Sanjay Ghodawat University

Kolhapur

School of Technology

Department of Electronics Engineering

B. Tech. Electronics & Communication Engineering

Curriculum

(Programme Structure and Course Contents)

Academic Year 2020 - 21

SANJAY GHODAWAT UNIVERSITY
KOLHAPUR

Sanjay Ghodawat University (SGU) is established in the Academic Year 2017-18, as a State Private University under Govt. of Maharashtra Act No. XL of 2017 dated 3rd May 2017, with the approval of the UGC and the state Government. "For the true measure of giving is giving without measure." Spread across 150 Acres, Sou. Sushila Danchand Ghodawat Charitable Trust's Sanjay Ghodawat University (SGU) is situated in serene atmosphere amidst idyllic hills and lush green meadows to study in harmony with Nature. The Institution aspires to run along the lines of best-in- the-world education and become a world-class institution where teaching-learning process gets a far deeper meaning. SGU always stands as the guiding star of brilliance, quality and deliverance beyond expectations. Innovativeness and Creativity are the hallmarks of a genius enterprise and SGU stands to be a stage where these qualities would be nurtured, encouraged and blossomed. The genius is incomplete without the sense of social responsibility and SGU's ultimate goal remains the development of an attitude of gratitude that freely gives back without expectations.

The Sanjay Ghodawat University stands as a beacon of light to guide the younger generation of the day on the right path to fulfilment in career and life. The USP of the University is its research based curriculum and academically oriented teaching staff. The world class ambience and infrastructure helps the students to easily accommodate themselves in an environment that is conducive to the teaching- learning process. Hands on experience, challenge based case studies, maximum participation of students in the classroom, use of modern digital technology, smart classrooms, solution oriented thinking promotion, stress on research and innovation, international tie ups, choice based credit system for flexibility in choosing areas of interest etc. are some of the features of the University.

The university will help students develop as a unique individual-to be educated as a whole person, intellectually, emotionally, socially, ethically, and spiritually. The educational program designs are worked out meticulously in line with best in class universities with special focus on:

- Flexible Choice Based Credit System
- OBE - Outcome Based Education System
- Experiential Learning
- Project Based Learning

- Case Based Learning
- Training need analysis based on Performance Appraisal System
- Active Learning tools for effective delivery
- Mentoring / Proctorship
- On line learning /Self learning platforms
- Flipped Classroom concept
- Effective Student Feedback Mechanism

VISION

Internationally recognized university of excellence in creating and disseminating knowledge through value-based quality education leading to betterment of mankind.

MISSION

- To prepare students for life-long learning and leadership in a global academic culture
- To create intellectual manpower relevant to the industry and society at large
- To collaborate with institutions of international repute for academic excellence
- To promote research and development through conducive environment
- To encourage entrepreneurship and skill development programs

CORE VALUES

- Integrity
- Transparency
- Accountability
- Equality
- Empathy
- Stewardship

QUALITY POLICY

Sanjay Ghodawat University is committed to establish high standards in value-based quality education to enhance and nurture young minds to excel in their chosen profession and develop into socially responsible citizens through resourceful collaboration, innovation and research

CHOICE BASED CREDIT SYSTEM (CBCS)

The credit based semester system provides flexibility in designing curriculum and assigning credits based on the course content and hours of teaching. The choice based credit system provides a 'cafeteria' type approach in which the students can take courses

of their choice, learn at their own pace, undergo additional courses and acquire more than the required credits, and adopt an interdisciplinary approach to learning.
University Grants Commission has come up with the Choice Based Credit System (CBCS) programme in which the students have a choice to choose from the prescribed courses, which are referred as core, elective or minor or soft skill courses and they can learn at their own pace and the entire assessment is graded-based on a credit system. The basic idea is to look into the needs of the students so as to keep up-to-date with development of higher education in India and abroad. CBCS aims to redefine the curriculum keeping pace with the liberalization and globalization in education. CBCS allows students an easy mode of mobility to various educational institutions spread across the world along with the facility of transfer of credits earned by students. Where the students can choose the prescribed courses, as the core, and elective or soft skill courses, from a range of options, rather than to simply consume what the curriculum offers. They can learn at their own pace and the assessments are graded based on a credit system. It provides an opportunity for students to have a choice of courses or subjects within a programmed resembling a buffet, against the mostly fixed set of subjects now being offered (except for the limited choice of electives in professional degrees and postgraduate programmers) with the flexibility to complete the programmed by earning the required number of credits at a pace decided by the students.

The UGC has always initiated measures to bring efficiency and excellence in the Higher Education System of India. The basic motive is to expand academic quality in all aspects, right from the curriculum to the learning-teaching process to examination and evaluation systems. However, so far multiple methods are followed by different universities across the country towards examination, evaluation and grading system. Considering this diversity, the implementation of the choice based credit system seems to be a good system in assessing the overall performance of a student in a universal way of a single grading system.

OUTCOME BASED EDUCATION (OBE) MODEL

Sanjay Ghodawat University (SGU) has implemented OBE model of education, which is a learner centered approach. SGU has witnessed a sea change in the entire academic systems with implementation of all three components of OBE – Design, Delivery and Assessment. The SGU model of autonomy focuses on experiential learning which believes in learning by doing. This is achieved through hands on experience, industrial assignments, mini projects and live problem solving and collaboration with industries.
SGU is set in to dynamics of transformation and witnessing a shift in focus from teaching to learning and entire academic system of SGU is designed to provide multiple learning

opportunities for students to acquire and demonstrate the Knowledge, Skills and Attitudes (KSA) for rewarding career.

The Vision and Mission of the Management, contribution from eminent BOG members and knowledgeable members of Academic Council and Board of Studies, the motivation and drive of the Director, the relentless efforts of the fellow Deans and Head of Departments and all teaching and non-teaching staff along with commitment to learning of students made it possible to successfully transform the institute and stand out to carve a niche for itself as an Institute of repute.

OBE is an approach of curriculum design and teaching that focuses on what students should be able to do (attained) at the end of course/ program. Outcome based education (OBE) is student-centered instruction model that focuses on measuring student performance through outcomes. Outcomes include knowledge, skills and attitudes (KSA). Its focus remains on evaluation of outcomes of the program by stating the knowledge, skill and behavior a graduate is expected to attain upon completion of a program and after 4 – 5 years of graduation. In the OBE model, the required knowledge and skill sets for a particular degree is predetermined and the students are evaluated for all the required parameters (Outcomes) during the course of the program.

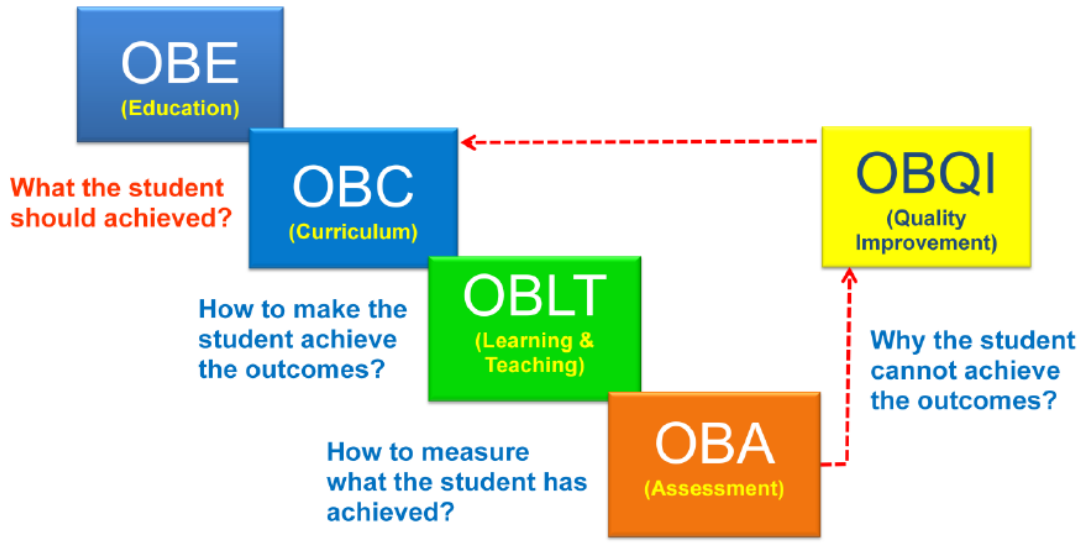
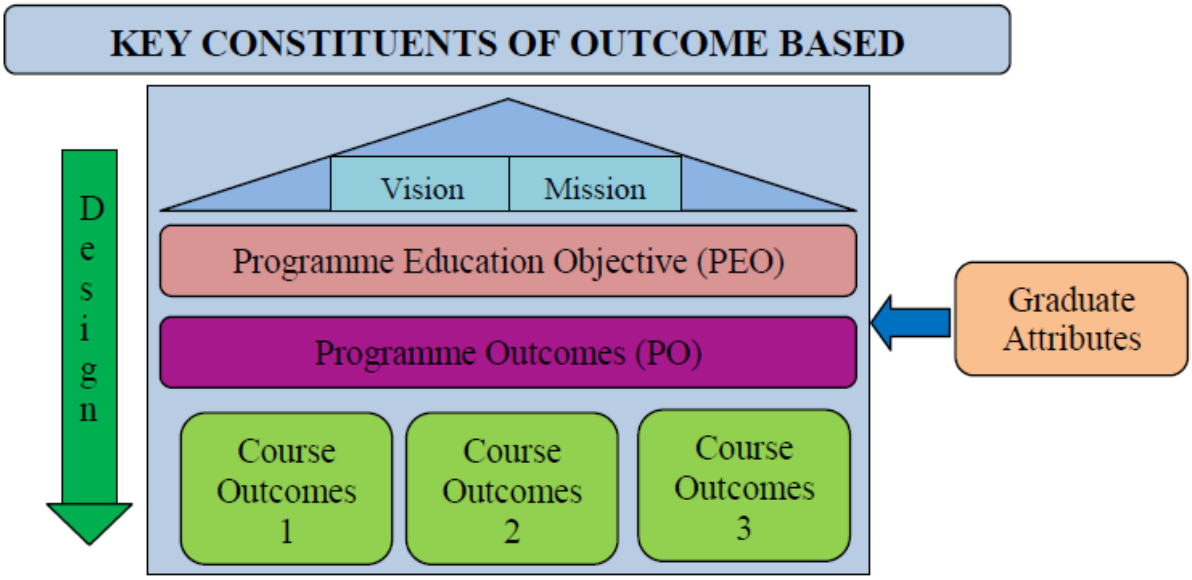


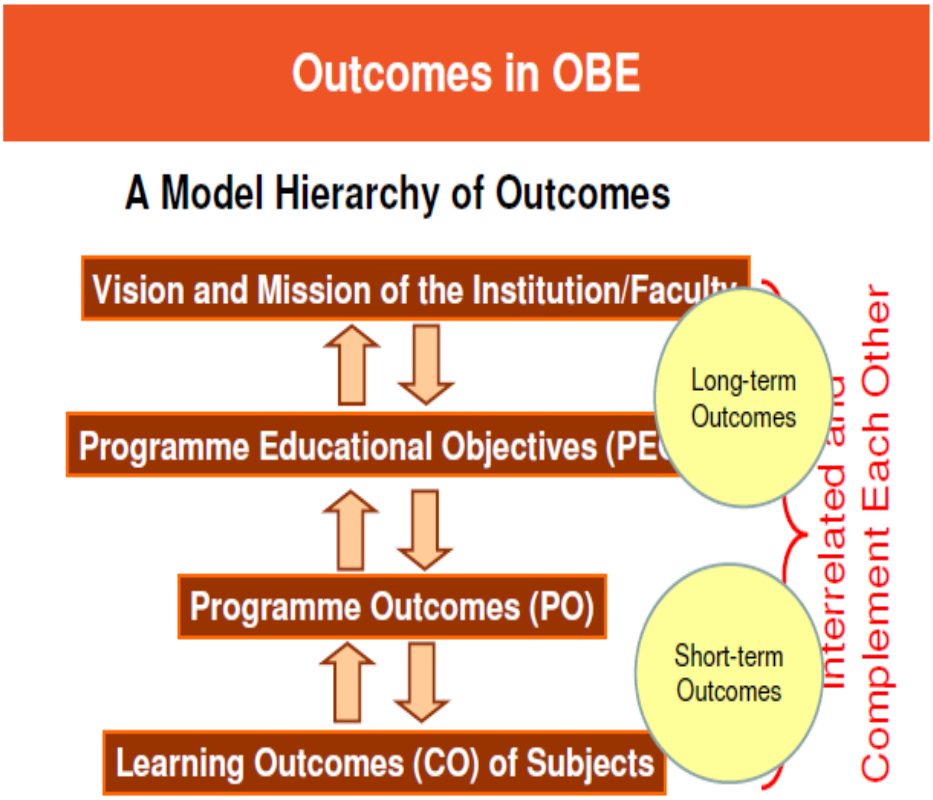
Figure 1: OBE flows and desciption



The OBE model measures the progress of the graduate in three parameters, which are

- Program Educational Objectives (PEO)
- Program Outcomes (PO)
- Course Outcomes (CO)

Program Educational Objectives (PEO) is broad statements that describe the career and professional accomplishments that the program is preparing the graduates to achieve. PEO's are measured 4-5 years after graduation. Program outcomes are narrower statements that describe what students are expected to know and be able to do by the time of graduation. They must reflect the Graduate attributes. Course outcomes are the measurable parameters which evaluates each students performance for each course that the student undertakes in every semester. The various assessment tools for measuring Course Outcomes include Tests and End Semester Examinations, Tutorials, Assignments, Project work, Labs, Presentations, Employer/ Alumni Feedback etc. These course outcomes are mapped to Graduate attributes and Program outcomes based on relevance. This evaluation pattern helps Institutions to measure the Program Outcome. The Program Educational Objective is measure through Employer satisfaction survey (Yearly), Alumni survey (Yearly), Placement records and higher education records.



