display Interface, Keypad Interface, Stepper Motor Interface, DAC Interface and Elevator Interface

DATABASE LABORATORY (CS0107) (0:0:3)

Database Design (ER-Diagram), SQL Queries for creating database, creating tables, deleting tables, inserting rows, viewing table details, viewing table contents, deleting rows, updating rows, applying constraints (Primary, Unique and Referential Integrity), Creating views, Creating Procedures, Using different types of Joins, Mini-Project.

VI SEMESTER

COMPUTER NETWORKS (CS0418) (4:0:0)

Introduction to network layer, Internet Protocol (IP), Unicast routing, Multicast routing and IPv6. Transport layer protocols, UDP, TCP. Application layer concepts, WWW and HTTP. Network Management and SNMP.

TEXT BOOKS:

1. Behrouz A Forouzan, Data Communications and Networking, McGraw Hill Education (India)-2013, 5th Edition.

OBJECT ORIENTED MODELING AND DESING (CS0523) (4:2:0)

Complexity: The inherent complexity of software, Object Model: Foundations, Elements of the object model. Classes and objects, Classification, Method, The Unified Modeling Language, Process: First Principles, The Macro Process: The Software /development Lifecycle, The Micro Process: Applications:

Control System. Design Patterns – 1: Pattern categories; Relationships between patterns; Communication Patterns: Design Patterns – 2: Idioms: Introduction; Counted Pointer example

TEXT BOOKS:

1. Grady Booch, Robert A. Maksimchuk, Michael W. Engle, Bobbi J.Young, Jim Conallen, Kelli A.Houston : ObjectOriented Analysis and Design with Applications, 3rd Edition, Pearson, 2007. (Chapters 1,2,3,4,5,6,7,9,11)
2. Frank Buschmann, Regine Meunier, Hans Rohnert, Peter Sommerlad, Michael Stal: Pattern-Oriented Software Architecture, A System of Patterns, Volume 1, John Wiley and Sons, 2006. (Chapters 1, 3.5, 3.6, 4)

COMPILER DESIGN (CS0425) (4:0:0)

Introduction and Scanners: The Translation Process, The Scanning Process, Implementation of a TINY Scanner. The Parsing Process, Syntax of the TINY language. Top-Down Parsing by Recursive-Descent, LL(1) Parsing. A Recursive-Descent Parser for the TINY Language. Semantic Analysis: Attributes and Attribute Grammars, The Symbol Table. Runtime Environments: Memory Organization during Program Execution, Runtime Environment for the TINY Language. Code Generations:Intermediate Code and Data Structures for Code Generation.

TEXT BOOKS:

1. Compiler construction, Principles and Practice by Kenneth C Louden, Thomson Publications.
2. Compilers; Principles, Techniques and Tools by Aho, Monica S Lam, J D Ullman, Pearson Publications.
3. Compiler Construction by Niklaus Wirth. An Ebook in PDF, available for free Download.

WEB TECHNOLOGIES AND APPLICATIONS (CS0450) (4:0:0)

Introduction about java, the creation of Java, Why Java is important to the Internet? Lexical issues of java; Data types, Variables and Arrays, Operators, Control Statements, Java Classes: Classes, Object, Methods, Constructors, stack class, inheritance, Interface, package, exception, Java I/O Streams, String Handling, XHTML, XML and CSS, Introduction to PERL, CGI, PHP, Mysql.

TEXT BOOKS:

1. The Complete Reference Java 2, Herbert Schildt, 5th Edition, Tata-McGraw-Hill, 2008
2. Programming the World Wide Web, Robert W. Sebesta, 4th Edition, Pearson Education, 2008.
3. Open Source Web Development with Lamp, James Lee and Brent Ware, Pearson Education, 2009

COMPUTER NETWORKS LAB (CS0109)(0:0:3)

Implementation of basic concepts of Networking, Usage of different networking devices, Usage of any packet analyzer to determine the various networking factors, Developing new networking topologies and analyzing various networking problems using various simulators such as Cisco Packet Tracer, NS-3 etc.

WEB TECHNOLOGIES AND APPLICATIONS LAB (CS0112) (0:0:3)

Implementation using Java: Arrays, Stack, Class, Methods, Interface, Packages, Multithreading, Exception Handling, I/O, String handling, Networking .Creating Webpages using XHTML,CSS AND XML, Perl : CGI programs, linking CGI with Mysql databases to work on tables, PHP: Programs using PHP, Linking PHP with Mysql databases to work on tables

VII SEMESTER

DISTRIBUTED OPERATING SYSTEM (CS0445) (4:0:0)

Introduction to distributed systems, Bus-based, switched multi-processors and multi-computers. Clock synchronization, Mutual exclusion, A centralized algorithm, A distributed algorithm, A token ring algorithm. Synchronization in distributed systems-II, Election algorithms, Atomic transactions, Processes and processors in distributed systems, Threads, Distributed file system design, Distributed file system implementation, Distributed shared memory, Shared variable distributed shared memory.

