ACADEMIC REGULATIONS
COURSE STRUCTURE
AND
DETAILED SYLLABUS

ELECTRICAL & ELECTRONICS
ENGINEERING

For
5 YEAR INTEGRATED DUAL DEGREE PROGRAM (I.D.P)
Leading to
(B.TECH. & M.Tech. / MBA )
(Applicable for the batches admitted from 2015-2016)

JNTUH COLLEGE OF ENGINEERING HYDERABAD
(Autonomous)
Kukatpally, Hyderabad – 500085
Telangana, India
1.0  5 Year Integrated Dual Degree Program in Engineering & Technology (IDP)

JNTUH offers 5 Year (10 Semesters) Integrated Dual Degree (IDP) Programme, under Choice Based Credit System (CBCS) at its Constituent Autonomous College - JNTUH College of Engineering Hyderabad, with effect from the Academic Year 2015-16 onwards, in the following Branches of Engineering

<table>
<thead>
<tr>
<th>S.No.</th>
<th>UG Program</th>
<th>PG Program</th>
<th>MBA (Specialization)*</th>
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</thead>
<tbody>
<tr>
<td>1)</td>
<td>B.Tech. in Electronics &amp; Communication Engineering</td>
<td>M.Tech. (Communications &amp; Signal Processing)</td>
<td>MBA (Human Resources / Finance/ Marketing/ Systems)</td>
</tr>
<tr>
<td>2)</td>
<td>B.Tech. in Computer Science &amp; Engineering</td>
<td>M.Tech. (Computer Science)</td>
<td>MBA (Human Resources / Finance/ Marketing/ Systems)</td>
</tr>
<tr>
<td>3)</td>
<td>B.Tech. in Electrical &amp; Electronics Engineering</td>
<td>M.Tech. (Power Electronics)</td>
<td>MBA (Human Resources / Finance/ Marketing/ Systems)</td>
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<tr>
<td>4)</td>
<td>B.Tech. in Mechanical Engineering</td>
<td>M.Tech. (Manufacturing Systems)</td>
<td>MBA (Human Resources / Finance/ Marketing/ Systems)</td>
</tr>
<tr>
<td>5)</td>
<td>B.Tech. in Civil Engineering</td>
<td>M.Tech. (Structural Engineering)</td>
<td>MBA (Human Resources / Finance/ Marketing/ Systems)</td>
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(* A Minimum of 15 students is necessary for any specialization to be offered.)

A student would be conferred the B.Tech Degree and M.Tech or MBA Degree in this IDP, after the successful completion of all the requirements for the 10 semesters of study and earning the appropriate credits.

2.0 Eligibility for Admission

2.1 Admission to the IDP shall be made either on the basis of the merit rank obtained by the qualifying candidate at an Entrance Test conducted by the Telangana State Government (EAMCET), OR the University, OR on the basis of any other order of merit approved by the University, subject to reservations as prescribed by the Government from time to time.

2.2 The medium of instructions for the entire IDP in E&T will be ENGLISH only.

2.3 Students opting for the 5 year integrated IDP must specify their choice for M.Tech. (with in the specializations given above) or MBA as the case may be, after choosing the appropriate Branch of Engineering, at the time of Admissions only. Option thus exercised is final, and cannot be changed during the study period.
2.4 Students opting for 5 years integrated IDP have to study for the specified period, to earn the relevant credits for the award of both the B.Tech. and M.Tech. / MBA Degrees, and they will not be permitted to have a choice for B.Tech. Degree alone after 4 years study.

3.0 IDP Structure

3.1 The IDP Programmes of JNTUH-CEH are of Semester Pattern, with 10 Semesters constituting 5 Academic Years, each Academic Year having TWO Semesters (First/Odd and Second/Even Semesters). Each Semester shall be of 22 Weeks duration (inclusive of Examinations), with a minimum of 90 Instructional Days per Semester.

3.2 UGC/ AICTE specified Definitions/ Descriptions are adopted appropriately for various terms and abbreviations used in these Academic Regulations, which are as listed below.

3.3 Semester Scheme:
Each Semester having - ‘Continuous Internal Evaluation (CIE)’ and ‘Semester End Examination (SEE)’. Choice Based Credit System (CBCS) and Credit Based Semester System (CBSS) as denoted by UGC.

3.4 Credit Courses:
All Subjects/ Courses are to be registered by a student in a Semester to earn Credits. Credits shall be assigned to each Subject/ Course in a L: T: P: C (Lecture Periods: Tutorial Periods: Practicals Periods : Credits) Structure, based on the following general pattern ..
• One Credit - for One hour/ Week/ Semester for Theory/ Lecture (L) Courses; and,
• One Credit - for Two hours/ Week/ Semester for Laboratory/ Practical (P) Courses or Tutorials (T).
Other student activities like NCC, NSS, NSO, Study Tour, Guest Lecture etc., and identified Mandatory Courses will not carry Credits.

3.5 Subject/ Course Classification:
All Subjects/ Courses offered for the UGP are broadly classified as : (a) Foundation Courses (FnC), (b) Core Courses (CoC), and (c) Elective Courses (E/C).
- Foundation Courses (FnC) are further categorized as : (i) HS (Humanities and Social Sciences), (ii) BS (Basic Sciences), and (iii) ES (Engineering Sciences);
- Core Courses (CoC) and Elective Courses (E/C) are categorized as PS (Professional Subjects), which are further subdivided as – (i) PC (Professional/ Departmental Core) Subjects, (ii) PE (Professional/ Departmental Electives) , (iii) OE (Open Electives); and (iv) Project Works (PW);
- Minor Courses (1 or 2 Credit Courses, belonging to HS/ BS/ ES/ PC as per relevance); and
- Mandatory Courses (MC - non-credit oriented).