Special Features of OBE

- OBE is an educational process that focuses on what students **can do** or the **qualities** they should develop after they are taught.
- OBE involves the restructuring of curriculum, assessment and reporting practices in education to reflect the achievement of high order learning and mastery rather than accumulation of course credits.
- Both structures and curricula are designed to achieve those **capabilities** or **qualities**. Discourages traditional education approaches based on direct instruction of facts and standard methods.
- It requires that the students demonstrate that they have learnt the required skills and content.

Sanjay Ghodawat University Kolhapur

(Established as a State University under Government of Maharashtra Act No XL dated 3rd May 2017)

Academic and Examination Rules and Regulations

Approved in the second Academic Council Meeting held on 27th May, 2019 and to be implemented from academic year 2019-20. [Version R1]

Sanjay Ghodawat University Kolhapur

Kolhapur - Sangli Highway, A/p Atigre - 416 118,
Tal. - Hatkanangale, Dist. Kolhapur,
Maharashtra, India

(Implemented from Academic year 2019-20)

Academic and Examination Rules and Regulations

1.0 Preamble

The Sanjay Ghodawat University (SGU) stands as a beacon of light to guide the younger generation of the day on the right path to fulfillment in career and life. Outcome Based Education (OBE) model is adopted to enhance the effectiveness of teaching learning process and Credit Based semester system is implemented.

The focus of the University is its research based curriculum and academically oriented teaching staff. The world class ambience and infrastructure helps the students to easily accommodate themselves in an environment that is conducive to the teaching- learning process. Hands on experience, challenge based case studies, maximum participation of students in the classroom, use of modern digital technology, smart classrooms, solution oriented thinking promotion, stress on research and innovation, international tie ups, choice based credit system for flexibility in choosing areas of interest etc. are some of the features of the University.

Vision of SGU is internationally recognized university of excellence in creating and disseminating knowledge through value-based quality education leading to betterment of mankind. To achieve the vision SGU will develop state-of-the-art infrastructure that promotes conducive ambience promoting innovation and research. Create intellectual manpower relevant to the industry and society at large. Foster mutually beneficial partnership with alumni, industry and academia. Inculcate ethics and values to develop socially responsible citizens and promote entrepreneurship.

SGU is offering various programs through schools such as School of Technology, School of Commerce and Management, School of Sciences and School of Arts.

SGU has implemented the outcome based Education (OBE) system and Credit based Evaluation System in all the schools.

The rules and regulations mentioned in this document are applicable to all the Under Graduate (UG) and Post Graduate programs offered by the Sanjay Ghodawat University from the academic year 2018-19. The rules and regulations stated here under are subjected to revisions / refinements, updates and modifications and amendments by academic council (AC) from time to time and applicable to all batches including those already undergoing programs at different year and are binding on all stakeholders including students, faculty, parents and University authorities.

The academic programs of the University shall be governed by rules and regulations approved by the academic council from time to time. Academic council is the supreme and statutory academic body that governs all academic matters of the university and the decisions of the academic council are final and binding in the matters related to academics.

2.0 Definition of Terms

1. University: University means Sanjay Ghodawat University, Kolhapur
2. Academic Year: The period of the year during which students attend university for all academic activities, usually it starts from first of July and ends on 30th of June next year.
3. **Semester:** Academic Year is divided in to 2 parts called Semester, Odd Semester which starts from July and Even Semester which starts from January.
4. **Duration of Semester**: Total duration of semester is usually 20weeks per semester including instructions, examination and evaluation. Total instructional days are 90 per semester.
5. **Course:** It is a Subject that is in a semester. The course may consist of Theory/Practical/Project/Seminar during semester. Usually taught by instructor in a class. e.g. Physics, Chemistry, Engineering Mechanics, Workshop etc.
6. **Program:** Collection of Courses is called Program. B Tech in Mechanical Engineering,
7. M Tech in Civil Engineering, Bachelor of Business Administration. Bachelor of Science etc.
8. **Department:** Department is a unit of the school which offers one or more programs.
9. **Contact Hours:** Time of students in class/laboratory with instructor. Usually in the range of 26-30 Hrs./Week. For the purpose of uniformity one contact hour is measured as 60 minutes
10. **Academic Council (AC):** Means apex academic body governing the academic programs responsible for framing policy, rules and regulations.
11. **Board of Examination (BOE):** Central body responsible for framing policy, rules and regulations for Examination.
12. **Board of Studies (BOS):** Departmental academic body to govern the academics of programs (BOS) offered by department.

3.0 Curriculum:

3.1. Curriculum:

Every program has a prescribed structure which, in general, is known as Curriculum. It prescribes courses to be studied in each semester. The booklet containing courses structure along with detail syllabus for each course of each program is updated periodically and made available on the website.

3.2. Semesters:

SGU implements a credit based semester system. The academic year is divided into two regular semesters. The semesters that begin in July are known as Odd semester and the semester that begin in January are known as even semester. Total duration of each semester is generally of 20 weeks including the period of examination, evaluation and grade declaration.

3.3. Course Credit System/Structure:

In general, a certain quantum of work measured in terms of credits is laid down as the requirement for a particular program. Calculation of number of credits

for a course in any semester is as per Table 3.1

Table 3.1: Calculation of number of credits for a course

Sr. No.	Course	Credits
1	Lecture of 1 hour/week	**1**
2	Tutorial of 1 hour/week	**1**
3	Practical / Laboratory / Drawing/mini-project of two hours/ week	**1**
4	Seminar (1 hour per week)	**1**

There are mainly two types of courses- viz. Theory courses and Laboratory courses. Generally a theory course consists of Lecture hours (L) and Tutorial hours (T). Tutorial hours may not be assigned to a particular theory course if it has a separate laboratory course. Laboratory course consists of practical hours (P) for which a student works in a Laboratory/Drawing Hall/Workshop. The other courses required to be taken by a student include seminar, mini project, and project at various levels of the program.

A student shall earn credits for a particular course by fulfilling the minimum academic requirements for attendance and evaluation. No credits shall be awarded if a student satisfies the minimum attendance requirements but fails to meet minimum evaluation requirements.

The total number of credits required for completing a program shall be mentioned in the course structure. The total number of credits in a semester which a student registers shall generally be 20--25. The maximum number of credits per semester shall not exceed 30.

3.4 Audit Course:

3.4.1 A student may have to register for an audit course in a semester which could be institute requirement or department requirement.

3.4.2 An audit course may include either a) a regular course required to be done as per structure or required as pre-requisite of any higher level course or b) the programmes like practical training, industry visits, societal activities etc.

3.4.3 Audit course shall not carry any credits but shall be reflected in Grade Card as "PP"/"NP" depending upon the satisfactory performance in the semester evaluation as per the course curriculum structure.

4.0 Course Registration:

4.1 Every student must register for the courses that he/she wants to study for earning credits at the beginning of each semester on the prescribed dates

Announced from time to time and shall be mandatory for every student till he/she completes the program. Only after registration his/her name shall appear in the roll list of each of such courses.

4.2 Students shall be required to fill up a Course Registration Form which shall be made available to them by the Student section of Administration office after payment of required fees.

4.3 Registration, according to rules, should be carried out as per the schedule given in academic calendar. Late registration may be permitted only for valid reasons and on payment of late registration fees. In any case, registration must be completed before the prescribed last date for registration, failing which his/her studentship shall be liable to be cancelled. Students having dues outstanding towards the institute or hostel shall be permitted to register only after clearing such dues.

4.4 In-absentia registration may be allowed only in rare cases at the discretion of the Dean Academics and with prior permission.

4.5 For registration in an odd semester, the student must have earned all the credits of the pre-previous year and at least 75% credits of the previous year. For example, for registration of the 5^{th} semester courses (i.e. 3^{rd} year of program), a student must have earned all the credits of the first year and 75% credits of the second year. Similarly, for registration of the 7^{th} semester courses (i.e. 4^{th} year of program), a student must have earned all the credits of the second year and 75% credits of the third year. However, if 75% calculation turns out to be a mixed number (integer + fraction) then only the integer part of that number shall be considered for taking decision related with this clause.

4.6 A student registered in odd semester shall be eligible to register for the courses offered in the even semester of that year irrespective of his/her SGPI or the number of credits earned by him/her in that odd semester.

5 .0 Lateral Entry for B Tech Programs

Post diploma students in engineering and B.Sc. Graduates can have lateral entry at third semester of the program. Such admissions are governed by the rules of regulatory bodies like AICTE New Delhi and Directorate of Technical Education Maharashtra state and Sanjay Ghodawat University for Admission criteria and shall undergo all academic requirements as specified by the Academic council.

For such students there shall not be First Year Performance Index (FYPI). Semester Performance Index (SGPI) and Cumulative Performance Index (CGPI) shall be calculated from the third semester onwards taking into consideration the courses undergone by them at Sanjay Ghodawat University Kolhapur.
Registration of the students not covered by the cases mentioned above shall be decided by the Academic Council. Such students shall undergo the academic program as specified by the Academic Council. Such odd entry students shall not be eligible for any medals or awards instituted by the institute.

6.0 Change of Program:

This is applicable to B Tech Program only. Students shall be eligible to apply for Change of Program after completing the first two semesters. The following rules/ guidelines shall be used for considering their applications for change:

6.1 The change of program shall be permitted strictly on merit basis subject to the rules of admissions prevailing at the time of such change.

6.2 Students without fail grades and/or backlogs shall be eligible to apply for change of program and can give their choices in the order of preference.

6.3 The request for change of program by a student from program A to program B shall be considered if number of students of program B does not exceed the sanctioned capacity of program B and also the minimum strength required to run the program as decided by Academic Council.

6.4 All such transfers can be effected only once at the beginning of the second academic year of the 4-year UG program. No application for change of program during subsequent academic years shall be entertained.

7.0 Facilitation to Students:

7.1 Faculty Advisor:

On joining the institute, a student or a group of students shall be assigned to a faculty advisor who shall be mentor for a student throughout his/her tenure in the institute. A student shall be expected to consult the faculty advisor on any matter relating to his/her academic performance and the courses he/she may take in various semesters / summer term. A faculty advisor shall be the person to whom the parents/guardians should contact for performance related issues of their ward. The role of a faculty advisor is as outlined below:
The role of the Faculty Adviser is outlined below:

a. Guide the students about the rules and regulations governing the courses of study for a particular degree.
b. Advise the students for registering courses as per curriculum given. For this purpose, the Faculty Adviser has to discuss with the student his/her academic performance during the previous semester and then decide the number and nature of the courses for which s/he can register during the semester as per the curriculum.
c. Approve the registration of the students.
d. Advice students to overload/ drop one or more courses/activities based on her/his academic performance as per the prescribed rules.
e. At the end of the first semester/year, the Faculty Adviser may even advise a reduced load program for a poorly performing student.

f. Pay special attention to weak students and carefully monitor performance of students recommended for slow track option.
g. Advice students for Course Adjustment / Dropping of courses during the Semester within the stipulated time frame given in the Academic calendar.
h. Advice students seeking semester drop either during the ongoing semester or before the commencement of the semester. FA has to ensure strict compliance of rules and regulations laid down for this purpose. Recommend the cases to the appropriate authorities for consideration.
i. Make revised plan of study for weak/bright students based on their semester wise performance.
j. Suggest modalities for course/credit requirements for the students recommended for exchange program.
k. Guidance and liaison with parents of students for their performance.
l. To ensure that students are not permitted to re-register for courses, which they have already passed.
m. Inform students that any academic activity (course / Lab. / seminar / project / noncredit requirement etc.) undergone without proper registration will not be counted towards the requirements of his/her degree.
n. Strictly warn students that if she/he fails to register during any semester without prior approval, his/her studentship is liable to be cancelled.
o. Keep the students updated about the Academic Administration of the University.

7 .2. Helping Weaker Students:

A student with backlog/s should continuously seek help from his/her faculty advisor, Head of the Department and the Dean of respective schools. Additionally, he/she must also be in constant touch with his/her parents/local guardians for keeping them informed about academic performance. The university also shall communicate to the parents/guardians of such student at-least once during each semester regarding his/her performance in in-in various tests and examination and also about his/her attendance. It shall be expected that the parents/guardians too keep constant touch with the concerned faculty advisor or Head of the Department, and if necessary - the Dean of the respective school.

8.0 Discipline and Conduct:

8.1 Every student shall be required to observe discipline and decorous behavior both inside and outside the campus and not to indulge in any activity, which shall tend to bring down the prestige of the university.

8.2 Any act of indiscipline of a student reported to the Dean, Student Development, shall be discussed in a Disciplinary Action Committee of the institute. The Committee shall enquire into the charges and recommend suitable punishment if the charges are substantiated.

8.3 If a student while studying in the university is found indulging in anti-national activities contrary to the provisions of acts and laws enforced by Government he/she shall be liable to be expelled from the institute without any notice.

8.4 If a student is involved in any kind of ragging, the student shall be liable for strict action as per provisions in the Maharashtra anti-ragging act.

8.5 If any statement/information supplied by the student in connection with his/her admission is found to be false/ incorrect at any time, his/ her admission shall be cancelled and he/she shall be expelled from the university and fees paid shall be forfeited.

8.6 If a student is found guilty of malpractice in examinations then he/she shall be punished as per the recommendations of the Grievance Redressed Committee (CRC) constituted by Board of Examinations.

8.7 Every admitted student shall be issued photo identification (ID) card which must be retained by the student while he/she is registered at Sanjay Ghodawat University Kolhapur. The student must have valid ID card with him/her while in the University Campus.

8.8 Any student who alters or intentionally mutilates an ID card or who uses the ID card of another student or allows his/her ID card to be used by another, student shall be subjected to disciplinary action.

8.9 The valid ID card must be presented for identification purpose as and when demanded by authorities. Any student refusing to provide an ID card shall be subjected to disciplinary action.