TEXT BOOKS:

1. Distributed Operating systems Andrew S. Tanenbaum , 1st edition, Pearson publication, Distributed systems, concepts and design, G. Colouris, J. Dollimore and Tim Kinderg, 3rd edition, pearson publications.

CRYPTOGRAPHY AND NETWORK SECURITY (CS0521) (4:0:2)

Introduction to Symmetric-Key Encipherment, Mathematics of cryptography, Advanced Encryption Standard (AES), Asymmetric-Key Cryptography, Message Integrity and Message Authentication Entity Authentication.

TEXT BOOKS:

1. Cryptography and Network Security, Behrooz Forouzan, SIE, 2nd Edition, McGraw-Hill.

PARALLEL PROCESSING ARCHITECTURE AND ALGORITHMS (CS0422) (4:0:0)

Pipelined Data Paths Pipelining Concepts, Introduction to Parallelism, Types of Parallelism, Simple Computations, Simple architectures, Parallel Algorithm Complexity: Programming Paradigms, Solving Recurrences, Models of Parallel Processing, RAM and Basic Algorithms, More Shared-Memory Algorithms: Sorting and Selection Networks. Other Circuit-Level Examples

TEXT BOOKS:

1. B. Parhami, Computer Architecture: From Microprocessors to Supercomputers, Oxford University Press, Indian edition, 2005
2. B. Parhami, Introduction to Parallel Processing: Algorithms and Architectures, Plenum series, KLUWER ACADEMIC PUBLISHERS, 2002

PROJECT PHASE – I (CS0205) (0:0:4)

In the first phase of the project work-I, students are expected to identify a real world engineering problem, formulate the problem, Outline a software project plan, check the feasibility of the solution, Carry out extensive literature survey. In the second phase of the project work – I the students will evaluate the available tools, develop a suitable design .Here the students are going to work in a batch limited to maximum of 4 students.

VIII SEMESTER

CLOUD COMPUTING (CS0501) (4:0:2)

Introduction, Distributed System Models and Enabling Technologies, Computer Clusters for Scalable Parallel Computing, Virtual Machines and Virtualization of Clusters and Data Centers, Cloud Platform Architecture over Virtualized Data Centers, Service-Oriented Architectures for Distributed Computing, Cloud Programming and Software Environments.

TEXTBOOK:

1. Cloud Computing Bible by Barrie Sosinsky, Wiley India
2. Distributed And Cloud Computing, Hwang, Kai; Fox, Geoffrey C; Dongarra, Jack J. Elsevier India Pvt. Ltd

SEMINAR (CS0110) (0:0:2)

Seminar should be given by individual student based on current emerging area and technologies. The student has to identify the current trend and real world issues, conduct literature survey, Understand

and interpret the results of technical work, Demonstrate both technical report writing and presentation skill, Communicate effectively, improve both oral and written skill.

PROJECT PHASE-II (CS0602) (0:0:12)

In the project work-II, students are expected to construct the proposed design of Phase-1, Implement the constructed design, Verify and validate the obtained results, Prepare a detailed technical report, suggest limitations and further extensions for the work, Publish the work in a reputed journal/conference.

JOURNAL/ PUBLICATION/ CONFERENCE (CS0113) (0:0:2)

Students are expected to publish paper in Journal or present paper in conference.

ELECTIVES

REAL TIME SYSTEMS (CS0317) (3:0:0)

Hard Versus Soft Real-Time Systems: Jobs and Processors, Release Times, Deadline and Timing Constraints. A Reference model of Real-Time systems Functional parameters of resources Approaches to Real-Time Scheduling: Clock-Driven approach, Weighted Round-Robin approach. Priority driven approach. Clock-driven Scheduling: Notations and assumptions, static, Timer-Driven Scheduler, Priority-Driven Scheduling of Periodic Tasks: Static assumption, Fixed Priority Versus Dynamic Priority algorithms, Resources and Resources Access Control: Assumptions on resources and their usage, Effects of resources contention and resources access control Non preemptive critical section.

TEXT BOOKS:

1. **Real Time Systems** – Jane W.S. Liu Pearson Education Asia, First Indian Reprint-2001.
2. **Real Time Systems Design and Analysis:** An Engineer's Hand book Second Edition, Lapante.

STORAGE AREA NETWORKS (CS0326) (3:0:0)

Server Centric IT Architecture and its Limitations, Intelligent Disk Subsystems ,I/O Technologies ,SCSI, Network Attached Storage, Fibre Channel Protocol Stack; Fibre Channel SAN; IP Storage, File System And NAS: Local File Systems; Network file Systems and file servers; Shared Disk file systems, Storage Virtualization, Implementation Considerations; Storage virtualization on Block or file level, Symmetric and Asymmetric storage virtualization in the Network.SAN Architecture and Hardware

devices, Software Components of SAN: The switch's Operating system, Device Drivers, The Supporting the switch's components, Configuration options for SANs.