3.6 Course Nomenclature:
The Curriculum Nomenclature or Course-Structure Grouping for the each of the IDP E&T is as listed below :

<table>
<thead>
<tr>
<th>S.No</th>
<th>UG/PG Program</th>
<th>Group/Category/Component</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>1)</td>
<td>UG</td>
<td>BS – Basic Sciences</td>
<td>Includes - Mathematics, Physics and Chemistry Subjects</td>
</tr>
<tr>
<td>2)</td>
<td>UG</td>
<td>ES - Engineering Arts and Sciences</td>
<td>Include fundamental engineering subjects</td>
</tr>
</tbody>
</table>
3) UG HS – Humanities and Social Sciences Includes subjects related to Humanities, Social Sciences and Management

4) UG PC – Professional Core Includes core subjects related to the parent discipline, department or branch of engineering

5) UG PE – Professional Electives Includes Elective subjects related to the parent discipline, department or branch of engineering

6) UG OE – Open Electives Elective subjects which include interdisciplinary subjects or subjects in an area outside the parent discipline, department or branch of engineering

7) UG Project B.Tech. Project or UG Project or UG Major Project

8) UG Industrial Training/ Mini Project Industrial Training/ Internship/ UG Mini Project/ Mini Project

9) PG PGC PG Core Subjects related to the M.Tech. Specialization / MBA

10) PG PGE PG Elective Subjects related to the M.Tech. Specialization / MBA

11) PG Project PG Project M.Tech. / MBA

12) PG Seminar Seminar / Colloquium at PG level, in M.Tech. / MBA

13) PG Comprehensive Viva Comprehensive Viva based on all Subjects

| Total | 254 |

4.0 Course Work

4.1 A student, after securing admission, shall pursue the IDP (B.Tech+M.Tech or MBA) in a minimum period of 5 Academic Years, and a maximum period of 10 Academic Years (starting from the Date of Commencement of I Year). The entire course of study is of five academic years, comprising of 10 semesters. All the I, II, III, IV and V years are on two-semester pattern.

4.2 Each student shall Register for and Secure the specified number of Credits required for the completion of the IDP and Award of the B.Tech+M.Tech / MBA. Degree in respective Branch of Engineering.

4.3 The student must secure a total of 260 credits for the IDP - 174 credits for the B.Tech. Degree Program, plus 86 credits for the M.Tech./ MBA Program.

4.4 The course work and curriculum for first 3 years (6 Semesters) would be same as that the Regular B.Tech (4 year) in the relevant branch of Engineering.

5.0 Course Registration

5.1 A ‘Faculty Advisor or Counselor’ shall be assigned to each student, who will advise him about the IDP, its Course Structure and Curriculum, Choice/Option for Subjects/ Courses, based on his competence, progress, pre-requisites and interest.

5.2 Academic Section of the College invites ‘Registration Forms’ from students before the beginning of the Semester, through ‘ON-LINE SUBMISSIONS’, ensuring ‘DATE and TIME Stamping’. The ON-LINE Registration Requests for any ‘CURRENT SEMESTER’ shall be completed BEFORE the commencement of SEEs (Semester End Examinations) of the ‘PRECEDING SEMESTER’.

5.3 A Student can apply for ON-LINE Registration, ONLY AFTER obtaining the ‘WRITTEN APPROVAL’ from his Faculty Advisor, which should be submitted to the College Academic Section through the Head of Department (a copy of the same being retained with Head of Department, Faculty Advisor and the Student).
5.4 A Student may be permitted to Register for his Subjects/Course of CHOICE upto III year II semester with a typical total of 24 Credits per Semester (Minimum being 20 C and Maximum being 28 C, permitted deviation being ±17%), based on his PROGRESS and SGPA/CGPA, and completion of the ‘PRE-REQUISITES’ as indicated for various Subjects/Courses, in the Department Course Structure and Syllabus contents. However, a MINIMUM of 20 Credits per Semester must be registered to ensure the ‘STUDENTSHIP’ in any Semester.

A Student may be permitted to Register for his Subjects/Course of CHOICE in IV year I semester and V year I semester with a typical total of 30 Credits per Semester (Minimum being 26 C and Maximum being 34 C, permitted deviation being ±14%), based on his PROGRESS and SGPA/CGPA, and completion of the ‘PRE-REQUISITES’ as indicated for various Subjects/Courses, in the Department Course Structure and Syllabus contents. However, a MINIMUM of 26 Credits per Semester must be registered to ensure the ‘STUDENTSHIP’ in any Semester.

A Student may be permitted to Register for his Subjects/Course of CHOICE in IV year II semester with a typical total of 28 Credits per Semester (Minimum being 24 C and Maximum being 32 C, permitted deviation being ±14%), based on his PROGRESS and SGPA/CGPA, and completion of the ‘PRE-REQUISITES’ as indicated for various Subjects/Courses, in the Department Course Structure and Syllabus contents. However, a MINIMUM of 24 Credits per Semester must be registered to ensure the ‘STUDENTSHIP’ in any Semester.

A Student must Register for his Subjects/Course in V year II semester with a total of 22 Credits per Semester.

5.5 Open Electives: Students are to register One Open Elective (OE-I) during III Year I Semester, one (OE-II) during III Year II Semester, from the list of Open Electives given. However, Students can not opt for an Open Elective Subject offered by their own (parent) Department, if it is already listed under any category of the Subjects offered by parent Department in any Semester.

5.6 There shall be an Industry oriented Mini-Project, in collaboration with an Industry of the relevant specialization, to be registered immediately after III year II semester examinations, and taken up during the summer vacation for about eight weeks duration.

5.7 Each Student shall Register the UG Project Work during the IV Year II Semester, as per the instructions of the Project Guide/Project Supervisor assigned by the Head of Department.

5.8 The PG Project shall start immediately after the completion of the IV Year II Semester, and shall continue through V Year I and II Semesters as per the instructions of the Project Guide/Project Supervisor assigned by the Head of Department and registered after approval from PRC.

5.9 Choice for ‘additional Subjects/Courses’ to reach the Maximum Permissible Limit of 28/32/34 Credits (above the typical 24/28/30 Credit norm) must be clearly indicated, which needs the specific approval and signature of the Faculty Advisor/Counselor.

5.10 If the Student submits ambiguous choices or multiple options or erroneous entries - during ON-LINE Registration for the Subject(s) / Course(s) under a given/specified Course Group/Category as listed in the Course Structure, only the first mentioned Subject/Course in that Category will be taken into consideration.

5.11 Subject/Course Options exercised through ON-LINE Registration are final and CAN NOT be changed, and CAN NOT be inter-changed; further, alternate choices will also not be considered. However, if the Subject/Course that has already been listed for Registration (by the Head of Department) in a Semester could not be offered due to any unforeseen or unexpected reasons, then the Student shall be allowed to have alternate choice - either for a new Subject (subject to offering of such a Subject), or
for another existing Subject (subject to availability of seats), which may be considered. Such alternate arrangements will be made by the Head of Department, with due notification and time-framed schedule, within the FIRST WEEK from the commencement of Class-work for that Semester.