8.10 Students should switch off the Mobiles during the Instructional hours and in the academic areas of university Building, Library, Reading room etc. Strict action will be taken if students do not adhere to this.

8.11 during the conduct of any Tests and Examination students must not bring their mobiles. A student in possession of the mobile whether in use or switched off condition will face disciplinary action and will be debarred from appearing for the Test / Examination.

9.0 Academic Calendar

The academic activities of the institute are regulated by Academic Calendar and are made available to the students/ faculty members and all other concerned in electronic form or hard copy. It shall be mandatory for students / faculty to strictly adhere to the academic calendar for completion of academic activities

10.0 Attendance:

10.1 Regular 100% attendance is expected from all students for every registered course in lectures, tutorial, laboratory, projects, mini-projects and other courses mentioned in

program curriculum. Hence, attendance is compulsory and shall be monitored during the semester rigorously. Students shall be informed at the end of every month if they are failing short of attendance requirements.

10.2 A Maximum of 25% absence for the attendance may be permitted only on valid grounds such as illness, death in family of blood relations (Father, Mother, Sister, and Brother) and any other emergency reason which is beyond the control of the student and shall be approved by the authorities in respective departments.

10.3 If a student fails to put up 75% attendance individually in each course, the student will be put under X grade category and student will be debarred form attending the End Semester Examination (ESE) and Re-Exam for that semester in that course. However, student has an option to re-register for the course whenever it is offered next time or he can appear for 100% examination for which he will be awarded two grade penalties. Student's FET, CAT1 and CAT2 marks are treated as null and void.

10.4 The maximum number of days of absence for students participating in Co-curricular activities /Sports/ Cultural events during a semester shall not exceed 10. Any waiver in this context shall be on the approval of the Academic council only after the recommendation by Dean Academics of the university, The HOD and Dean of the respective school shall report and recommend to Academic council the cases of students not having 75% attendance as per the records of course instructor. After rigorously analyzing these cases AC may take a decision to debar such student from End-Semester Examination (ESE) for that course. Such a student shall re-register for that course as and when it is offered next. ISE and MSE evaluations of such a student for this course during regular semester shall be treated as null & void.

10.5 A student remaining absent during ESE of a course either on medical ground (Accident and/or hospitalization of a student) or any other emergency circumstances (death of immediate close relative i.e. father, mother, brother and sister) or due to representing University at university/state level in sports/co-curricular activities shall be treated as per the rules of Sec 12.6.2 and 11.1.2

The critical cases of absenteeism which are not covered by any of the above clauses shall be reported by concerned Head of Department to Academic dean and all such cases the decision of Academic council is final.

11.0 Modes of Assessment:

11.1 Assessment of Theory Courses:

11.1.1 A student shall be evaluated for his/her academic performance in a theory course through Faculty Evaluation Theory (FET), Continuous Assessment Tests (CAT1 and CAT2) and End Semester Examination (ESE).

11.1.2 The relative weightage for the theory courses having ESE shall be generally as shown in the Table 11.1.2

Table 11.1.2: Weightage for the theory courses in %

FET	CAT1	CAT2	ESE
20	15	15	50

The details of the weightage of each course shall be listed in the structures of each program.

11.1.3 FET shall be based on student's performance in assignments, quizzes, seminars, Course projects and field assignments, term papers, etc. The mode of FET shall be decided and announced by the Course Instructor at the beginning of the course.

11.1.4 CAT1 shall generally be of one hour duration for each course and shall be held as per the schedule declared in the Academic calendar for that Semester. The test will be based on first two units of the course.

11.1.5 CAT2 shall generally be of one hour duration for each course and shall be held as per the schedule declared in the Academic calendar for that semester based on unit 3 and unit 4 of the syllabus.

11.1.6 ESE is of three hours comprehensive examination having the weightage of 60% for unit 5 and 6 and 40% to unit 1 to unit 4. It is of 100 marks

11.1.6 All examinations and evaluations shall be compulsory. Credits for a course shall be awarded only if a student satisfies evaluation criteria and acquires the necessary minimum grade.

11.1.7 There shall be no re-examination for CAT1 and CAT2 of the courses having all the three components of evaluation viz. FET, CAT1 CAT2 and ESE. However, a student remaining absent for CAT1 and CAT2 for representing the institute in state level or university level sports/co-curricular activities (on prior recommendation and approval from) or on valid grounds such as illness, death in family or other emergency

reason which is beyond control of a student (on approval by the head of department and dean of respective school shall be considered for Make- up examinations.

11.1.8 A student remaining absent for ESE of a course either due to medical reason (Accident and/or hospitalization of a student) or other emergency circumstances (death of immediate close relative i.e. father, mother, brother and sister) or due to representing college at university/state level in sports/co-curricular activities shall be awarded with grade "I". Such a student shall be allowed to appear for make-up examination scheduled along with re-examinations of other courses. The student shall apply to COE with proper documentary evidence to appear for make-up examination. After make-up examination, a student shall be entitled to an appropriate grade as per Table I of Sec. 10.1.2 based on his/her performance during the regular semester and in make-up examination.

11.2 Assessment of Laboratory Courses:

11.2.1 The assessment of laboratory course shall be continuous and based on turn-by-turn supervision of the student's work and the quality of his/her work as prescribed through laboratory journals and his/her performance in viva-voce examinations uniformly distributed throughout the semester. Where ESE for the laboratory course is specified ESE shall be based on performing an experiment followed by an oral examination. The relative weightage for FEP and ESE for assessment of laboratory courses shall be 50% each for FEP and ESE and a minimum performance of 40% in both ISE and ESE separately shall be required to get the passing grade.

11.2.2 ESE for laboratory course shall normally be held before the ESE for theory courses and shall be conducted by a panel of examiners appointed by COE from the panel of experts approved by BOS. This activity shall be coordinated by Department Examination Coordinator (DEC) in consultation with HOD of the respective department.

11.2.3 Student failed in ESE of a laboratory course in a regular semester shall be eligible to appear for 100% examination conducted along with ESEs of laboratory courses of the subsequent semester. Such examination shall be fairly comprehensive (generally of 3 hours similar to POE i.e. Practical-Oral-Examinations) to properly judge his/her practical skill and theoretical knowledge for that laboratory course. He/She shall suffer one grade penalty.

12.0 The Grading System:

Absolute Grading System (AGS) is adopted based on absolute numerical marks obtained by the student during all stages of evaluation for a course.

12.1. Award of Grade (Regular Semester):

12.1.1 For every course registered by a student in a semester, he/she shall be assigned a grade based on his/her combined performance in all components of evaluation scheme of a course as per the structure. The grade indicates an assessment of the student's performance and shall be associated with equivalent number called a grade point.

12.1.2 The academic performance of a student shall be graded on a ten point scale. The Absolute Grading System is followed. Letter grades, the guidelines for conversion of marks to letter grades and their equivalent grade points are as given in Table 12.1.2

Table 12.1.2: Grade Table for Regular Semester

Marks Obtained	Grade Letter GL	Grade Point	Performance Description
90-100	**O**	**10**	Outstanding
80-89	**A+**	**09**	Excellent
70-79	**A**	**08**	Very Good
60-69	**B+**	**07**	Good
50-59	**B**	**06**	Above Average
45-49	**C**	**05**	Average
40-44	**P**	**04**	Pass
00-39	**F**	**00**	Fail
-	**Ab**	**00**	Absent
-	**X**	**00**	Detained (Failed)
-	**Satisfactory**	**-**	Pass in Non Credit Courses
-	**Un Satisfactory**	**-**	Failed in Non Credit Courses

12.1.3 A student shall pass the course if he/she gets any grade in the range "O" to "P".

12.1.4 “FF" grade shall be awarded to a student in a course if he/she gets less than 40% marks jointly in the FET, CAT1, and CAT2 & ESE for a theory course and in PET & ESE for a laboratory course. A course shall then be eligible to apply for re-examination. A student failed in laboratory course shall be eligible to apply only for 100% examination conducted with the laboratory examinations of the subsequent semester. In both cases, a student has to suffer one grade penalty.

13.0 Assignment of X Grade

Grade "X" in a regular course shall be given to a student if he/she falls in any of the following categories.

13.1 A student does not maintain the minimum 75% attendance in any of the theory or laboratory courses.

13.2 A student has not completed most of the Evaluations like FET, CAT1 and CAT2 due to non-medical reasons (for example when a student has missed all or most of the components of internal evaluation conducted by the instructor in that semester).

13.3 Th**e** performance of a student is less than 40% in FET, CAT1 and CAT2 Combined.

13.4 A student is guilty of any academic malpractice during semester (Such cases shall be dealt by Grievance Redressed and Discipline Committee).

In above four cases grade "X" shall be declared one week before ESE and intimated to the Academic Office and COE immediately thereafter. Such a student shall not be permitted to take the ESE of that course.

13.5 Grade "X" may be given to a student if
13.5.1 A student eligible for ESE remains absent for ESE of a course with no written intimation to Exam Cell within four days after the respective ESE is over.

13.5.2 A student is guilty of any academic malpractice during examination. (Such cases shall be dealt by Grievance Redressal Committee).

In 13.5.2 grade "X" in that course shall be declared after Grievance Redressed Committee confirms the academic malpractice.

In above two cases when a student gets "X" grade in a course, then this shall be treated as "FF" for the purpose of calculation of Semester Performance Index (SGPI) and First Year Performance Index (FYPI) or Cumulative Performance Index (CGPI).

13.6 Following rules apply to the student who has obtained grade "X" in a regular semester:

13.6.1 A student obtaining grade "X" in a course in a regular semester or during examination shall be not be allowed to appear for End semester examination and also Re ESE conducted before the beginning of the next semester. His/her FET, CAT1 and CAT2 evaluations for all courses shall be treated as null and void. He/She needs to re-register for courses of that semester in the next academic year whenever they are offered and undergo all evaluations along with fresh regular students for which he will get one grade penalty.

13.6.2 Grade "I" shall be declared in a theory/laboratory course if a student has satisfactory performance FET, CAT1, CAT2 and has fulfilled the 75% attendance requirement, but has not appeared for ESE due to genuine reasons. Such students shall be eligible for the make-up examination of ESE only on medical grounds/valid reasons and on production of authentic medical certificate or other supporting document/s (as required by the University) to the COE within ten days after the respective examination is over. The application form with requisite amount of fees must be submitted to the Exam Cell before the last date of filling such application forms for make-up examinations. These examinations shall be based on 100% syllabus and shall be scheduled before the commencement of the subsequent semester for theory courses and along with ESEs of laboratory courses of the subsequent semester. A student with "I" grade when appears for the make-up examination shall be eligible to obtain a regular performance grade ("O" to "F") as per Table 12.1.2 depending on his/her overall performance in FET, CAT1, CAT2 and make-up examination. If a student fails to appear for make-up examination too, a grade "XX" shall be awarded to him/her. Thus "I" is only a temporary grade and shall be replaced by a valid grade only after make-up examination.

13.6.3 There shall be a few audit courses as per the policies of the institute or as decided by DPC of respective program. The grade "PP" (Passed)/ "NP" (Not Passed) shall be awarded for such courses depending upon the performance of a student evaluated by the faculty in-charge. No grade points shall be associated with these grades and performance in these courses shall be not taken into account in the calculation of the performance indices (SGPI, CGPI). However, the award of the degree shall be subject to obtaining a "PP" grade in all such courses.

14.0 Award of Grades for Re-Examination:

14.1 A student who has obtained grade "F" in regular semester shall be eligible to appear for re-examination conducted before the commencement of the next regular

semester. In such cases FET, CAT1 and CAT2 marks are carried forward and a student has to suffer one grade penalty

14.2 A student shall apply for re-examination before the last date of such application and shall appear for re-examination.

14.3 50% weightage similar to ESE shall be given to re-examination and there is one grade penalty.

14.3.1 A student who has obtained "F" grade in ESE of a regular semester and has not availed re-examination option or a student who has obtained "F" grade in both ESE and re-examination shall be eligible to choose one of the two options below to clear his/her backlog:

- Re-registration for the next regular semester course whenever that course is offered.
- Appearing for ESE of the course when conducted,
- Student detained in a regular semester due to either a) by obtaining "X" grade or b) by involvement in academic malpractice or c) by breaking the institute code of conduct and discipline can re-register for the course when offered next

14.4 Following rules apply for these cases:

14.4.1 In first case i.e. Re- registration the earlier performance of a student in all the evaluations of that course shall be treated as null and void. The student has to undergo all the evaluations after re-registration.

14.4.2 Grades for Third and Subsequent attempts:

If A student opts for ESE or Re ESE who previously had obtained grade "F" in a course in two attempts, his/her FET, CAT1 and CAT2 performance of the regular semester shall be considered for evaluation and He/She has to suffer two grade penalty for the third attempt and for 4th and subsequent attempts shall be awarded a grade "P" or "F" or "X" based on his/her performance. However, if a student takes more than three chances (regular examination being the first chance, re-examination being the second chance, to clear a course, then the maximum passing grade that he/she can get shall be only "P". Thus a student has to suffer a grade penalty by accepting a lower grade than that obtained in the regular examination, re-examination, or examination for a re-registered course.

15.0 CALCULATION OF PERFORMANCE INDICES:

15.1. Semester Grade Point Average (SGPA)

The performance of a student in a one specific semester is indicated by SGPA. SGPA is a weighted average of the grade points obtained in all courses registered by the students during the semester. SGPA can be calculated by following equation.

$$SGPA = S_i = \frac{\sum_{i=1}^{n} C_i P_i}{\sum_{i=1}^{n} C_i}$$

Where, i = 1,2,3…….n are number of courses during semesters. C = No of credits associated with that course and P = Grade point earned in that course. SGPA will be rounded off to two decimal places.