TEXT BOOKS:

1. Storage Networks Explained, Ulf Troppens, Rainer Erkens and Wolfgang Muller, John Wiley & Sons, 2003.
2. Storage Networks: The Complete Reference, Robert Spalding, Tata McGraw Hill, 2003.

LINUX INTERNALS (CS0318) (3:0:0)

Linux-The Operating System: Main Characteristics, Linux Distributions: Compiling the kernel, Additional Configuration facilities. Introduction to kernel, The Booting process: Carrying out the booting processes. Memory Management, The Virtual address space of a process, Block device caching, Paging under Linux. Interprocess communication, System V IPC File System. Device Drivers Under Linux: Character and Block devices, Hardware, Polling, interrupts, and waiting queues. Network Implementation: Modules and Debugging, the kernel daemon, Simple data swapping between modules, An example module, Debugging. Kernel-Related Commands

TEXT BOOKS:

1. **Linux Kernel Programming**, M. Beck, et.al., III edition, Pearson Education 2002
2. **Linux Kernel Development**, Robert Love, Pearson Education 2004
3. **Understanding the Linux Kernel**, Daniel Bovet, Marco Cesati., III Edition, O'rielly Publications, 2005

DESIGN OF THE UNIX OPERATING SYSTEM (CS0320) (3:0:0)

Introduction to Unix operating system, Internal and External Commands of Unix OS, Shell scripts. Design of the Unix kernel and Buffer cache, File system, processes in Unix OS, Process control and Management.

TEXT BOOKS:

1. Sumithabha Das , Unix Concepts and Applications The McGraw Hill, 4th Edition.
2. Maurice J Bach, The Design of the Unix operating system, Prentice- Hall, 2006.

PROTOCOL ENGINEERING (CS0327) (3:0:0)

Introduction to Communication model, Communication Software, Communication Subsystems, Communication Protocol Definition/Representation, Formal and Informal Protocol Development Methods, Protocol Engineering Phases Network Reference Models: OSI Model Layer ,TCP/IP Protocol

Suite, Protocol Functions: Functions, Application Protocols. Protocol Specification, Channel specification, Interface specifications, Interactions, Multimedia specifications, Communication System Description using SDL, Structure of SDL Data types and communication paths, Examples of SDL based Protocol Specifications, Protocol Verification ,Validation, Protocol Conformance and Performance Testing, Protocol Synthesis and Implementation.

TEXT BOOKS:

1. Communication Protocol Engineering ,Pallapa Venkataram and Sunilkumar S. Manvi, PHI, 2004
2. Elements of Protocol Design, Mohammed G. Gouda, Wiley Student Edition, 2004.

COMPUTER GRAPHICS AND VISUALIZATION (CS0307) (3:0:0)

Introduction to Computer Graphics – Graphics system, architecture, applications, OpenGL APIs – types of functions, example programs, Input and Interaction – input devices, building, animating & designing interactive programs, Geometric Objects Transformations – homogeneous coordinate system, translation, rotation, scaling, transformation matrices, OpenGL functions, Viewing – Parallel and Perspective viewing, OpenGL APIs for viewing, Projection Matrices.

TEXT BOOK:

1. Edward Angel: Interactive Computer Graphics A Top-Down Approach with OpenGL, 5th Edition, Pearson Education, 2008. (Chapters 1 to 5)

MULTIMEDIA COMPUTING (CS0308) (3:0:0)

Multimedia communications, Representation, Networks, Applications, Multimedia information representation, Compression Techniques, Text Compression and its Types, Image Compression and its Types, Audio Compression and its Types, Video Compression and its principles, Standards for Multimedia Communications, TCP/IP Model, Java Scripts

TEXT BOOKS:

1. Multimedia Communications – Applications, Networks, Protocols and Standards – Fred Halsall, Pearson Education, 2009.

INTRODUCTION TO C# PROGRAMMING AND .NET CONCEPTS (CS0312) (3:0:0)

The Philosophy of .NET, Building C# Applications, C# Language Fundamentals Object- Oriented Programming with C#, Exceptions, object Lifetime, Interfaces and Collections, Callback Interfaces, Delegates, Events, Advanced Techniques, understanding .Net Assembles.

TEXT BOOKS

1. C# and the .NET platform - Andrew Troelsen, Special Edition, Dream Tech Press, India, 2003.
2. Inside C# - Tom Archer, WP Publishers, 2001.

EMBEDDED SYSTEMS (CS0331) (3:0:0)

Custom single-purpose processor, Optimizing custom single-purpose processors, **Timers, counters, and watchdog timers, State machine models,** Using state machines, Hierarchical/Concurrent state machine model, Program state machine model (PSM), **Concurrent process models,** Communication among processes, Synchronization among processes, **Survey of Software Architecture, Introduction to RTOS, Operating Systems Services, Basic Design Using an RTOS, Embedded Software Development Tools,** Linker/Locator for Embedded Software.

TEXT BOOKS:

1. **Embedded System Design: A Unified Hardware/ Software Introduction** - Frank Vahid, Tony Givargis, John Wiley & Sons, Inc.2002 ,
2. **An Embedded Software Primer** - David E. Simon: Pearson Education, 1999.