5.12 Cancelation of Registration of Subjects/ Courses may be permitted, ONLY AFTER obtaining prior approval from the Faculty Advisor (subject to retaining a minimum of required credits) ‘within 15 Days of Time’ from the beginning of the current Semester.

6.0 Subjects/ Courses to be offered

6.1 A Subject/ Course may be offered to the Students, ONLY IF a Minimum of 1/3 of the class Strength opt for the same. The Maximum Strength of a class is limited to 80 (60 + 1/3 of the class Strength).

6.2 More than ONE TEACHER may offer the SAME SUBJECT (Lab./ Practicals may be included with the corresponding Theory Subject in the same Semester) in any Semester. However, selection choice for students will be based on - ‘FIRST COME FIRST SERVE Basis and CGPA Criterion’ (i.e., the first focus shall be on early ON-LINE ENTRY from the student for Registration in that Semester, and the second focus, if needed, will be on CGPA of the student).

6.3 If more entries for Registration of a Subject come into picture, then the concerned Head of Department shall take necessary action, whether to offer such a Subject/ Course for TWO (or multiple) SECTIONS or NOT.

6.4 In case of options coming from Students of other Departments/ Branches/ Disciplines (not considering OPEN ELECTIVES), PRIORITY shall be given to the student of the ‘Parent Department’ first.

7.0 Attendance Requirements

7.1 A student shall be eligible to appear for the End Semester Examinations upto III year I semester, if he acquires a minimum of 75% of attendance in aggregate of all the Subjects/ Courses (excluding Mandatory or Non-Credit Courses) for that Semester.

A student shall be eligible to appear for the End Semester Examinations in IV and V year, I Semester and II Semester, if he acquires a minimum of 75% of attendance in that subject.

7.2 Condoning of shortage of attendance is up to 10% (65% and above, and below 75%) in each Semester may be granted by the College Academic Committee on genuine and valid grounds, based on the student’s representation with supporting evidence.

7.3 A stipulated fee shall be payable towards condoning of shortage of attendance.

7.4 Shortage of Attendance below 65% shall in NO case be condoned.

7.5 Students, whose shortage of attendance is not condoned in any Semester, are not eligible to take their End Examinations of that Semester; they get detained and their registration for that Semester shall stand cancelled. They will not be promoted to the next Semester. They may seek re-registration for all those Subjects registered in that Semester in which he got detained, by seeking re-admission for that Semester as and when offered; in case if there are any Professional Electives and/ or Open Electives, the same may also be re-registered if offered, however, if those Electives are not offered in later Semesters, then alternate Electives may be chosen from the SAME set of Elective Subjects offered under that category.

7.6 Students from IV year I semester onwards, whose shortage of attendance is not condoned in any Subject, are not eligible to take their End Examinations of that Subject, they get
detained and their registration for that Subject shall stand cancelled. They may seek re-registration for all those Subjects registered in which they got detained, by seeking re-register for that Subjects as and when offered.

8.0 Academic Requirements
The following Academic Requirements have to be satisfied, in addition to the Attendance Requirements mentioned in Item No.7.

8.1 (a) UG Part
A student shall be deemed to have satisfied the Academic Requirements and earned the Credits allotted to each Subject/Course, if he secures not less than 35% marks (25 out of 70 marks) in the End Semester Examination, and a minimum of 40% of marks in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together; in terms of Letter Grades, this implies securing P Grade or above in that Subject/ Course.

A student shall be deemed to have satisfied the Academic Requirements and earned the Credits allotted to - Industry oriented Mini-Project/ Seminar, if he secures not less than 40% of the total marks (40 marks) to be awarded for each. The student would be treated as failed, if he - (i) does not submit a report on his Industry oriented Mini-Project, or does not make a presentation of the same before the Evaluation Committee as per schedule, or (ii) does not present the Seminar as required in the IV year II Semester, or (iii) secures less than 40% of marks (40 marks) in Industry oriented Mini-Project/ Seminar evaluations.

He may reappear once for each of the above evaluations, when they are scheduled again; if he fails in such ‘one reappearance’ evaluation also, he has to reappear for the same in the next subsequent Semester, as and when it is scheduled.

(b) PG Part
A Student shall be deemed to have satisfied the Academic Requirements and earned the Credits allotted to - Seminar, and Comprehensive Viva-voce, if he secures not less than 50% of the total Marks (28 out of 70 Marks) in the End Semester Examination, and a minimum of 50% of Marks in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together; in terms of Letter Grades, this implies securing B Grade or above in that Subject.

A Student shall be deemed to have satisfied the Academic Requirements and earned the Credits allotted to - Seminar, and Comprehensive Viva-voce, if he secures not less than 50% of the total Marks to be awarded for each. The Student would be treated as failed, if he - (i) does not attend the Comprehensive Viva-voce as per the schedule given, or (ii) does not present the Seminar as required, or (ii) secures less than 50% of Marks ( < 50 Marks) in Seminar/ Comprehensive Viva-voce evaluations.

He may reappear for comprehensive viva where it is scheduled again; For seminar, he has to reappear in the next subsequent Semesters, as and when scheduled.

8.2 A Student will not be promoted from I Year to II Year, unless he fulfils the Attendance and Academic Requirements and secures a total of 24 Credits out of 48 Credits of I Year, from all the relevant regular and supplementary examinations, whether he takes those examinations or not.

8.3 A Student will not be promoted from II Year to III Year, unless he fulfils the Attendance and Academic Requirements and secures a total of 43 Credits out of 72 Credits upto II Year I Semester, from all the relevant regular and supplementary examinations, whether he takes those examinations or not.
8.4 A Student will not be promoted from III Year to IV Year, unless he fulfils the Attendance and Academic Requirements and secures a total of 72 Credits out of 120 Credits upto III Year I Semester, from all the relevant regular and supplementary examinations, whether he takes those examinations or not.

A student shall be promoted from IV Year to V Year, if the student completes the UG Project satisfactorily and earns the prescribed number of credits for UG Project by the end of IV Year II Semester.

8.5 A Student shall - register for all Subjects covering 254 Credits as specified and listed (with the relevant Course/Subject Classifications as mentioned) in the Course Structure, put up all the Attendance and Academic requirements for 254 Credits securing a minimum of P/B Grade (Pass Grade) or above in each Subject, and ‘earn ALL 254 Credits securing SGPA ≥ 5.0 / 6.0 (in each Semester), and CGPA (at the end of each successive Semester) ≥ 5.0/ 6.0 , to successfully complete the UGP and PGP.