15.2 Cumulative Grade Point Average (CGPA)

The total cumulative performance of a student at the end of specific semester is indicated by CGPA. An up-to-date assessment of the overall performance of a student for the courses from the first semester onwards till completion of the program shall be obtained by calculating Cumulative Grade Point Average (CGPA). CGPA is a weighted average of the SGPA obtained in all semesters by the students during the semesters. CGPA can be calculated by following equation.

$$CGPA = \frac{\sum_{j=1}^{n} C_j S_j}{\sum_{j=1}^{n} C_j}$$

Where, j = 1,2,3…….n are number of semester during program. C = Total No of credits in the semester for which CGPA is to be calculated.

CGPA will be rounded off to two decimal places.

Conversion of CGPA to percentage marks for CGPA ≥ 4.5 can be obtained using equations. Percentage marks = (CGPA x 10) – 7.5.

15.3 For the students acquiring "I" grade (which is only a temporary grade) in any of the courses, SGPA, CGPA shall be calculated only after make-up examination.

15.4. First Year Performance Index (FYPI): (Applicable For B. Tech Programs Only)

15.4.1 For a student registered in Sanjay Ghodawat University Kolhapur right from the First semester, First-Year-Performance-Index (FYPI) shall be calculated as weighted average of the grade points obtained in all the courses registered by him/her in semesters I and II only.

$$\text{FYPI} = \frac{\sum_{i} C_i g_i}{\sum_{i} C_i}$$

Where summation is for all the courses registered by a student in first two semesters. FYPI shall be calculated when SPI for the second semester is calculated. FYPI shall be rounded off to two decimal places.

15.4.2 FYPI shall reflect all the courses undergone by a student in the first year including the courses in which he/she has failed. FYPI may get modified in the subsequent semesters whenever a student clears his/her first year backlog courses.

15.4.3 If a student has been awarded "I" grade in the regular semester course of the first year then, FYPI shall be calculated after the make-up examination on the basis of the grade obtained by that student in a make-up examination.

15.4.4 If a student has obtained grade "F" or "X" at any time in any of the courses registered by him, then zero grade points corresponding to these grades shall be taken into consideration for calculation of FYPI.

16.0 Maximum Duration for Completing the Program

Maximum duration for completing any program UG/PG offered by Sanjay Ghodawat University is respective program duration plus two additional years.

Maximum duration for getting the B. Tech degree for students admitted in the first semester of UG program is, program duration plus two additional years (i.e. 12 Semesters and 6 academic years) For lateral entry student academic admitted in the third semester shall be (10 Semester and 5 Years).

The maximum duration of the program includes the period of withdrawal, absence and different kind of leaves permission to student but excludes the period of rustication of the student from the university however genuine case a confidential of valid reason may be referred to academic council for extending this limit by additional criteria.

17.0 NFTE (Not Fit for Technical Education) **(Applicable to B Tech program only)**

It is mandatory for the student to earn all credits of first year specified for semester I & II or eligible for ATKT as per the rules to seek admission to semester III of second year in three years from the date of admission to avoid NFTE. If a student fails to become eligible for admission to Semester III in three year form the date of his admission, he shall be

declared as “Not Fit for Technical Education” leading to discontinuation of his/her registration with the university. Such cases should be put up in the academic council.

18.0 Academic Progress Rules (ATKT Rules):

18.1 A student shall be allowed to register for the courses of the next year's odd semester only if he/she has earned all the credits of the previous year and has earned at least 75% credits of the current year. If 75% calculation turns out to be a mixed number (integer + fraction) then only the integer part of that number shall be considered for deciding the eligibility for ATKT.
At the end of 1st year a student shall be allowed to keep terms (ATKT) to 2nd year of study provided he/she attends course work prescribed for 1st year with prescribed attendance and successfully earned at least 75% of the total credits specified for 1st year program.

For Example: Total credits for B. Tech first year 2017-18, are 45 (Total of Semester I and II). A Student should earn mininum75% of the 45 Credits i.e. 33.15 (Rounded to 33 Credits). A student can go to next higher class with a maximum backlog of 12 credits of semester I & II of the first year. Student, who fails to earn those credits, cannot register for next semester, either it can re-registrar for the course and credits or can use the next opportunity to earn the credits when exams are conducted. **.**

(b) At the end of 2nd year a candidate shall be allowed to keep terms to 3rd year of study provided he/she attends course work prescribed for 2nd year with prescribed attendance, and successfully cleared 1st year program and at least 75% of total credits prescribed for 2nd year program.

(c) At the end of 3rd year a candidate shall be allowed to keep terms to final year of study provided he/she attendants course work prescribed for 3rd year with prescribed attendance, and should have completed 2nd year program and 75% of total credits prescribed for 3rd year program.

All such candidates fulfilling the above criteria shall be declared as FAILED, ATKT.

A student shall be allowed to take admission for odd semester of next academic year only if he/ she have earned all the credits of the previous year and 75% happens to be a decimal, it is rounded to only integer part.

19.0 Semester Grade Report:

19.1 Semester grade report reflects the performance of a student in that semester (SGPI) and also his/her cumulative performance for the first year (FYPI) and also the cumulative performance since the third semester of his/her study (CGPA).

19.2 The semester grade card issued at the end of each semester/ summer term to each student shall contain the following.

- The credits for each course registered for that semester.
- Any audit course/s undertaken by a student in a Semester.
- The letter grade obtained in each course.
- The total number of credits earned by a student for the first year separately.
- The total number of credits earned by a student since the 3rd semester onwards.
- SGPI, FYPI, CGPI.
- A list of backlog courses, if any.
- Remarks regarding eligibility of registration for the next semester.

19.3 Semester grade card shall not indicate class or division or rank however a conversion from grade point index to percentage based on CGPI shall be indicated on the final grade card of the program.

20.0 Award of Degree:

Following rules prevail for the award of degree.

- A student has registered and passed all the prescribed courses under the general institutional and departmental requirements.
- A student has obtained CGPI ≥ 4.75.
- A student has paid all the institute dues and satisfied all the requirements prescribed.
- A student has no case of indiscipline pending against him/her.
- Academic Council shall recommend the award of degree to a student who is declared to be eligible and qualified for above norms.

21.0 Grace Marks

- Maximum total grace marks will be 1 % of the total theory credit courses x 100 subjected
- To maximum 6 marks in that semester.
- Grace marks will be given candidate for change in grades for theory credit courses, i.e. from
- Fail to pass grade only and will be reflected in final ESE marks.
- The grace marks are applicable only for maximum 1/3rd courses (rounded to higher Integer part i.e. if there are 4 theory courses then 4/3 = 1.33 = 2 courses).
- Maximum grace marks will be distributed in maximum courses

- Benefit of grace marks is not applicable for any medal/award.
- Applicable to theory and (Theory + Practical Courses). If is not applicable for Practical courses.
- Scheme for grace marks only can be used when the student will pass in all courses of that semester.

22.0 CGPA Improvement Policy for Award of Degree:

An opportunity shall be given to a student who has earned all the credits required by the respective program with CGPA greater than or equal to 4.00 but less than 4.75 to improve his/her grade by allowing him/her to appear for ESE examinations of maximum two theory courses of seventh semester. Such examinations shall be scheduled along with re-examinations/make-up examinations. However, CGPA shall be limited to 4.75 even though the performance of a student as calculated through modified CGPA becomes greater than 4.75.

Conclusions:

The academic policies regarding conduct of programs in Sanjay Ghodawat University Kolhapur are published in this document. The Academic Council shall reserve the right to modify these policies as and when required from the point of view of achieving academic excellence. In special and abnormal cases (i.e. the cases not covered through above rules) the decision of the (Chairman, Academic Council shall be final and shall be binding on all concerned.

Chairman

Academic Council

Semester III

Course Code	Course Title	L	T	Pr	C	Evaluation Scheme for Theory and Practical			
						Component	Exam	WT %	Pass Min (%)
ECE201 (BS)	Transforms and Vector Calculus	3	1	-	4	Theory (100)	FET	20	40
							CAT I	15	
							CAT II	15	
							ESE	50	40
ECE203 (PC)	Analog Circuit Design	3	-	-	3	Theory (100)	FET	20	40
							CAT I	15	
							CAT II	15	
							ESE	50	40
ECE205 (PC)	Network Analysis	3	-	-	3	Theory (100)	FET	20	40
							CAT I	15	
							CAT II	15	
							ESE	50	40
ECE207 (PC)	Communication Engineering - I	3	-	-	3	Theory (100)	FET	20	40
							CAT I	15	
							CAT II	15	
							ESE	50	40
ECE209 (PC)	Digital Electronics	3	-	-	3	Theory (100)	FET	20	40
							CAT I	15	
							CAT II	15	
							ESE	50	40
ECE211 (PC)	Analog Circuit Design Lab	-	-	2	1	Practical (100)	FEP	50	40
							POE	50	40
ECE213 (PC)	Communication Engineering - I Lab	-	-	2	1	Practical (100)	FEP	50	40
							POE	50	40
ECE215 (PC)	Digital Electronics Lab	-	-	2	1	Practical (100)	FEP	50	40
							POE	50	40
ECE217 (PC)	Advance Programming Techniques- I	1	-	2	2	Practical (100)	FEP	50	40
							POE	50	40
ECE219 (HS)	Environmental Studies	1	-	2	Audit	Practical (100)	FEP	100	40
ECE221 (HS)	Professional Development Skills- I	-	-	2	NC	Practical (100)	FEP	100	40
	Total	**17**	**01**	**12**	**21**	**Total Hrs.: 30, Total Credits: 21**			

L: Lecture, T: Tutorial, Pr: Practical, C: Credits, Th.: Theory, WT: Weight Age PC: Program Core, PE: Program Elective, UC: University Core, UE: University Elective FET: Faculty Evaluation Theory, CAT: Continuous Assessment Test, ESE End Semester Examination, TW : Term Work, POE : Practical Oral Examination.

Semester IV

Course Code	Course Title	L	T	Pr	C	Evaluation Scheme for Theory and Practical			
						Component	**Exam**	**WT %**	**Pass Min (%)**
ECE202 (PC)	Control System	3	1	-	4	Theory (100)	FET	20	40
							CAT I	15	
							CAT II	15	
							ESE	50	40
ECE204 (PC)	Sensors and Instrumentation	3	-	-	3	Theory (100)	FET	20	40
							CAT I	15	
							CAT II	15	
							ESE	50	40
ECE206 (PC)	Communication Engineering - II	3	-	-	3	Theory (100)	FET	20	40
							CAT I	15	
							CAT II	15	
							ESE	50	40
ECE208 (PC)	Microcontrollers	3	-	-	3	Theory (100)	FET	20	40
							CAT I	15	
							CAT II	15	
							ESE	50	40
ECE210 (PC)	Signals and Systems	3	1	-	4	Theory (100)	FET	20	40
							CAT I	15	
							CAT II	15	
							ESE	50	40
ECE212 (PC)	Sensors and Instrumentation Lab	-	-	2	1	Practical (100)	FEP	50	40
							POE	50	40
ECE214 (PC)	Communication Engineering - II Lab	-	-	2	1	Practical (100)	FEP	50	40
							POE	50	40
ECE216 (PC)	Microcontrollers Lab	-	-	2	1	Practical (100)	FEP	50	40
							POE	50	40
ECE218 (PC)	Advance Programming Techniques- II	1	-	2	2	Practical (100)	FEP	50	40
							POE	50	40
ECE220 (PC)	Mini Project		-	2	1	Practical (100)	FEP	100	40
ECE222 (HS)	Professional Development Skills- II	-	-	2	NC	Practical (100)	FEP	100	40
	Total	**16**	**02**	**12**	**23**	**Total Hrs.: 30, Total Credits: 23**			

L: Lecture, T: Tutorial, Pr: Practical, C: Credits, Th. : Theory, WT: Weight Age PC: Program Core, PE: Program Elective, UC: University Core, UE: University Elective FET: Faculty Evaluation Theory, CAT: Continuous Assessment Test, ESE End Semester Examination, TW : Term Work, POE : Practical Oral Examination.

ECE 201: Transforms and Vector Calculus
(Ver 1.0, Basic Science, School of Science)

Lect.	Tut.	Pract.	Credits	Evaluation Scheme				
				Component	Exam	WT %	Min Pass (%)	
3	1	-	4	Theory (100)	FET	20	40	40
					CAT-I	15		
					CAT-II	15		
					ESE	50	40	

Course Outcomes: At the end of this course students will able to

CO1 : **Solve** [3] LDE with constant coefficients**.**

CO2 : **Find** [2] Laplace transforms

CO3 : **Find** [2] Inverse Laplace Transforms.

CO4 : **Represent** [4] periodic function as a Fourier series.

CO5 : **Find**[2] Fourier transform and inverse Fourier transform of given function

CO6: **Find** [2] Divergence, Gradient, Curl of a vector point function.

Syllabus (Theory)

Units	Description	Hours
I	**Linear Differential Equations (LDE):** Linear Differential Equations with constant coefficients Definition, Complementary function and Particular integral (without method of variation of Parameters), Homogeneous Linear differential equations.	8

II	**Laplace Transform:** Definition, Transforms of elementary functions, Properties of Laplace transform. Transforms of derivatives and Integral. Transforms of periodic function.	6
III	**Inverse Laplace Transform:** Standard formulae, Inverse Laplace transforms by using partial fractions and Convolution theorem. Solution of Linear differential equation with constants coefficients by Laplace transforms method.	7
IV	**Fourier Series:** Definition, Euler's Formulae, Dirichlet's Condition. Functions having points of discontinuity Change of interval, Expansion of odd and even periodic functions, Half range series.	6
V	**Fourier Transforms:** Fourier Transforms, Fourier Sine and Cosine Transforms, Complex form of Fourier Integral, Finite Fourier Sine and Cosine Transform.	6
VI	**Vector Differential Calculus:** Differentiation of vectors, Gradient of scalar point function, Directional derivative, Divergence of vector point function, Curl of a vector point function. Irrotational and solenoidal vector field.	6

Tutorial

One hour per week per batch tutorial is to be utilized for problem solving to ensure that students have properly learnt the topics covered in the lectures. This shall include group discussions on

problems other than class and any academic activity to strengthen fundamental concepts of the subject.