GAME THEORY (CS0310) (3:0:0)

Introduction, Strategic Games, Mixed Strategy Equilibrium, Extensive Games, Bayesian Games, Strictly Competitive Games, Rationalizability, Evolutionary Equilibrium, Iterated Games.

TEXT BOOKS:

1. **An Introduction to Game Theory –** Martin Osborne, Oxford University Press, Indian Edition, 2004.

ADHOC NETWORKS (CS0328) (3:0:0)

Cellular and Ad Hoc Wireless networks, Applications of Ad Hoc wireless networks; Issues in Ad hoc wireless networks, Ad hoc wireless Internet. Issues in designing a MAC protocol, Design goals and Classification of MAC Protocols, Working of D-PRMA,CATA,SRMA/PA,FPRP, HRMA and MACA/PR. Issues in Designing a Routing Protocol, Classification and design goals of Routing Protocols, Working of DSDV, WRP, CGSR,DSR, AODV, TORA, LAR, ABR, and FORP and SSA. Issues in Designing a Transport Layer Protocol, Design Goals and classification of Transport Layer Solutions, TCP over Ad-hoc wireless Networks, Working of TCP-F, TCP with ELFN, TCP-BUS, Ad-hoc TCP, Split TCP,ACTP and ATP. Network security requirements, Issues &Challenges in Security Provisioning, Network security Attacks, Key Management, Working of SAR protocol, Security-Aware AODV protocol and ARAN.

TEXT BOOKS:

1. **Ad hoc Wireless Networks** – C. Siva Ram Murthy & B. S. Manoj, 2nd Edition, Pearson Education, 2005.

WIRELESS COMMUNICATION NETWORKS (CS0305) (3:0:0)

Wireless communication systems and networking, modern wireless communication systems, the cellular concept, mobile radio propagation, modulation techniques for mobile radio, multiple access techniques for wireless communication

TEXT BOOKS:

1. Wireless communications, principles and practice, second edition, theodres rappaport, pearson education asia

INTRODUCTION TO ANDROID PROGRAMMING (CS0313) (3:0:0)

Getting started with Android Programming: Activities, Fragments and Intents, Getting to know the android user interface, Designing your user interface with views, Displaying Pictures and Menus with Views, Using Internet Resources, Files, Saving States and Preferences, Database and Content Providers.

TEXT BOOKS:

1. Wei-Meng Lee, Beginning Android 4 Application Development, Wrox, Wiley India Edition.
2. Reto Meier, Professional Android 4 Application Development, Wrox, Wiley India Edition

BIG DATA ANALYTICS (CS0324) (2:0:2)

Getting an Overview of Big Data, Introducing Technologies for Handling Big Data and Hadoop Ecosystem, Understanding MapReduce Fundamentals and HBase, NoSQL Data Management, Understanding Analytics and Big Data, Analytical Approaches: Tools to Analyze Data, Exploring R

TEXTBOOKS:

1. Big Data: Black Book, DT Editorial Services, Wiley India Pvt Ltd, 2015 Edition

INTRODUCTION TO DATA MINING (CS0325) (3:0:0)

Introduction to Data Mining, Data Warehouse and OLAP Technology for Data Mining, Data Preprocessing.

TEXTBOOKS:

1. Data Mining Concepts and Techniques, Jiawei Han and Micheline Kamber, Morgan Kaufman Publications.

QOS IN ADHOC NETWORKS (CS0329) (3:0:0)

Introduction to Ad Hoc Networks and Wireless Sensor Networks, Traffic Profiles, Types of mobile Communications, Types of Mobile Host Movements, Challenges Facing Ad hoc Mobile Networks, Ad hoc wireless Internet. Issues and Challenges in Providing QoS, classification of QoS Solutions, MAC Layer Solutions, Network Layer Solutions, QoS Frameworks for Ad hoc Wireless Networks. Battery Management Schemes, Transmission Power Management Schemes, System Power Management Schemes.

TEXTBOOKS:

1. C. Siva Ram Murthy and B. S. Manoj, “Ad Hoc Wireless Networks Architectures and Protocols”, Prentice Hall, PTR, 2004.

CLIENT – SERVER PROGRAMMING (CS0321) (3:0:0)

The Client Server Model and Software Design, Program Interface to Protocols, The Socket Interface, Algorithms and Issues in Client Software Design, Example Client Software, Algorithm and Issues in Server Software Design, Iterative - Connectionless Servers (UDP), Iterative -Connection-Oriented Servers (TCP).

TEXTBOOKS:

1. Internetworking with TCP/IP: Client-Server Programming and Applications, 2nd Edition, Vol. 3 – Douglas E.Comer, David L. Stevens, PHI.