8.6 If a Student registers for some more ‘extra Subjects’ (in the parent Department or other Departments/Branches of Engg.) other than those listed Subjects totaling to 254 Credits as specified in the Course Structure of his Department, the performances in those ‘extra Subjects’ (although evaluated and graded using the same procedure as that of the required 254 Credits) will not be taken into account while calculating the SGPA and CGPA. For such ‘extra Subjects’ registered, % marks and Letter Grade alone will be indicated in the Grade Card, as a performance measure, subject to completion of the Attendance and Academic Requirements as stated in Items 7 and 8.1 – 8.4 above.

8.7 Students who fail to earn 254 Credits as per the Course Structure, and as indicated above, within 10 Academic Years from the Date of Commencement of their I Year shall forfeit their seats in IDP Programme and their admissions shall stand cancelled.

8.8 When a Student is detained due to shortage of attendance in any Semester, he may be readmitted into that Semester, as and when offered, with the Academic Regulations of the Batch into which he gets readmitted. However, no Grade Allotments or SGPA/CGPA calculations will be done for that entire Semester in which he got detained.

8.9 When a Student is detained due to lack of Credits in any year, he may be readmitted in the next year, after fulfillment of the Academic Requirements, with the Academic Regulations of the Batch into which he gets readmitted.

8.10 A student eligible to appear in the End Semester Examination in any Subject/Course, but absent at it or failed (thereby failing to secure P Grade or above), may reappear for that Subject/Course at the supplementary examination/SEE as and when conducted. In such cases, his Internal Marks assessed earlier for that Subject/Course will be carried over, and added to the Marks to be obtained in the supplementary examination/SEE, for evaluating his performance in that Subject.

9.0 Evaluation - Distribution and Weightage of Marks

(a) UG Part

9.1 The performance of a student in each Semester shall be evaluated Subject-wise (irrespective of Credits assigned) with a maximum of 100 marks for Theory or Practicals or Seminar or Drawing/Design or Industry oriented Mini-Project or Minor Course, etc; For all Subjects/Courses as mentioned above, the distribution shall be 30 marks for CIE; and 70 marks for the SEE. However, the UG Project Work ( Major Project) will be evaluated for 200 Marks. These evaluations shall be based on 30% CIE (Continuous Internal Evaluation) and 70% SEE (Semester End Examination), and a Letter Grade corresponding to the % marks obtained shall be given.
9.2 a) For Theory Subjects (inclusive of Minor Courses), during the Semester, there shall be 2 mid-term examinations for 25 marks each. Each mid-term examination consists of one objective paper for 10 marks, plus one subjective paper for 15 marks, with a duration of 120 minutes (20 minutes for objective and 100 minutes for subjective papers). Further, there will be an allocation of 5 marks for Assignment. Objective paper may be set with multiple choice questions, True/False, fill-in the blanks, matching type questions, etc. Subjective paper shall contain 5 questions, out of which the Student has to answer 3 questions, each for 5 marks.

b) The first mid-term examination shall be conducted for the first 50% of the syllabus, and the second mid-term examination shall be conducted for the remaining 50% of the syllabus.

c) First Assignment should be submitted before the conduct of the first mid-term examinations, and the Second Assignment should be submitted before the conduct of the second mid-term examinations. The Assignments shall be as specified by the concerned subject teacher.

d) The first mid-term examination Marks and first Assignment Marks shall make one set of CIE Marks, and the second mid-term examination Marks and second Assignment Marks shall make second set of CIE Marks; and the better of these two sets of marks shall be taken as the final marks secured by the Student towards Continuous Internal Evaluation in that Theory Subject.

9.3 For Practical Subjects, there shall be a Continuous Internal Evaluation (CIE) during the Semester for 30 internal marks, and 70 marks are assigned for Lab./Practical End Semester Examination (SEE). Out of the 30 marks for internals, day-to-day work in the laboratory shall be evaluated for 20 marks; and for the remaining 10 marks - two internal practical tests (each of 10 marks) shall be conducted by the concerned laboratory teacher and the better of these two tests is taken into account. The SEE for Practicals shall be conducted at the end of the Semester by Two Examiners appointed by Head of the Department.

9.4 For the Subjects having Design and/or Drawing, (such as Engineering Graphics, Engineering Drawing, Machine Drawing, Production Drawing Practice, and Estimation), the distribution shall be 30 marks for CIE (20 marks for day-to-day work, and 10 marks for internal tests) and 70 marks for SEE. There shall be two internal tests in a Semester and the better of the two shall be considered for the award of marks for internal tests.

9.5 The Industry oriented Mini-Project shall be submitted in a Report form, and a presentation of the same shall be made before a Committee, which evaluates it for 100 marks. The Committee shall consist of Head of the Department, the supervisor of Mini-Project, and a Senior Faculty Member of the Department. There shall be no internal marks for Industry oriented Mini-Project. The Mini-Project shall be evaluated in the IV Year I Semester.

9.6 Out of a total 200 marks allotted for the Project Work, 60 marks shall be for CIE (Continuous Internal Evaluation and 140 marks for the SEE (End Semester Viva-voce Examination). The Project Viva-voce shall be conducted by a Committee comprising of an External Examiner, Head of the Department, Senior faculty and Project Supervisor. Out of 60 marks allocated for CIE, 30 marks shall be awarded by the Project Supervisor (based on the continuous evaluation of student’s performance throughout the Project Work period), and the other 30 marks shall be awarded by a Departmental Committee consisting of Head of the Department and Project Supervisor, based on the work carried out and the presentation made by the Student at the time of Viva-voce Examination.

9.7 For NCC/ NSS/ NSO types of Courses, and/or any other Mandatory Non-Credit Course offered in a Semester, a ‘Satisfactory Participation Certificate’ shall be issued to the Student from the concerned authorities, only after securing ≥ 65% attendance in such a Course. No marks or Letter Grade shall be allotted for these activities.
(b) PG Part (M.Tech.)

9.8 The performance of a Student in each Semester shall be evaluated Subject-wise (irrespective of Credits assigned) with a maximum of 100 Marks for Theory or Practicals or Seminar or Drawing/Design or Comprehensive Viva-voce etc; These evaluations shall be based on 30% CIE (Continuous Internal Evaluation) and 70% SEE (Semester End Examination), and a Letter Grade corresponding to the % Marks obtained shall be given.

i) For Theory Subjects, CIE Marks shall comprise of - Mid-Term Examination Marks (for 25 Marks), and Assignment Marks (for 5 Marks).

ii) During the Semester, there shall be 2 Mid-Term examinations. Each Mid-Term examination shall be for 25 Marks ( 120 minutes duration). The better performance out of these two Mid-Term Examinations shall be considered for the award of 25 Marks.