List of Tutorials

Tutorial No.	Details
1	Linear Differential Equations with constant coefficients
2	Homogeneous Linear differential equations.
3	Find Laplace Transform of standard functions
4	Find Laplace Transform by using standard formule
5	Find Inverse Laplace Transform
6	Find Fourier series for periodic function of period 2π and $2l$
7	Half range Fourier series.
8	Find Fourier Sine and Cosine Transforms
9	Find Divergence and curlk of vector point function
10	Find Irrotational and solenoidal vector field

Reference Books:

Sr. No.	Title of Book	Author	Publisher/Edition
1	Higher Engineering Mathematics	Dr. B. S. Grewal	Khanna Publishers, Delhi.
2	A text book of Applied Mathematics, Vol.-I,II,III	P. N. Wartikar & J. N. Wartikar	Pune Vidyarthi Griha Prakashan, Pune.

3	Advanced Engineering Mathematics	Erwin Kreyszig	Wiley India Pvt. Ltd.
4	Advanced Engineering Mathematics	H. K. Das	S. Chand Publication
5	Mathematical methods of Science and Engineering	Kanti B. Datta	Cengage Learning
6	Engineering Mathematics	V. Sundaram	Vikas Publication
7	Advance Engineering Mathematics	Merle C. Potter	Oxford University Press

ECE203: Analog Circuit Design

(Ver 1.0, Program Core, School of Technology)

Lect.	Tut.	Pract.	Credits	Evaluation Scheme			
				Component	Exam	WT %	Pass
3	-	-	3	Theory	FET	20	40
					CAT-I	15	
					CAT-II	15	
					ESE	50	

Course Outcomes: At the end of this course students will able to

CO1 **Classify**[2] basic classification and operation of amplifier circuits.
CO2 **Analyze**[4] the characteristics of amplifier circuits for different applications.
CO3 **Design**[6] various amplifier circuits and timers.
CO4 **Solve**[3] numerical on various amplifier and oscillator design**.**
CO5 **Illustrate**[3] the working of Amplifiers, FETs and Timers.

Syllabus

Units	Description	Hours
I	**Voltage Amplifiers**: Single stage RC coupled amplifier(BJT and FET based)-operation and characteristics(frequency response),Design of RC coupled amplifier, two port network, hybrid parameters, -general derivation for Av,Ai,Zi,Zo in terms of h-parameters. Derivation for Av ,Ai ,Zi, Zo for common emitter amplifier, derivation for lower and upper 3dB frequency for sinusoidal signal of RC coupled amplifier,Introduction to Multistage amplifier, Design and numericals expected.	7
II	**Feedback Amplifiers**: Feedback, types of feedback, Block diagram of feedback amplifier, types of negative feedback, advantages of negative feedback, ,Voltage series feedback amplifier circuit, voltage shunt, current series & current shunt amplifiers-derivation for AV,Zi,Ai, Zo, numericals expected.	7
III	**FET Amplifiers**: Biasing of JFET-Gate bias, Self-bias, voltage divider bias , JFET as an amplifier, Common source amplifiers-analysis, Classification of MOSFET, Operation and characteristics of Enhancement type MOSFET and Depletion type	7

	MOSFET-Drain and Mutual characteristics, Difference between JFET and MOSFET, Applications of MOSFET.	
IV	**IC based Voltage regulators**: Types of IC voltage regulators-78xx, 79xx, LM317, LM723-Design of above regulators, pin diagram of regulators.	6
V	**Oscillators**: Definition, positive feedback, classification of oscillators, Barkausen criteria ,RC and LC oscillators ,operation and design of RC phase shift oscillator, wein bridge oscillator, Hartley oscillator, Colipitts oscillator, Pierce crystal oscillators(BJT and FET based), derivation for frequency of oscillation of RC and LC oscillators, derivation for series and parallel resonance of crystal.	7
VI	**Timers:** Block diagram of IC 555 Timer,Pin diagram, Applications-Design of Astable Multivibrator circuit ,design of Monostable multivibrator circuit using timer,PLL block diagram,pin diagram of IC 565 applications,characteristics of PLL.Numericals expected.	7

TEXT BOOKS

1. Electronics devices and circuits,Allen Mottershed,Prentice Hall India.
2. Electronics devices and circuits, David A Bell ,Prentice Hall India.
3. Electronics devices and circuits, A Salivahan ,Prentice Hall India.

REFERENCE BOOKS

1. Electronic devices and circuit theory, Robert Boylsted,Louis Nashelky,Pearson Education
2. Electronics devices and circuits-II, A.P.Godse and U.A.Bakshi,Technical Publications.
3. A text book of Applied Electronics by R.S.Sedha,S.Chand publications.

ECE205: Network Analysis

(Ver 1.0, Program Core, School of Technology)

Lect.	Tut.	Pract.	Credits	Evaluation Scheme			
				Component	Exam	WT %	Pass
3		-	3	Theory (100)	FET	20	40
					CAT-I	15	
					CAT-II	15	
					ESE	50	

Course Outcomes: At the end of this course students will able to

CO1 **Demonstrate**[2] basics of circuit's analysis and theorem.
CO2 **Apply**[3] basics of theory for simplification of circuit analysis.
CO3 **Analyze**[4] the effect of different parameters on circuit.
CO4 **Examine**[4] the circuit for different parameters.
CO5 **Evoluate**5 RLC elements response to sinusoidal excitation.

Syllabus (Theory)

Units	Description	Hours
I	**Basic of network elements:** Types of Voltage and current sources, Types of Network- Linear and Non-Linear, Lumped and Distributed, Bilateral and Unilateral, Time variant and Time invariant. Voltage divider and current divider, Source transformation and Shifting, Network equation on Loop basis and Node basis, Concept of Super node and super mesh, Solution of mesh equations by Cramer's rule, Solutions of problems with DC and AC sources. Star-Delta transformation.	7
II	**Network Theorems :** Thevenin's & Norton's theorem, Superposition theorem, Maximum power transfer theorem – Reciprocity Theorem - Millman's theorem, Concept of Duality.	7
III	**Network Topology**: Introduction to Network Topology: Definition of basic terms – Incidence matrix – Tie-sets- Cut-sets: Analysis and formulation of network equations using tie-set and cut-set. Concept of network graphs (incidence, tie set and cut set matrix	7

IV	**Two port network theory**: 2-port Circuits: network variables, short circuit and open circuit parameters, transmission and hybrid parameters, relationships between parameter sets, parallel connection of 2-port network. Calculations of network functions for Ladder and general network, Poles and zeroes of network functions, Restrictions on poles and zeroes locations for driving point functions, Restrictions on poles and zeroes locations for transfer functions Stability& causality, Routh-Hurwitz criterion, pole zero diagram. Positive real function. Driving point impedance, Transfer impedance.	7
V	**Resonance:** Definitions,Types:Series &Parallel resonance, Series resonant frequency, Variation of impedance, admittance ,across L & C with respect to frequency ,Selectivity, B.W.& Quality factor. **Transient Response:** Network Solution using Laplace transforms DC response of for R-L, R-C and R-L-C circuits. Initial and Final Condition of element, network (Series and parallel).-Zero state response-Zero input response - Complete Response.	7
VI	**Filters:** Definitions, classification & characteristics of different filters, filter fundamental such as attenuation constant (O), phase shift (N) propagation constant (S) characteristic impedance (Zo), decibel, Neper. Design & analysis of constant K filters (low pass, high pass, band pass & band stop filters): T & Pi sections,	7

Text Book

1. Van Valkenburg M E, "Network Analysis" 3rd Edition, Prentice Hall 1974.
2. A. Chakrabarti "Circuit Theory, Analysis and Synthesis", Dhanpat Rai & co.
3. A. Sudhakaar & Shyanmugam S. Palli "Circuits & Network Analysis & Synthesis", 2nd Edition, Tata McGraw Hill, 1994.
4. Ravish R Singh, "Network Analysis and synthesis", McGraw Hill education (India) Pvt. Ltd, 3rd edition 2015.

References

1. Franklin. F. Kuo, Network Analysis and Synthesis, II Ed, John Wiley & sons, 1999.
2. Hayt, Kimmerly, Engineering Circuit Analysis, 5th Ed., McGraw Hill, 1993.
3. Desoer C.A. & Kuh E.S., Basic Circuit Theory, McGraw-Hill, 1985.
4. Ryder J.D., Networks, Lines and Fields, Prentice Hall, 2nd Ed., 1991.
5. B. P. Lathi, Linear Systema and Signals, Oxford University Press, 2nd Ed., 2006

ECE 207: Communication Engineering -I

(Ver 1.0, PC, School of Technology)

Lect.	Tut.	Pract.	Credits	Evaluation Scheme			
				Component	Exam	WT %	Pass
3	-	-	3	Theory (100)	FET	20	40
					CAT-I	15	
					CAT-II	15	
					ESE	50	40

Course Outcomes: At the end of this course students will able to

CO1 **Describe**[2] different types of noise and predict its effect on various analog communication systems

CO2 **Illustrate**[2] generation and detection of different analog modulation techniques

CO3 **Derive**[3] mathematical expressions for various modulation techniques in time and frequency domain

CO4 **Analyze**[4] the performance of different types of communication systems for a given set of parameters.

Syllabus (Theory)

Units	Description	Hours
I	**Amplitude Modulation:** Evolution of communication system, Elements of electronic communications systems, need for modulation, Types of modulation, Electromagnetic frequency spectrum. Principles of Amplitude modulation: Frequency Spectrum, Power equations. DSB-SC modulation: time and frequency domain representation, generation and detection of DSB-SC modulated waves. SSB Modulation: Time domain representation of SSB signal, generation and detection of SSB modulated waves. Vestigial sideband modulation: Frequency domain representation, generation and detection of VSB, comparison of amplitude modulation techniques.	8
II	**AM Receiver:** Simplified block diagram of AM receiver, receiver parameters: Sensitivity, Selectivity, BW, dynamic range, Tracking, fidelity, AM receiver using diode, practical diode detector, distortion in diode detector. Negative peak clipping &diagonal clipping, Demodulation of SSB using: product demodulator & diode balanced modulator	7

III	**Angle Modulation:** Instantaneous frequency, Concept of angle modulation, frequency spectrum, Narrow band & Wide Band FM, Modulation Index, Bandwidth, Phase modulation, Bessel,s Function and it,s mathematical Analysis, Generation of FM (Direct and Indirect Method), Comparison of FM and PM.	7
IV	**FM demodulator:** Tuned circuit frequency discriminators, slope detectors, fosters Seeley discriminator, ratio detectors, PLL-FM demodulators, FM noise suppression, preemphasis and de-emphasis, FM radio.	6
V	**Pulse Modulation:** Pulse Amplitude Modulation (PAM), natural sampling, flat top sampling, Generation and detection of PAM , transmission of PAM signals, Time Division Multiplexing (TDM), bandwidth of PAM signals, Pulse Time Modulation(PPM,PWM): Generation and detection of PTM(PPM, PWM).	7
VI	**Noise:** Sources of noise, Types of noise White noise, shot noise, thermal noise, partition noise, low frequency or flicker noise, burst noise, avalanche noise, signal to noise ratio, SNR of tandem connection. Noise Figure, Noise Temperature, FRISS formula for noise figure, Noise bandwidth.	7

Text Books:

1. George Kennedy, “Electronic Communications”, McGraw Hill Kennedy.
2. Wayne Tomasi ‘Electronics Communication System’ -Fundamentals through Advanced.- Vth Edition- Pearson Education.
3. V. Chandra Sekar, “Analog Communication”, OXFORD University press

Reference Books:

1. B.P. Lathi, “Analog and Digital Communication”, OXFORD University press.
2. Simon Haykin, “An introduction to analog & digital communications”, John Wiley & Sons
3. R P Singh, S D Sapre ‘Communication System-Analog & Digital’ IInd Edition –Tata Mc Graw Hill Publication
4. Blake”Electronic Communication Systems”,2nd Edition CENGAGE learning
5. Louis E. Frenzel, “Principals of electronic communication system”, IIIrd Ed., TMH Pub

ECE209: Digital Electronics (Theory)
(Ver 1.0, Program Core, School of Technology)

Lect.	Tut.	Pract.	Credits	Evaluation Scheme			
				Component	Exam	WT %	Pass
3	-	-	3	Theory (100)	FET	20	40
					CAT-I	15	
					CAT-II	15	
					ESE	50	40

Course Outcomes: At the end of this course students will able to

CO1 **Demonstrate**[3] understanding of the different logic families.

CO2 **Apply**[3] the laws of Boolean algebra to simplify circuits and expressions

CO3 **Use**[3] the methods of systematic reduction of Boolean algebra expressions including Karnaugh maps & Quine-McCluskey minimization technique.

CO4 **Design**[6] combinational and Sequential logic circuits.

CO5 **Analyze**[4] Sequence Machines.