WEB PROGRAMMING (CS0314) (2:0:2)

Fundamentals: Introduction To The Internet, The World Wide Web, Web Browsers, Web Servers, Uniform Resource Locators, Multipurpose Internet Mail Extensions, The Hypertext Transfer Protocol, The Web Programmer’s Toolbox, Introduction To XHTML, Cascading Style Sheets, The Basics Of JavaScript, JavaScript and XHTML Documents, Dynamic Document With JavaScript, Introduction To XML.

TEXTBOOKS:

1. Robert W. Sebesta : Programming the World Wide Web, 4th Edition, Pearson Education

WIRELESS AND MOBILE NETWORKS (CS0330) (3:0:0)

Wireless communication systems and networking, Mobility and handoff management, Cellular digital packet data and mobile number portability, GSM, GPRS ,3G and upwards and USSD technologies, Mobile operation systems, SDKs, Bluetooth ,WLL, VoIP, Mobile IP and SMS

TEXT BOOKS

1. Yi Bing Lin, “Wireless and Mobile Network Architecture”, John Wiley

PYTHON PROGRAMMING (CS0315) (3:0:0)

Introduction to Python programming language, Variables, expressions and statements, Functions, Conditionals and recursion, Fruitful functions, Iteration, Tuples, Files, Databases, Pickling. Classes and objects Classes and functions, Pure functions, Classes and methods: Object-oriented features.

TEXT BOOKS:

1. **Think Python -** How to Think Like a Computer Scientist**,** Allen Downey, Green Tea Press, 2nd Edition (2.0.17)

OPERATION RESEARCH (CS0311) (3:0:0)

Introduction to Operation Research, Linear Programming Model and Examples, Simplex Method and Example Problems, Duality Theory, Transportation and Assignment Problems, Game Theory, Decision Analysis, Metaheuristics.

TEXT BOOKS:

1. Frederick S. Hiller and Gerald J. Lieberman: Introduction to Operations Research: Concepts and Cases, 9th Edition, Tata McGraw Hill, 2010

ADVANCED JAVA (CS0316) (3:0:0)

Applet, Event handling in Java, Introduction to AWT, Using AWT Controls, Layout Manager and Menus, Swing, Exploring Swing, JavaBeans, Introducing Servlets, Servlets, JDBC-connectivity to Database.

TEXT BOOKS

1. Core JAVA An Integrated Approach, by Dr.R.Nageswara Rao, Dreamtech Press,2008
2. Java The Complete Reference, Herbert Schildt,9th Edition, Tata-McGraw-Hill,2014

ADVANCED ALGORITHMS (CS0323) (3:0:0)

Hash tables, Red Black Trees. Dynamic Programming, Greedy Algorithms B-trees, Fibonacci Heaps, Amortized Analysis, Single Source Shortest paths, Flow networks, the Ford-Fulkerson method, Maximum bipartite matching, push reliable algorithm, Multi threaded algorithms, Number-Theoretic Algorithms: Modular arithmetic, Solving modular linear equations, The Chinese remainder theorem, Powers of an element, the RSA public-key cryptosystem, String matching algorithms

TEXT BOOKS:

1. **Introduction to Algorithms –**Thomas H. Cormen, Charles E. Leiserson, Ronald L.Rivest, Clifford Stein PHI, 3rd Edition.

DECISION SUPPORT SYSTEMS (CS0304) (3:0:0)

Decision Making and Computerized Support, Decision Support Systems-An Overview, Decision Support Systems Development, Group Support Systems, Enterprise Information Systems, Knowledge Management.

TEXT BOOKS:

1. **Decision Support Systems and Intelligent Systems** - Efraim Turban. Jay E. Aronson, Ting-Peng Liang:, 7th Edition, Prentice-Hall of India, 2006.

PERVASIVE COMPUTING (CS0303) (3:0:0)

Past, present, future: The vine and fig tree dream, Pervasive computing, the pervasive computing market. Device connectivity: Protocols, Security, Device management. WAP and beyond: Introduction, Components of the WAP architecture, WAP infrastructure. Voice technology: Basics of speech recognition, Voice standards Speech applications, Speech and pervasive computing, Security. Personal digital assistants: History, Device categories, Personal digital assistant operating systems. Server-side programming in Java: Java 2 Enterprise Edition: overview, Servlets, Enterprise Java Beans, Java Server pages, Web services. Example application: Introduction, Architecture,

Implementation Access from PCs: Smart-card-based authentication via the Internet. Access via WAP: WAP functionality. User interfaces overview, implementation

TEXT BOOKS:

1. **Pervasive Computing: Technology and Architecture of Mobile Internet Applications**, Jochen Burkhardt, Thomas Schaeck, Horst Henn, Stefan Hepper, Klaus Rindtorff, Pearson Education, April 2002.