9.9 For Practical Subjects, there shall be a Continuous Internal Evaluation (CIE) during the Semester for 30 Internal Marks, and 70 Marks are assigned for Lab./Practicals End Semester Examination (SEE). Out of the 30 Marks for Internals, day-to-day work assessment in the laboratory shall be evaluated for 20 Marks; and the performance in an internal Lab./Practical Test shall be evaluated for 10 marks. The SEE for Lab./Practicals shall be conducted at the end of the Semester by the concerned Laboratory Teacher and another faculty member of the same Department as assigned by the Head of the Department.

9.10 There shall be a Seminar Presentation in V Year I Semester. For the Seminar, the Student shall collect the information on a specialized topic, prepare a Technical Report and submit to the Department at the time of Seminar Presentation. The Seminar Presentation (along with the Technical Report) shall be evaluated by Two Faculty Members assigned by Head of the Department, for 100 Marks. There shall be no SEE or External Examination for Seminar.

9.11 Each Student shall appear for a Comprehensive Viva-Voce at the end of the V Year II Semester. The Comprehensive Viva-Voce shall be conducted by a Committee, consisting of three senior faculty members of Department nominated by the Head of the Department, and the performance evaluation shall be for 100 Marks. There are no Internal Marks for the Comprehensive Viva-voce.

9.12 i) The PGP Project shall start immediately after the completion of the IV Year II Semester, and shall continue through V Year I and II Semesters after approval of PRC. The Student shall carry out the literature survey, select an appropriate topic and submit a Project Proposal within 6 weeks (immediately after his IV Year II Semester End Examinations), for approval by the Project Review Committee (PRC). The PRC shall be constituted by the Head of Department, and shall consist of the Head of Department, Project Supervisor, and a Senior Faculty Member of the Department. The Student shall present his Project Work Proposal to the PRC (PRC-I Presentation), on whose approval he can ‘REGISTER’ for the PG Project’. After Registration, the Student shall carry out his work, and continually submit ‘a fortnightly progress report’ to his Supervisor throughout the Project period. The PRC will monitor the progress of the Project Work and review, through PRC-II and PRC-III Presentations – one at the end of the V Year I Semester, and one before the submission of M.Tech. Project Work Report/ Dissertation.

ii) After PRC-III presentation, the PRC shall evaluate the entire performance of the Student and declare the Project Report as ‘Satisfactory’ or ‘Unsatisfactory’. Every Project Work Report/ Dissertation (that has been declared ‘satisfactory’) shall undergo ‘Plagiarism Check’ as per the University/ College norms to ensure content plagiarism below a specified level of 30%, and to become acceptable for submission. In case of unacceptable plagiarism levels, the student shall resubmit the Project Work Report,
after carrying out the necessary modifications/ additions to his Project Work/ Report as per his Supervisor’s advice, within the specified time, as suggested by the PRC.

iii) If any Student could not be present for PRC-II at the scheduled time (after approval and registration of his Project Work at PRC-I), his submission and presentation at the PRC-III time (or at any other PRC specified dates) may be treated as PRC-II performance evaluation, and delayed PRC-III dates for him may be considered as per PRC recommendations. Any Student is allowed to submit his M.Tech. Project Dissertation ‘only after completion of 40 weeks from the date of approval/registration’ of his Project, and after obtaining all approvals from the PRC.

iv) A total of 200 Marks are allotted for the M.Tech. Project Work, ( out of which 100 Marks are allotted for internal evaluation and 100 Marks for external evaluation). For internal Evaluation of 100 marks, Project Supervisor shall evaluate for 60 marks based on the continuous Internal Evaluation(CIE) of the student’s performance and combined PRC-I, II & III performance evaluation will be for 40 marks ( to be awarded by PRC, as SEE).

9.13 i) The Student shall be allowed to submit his Project Dissertation, only on the successful completion of all the prescribed PG Subjects (Theory and Labs.), Seminar, Comprehensive Viva-voce etc. (securing B Grade or above), and after obtaining all approvals from PRC. In such cases, the M.Tech. Dissertations will be sent to an External Examiner nominated by the Principal of the College, on whose ‘approval’, the Student can appear for the M.Tech. Project Viva-voce Examination, which shall be conducted by a Board, consisting of the PG Project Supervisor, Head of the Department, and the External Examiner who adjudicate the M.Tech. Project Work and Dissertation. The Board shall jointly declare the Project Work Performance as ‘satisfactory’, or ‘unsatisfactory’; and in successful cases, the External Examiner shall evaluate the Student’s Project Work presentation and performance for 100 Marks (SEE).

ii) If the adjudication report of the External Examiner is ‘not favourable’, then the Student shall revise and resubmit his Dissertation after one Semester, or as per the time specified by the External Examiner and/ or the PRC. If the resubmitted report is again evaluated by the External Examiner as ‘not favourable’, then that Dissertation will be summarily rejected. Subsequent actions for such Dissertations may be considered, only on the specific recommendations of the External Examiner and/ or PRC.

iii) In cases, where the Board declared the Project Work Performance as ‘unsatisfactory’, the Student is deemed to have failed in the Project Viva-voce Examination, and he has to reappear for the Viva-voce Examination as per the Board recommendations. If he fails in the second Viva-voce Examination also, he will not be considered eligible for the Award of the Degree, unless he is asked to revise and resubmit his Project Work by the Board within a specified time period (within 5 years from the date of commencement of his I Year I Semester).

(c) PG Part (MBA)

10.1 Theory Subjects are evaluated for 100 marks, and Practicals / Lab. Subjects are also evaluated for 100 marks.

10.2 PG Summer Internship, Seminar and Comprehensive Viva-voce shall be evaluated for 100 marks each.

10.3. There shall be a PG Summer Internship, preferably in an industry, to be taken up during the vacation, immediately after the IV year II Semester End Examinations. The Internship Activity shall be submitted in a Report form, and the student shall also deliver a Seminar (based on the PG Summer Internship) before the MBA Project Evaluation Committee (PEC); both the Report and the Seminar shall be evaluated for 100 marks each by the PEC, at the beginning of the V Year I Semester. The PEC shall be constituted by the Head of Dept. or
Principal/Director of the College/School, and shall consist of the Head of the Department, the Supervisor of PG Summer Internship Program/Seminar/PG Project and a Senior Faculty Member of the Department. There shall be no internal marks for this PG Summer Internship Program.