Syllabus (Theory)

Units	Description	Hours
I	**Digital Logic Family :**Characteristics of digital ICs-Speed of operation, power dissipation, figure of merit, fan in, fan out, current and voltage parameters, noise immunity, operating temperatures and power supply requirements, comparison of TTL and CMOS logic family Characteristics, CMOS logic – CMOS inverter (NOT), NAND, NOR gates.	6
II	**Boolean algebra:** Binary logic functions, Boolean laws, truth tables, associative and distributive properties, De'Morgans theorems, realization of switching functions using logic gates.	6
III	**Combinational Logic Optimization**: Introduction to combinational logic, canonical logic forms, sum of product & product of sums, Karnaugh maps, two, three and four variable Karnaugh maps, simplification of expressions, Quine-McCluskey minimization technique.	8

IV	**Digital Coders:** General approach, Decoders-BCD decoders, encoders, Digital multiplexers-using multiplexers as Boolean function generators, adders & subtractors, Comparators, code converters (binary to gray & gray to binary, BCD to Excess 3 and vice versa).	7
V	**Sequential Logic Circuit Design**: 1 Bit Memory Cell, Latches (SR, JK, D and T), Clocked latches (SR, JK, D and T), flips flop (JK, T and D), timing specifications, asynchronous and synchronous counters, counter design with state equations, Registers, serial in & serial out shift registers, timing considerations.	8
VI	**Synchronous Sequence Machines and Memory Devices :** FSM, Moore/Mealy machines, representation techniques, state diagram, state table, state assignment and state reduction, implementation using D flip flop, Application like sequence detector. Memory devices: ROM, PROM, EPROM, EEPROM, RAM, SRAM, DRAM, NVRAM.	7

Text Books:

1. R. P. Jain, "Modern digital electronics", 3rd edition, 12th reprint TMH Publication, 2007.
2. A. Anand Kumar, "Fundamentals of digital circuits" 1st edition, PHI publication, 2001

Reference Books:

1. Roth Kinney, "Fundamentals of Logic Designs", 6th edition, CENGAGE learning.
2. Anil K. Maini, "Digital Electronics principles and Integrated Circuits" Wiley Publications
3. Digital Design - M. Morris Mano - Pearson Education (3rd Edition) (Unit 1,2,3,4)
4. Digital Principles – Leach, Malvino, TMH (6th Edition).

ECE 213: Communication Engineering-I Lab

(Ver 1.0, PC, School of Technology)

Lect.	Tut.	Pract.	Credits	Evaluation Scheme			
				Component	Exam	WT	Pass
-	-	2	1	Pr (100)	FEP	50	40
					POE	50	40

Learning Outcomes: At the end of this lab students will able to

CO1	**Demonstrate**[2] the functioning of various analog communication techniques using lab kits.
CO2	**Experiment with**[3] varying parameters of modulation and its effect on the quality of communication.
CO3	**Identify**[3] the functional blocks and elements of commercial AIR/FM radio station.

List of Experiments:

1. Setup and Perform Amplitude Modulation and Demodulation.
2. Calculation of modulation index by graphical method of DSBFC signal & measurement of power of AM wave for different modulating signal.
3. SSB modulation using any method (filter method, Phase shift method) and its detection.
4. Performance and analysis of AM system using trapezoidal method
5. Performance and analysis of frequency modulator system and also find the modulation index
6. Experiment on Sampling and reconstruction and also observe aliasing effect by varying sampling frequency.
7. Setup and Perform PAM Modulation and Demodulation.
8. Setup and Perform of PPM Modulation and Demodulation.
9. Setup and Perform PWM Modulation and Demodulation.
10. Setup and Perform PAM-TDM Modulation and Demodulation.

11. Experiment on Pre-emphasis and De-emphasis.
12. Visit to AIR

ECE215: Digital Electronics Lab

Lect.	Tut.	Pract.	Credits	Evaluation Scheme			
				Component	Exam	WT %	Pass
-	-	2	1	Pr (100)	FEP	50	40
					POE	50	40

Learning Outcomes: At the end of this lab, students will able to

CO1 **Verify[4]** working of logic gates, flip-flops etc.

CO2 **Use[4]** digital IC's for code conversion.

CO3 **Design[6]** and **implement[6]** combinational and sequential logic circuits

List of Experiments: (Minimum 10 experiments to be conducted)

1. Study of basic gates.
2. Study of De- Morgan's theorem
3. Universal gates as building blocks
4. Design of adder/ sub (half/Full)

5. Design of 2 bit comparator using combination logic circuits (4bit using 7485)
6. Design of 8 bit magnitude comparator
7. Design of code converter (Binary to Gray, Gray to Binary)
8. Implementation of Decoder & Encoder
9. Design of multiplexer and de-multiplexer
10. Design of. Flip Flop
11. Design of mod-n Counter
12. Design of 4 bit synchronous counter
13. Design of universal shift register
14. Design of 4 bit sequence detector
15. Mini project (compulsory)

ECE 217: Advance Programming Techniques –I

(Ver 1.0, Program Core, School of Technology)

Subject:

Lect.	Tut.	Pract.	Credits	Evaluation Scheme			
				Component	Exam	WT %	Pass
1	-	2	NC	Practical (100)	FEP	50	Min 40
					POE	50	

Course Outcomes: At the end of this course students will able to

CO1 Illustrate[3] Process of procedure oriented programming.

CO2 Describe[2] object oriented programming.

CO3 Recognise[1] the elements of object oriented programming.

CO4 Cpmpare[4] procedure oriented & object oriented programming.

CO5 Write[4] software programs for basic tasks & operations.

Syllabus (Theory)

Units	Description	Hours
I	**Introduction to Procedure Oriented programming:** Constants, Data-types, Variables, Operators, Decision and Looping Statements, Command Line Arguments, Functions, Recursion, Array, Pointers.	4
II	**Introduction to Object Oriented Programming:** OOP Principles, Class, Object, Access Specifiers, Constructors, Destructors, inline function, friend functions, static member.	5
III	**Inheritance:** Class hierarchy, Derived classes, Types of Inheritance, Virtual base class, constructor and destructor execution, base initialization using derived class constructors.	4

IV	**Polymorphism Static polymorphism**: Early Binding, Function Overloading, Operator overloading **Dynamic polymorphism:** Late binding, method overriding with virtual functions, pure virtual functions, abstract classes.	5
V	**Dynamic memory**: Dynamic memory management, new and delete operators, object copying, copy constructor, assignment operator	4
VI	**Exception handling:** Error & Exception, Try and catch, throw exceptions and derived classes, function exception declaration.	4

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Text Books:

1. Let Us 'C', Yashawant Kanitkar, BPB Publications
2. Object Oriented Programming with C++, E. Balagurusamy, McGraw-Hill Education.
3. ANSI and Turbo C++,Ashoke N. Kamthane, Pearson Education.

Reference Books:

1. C++ the Complete Reference, HSchildt, McGraw-Hill Education.
2. Programming with C++, D. Ravi Chandran Tata, Tata McGraw Hill

List of Experiments

Sr. No.	Name of the Experiment
1	Write an Application for implementation of decision control statements a. If…… b. If ……. Else c. Nested If- else d. Switch
2	Write an Application for implementation of loop control statements a. For…. b. Do…while… c. While….
3	Write an Application for implementation of functions a. Call by value b. Call by reference c. Recursion
4	Write an Application for implementation of array and pointer a. One-dimensional array b. Multi-dimensional array c. Pointer
5	Write an Application for implementation of classes and Objects.
6	Develop a Program for implementation of types of constructor a. Default constructor b. Parameterized constructor c. Copy constructor
7	Develop a Program for implementation of polymorphism – a. Function Overloading b. Operator Overloading
8	Develop a Program for implementation of Friend Functions in Class
9	Develop a Program for implementation of types of inheritance a. Single level Inheritance b. Multilevel Inheritance c. Multiple Inheritance d. Hybrid Inheritance e. Hierarchical inheritance
10	Write an Application for implementation of Exception handling mechanism using – a. Try – Catch b. throws

ECE219: Environmental Studies
(Ver 1.0, University Core, School of Science)

Lect.	Tut.	Pract.	Credits	Evaluation Scheme			
				Component	Exam	WT %	Pass
1	-	2	Audit	Pr (100)	FEP	100	40

Course Outcomes: At the end of this course students will able to

CO1: Describe[1] multidisciplinary nature and importance of Environmental Studies

CO2: Explain[2] concept of ecosystem and natural recourses

CO3: Recognize[1] importance of biodiversity, threats and conservation practices

CO4: Explain[2] concept of environmental pollution, causes, effects and control measures

CO5: Describe[1] global environmental issues and lows.

CO6: Associate[2] relationship between human community and environment

Syllabus (Theory)

Units	Description	Hours
I	**a) Introduction to environmental studies:** Multidisciplinary nature of environmental studies; Scope and importance; Concept of sustainability and sustainable development.Renewable and non renewable resources: **b) Natural resources and associated problems** Forest resources: Use and over-exploitation, deforestation, case studies, Timber extraction, mining, dams and their effects on forests and tribal people. Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dam's benefits and problems. Mineral Resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. Energy Resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, case studies.	3

c) Role of individual in conservation of natural resources.
d) Equitable use of resources for sustainable life styles.

Concept of an eco system

II Structure and function of an eco system. Producers, consumers, decomposers. Energy flow in the eco systems. Food chains, food webs and ecological pyramids. Introduction, types, characteristic features, structure and function of the following eco systems: Forest ecosystem, Grass land ecosystem Desert ecosystem. Aquatic eco systems (ponds, streams, lakes, rivers, oceans, estuaries) 3

III

Biodiversity and Conservation

Introduction-Definition: genetics, species and ecosystem diversity. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values Biodiversity at global, national and local level. India as a mega diversity nation. Hot-spots of biodiversity. Threats to biodiversity: habitats loss, poaching of wild life, man wildlife conflicts. Endangered and endemic spaces of India. Conservation of biodiversity: in-situ and ex-situ conservation of biodiversity 3

IV **Environmental Pollution**

Definition Causes, effects and control measures of: 3
a. Air pollution
b. Water pollution
c. Soil pollution
d. Marine pollution
e. Noise pollution
f. Thermal pollution
g. Nuclear hazards
Solid waste Management: Causes, effects and control measures of urban and industrial wastes
Role of an individual in prevention of pollution
Pollution case studies
Disaster management: Floods, earth quake, cyclone and land slides.

V **Social Issues and environment** 8

Form unsustainable to sustainable development Urban problems related to energy Water conservation, rain water harvesting, water shed management Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, case studies.

Environment protection Act Air (prevention and control of pollution) Act Water (prevention and control of pollution) Act Wildlife protection act Forest conservation act Issues involved in enforcement of environmental

legislations Public awareness

VI Human Population and the environment 2

Growth and variation among nations Population explosion- family welfare program Environment and human health, Human rights, Value education HIV / AIDS, Women and child welfare, Role of information technology in environment and human health, Case studies

Environmental Studies Project (Field Work)
(Ver 1.0, University Core, School of Science)

Lect.	Tut.	Pract.	Credits	Evaluation Scheme			
				Component	Exam	WT %	Pass
-	-	2	--	Practical (100)	FEP	50	Min 40
					POE	50	

Course Outcomes: Course Outcomes: At the end of this course students will able to

CO1 Classify[2] natural recourses and their conditions in local area

CO2 Interpret[2] local environmental issues

CO3 Describe[1] local common biodiversity

CO4 Analyze[4] and modify[3] solution on local environmental issues

Field Work

Description
• Visit to an area to document environmental assets: river/ forest/ flora/fauna, etc. • Visit to a local polluted Site-Urban/Rural/Industrial/Agricultural. • Study of common plants, insects, birds and basic principles of identification. • Study of simple ecosystems-pond, river, etc.

References

1. Erach Bharucha, UGC, Textbook for Environmental Studies
2. Gadgil, M., & Guha, R. 1993. This Fissured Land: An Ecological History of India. Univ. of California Press.
3. Gleeson, B. and Low, N. (eds.) 1999. Global Ethics and Environment, London, Routledge.
4. Gleick, P. H. 1993. Water in Crisis. Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute, Oxford Univ. Press.
5. Groom, Martha J., Gary K. Meffe, and Carl Ronald Carroll. Principles of Conservation Biology. Sunderland: Sinauer Associates, 2006.
6. Grumbine, R. Edward, and Pandit, M.K. 2013. Threats from India's Himalaya dams. Science, 339: 36-37.
7. McCully, P. 1996. Rivers no more: the environmental effects of dams (pp. 29-64). Zed Books.
8. McNeill, John R. 2000. Something New Under the Sun: An Environmental History of the Twentieth Century.
9. Deeksha Dave, S.S. Katewa, Textbook of Environmental Studies.
10. B.K. Sharma, Environmental Chemistry.
11. Bharucha Erach, The Biodiversity of India, Mapin Publishing pvt. Ltd., Ahmedabad 380013, India, Email:mapin@icenet.net (R)
12. De A.K., Environmental Chemistry, Wiley Wastern Ltd.
13. Trivedi R.K. Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, vol. I anfd II, Environmental Media (R)

ECE221: Professional Development Skills - I

(Ver 1.0, Program Core, School of Technology)

For Sem-III of B. Tech (Common for All Branches)

Lect.	Tut.	Practical	Credits	Evaluation Scheme for (Th and Pr)			
				Component	Exam	WT	Pass
-	-	2	1		CAT I	-	
					CAT II	-	
					ESE	-	
				Pr (100)	TW	50	Min 50
					POE	50	

Course Description: This course aims to prepare the students for soft skills. The course will help them to understand their potential and set goals accordingly and organize their activities to achieve their set goals. The course also focuses on presentation and public speaking.

Course Outcomes: At the end of this course students will be able to:

CO01 : apply[3] self analysis techniques

CO02 : plan[4] and execute SMART goals

CO03 : demonstrate[3] team building skills

CO04 : prepare time table and action plan to achieve set goals.

CO05 : exhibit[3] presentation and public speaking skills

Syllabus

Units	Description	Hrs
I	**Soft Skills:** What are soft skills? Importance of soft skills, selling your soft skills, identifying and improving your soft skills **Self Analysis:** Importance of knowing yourself, SWOT Analysis, Importance of Self Confidence, Self Esteem	04
II	**Goal Setting:** SMART Goals, Short Term goals, Moderate term goals, Long Term, Life Time Goals	04
III	**Team Building and Teamwork:** Introduction-meaning–aspects of team building, team Vs group, Stages of team building, Characteristics of effective team, role of a team leader, role of team members	04
IV	**Time Management:** Value of time, Diagnosing Time Management, Preparing to do list, Prioritizing work	04
V	**Presentation skills and Public Speaking:** Elements of an effective presentation, Structure of a presentation, Presentation tools, Audience analysis, Language: Articulation, Good pronunciation, Voice quality, Modulation, Accent and Intonation. Extempore and Prepared speeches	04

Note: During the practical sessions, it is expected that the contents of all modules should be delivered to the students of different batches and assignments be given based on the activities discussed as per the modules. Students must demonstrate the acquired skills by means of giving presentations, delivering public speeches, group discussions etc.