CONCURRENT PROGRAMMING (CS0319) (3:0:0)

The Nature and Uses of Concurrent Programming: Introduction, Sequential Programming as a total ordering, Breaking away from the sequential paradigm, Concurrent programming as a partial ordering, Process Representation and Life-cycle: The concept of process, Process Structures, The process model in Pascal-FC. Process interaction: Active and passive entities, The Ornamental Gardens Problem, Mutual exclusion and other synchronizations, Synchronous Message-passing: Alternative Language models, Selective waiting. Semaphores: Definition of semaphores, Pascal-FC's Semaphores, Mutual exclusion with semaphore, Fairness and semaphores, Semaphore invariants, Condition synchronization with semaphores, Conditional Critical Regions and Monitors: Beyond semaphores, Critical regions, Conditional critical regions, Monitors for mutual exclusion, Condition

synchronization with monitors, Illustrative examples of the use of monitors, More on the semantics 52 of resume, Monitor invariant.

TEXT BOOKS:

1. **Concurrent Programming:** Alan Burns, Geoffrey Davis, Addison-Wesley (1993).

PARALLEL ALGORITHMS (CS0306) (3:0:0)

Models of Computation, Parallel Prefix, Pointer Jumping and divide and Conquer, Computational Geometry, Graph Algorithms, Numerical Problems.

TEXT BOOKS:

1. **Algorithms Sequential and Parallel: A Unified Approach,** Second Edition,2005, By: RussMiller; Laurence Boxer, Course Technology PTR.

UNIX SYSTEM PROGRAMMING (CS0322) (2:0:2)

UNIX System Overview, File I/O, Files and Directories, Process Environment, Process Control, Signals, Threads, Daemon Processes, Interprocess Communication

TEXT BOOKS:

1. **Advanced Programming in the UNIX Environment** – W. Richard Stevens and Stephen A Rago,2nd Edition, Pearson Education / PHI, 2005.

Student Mentor Programme
2016-17

CONTENTS

1.0 Introduction

The Student Mentor Programme (SMP) is a programme of student community, within The National Institute of Engineering (NIE),Mysuru, with the following primary objectives:
1. Enabling constructive interaction, guidance and mentorship of junior students by senior students
2. Providing a reliable and comprehensive support system to motivate students to excel in both academic and non-academic fields and to make the most of their life at the Institute.

The two-way system is devised to help freshman to be at ease with the new environment of NIE. In this system a group of 10 to 15 mentees (freshmen) of a particular branch are allotted to a Student Mentor (SM) of the same branch. At the same time, one of the teachers, who is teaching a particular section is made Faculty Mentor for about 60 students of that section. This scheme is given below:

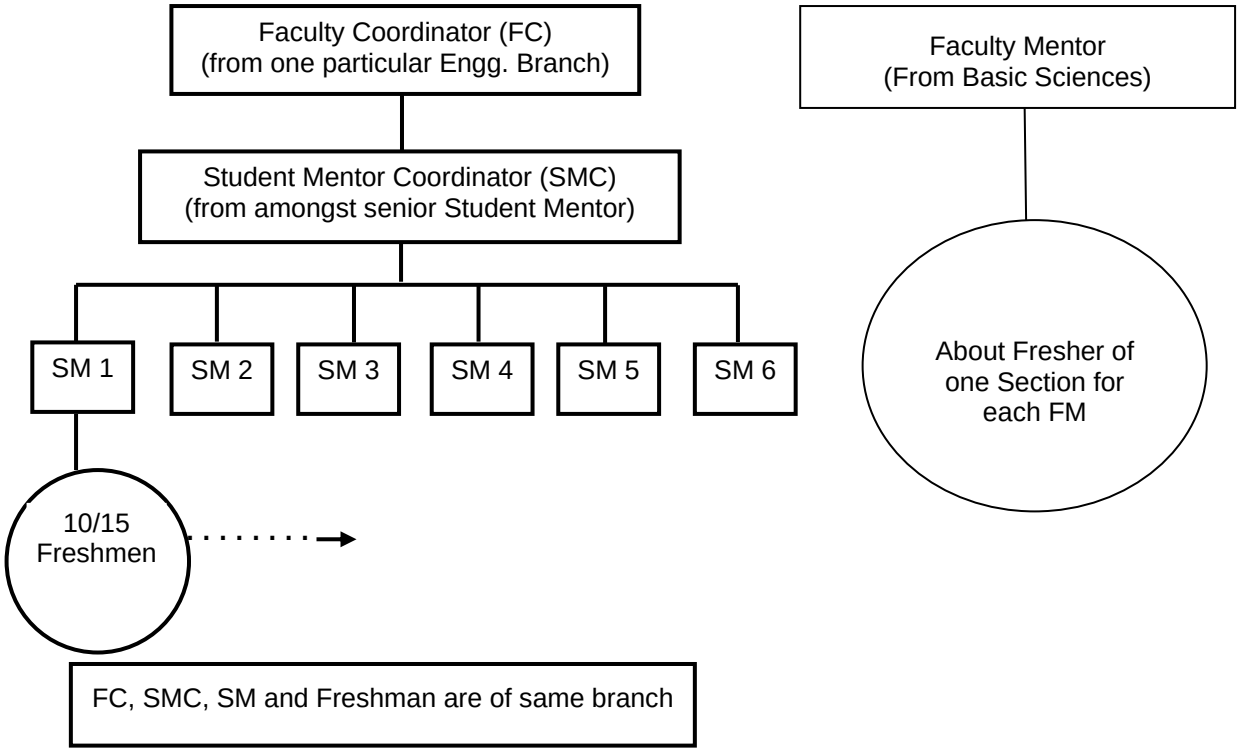


Fig. 1 Scheme of SMP

2.0 Objectives of the SMP

The objectives of the SMP include to:

- Help undergraduate fresh students understand the challenges and opportunities present in the Institute and develop a smooth transition to campus life
- Counsel academically weak undergraduate first year students and to play an important role in helping troubled students cope with academic, extra-academic and personal issues
- Provide positive role models to first year undergraduate students in the institute

- Proactively try to identify various issues of concern to the general student populace and to bring them to the notice of the concerned authorities
- Provide them one such friend among the seniors, with whom they can freely share their problems, ask any queries which they otherwise feel shy to ask or share.

The SMP endeavors to pursue these objectives by carefully identifying those who can act as an anchor and guide for a freshman or an academically weak student to bank upon. SM's are selected to play this role and are given the authority to pursue the mission of this programme.

SM's are respected, well-balanced students usually belonging to the 3rd year B.E.A SM's role may be perceived to be facilitative, supportive and developmental for the student community in general.The implementation of the SMP and its details are covered subsequently in this document.

3.0 Structure of the SMP

This programme primarily deals with first year undergraduate students. The senior students, called Student Mentors (SM) are responsible for helping a set of freshmen adjust to the new environment and subsequently monitor their progress throughout the year. Every undergraduate freshman is covered by this programme.

People involved in the SMP

1) Dean (Academic)
2) Students Welfare Officer
3) Warden
4) Student Counselor/s
5) Faculty Coordinators- One from each Branch
6) Faculty Mentors from Basic Science Department

Student Mentors (SMs)

Selected students from the 3rd year B.E.,constitute the team of SMs. Each of them would be assigned a group of first year students. Each SMreports directly to the Faculty co-coordinator.He/she would be the direct point of interaction with the first year students and may report special cases for the consideration of Faculty Co-ordiantor.

4.0 Essential Qualities of a Student Mentor(SM)

The qualities mentioned below are guidelines used by the Faculty co-coordinators in selecting the new Mentor team. A Student Mentor is normally a student from the 3rd year B.E.

- Empathy and humility are the most essential qualities for any mentor to possess. It is necessary for a mentor to empathize with the wide variety of situations his mentees could face and be humble enough not to impose their own opinions but to tailor advice to the mentee's needs.
- Ethics are of paramount importance for SMs and they should be able to instill the same in their mentees.
- SMs should be academically inclined and capable of persuading others to be the same.
- SMs should be someone as a role model people can look up to, because of their achievements and personality. SM shall be a person of high integrity.

5.0 Functioning of the SMP

The Student Mentor body is vested with the following powers:

- In matters pertaining to hostel-life, which require intervention in the interest of the wards, the student mentors are empowered to do so by notifying the case to the hostel authorities. The

same must be taken with utmost seriousness by the concerned hostel bodies. StudentMentors may enter freshmen wings at any time in order to talk with freshmen if they seek his/her help.

- Every Studentmentor has the right to halt any activity that involves freshmen. Such activities include, but are not limited to: introduction sessions conducted by seniors, either personal or relating to extracurricular activities, fundae sessions in hostels which extend beyond acceptable limits of time or decency etc. Senior/Junior Prefect are advised to keep the SMs informed about any activities involving freshmen.
- In matters pertaining to academics, which require preventive or curative action to be taken in the interest of the wards, the mentor has the responsibility and the right to bring the case to the notice of the concerned Faculty co-oordinator/ Faculty Mentor, who would in turn take the necessary action.
- In matters that affect the wards, and can only be resolved at the institute level, the Student Mentors shall bring the matter to the notice of Faculty Co-ordinator, Student Mentor co-oridnator and Deans. It is however essential that the mentor team works in harmony with the other functionaries of the Institute.
- In case of fresher who needs additional help, Students Mentors shall co-ordinate with Faculty co-oordinator. Student Mentor will also receive inputs/guidance from Faculty Mentor.

6.0 Role of the Faculty Coordinators(FC)

- The FCs play a very important role in selecting the team of Institute Student Mentors. Selecting a team of responsible, sensitive and dedicated mentors is very crucial to the success of the SMP.
- The FCs oversee the day-to-day functioning of the SMP. For this, they must keep in regular touch with the SMs and freshmen to ensure that the primary objective of the programme is being fulfilled.
- The SMs are expected to give regular updates regarding the functioning of the SMP to the FC.
- In particular, if a SM feels that a particular freshman is facing academic/emotional problems that cannot be handled by him/her, the SM must report the matter to the FCand Counselor immediately.
- The FCs must ensure accountability from all SMs to the extent possible. As such, they may recommend suspension or removal of SMs from the team for dereliction of duty/non-performance to the SMP body.
- The SMP body should interact and share their experiences once in a month in the odd semester, and twice in even semester.