10.4 For theory subjects, the distribution shall be 30 marks for Internal Evaluation and 70 marks for the End-Examination. For the award of the 30 Internal (sessional) marks for theory subjects, there shall be 2 internal examinations during the Semester, one at the middle of the Semester and the other immediately after the completion of instructions; each of which shall be evaluated for 25 marks, and the better of these two internals shall be considered for awarding the 25 sessional marks. The remaining 5 sessional marks, will be awarded based on the student’s performance in the Assignments.

10.5 i) Every PGP Student shall be required to execute his MBA Project, under the guidance of the Supervisor assigned to him by the Head of Department. The PGP Project shall start immediately after the completion of the V Year I Semester, and shall continue through V Year II Semesters. The Student shall carry out the literature survey, select an appropriate topic and submit a Project Proposal within 6 weeks (immediately after his V Year I Semester End Examinations), for approval by the Project Review Committee (PRC). The PRC shall be constituted by the Head of Department, and shall consist of the Head of Department, Project Supervisor, and a Senior Faculty Member of the Department. The Student shall present his Project Work Proposal to the PRC (PRC-I Presentation), on whose approval he can ‘REGISTER for the PG Project’. Every Student must compulsorily register for his MBA Project Work, within the 6 weeks of time-frame as specified above. After Registration, the Student shall carry out his work, and continually submit ‘a fortnightly progress report’ to his Supervisor throughout the Project period. The PRC will monitor the progress of the Project Work and review, through PRC-II and PRC-III Presentations – one at the end of the V Year II Semester, and one before the submission of MBA Project Work Report/Dissertation.

ii) After PRC-III presentation, the PRC shall evaluate the entire performance of the Student and declare the Project Report as ‘Satisfactory’ or ‘Unsatisfactory’. Every Project Work Report/ Dissertation (that has been declared ‘satisfactory’) shall undergo ‘Plagiarism Check’ as per the University/College norms to ensure content plagiarism below a specified level of 30%, and to become acceptable for submission. In case of unacceptable plagiarism levels, the student shall resubmit the Project Work Report, after carrying out the necessary modifications/additions to his Project Work/Report as per his Supervisor’s advice, within the specified time, as suggested by the PRC.

iii) If any Student could not be present for PRC-II at the scheduled time (after approval and registration of his Project Work at PRC-I), his submission and presentation at the PRC-III time (or at any other PRC specified dates) may be treated as PRC-II performance evaluation, and delayed PRC-III dates for him may be considered as per PRC recommendations. Any Student is allowed to submit his MBA Project Dissertation ‘only after completion of 24 weeks from the date of approval/registration’ of his Project, and after obtaining all approvals from the PRC.

iv) A total of 200 Marks are allotted for the MBA Project Work, (out of which 100 Marks are allotted for internal evaluation and 100 Marks for external evaluation). For internal Evaluation of 100 marks, Project Supervisor shall evaluate for 60 marks based on the continuous Internal Evaluation (CIE) of the student’s performance and combined PRC-I, II & III performance evaluation will be for 40 marks (to be awarded by PRC, as SEE).

10.6 i) The Student shall be allowed to submit his Project Dissertation, only on the successful completion of all the prescribed PG Subjects (Theory and Labs.), Seminar, Comprehensive Viva-voce etc. (securing B Grade or above), and after obtaining all approvals from PRC. In such cases, the MBA. Dissertations will be sent to an External Examiner nominated by the Principal of the College, on whose ‘approval’, the Student can appear for the MBA. Project Viva-voce Examination, which shall be conducted by a Board, consisting of the PG Project Supervisor, Head of the
Department, and the External Examiner who adjudicated the MBA Project Work and Dissertation. The Board shall jointly declare the Project Work Performance as ‘satisfactory’, or ‘unsatisfactory’; and in successful cases, the External Examiner shall evaluate the Student’s Project Work presentation and performance for 100 Marks (SEE).

ii) If the adjudication report of the External Examiner is ‘not favourable’, then the Student shall revise and resubmit his Dissertation after one Semester, or as per the time specified by the External Examiner and/or the PRC. If the resubmitted report is again evaluated by the External Examiner as ‘not favourable’, then that Dissertation will be summarily rejected. Subsequent actions for such Dissertations may be considered, only on the specific recommendations of the External Examiner and/or PRC.

iii) In cases, where the Board declared the Project Work Performance as ‘unsatisfactory’, the Student is deemed to have failed in the Project Viva-voce Examination, and he has to reappear for the Viva-voce Examination as per the Board recommendations. If he fails in the second Viva-voce Examination also, he will not be considered eligible for the Award of the Degree, unless he is asked to revise and resubmit his Project Work by the Board within a specified time period (within 5 years from the date of commencement of his 1 Year I Semester).

10.7 There shall be a Comprehensive Viva at the end of the V year II Semester, for the award of 100 marks. The Comprehensive Viva-Voce shall be conducted by the PRC, with the addition of one more Senior Faculty Member of the Department/School. The Comprehensive Viva is aimed to assess the student’s understanding in various subjects studied during the PG part of Dual Degree Program. There are no internal marks for the Comprehensive Viva.

11.0 Grading Procedure

11.1 Marks will be awarded to indicate the performance of each student in each Theory Subject, or Lab/Practicals, or Seminar, or Project, or Mini-Project, Minor Course etc., based on the % marks obtained in CIE + SEE (Continuous Internal Evaluation + Semester End Examination, both taken together) as specified in Item 9 above, and a corresponding Letter Grade shall be given.