References:

1. Wallace & Masters, Personal development for Life & work, Thomson Learning.

2. Barun K. Mitra, Personality Development and Soft- Skills, Oxford University Press.

3. Fred Luthans, Organizational behavior, McGraw Hill.

4. Asa Don Brown, Interpersonal skills in the Workplace, Tate publishing and Enterprises.

Web links:

https://www.monster.com/career-advice/article/soft-skills-you-need
www.saddleback.edu/book/export/html/4405
https://www.wikijob.co.uk/content/interview-advice/competencies/soft-skills
http://www.indiabix.com/
https://www.edx.org/professional-certificate/ritx-soft-skills
https://www.bookmytrainings.com/soft-skills-trainings
www.softskillstraininggroup.com/
www.softskillsindia.com
www.niit.com/solution/soft-skill-training
https://www.skillsyouneed.com/interpersonal-skills.html

SEM- IV

ECE 202: Control System

(Ver 1.0, PC, School of Technology)

Lect.	Tut.	Pract.	Credits	Evaluation Scheme			
				Component	Exam	WT %	Pass
3	-	-	3	Theory (100)	FET	20	40
					CAT-I	15	
					CAT-II	15	
					ESE	50	40

Course Outcomes: At the end of this course students will able to

CO1 **Understand**[2] basics of control systems.

CO2 **Demonstrate**[2] **& compare**[2] different control systems.

CO3 **Identify**[3] different control systems in time & frequency domain

CO4 **Classify**[4] control system model.

Unit I

Introduction to Control Systems: What is a control system? It's Types. Effect of Feedback on control Systems, Differential equation of Physical Systems – Mechanical Systems, Electrical Systems. Block diagrams and signal flow graphs: Transfer functions, Block diagram algebra and Signal Flow graphs. (8Hrs)

Unit II

Time Response of feedback control systems:
Standard test signals, Unit step response of First and Second order Systems. Time response specifications, Time response specifications of second order systems, steady state errors and error constants. (08 Hrs)

Unit III

Stability analysis:
Concepts of stability, Necessary conditions for Stability, Routh stability criterion, Relative stability analysis, Introduction to Root-Locus Techniques, The root locus concepts. (04 Hrs)

Unit IV

Frequency domain analysis and stability:
Correlation between time and frequency response, Draw Bode Plots.Gain margin and phase margin. Comment on stability from Bode plot. Introduction to Polar Plots, Introduction to Nyquist Stability criterion and its Rules. (08 Hrs)

Unit V

Introduction to Digital Control System and State Variables:
Why digital control? Structure of a digital control system. Sampling ADC and DAC. Examples of digital control systems. Sampling process, Signal reconstruction, State variables: Introduction, Concept of State, State variables & State model, State model for Linear Continuous & Discrete time systems. (08 Hrs)

Unit VI

Classical Control Design Techniques
Introduction to lead, lag and lead-lag compensating networks (excluding design). Introduction to PI, PD and PID Controllers (excluding design). (04 Hrs)

Text Books:

1.Control Systems Engineering, I .J. Nagrath and M. Gopal, 5thEdition, Anshan Publishers.
2.Control System Engineering, Dr. Rajeev Gupta, Wiley Precise Publication
3.Automatic Control Systems, Kuo & Golnaraghi, Kunche Sridhar, Wiley Publication
4.Digital Control Engineering Analysis and Design Second Edition M. Sami Fadali Antonio Visioli

Reference Books:

1.Feedback Control Dynamic system, Franklin Powel 5thEdition Pearson Education.
2.Automatic Control Systems, S. Palani, Anoop K. jairath, Ane books pvt. Ltd.
3.Modern Control Engineering, Eastern Economy, K. Ogata, 4th Edition.
4.Control System Principles and Design, M. Gopal, Tata McGraw Hill 3rdEdition.

ECE 204: Sensors and Instrumentation
(Ver 1.0, PC, School of Technology)

Lect.	Tut.	Pract.	Credits	Evaluation Scheme			
				Component	Exam	WT %	Pass
3	-	-	3	Theory (100)	FET	20	40
					CAT-I	15	
					CAT-II	15	
					ESE	50	40

Course Outcomes: At the end of this course students will able to

CO1 **Understand**[2] basics of Instrumentation

CO2 **Differentiate**[2] types of sensors

CO3 **Identify**[3] different sensors and there characteristics

CO4 **Classify**[4] thermal, mechanical and optical sensors

Unit I	
Classification and Functional Elements of Instrument/ measurement system: Measurement, significance of measurement, instruments and measurement systems, mechanical, electrical and electronic instruments, Elements of generalized measurement system, Input-output configuration of measuring instruments and measurement systems, methods of correction for interfering and modifying inputs. Transducers, Classifications of transducers-primary & secondary, active & passive, analog and digital transducers. General Concepts And Terminology, Sensor Classification, General Input-Output Configuration, Static Characteristics Of Measurement Systems, Dynamic Characteristics, Other Sensor Characteristics, Primary Sensors, Materials For Sensors, Microsensor Technology. • RESISTIVE, REACTANCE VARIATION, ELECTROMAGNETIC SENSORS	**08**
Unit II	**08**

Sensors Potentiometers, Strain Gages, Resistive Temperature Detectors (RTDs), Thermistors, Magnetoresistors, Light-Dependent Resistors (LDRs), Resistive Hygrometers, Resistive Gas Sensors, Liquid Conductivity Sensors, Signal Conditioning for Resistive Sensors: Resistance Measurement, Voltage Dividers, Dynamic Measurements, Capacitive Sensors, Inductive Sensors, Electromagnetic Sensors.	
Unit III	**06**
Measurement of Displacement: Introduction, Principles of Transduction, Variable resistance devices, variable Inductance Transducer, Variable Capacitance Transducer, Hall Effect Devices, Proximity Devices, Digital Transducer **Measurement of Level:** Capacitance probes, conductivity probes, differential pressure level detector, float level devices, optical level switches, radiation level sensor, ultrasonic level detector, thermal level sensors	
Unit IV	**06**
Measurement of Strain: Introduction, Factors affecting strain measurements, Types of Strain Gauges, Theory of operation of resistance strain gauges, Types of Electrical Strain Gauges – Wire gauges, unbounded strain gauges, foil gauges, semiconductor strain gauges (principle, types & list of characteristics only), Materials for Strain Gauges, Strain gauge Circuits – Wheatstone bride circuit, Applications. **Measurement of Force & Torque:** Introduction, Force measuring sensor – Load cells – column types devices, proving rings, Hydraulic load cell, Electronic weighing system. Torque measurement: Absorption type, transmission type, stress type & deflection type	
Unit V	**06**
Thermoelectric Sensors: Thermocouples, Piezoelectric Sensors, Pyroelectric Sensors, Electrochemical Sensors, Acoustic Temperature Sensors, Nuclear Thermometer, Magnetic Thermometer, Semiconductor Types, Thermal Radiation, Quartz Crystal, NQR, Spectroscopic Noise Thermometry, Heat Flux Sensors. Temperature ICS: principle, working and brief discussion on AD590, LM35	
Unit VI	**06**

DIGITAL AND SEMICONDUCTOR SENSORS Position Encoders, Resonant Sensors, SAW Sensors, Sensors Based On Semiconductor Junctions, Sensors Based On MOSFET Transistors, Charge-Coupled And CMOS Image Sensors, Fiber-Optic Sensors, Ultrasonic-Based Sensors, Biosensors **Proximity Sensors:** Typical Sensor Characteristics, Technologies For Proximity Sensing, Electro-Optical Sensors, Capacitive Sensors, Magnetic Sensors	

Text Books:

1. Shawhney A. K., "Electrical and Electronics Measurements and Instrumentation", Dhanpat Rai & Sons, 1994.
2. Patranabis D., "Sensors And Transducers", Prentice-Hall India, 2nd Ed., 2004.

Reference Books:

1. Patranabis D., "Sensors And Transducers", Prentice-Hall India, 2nd Ed., 2004.
2. Ramon Pallas & John G. Webster, "Sensors and Signal Conditioning", John Wiley & Sons, 2nd Ed., 2001.
3. Webster John G., "Instrumentation and Sensors Handbook", CRC Press, 1st Ed., 1999.
4. Jacob Fraden, "Handbook of Modern Sensors: Physics, Designs and Applications", Springer, 3rd Ed., 2004.

ECE 206: Communication Engineering -II

(Ver 1.0, PC, School of Technology)

Lect.	Tut.	Pract.	Credits	Evaluation Scheme			
				Component	Exam	WT %	Pass
3	-	-	3	Theory (100)	FET	20	40
					CAT-I	15	
					CAT-II	15	
					ESE	50	40

Course Outcomes: At the end of this course students will able to

CO1 **Describe** uniform and non-uniform quantization and encoder for analog to digital conversion.

CO2 **Differentiate** amongst different digital modulation techniques.

CO3 **Understand** the baseband transmission for modifying and transmitting the data in various formats, with optimum receiver operation and working.

CO4 **Apply** the knowledge of basic information theory for solving problems.

CO5 **Illustrate** the basics of linear block code and cyclic code by solving problems.

CO6 **Realize** and solve the problems related to random signals and also the related issues like power spectral density

Unit I

Quantization and source coding: Introduction to digital communication systems, Sampling Theorem, Quantization of Signals, Quantization Error, Companding, PCM, DPCM, DM, ADM. (06 Hrs)

Unit II

Digital Modulation Techniques: Bandpass Modulation Techniques: ASK, FSK, PSK, DPSK, QPSK, & QAM. Coherent, Non- Coherent detection. Introduction to Spread Spectrum techniques: DSSS, FHSS. (06 Hrs)

Unit III

Baseband Processing: Line codes: Unipolar, Bipolar, NRZ, RZ, RZ-AMI, Manchester Baseband pulse Shaping, Duo binary, M-ary Signaling, eye diagram, ISI, scrambler, Unscramble. Optimum Receivers-Matched Filters, Correlation receivers, Optimum detection using ML criteria (06 Hrs)

Unit IV

Error Control Coding: Types of Errors &codes, Linearblock codes: Encoding-Decoding using Syndrome, error detection & correction, Hamming codes. Cyclic codes: Encoding and syndrome decoding. Convolution codes: Encoders, Decoders, Code (06 Hrs)

Unit V

Elements of Information Theory: Information Theory: Measure of Information, Entropy, Information Rate, Shannon's encoding theorem, communication channels –Discrete & Continuous, Shannon–Hartley theorem, Huffman's coding & Shannon-Fanno Coding techniques (06 Hrs)

Unit VI

Significance of Probability Theory in Digital communication: probability, Bayes" rule, Joint & conditional Probability, PDF & CDF, Power Spectral density of Stationary random processes**,** probability models (06 Hrs)

Text Books:

1. Pabitra Kumar Ray, "Digital Communications – Fundamentals and Applications", 2nd Edition, Pearson, 2001.
2. Taub, Schilling, Saha, "Principals of Communication systems", TMGH, 2nd Edition,2003
3. Lathi B. P., Ding Z, "Modern Digital and Analog Communication Systems", Oxford University, 3rd Edition ,2004
4. John Proakis, Masoud Salehi, "Digital Communications", TMH, 5th Edition ,2008

Reference Books:

1. K. Sam Shanmugam, "Digital & Analog Communication", 3rd Edition, John Wiley,2013
2. Simon Haykin, "Digital Communication" 2nd Edition, John Wiley, 2014.
3. Singh Sapre, "Communication Systems", 2nd Edition, TMGH, 2004.
4. W. Tomasi, "Advanced Electronic Communications Systems", 5th Edition, PHI,2011

ECE 208: Microcontrollers

(Ver 1.0, PC, School of Technology)

Lect.	Tut.	Pract.	Credits	Evaluation Scheme			
				Component	Exam	WT %	Pass
4	-	-	4	Theory (100)	FET	20	40
					CAT-I	15	
					CAT-II	15	
					ESE	50	40

Course Outcomes: At the end of this course students will able to

CO1 Describe the internal architectural details of 8051.
CO2 Make use of the internal peripherals of 8051 for different applications.
CO3 Interface external peripherals to 8051 for developing various applications.
CO4 Describe the internal architectural details of PIC 16F877.
CO5 Make use of the internal peripherals of PIC 16F877 for different applications.
CO6 Write Embedded C programs for PIC 16F877.