7.0 Role of Faculty Mentor (FM)

- Faculty Mentorshall meet respective batches during their Laboratory classes in the Department. Information regarding timing of these laboratory classes is given.
- FM shall certainly meet students of their batches in the first week and discuss general matters and make them at ease.
- Subsequently, they shall meet students after the Mid Semester examinations and discuss their performance and comfort level

- A meeting with students just before the Semester End Examination is very essential.
- FM shall counsel the students with difficulty in adjusting to the environment, and if need be, help them to approach Institute counselor.
- FM shall also, advise students to take help of their Student Mentors (SM), as per their branch of engineering.
- FM shall sign the leave applications, request for absentee exam from students, after ascertaining the reasons, thereof.

8.0 Role ofthe Student Mentor (SM)

Each Institute Student Mentor is assigned a group of 10-15 freshmen, who would henceforth become his/her mentees. Under normal circumstances, it is the primary duty of the SM to guide the group of students assigned to him/her through their first year in the institute. However, the responsibility of each mentor extends to the entire first year batch and hence, the Mentor should feel free to intervene in any matter related to freshmen.

- The Mentor should ensure to the best of his/her ability that the freshmen (especially his/her mentees) are able to adjust comfortably to life at NIE - both in the institute and in the hostel.
- For this, it is imperative that the Mentor establishes a close rapport with his/her mentees.
- The Mentor should see to it that he/she meets them at certain critical junctures of the first year such as the first few weeks of the semester, well before Test, Mid Semester Exam, end semester exams and at the time of results.
- The Mentor must act on any complaint of misbehavior by a senior. The institute has strict policies against ragging of any form.
- Time management is a crucial aspect of one's life at NIE, and the Mentor should tell the mentees about this aspect. The Mentor has to impress upon his/her mentee the need to maintain a balance between academic and co-curricular activities, so that one utilizes one's time at NIE in the most productive manner.
- The Mentor must ensure that no activity is forced upon any freshman against his/her will. The thin line between forcing and persuasion is one which the Mentor has to judge based upon his/her perception of the freshman, and the matter at hand.
- The Mentor should be ready to help his/her mentee overcome any problems (academic or social) in an advisory role and act as a responsible role model. At the same time, he must realize the importance of making his/her mentee independent and self-reliant. Mentors must refrain from spoon feeding the Mentees.
- Mentors should immediately inform the FCor the Student Welfare Officer regarding any potentially serious case related to their mentees or any other student (if they come to knowof it).
- Mentors are expected to play their role as responsible seniors using their own discretion.
- There are many activities, seminars, workshops which take place in Institute, which freshmen are unaware of. Mentors can thus inform their mentees about any such event going on catering to his/her mentee’s interest.

- Mentors are as well expected to keep a check on whether his/her mentees haven't deviated from their track and fallen prey to any bad habits. The mentor should be influential in helping his mentee cope up from any such activities if found indulged in.

9.0 Checklist for Student Mentor (SM)

Following information, a mentor should definitely know about his/her mentees by the end of the first month:

1. Name, room No./address and contact number
2. Whether he/she is at ease in interacting with others? Is he/she too reserved?
3. If he/she faces any Language problems
4. If he/she suffers from any medical issues
5. If he/she hails from a remote village/town/metropolis
6. Whether he/she is enthusiastic for engineering/academics
7. His/her hobbies?
8. Whether he/she is able to cope up with the academics or has he/she given up?
9. Whether he/she has fallen prey to any bad habit?
10. Attendance (rough estimate)
11. How well he/she has settled in the institute
12. Is mentee communicating regularly with family/friends ?

10.0 Important Phone Numbers

Student Welfare Officer	0821-4004903	**Hospitals**:	
Dean (Academic)	0821-4004953	JSS Hospital	0821-2335555
Academic Section	0821-4004950	Apollo Hospital	0821-2568888
Exam Section	0821-4004943	Kamakshi Hospital	0821-2344319
Account Section	0821-4004900	Vikram Hospital	0821-2343039
Sport Section	0821-2480996	Colambia Asia Hospital	0821-3989896
Library Xerox Section	0821-4004907	Vidyaranya Hospital	0821-2330555
Manager/ Hostel Section:		Brindavan Hospital	07870321842
Hostel Office	0821-2484819	Snake Friends (Snake Shyam)	09448069399
Warden Boys Hostel	0821-2488594	**Police Station:**	
Warden Girls Hostel	0821-2480243	Vidyaranya Puram Police Stn.	0821-2418322
Bank:		Ashok Puram Police Stn.	0821-2418321
Syndicate Bank, NIE Campus Branch	0821-2481495	Fire Brigade	0821-2540970
Registrar	0821-2480475	**Railway Inquiry:**	
PRE	9945996228	Toll Free	139
		Mysore Railway Station	08095090112
		Bus Inquiry:	
		KSRTC Main Bus Stand	0821-2425819