11.2 As a measure of the student’s performance, a 10-point Absolute Grading System using the following Letter Grades (UGC Guidelines) and corresponding percentage of marks shall be followed …
(a) For UG

<table>
<thead>
<tr>
<th>% of Marks Secured (Class Intervals)</th>
<th>Letter Grade (UGC Guidelines)</th>
<th>Grade Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>80% and above (≥ 80% , ≤ 100%)</td>
<td>O (Outstanding)</td>
<td>10</td>
</tr>
<tr>
<td>Below 80% but not less than 70%</td>
<td>A+ (Excellent)</td>
<td>9</td>
</tr>
<tr>
<td>(≥ 70% , &lt; 80%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below 70% but not less than 60%</td>
<td>A (Very Good)</td>
<td>8</td>
</tr>
<tr>
<td>(≥ 60% , &lt; 70%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below 60% but not less than 55%</td>
<td>B+ (Good)</td>
<td>7</td>
</tr>
<tr>
<td>(≥ 55% , &lt; 60%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below 55% but not less than 50%</td>
<td>B (above Average)</td>
<td>6</td>
</tr>
<tr>
<td>(≥ 50% , &lt; 55%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below 50% but not less than 45%</td>
<td>C (Average)</td>
<td>5</td>
</tr>
<tr>
<td>(≥ 45% , &lt; 50%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below 45% but not less than 40%</td>
<td>P (Pass)</td>
<td>4</td>
</tr>
<tr>
<td>(≥ 40% , &lt; 45%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below 40% (&lt; 40%)</td>
<td>F (FAIL)</td>
<td>0</td>
</tr>
<tr>
<td>Absent</td>
<td>Ab</td>
<td>0</td>
</tr>
</tbody>
</table>

(b) For PG

<table>
<thead>
<tr>
<th>% of Marks Secured (Class Intervals)</th>
<th>Letter Grade (UGC Guidelines)</th>
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</tr>
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</tr>
<tr>
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<td>F (FAIL)</td>
<td>0</td>
</tr>
<tr>
<td>Absent</td>
<td>Ab</td>
<td>0</td>
</tr>
</tbody>
</table>

11.3 A student obtaining F Grade in any Subject shall be considered ‘failed’ and will be required to reappear as ‘Supplementary Candidate’ in the End Semester Examination (SEE), as and when offered. In such cases, his Internal Marks (CIE Marks) in those Subject(s) will remain same as those he obtained earlier.

11.4 A Letter Grade does not imply any specific % of Marks.

11.5 In general, a student shall not be permitted to repeat any Subject/ Course(s) only for the sake of ‘Grade Improvement’ or ‘SGPA/ CGPA Improvement’. However, he has to repeat all the Subjects/ Courses pertaining to that Semester, when he is detained (as listed in Items 8.8-8.9).
11.6 A student earns Grade Point (GP) in each Subject/ Course, on the basis of the Letter Grade obtained by him in that Subject/ Course (excluding Mandatory non-credit Courses). Then the corresponding ‘Credit Points’ (CP) are computed by multiplying the Grade Point with Credits for that particular Subject/ Course.

Credit Points (CP) = Grade Point (GP) \times \text{Credits} \quad \text{.... For a Course}

11.7 The Student passes the Subject/ Course only when he gets GP \geq \frac{4}{6} \text{ (P Grade or above)}.

11.8 The Semester Grade Point Average (SGPA) is calculated by dividing the Sum of Credit Points (\Sigma CP) secured from ALL Subjects/ Courses registered in a Semester, by the Total Number of Credits registered during that Semester. SGPA is rounded off to TWO Decimal Places. SGPA is thus computed as

\[
SGPA = \frac{\Sigma_{i=1}^{N} C_i G_i}{\Sigma_{i=1}^{N} C_i} \quad \text{.... For each Semester,}
\]

where \( i \) is the Subject indicator index (takes into account all Subjects in a Semester), \( N \) is the no. of Subjects ‘REGISTERED’ for the Semester (as specifically required and listed under the Course Structure of the parent Department), \( C_i \) is the no. of Credits allotted to the \( i \)th Subject, and \( G_i \) represents the Grade Points (GP) corresponding to the Letter Grade awarded for that \( i \)th Subject.

11.9 The Cumulative Grade Point Average (CGPA) is a measure of the overall cumulative performance of a student over all Semesters considered for registration. The CGPA is the ratio of the Total Credit Points secured by a student in ALL registered Courses in ALL Semesters, and the Total Number of Credits registered in ALL the Semesters. CGPA is rounded off to TWO Decimal Places. CGPA is thus computed from the I Year Second Semester onwards, at the end of each Semester, as per the formula

\[
CGPA = \frac{\Sigma_{j=1}^{M} C_j G_j}{\Sigma_{j=1}^{M} C_j} \quad \text{.... for all S Semesters registered}
\]

where \( M \) is the TOTAL no. of Subjects (as specifically required and listed under the Course Structure of the parent Department) the Student has ‘REGISTERED’ from the 1\(^{st}\) Semester onwards upto and inclusive of the Semester S (obviously \( M > N \)), \( j \) is the Subject indicator index (takes into account all Subjects from 1 to S Semesters), \( C_j \) is the no. of Credits allotted to the \( j \)th Subject, and \( G_j \) represents the Grade Points (GP) corresponding to the Letter Grade awarded for that \( j \)th Subject. After registration and completion of I Year I Semester however, the SGPA of that Semester itself may be taken as the CGPA, as there are no cumulative effects.

11.10 For Merit Ranking or Comparison Purposes or any other listing, ONLY the ‘ROUNDED OFF’ values of the CGPAs will be used.

11.11 For Calculations listed in Item 11.6 – 11.10, performance in failed Subjects/ Courses (securing F Grade) will also be taken into account, and the Credits of such Subjects/ Courses will also be included in the multiplications and summations. However, Mandatory Courses will not be taken into consideration.

11.12 Passing Standards:

i) A student shall be declared successful or ‘passed’ in a Semester, only when he gets a SGPA \geq 5.00/6.00 (at the end of that particular Semester); and a student shall be declared successful or ‘passed’ in the entire UGP, only when gets a CGPA \geq 5.00/6.00; subject to the condition that he secures a GP \geq 4/6 (P Grade or above) in every registered Subject/ Course in each Semester (during the entire UGP/PGP) for the Degree Award, as required.
ii) In spite of securing P Grade or above in some (or all) Subjects/Courses in any Semester, if a Student receives a SGPA < 5.00 / 6.00 and/or CGPA < 5.00/ 6.00 at the end of such a Semester, then he ‘may be allowed’ (on the ‘specific recommendations’ of the Head of the Department and subsequent approval from the Principal) -

(a) to go into the next subsequent Semester (subject to fulfilling all other attendance and academic requirements as listed under Items 7-8);

(b) to ‘improve his SGPA of such a Semester (and hence CGPA) to 5.00/ 6.00 or above’, by reappearing for ONE or MORE (as per Student’s choice) of the same Subject(s) / Course(s) in which he has secured P Grade(s) in that Semester, at the Supplementary Examinations to be held in the next subsequent Semester(s). In such cases, his Internal Marks (CIE Marks) in those Subject(s) will remain same as those he obtained earlier.