Unit I

Introduction to MCS-51: - Introduction to Microprocessors and Microcontrollers, Intel MCS-51 family features, 8051 Memory Organization and Architecture, Instruction set and Assembly language programs. (09 Hrs)

Unit II

Internal Peripherals: - Study of SFR's and Block diagram of following peripherals: I/O Ports, Interrupts, Timers/Counters, UART. **C programming with 8051: -** I/O Programming, Timers/counters, Serial Communication, Interrupts. (06 Hrs)

Unit III

Interfacing External Peripherals: - RAM, ROM, LED, Seven segment display, LCD, Keypad, Stepper Motor. (06 Hrs)

Unit IV

Introduction to PIC family: Features of 16F877 microcontroller, Architecture, pipelining, memory organization, Instruction set, simple assembly language programs. (08 Hrs)

Unit V

Internal Peripherals: - Study of SFR's and Block diagram of following peripherals: I/O ports, Interrupts, Timers, CCP Module, ADC, Serial communication (I^2C, SPI, USART), Configuration word, Oscillator configuration, Reset alternatives. (08 Hrs)

Unit VI

C programming with PIC: - I/O Programming, Timers/counters, serial communication with external devices. (05 Hrs)

Text Books:

1. Mohammad Ali Mazidi, Janice Gillispie Mazidi, "The 8051 Microcontroller and Embedded Systems (Using assembly and C)" Pearson education/ Prentice Hall of India Pvt. Ltd., 2007.
2. PIC 16F87XX datasheet available online at www.microchip.com

Reference Books:

1. Myke Predko, "Programming & Customizing the 8051", Tata McGraw Hill, 1999.
2. Raj Kamal, "Embedded Systems, Architecture, Programming and Design", Tata McGraw Hill 2003.
3. Kenneth J.Ayla, 'The 8051 Microcontroller', Thomson learning, 3rd edition, 2004
4. John B. Peatman , "Design with PIC Microcontrollers", Pearson, 2002
5. E Balagurusamy, "Programming in ANSI C" Edition 2.1, Tata McGraw-Hill Publishing Company Limited, New Delhi.
6. Keil A51, BL51 and C51 manuals

ECE 210: Signals & Systems

(Ver 1.0, PC, School of Technology)

Lect.	Tut.	Pract.	Credits	Evaluation Scheme			
				Component	Exam	WT %	Pass
3	-	-	3	Theory (100)	FET	20	40
					CAT-I	15	
					CAT-II	15	
					ESE	50	40

Course Outcomes: At the end of this course students will able to

CO1 **Demonstrate**[3] understand the mathematical description of continuous and discrete time signals and systems.

CO2 **Apply** [3] Develop input output relationship for linear time invariant system and understand the convolution operator for continuous and discrete time system.

CO3 **Use**[3] of Fourier series and Fourier transforms in frequency domain analysis of signals.

CO4 **Analyze**[4] system using Z-transform.

Unit I

Introduction to Signals and Systems: Introduction and Classification of signals**:** Definition of signal and systems ,Review of sampling theorem, Continuous time and discrete time signal, Classification of signals as even, odd, periodic and non-periodic, deterministic and non-deterministic, energy and power. Basic signals**:** exponential, sine, impulse, step ,ramp, Operations on signals.
Systems**:** Definition, Classification: linear and non-linear, time variant and invariant, causal and non-causal, static and dynamic, stable and unstable, invertible. (07 Hrs)

Unit II

Time domain representation of LTI System: CT and DT LTI system, definition of impulse response, convolution sum, convolution integral, computation of convolution integral,

Computation of convolution sum. Properties of convolution. system properties in terms of impulse response, step response. Representation of systems using differential /difference equation. (06 Hrs.)

Unit III

Fourier Series: Fourier series representation of periodic Continuous Time signals, existence of Fourier series, FS representation of CT signals using trigonometric and exponential Fourier series. Relation between trigonometric and exponential Fouirier series. Discrete Time Fourier Series, Properties of Fourier series. (06 Hrs)

Unit IV

CT Fourier transform: Fourier Transform representation of aperiodic CT signals, existence of Fourier transform, evaluation of magnitude and phase response, FT of standard CT signals. Properties of Fourier transform. (07 Hrs)

Unit V

DT Fourier transform: Introduction to Discrete time Fourier transform, Existence of DTFT, Properties of DTFT. Symmetry properties of DTFT. (04 Hrs)

Unit VI

Z-transform: Need of Z-Transform, definition of unilateral and bilateral Z-Transform, Z-Transform of finite and infinite duration sequences, properties of Z-transform, Inverse Z-Transform-long division method, PFE method, Z-Transform of standard signals, ROC for ZT, plotting poles and zeros of transfer function, causality and stability of systems. (06 Hrs)

Text Books:

1. Alan V. Oppenhiem, Alan S. Willsky and S. Hamid Nawab, "*Signals and Systems*", Prentice-Hall of India, Second Edition, 2002.
2. Ramesh Babu 'Signals & Systems' SciTech publication

Reference Books:

1. Hwei. P Hsu, "*Signals and Systems"*, Tata McGraw Hill, Third edition, 2010
2. Michael J Roberts, "*Fundamentals of Signals and systems*", Tata McGraw Hill, special Indian Economy edition, 2009.
3. NagoorKani, "*Signals and Systems"*, Tata McGraw Hill, Third Edition, 2011
4. Simon Haykin and Barry Van Veen, "*Signals and Sytems"*, John Wiley and Sons, Second Edition,2004.

ECE 216: Microcontrollers Lab

(Ver 1.0, PC, School of Technology)

Lect.	Tut.	Pract.	Credits	Evaluation Scheme			
				Component	Exam	WT %	Pass
-	-	2	1	Practical (100)	FEP	50	40
					POE	50	40

Learning Outcomes: At the end of this lab students will able to

CO1 Make use of software tools for writing programs for 8051 and PIC 16F877.

CO2 Interface external hardware peripherals to 8051 and PIC 16F877.

List of Experiments: (Minimum 10 experiments to be conducted)

Programming 8051 and PIC 16F877 Micro controller using ASM and C language

1. Programming with Arithmetic logic instructions [Assembly]
2. Delay generation using Timer [Assembly and C]
3. Programming Interrupts [C program]
4. Implementation of standard UART communication for 8051 [C program]
5. Interfacing LEDs [C program]
6. Interfacing Seven Segment display and displaying various digits. [C program]
7. Interfacing LCD Display [C program]
8. Interfacing Stepper motor [C program]
9. Use of internal ADC of PIC 16F877 [C program]
10. Implementation of I2C and SPI communication for PIC 16F877 [C program]
11. Interfacing DAC [C program]

ECE 214: Communication Engineering-II Lab

(Ver 1.0, PC, School of Technology)

Lect.	Tut.	Pract.	Credits	Evaluation Scheme			
				Component	Exam	WT	Pass
-	-	2	1	Pr (100)	FEP	50	40
					POE	50	40

Learning Outcomes: At the end of this lab students will able to

CO1	**Demonstrate[2]** the functioning of various digital communication techniques using lab kits.
CO2	**Experiment with[3]** varying parameters of modulation and its effect on the quality of communication.
CO3	**Make use of[3]** programming tools like MATLAB for simulation of the communication systems.

List of Experiments:

1. Setup and Perform the Multiplexing and demultiplexing using PCM modulation and demodulation.
2. Setup and Perform DPCM and ADPCM modulation and demodulation.
3. Setup and Perform DM –ADM modulation and demodulation.
4. Setup and perform generation of different Line codes like NRZ,RZ,AMI etc.
5. Setup and Perform ASK,FSK and PSK modulation and demodulation.
6. Setup and Perform QPSK modulation and demodulation
7. Setup and Perform Spread Spectrum modulation and demodulation.
8. Study of generation of cyclic codes using Matlab/Scilab software.
9. Study of Eye Diagram using oscilloscope using Matlab/Scilab software.
10. Study of any digital modulation scheme using Matlab communication tool
11. Experiments on random signals using Matlab/Scilab software's
    (Study of Continuous Random Variable-probability, variance)

12 Experiments on error correction codes using Matlab/Simulink Software.

ECE218: Advance Programming Techniques –II

Lect.	Tut.	Pract.	Credits	Evaluation Scheme			
				Component	Exam	WT %	Pass
1	-	2	2	Practical (100)	FEP	50	40
					POE	50	40

Course Outcomes: At the end of this course students will able to

CO1 Identify[3] various data types & algorithms in data structure.
CO2 Analyse[4] arrays records & pointers for object oriented programming.
CO3 Model[3]a linked list,binary tree & graphs for different data structure.
CO4 Evaluate[5]Outcomes of moderate level programs.
CO5 Develope[4] moderate level programs to perform simple operations using C&C++

Lectures: 2 / week Practical: 2hr / weeks
TW: 25M OE: 25M

UNIT I

Introduction & Overview: Introduction to theory of data structures & its data types, Algorithms: complexity, time space trade-off with example, Hash Table- Concepts-hash table, hash function, bucket, collision, probe, synonym, overflow, open hashing, closed hashing, perfect hash function, load density, full table, load factor, rehashing, issues in hashing, hash functions- properties of good hash function, division, multiplication, extraction, mid-square

8h

UNIT II

Arrays, Records & Pointers: Introduction, linear arrays, representation of linear array in memory, traversing linear arrays, inserting & deleting, Sorting: bubble sort, searching: linear search, binary search, Multidimensional arrays, Pointers: pointer arrays, Records: Record structures, representation of records in memory, parallel arrays, matrices, space matrices.

7h

UNIT III

Linked Lists: Introduction, linked lists & its representation, Traversing & searching a linked list, memory allocation, Garbage collection, insertion & deletion of nodes of linked list, header linked llist, two-way lists, programming problems.

6h

UNIT IV

Introduction to stacks, stack as an Abstract Data Type , representation through Arrays & linked lists , Applications of stacks , stacks & recursion, Queue as an abstract data type representation, cicular, double ended, priority, application of queues.

4h

UNIT V

Binary Tree: introduction, types, definition, properties, representations, operations, binary tree traversal reconstruction, counting number of binary trees, applications. Advanced trees : AVL trees or height balanced trees, B+ trees, Heaps, construction of a Heap.

8h

UNIT VI

Graphs: Introduction, Graph theory terminology, sequential representation of graphs: Adjacency Matrix, Path matrix, Warshall's Algorithm, shortest paths, linked representation. Operations, Traversing, Posets, Topological sorting 7h

Text Books:

1. Data structures, Seymour Lipschautz Tata McGraw Hill

2. Data structure using C & C++ Langsam, Rubenstein, Tenenbaun PHI

3. Data structure & algorithm analysis in C

4. Mark Allen Weiss Pearson Education (LPE)

5. Horowitz, Sahani, Dinesh Mehata, ―Fundamentals of Data Structures in C++‖, Galgotia Publisher

Reference Books:

1. Data structure using C ISRD group Tata McGraw Hill

2. Programming with C++, D. Ravi Chandran Tata, Tata McGraw Hill

3. Data Structures & Algorithms in C++ M.T. Goodrich, R. Tamassia, D. Mount Wiley Publication

List of Experiments

1. Program to Insert and Delete the Number in an Array

2. Program for storing appointment schedule for day. Appointments are booked randomly using linked list. Set start and end time and min and max duration for visit slot. Write functions for- a) Display free slots b) Book appointment c) Sort list based on time

3. Program on Bubble Sort

4. Program to Perform Linear search

5. Program to Perform Binary search

6. Program To Display 2D Array

7. Program to Insert and Delete the Node in Link List

8. Program to Perform Push and Pop Operation on Stack

9. Program to Perform Operation on Queue

10. To Study Properties of Binary tree

11. To Study Traversing operation of Tree

12. To Study Traversing operation of Graph

13. Consider telephone book database of N clients. Make use of a hash table implementation to quickly look up client‘s telephone number. 15 Implement all the functions of a dictionary (ADT) using hashing. Data: Set of (key, value) pairs, Keys are mapped to values, Keys must be comparable, Keys must be unique Standard Operations: Insert(key, value), Find(key), Delete(key)

14. Consider telephone book database of N clients. Make use of a hash table implementation to quickly look up client‘s telephone number. 15 Implement all the functions of a dictionary (ADT) using hashing. Data: Set of (key, value) pairs, Keys are mapped to values, Keys must be comparable, Keys must be unique Standard Operations: Insert(key, value), Find(key), Delete(key)

ECE222: Professional Development Skills – II

(Ver 1.0, Program Core, School of Technology)

For Sem-IV of B. Tech (Common for All Branches)

Lect.	Tut.	Practical	Credits	Evaluation Scheme for (Th and Pr)			
				Component	Exam	WT	Pass
-	-	2	1		CAT I	-	
					CAT II	-	
					ESE	-	
				Pr (100)	TW	50	Min 50
					POE	50	

Course Description: This course is the extension of the Professional Development – I course of third semester. The course aims to develop leadership skills and sharpen their decision making skills. The major focus of the course is to prepare students for job.

Course Outcomes: At the end of this course students will be able to:

CO01 : demonstrate[3] leadership skills

CO02 : evaluate[6] process and practical ways of decision making

CO03 : judge[6] causes of stress and find remedies to reduce stress

CO04 : apply[3] business etiquettes and ethics

Co05 : exhibit[3] group discussion and Interview skills

Syllabus

Units	Description	Hrs.
I	**Leadership:** Skills for a good Leader, Assessment of Leadership Skills **Creativity:** Lateral thinking, vertical thinking, Out of box thinking	4

II	**Decision Making:** Importance and necessity of Decision Making, Process and practical way of Decision Making, Weighing Positives & Negatives.	4
III	**Stress Management**: Causes of Stress and its impact, how to manage & distress, Circle of control, Stress Busters. **Emotional Intelligence**: What is Emotional Intelligence, dealing with feelings, emotional quotient, why Emotional Intelligence matters, Emotion Scales. Managing Emotions.	4
IV	**Adapting to corporate life**: Corporate Grooming and dressing, Business Etiquette Business Ethics, Dinning Etiquette, Ethics policy	4
V	**Group Discussion:** Group discussions as part of selection process. Structure of a group discussion, Dynamics of group behavior, techniques for effective participation, Team work and use of body language. **Interview:** Process, techniques, Pre-In-After the interview preparation.	4

References:

1. Wallace & Masters, Personal development for Life & work, Thomson Learning.

2. Barun K. Mitra ,Personality Development and Soft- Skills , Oxford University Press.

3. Fred Luthans, Organizational behavior, McGraw Hill.

4. Asa Don Brown, Interpersonal skills in the Workplace, Tate publishing and Enterprises.

Web links

https://www.monster.com/career-advice/article/soft-skills-you-need
www.saddleback.edu/book/export/html/4405
https://www.wikijob.co.uk/content/interview-advice/competencies/soft-skills
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