In these considerations, the newly secured Letter Grades will be recorded and taken into account for calculation of SGPA and CGPA, only if there is an improvement.

(iii) A Student shall be declared successful or ‘passed’ in any Non-Credit Subject/Course, if he secures a ‘Satisfactory Participation Certificate’ for that Mandatory Course.

11.13 After the completion of each Semester, a Grade Card or Grade Sheet (or Transcript) shall be issued to all the Registered Students of that Semester, indicating the Letter Grades and Credits earned. It will show the details of the Courses Registered (Course Code, Title, No. of Credits, Grade Earned etc.), Credits earned, SGPA, and CGPA.

12.0 Declaration of Results

12.1 Computation of SGPA and CGPA are done using the procedure listed in 11.6 – 11.10.

12.2 For Final % of Marks equivalent to the computed final CGPA, the following formula may be used …

% of Marks = (final CGPA – 0.5) x 10

13.0 Award of Degree

13.1 A Student who registers for all the specified Subjects/Courses as listed in the Course Structure, satisfies all the Course Requirements, and passes all the examinations prescribed in the entire IDP E&T Programme and secures the required number of 174 for UGP and 80 Credits for PGP (with CGPA ≥ 5.0/ 6.0), within 10 Academic Years from the Date of Commencement of the First Academic Year, shall be declared to have ‘QUALIFIED’ for the Award of the B.Tech.+M.Tech /MBA Degree(UGP and PGP) in the chosen Branch of Engineering as selected at the time of Admission.

13.2 A Student who qualifies for the Award of UG + PG Degree as listed in Item 13.1 shall be placed in the following Classes …

13.3 Students with final CGPA (at the end of the IDP) for both UGP/ PGP ≥ 8.00/ 7.75, and fulfilling the following conditions -

(i) should have passed all the Subjects/Courses in ‘FIRST APPEARANCE’ within the first 5 Academic Years (or 10 Sequential Semesters) from the Date of Commencement of his First Academic Year,

(ii) should have secured a CGPA ≥ 8.00/ 7.75, at the end of each of the 10 Sequential Semesters, starting from the I Year I Semester onwards,
(iii) should not have been detained or prevented from writing the End Semester Examinations in any Semester due to shortage of attendance or any other reason, shall be placed in ‘FIRST CLASS with DISTINCTION’.

Students having final CGPA (at the end of IDP) for both UGP/PGP ≥ 8.00/7.75, but not fulfilling the above conditions shall be placed in ‘FIRST CLASS’.

13.4 Students with final CGPA (at the end of the IDP) for UGP/PGP ≥ 6.50/6.75 but < 8.00/7.75, shall be placed in ‘FIRST CLASS’.

13.5 Students with final CGPA (at the end of the IDP) for both UGP/PGP ≥ 5.50/6.00 but < 6.50/6.75, shall be placed in ‘SECOND CLASS’.

13.6 All other Students who qualify for the Award of the Degree (as per Item 13.1), with final CGPA (at the end of the IDP) for UGP ≥ 5.00 but < 5.50, shall be placed in ‘PASS CLASS’.

13.7 A student with final CGPA (at the end of the IDP) for UGP < 5.00 will not be eligible for the Award of the B. Tech Degree.

13.8 A student with final CGPA (at the end of the IDP) for PGP < 6.00 will not be eligible for the Award of the M. Tech / MBA Degree.

13.9 Students fulfilling the conditions listed under Item 13.1 alone will be eligible candidates for - ‘University Rank’ and ‘Gold Medal’ considerations.

14.0 Withholding of Results

14.1 If the student has not paid fees to University/College at any stage, or has pending dues against his name due to any reason whatsoever, or if any case of indiscipline is pending against him, the result of the student may be withheld, and he will not be allowed to go into the next higher Semester. The Award or issue of the Degree may also be withheld in such cases.

15.0 Transitory Regulations

15.1 Student who has discontinued for any reason, or has been detained for want of attendance or lack of required credits as specified, or who has failed after having undergone the Degree Programme, may be considered eligible for readmission to the same Subjects/Courses (or equivalent Subjects/Courses, as the case may be), and same Professional Electives/Open Electives (or from set/category of Electives or equivalents suggested, as the case may be) as and when they are offered (within the time-frame of 10 years from the Date of Commencement of his I Year I Semester).

16.0 Student Transfers

16.1 There shall be no Branch transfers after the completion of Admission Process.

16.2 There shall be no transfer among the Constituent Colleges and Units of Jawaharlal Nehru Technological University Hyderabad.

17.0 Scope

i) Where the words “he”, “him”, “his”, occur in the write-up of regulations, they include “she”, “her”, “hers”.

ii) Where the words “Subject” or “Subjects”, occur in these regulations, they also imply “Course” or “Courses”.

iii) The Academic Regulations should be read as a whole, for the purpose of any interpretation.
iv) In case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Vice-Chancellor/Principal is final.

v) The College may change or amend the Academic Regulations, Course Structure or Syllabi at any time, and the changes or amendments made shall be applicable to all Students with effect from the dates notified by the College Authorities.

MALPRACTICE RULES

The following Malpractice rules are applicable to both Internal Examinations/SEE/Supplementary Examinations:

<table>
<thead>
<tr>
<th>Nature of Malpractices</th>
<th>Punishment</th>
</tr>
</thead>
<tbody>
<tr>
<td>If the candidate:</td>
<td></td>
</tr>
<tr>
<td>1 (a)</td>
<td></td>
</tr>
<tr>
<td>Possesses or keeps accessible in examination hall, any paper, notebook, programmable calculators, cell phones, pager, palm computers or any other form of material concerned with or related to the subject of the examination (theory or practical) in which he is appearing but has not made use of (material shall include any marks on the body of the candidate which can be used as an aid in the subject of the examination)</td>
<td>Expulsion from the examination hall and cancellation of the performance in that subject only.</td>
</tr>
<tr>
<td>1 (b)</td>
<td></td>
</tr>
<tr>
<td>Gives assistance or guidance or receives it from any other candidate orally or by any other body language methods or communicates through cell phones with any candidate or persons in or outside the exam hall in respect of any matter.</td>
<td>Expulsion from the examination hall and cancellation of the performance in that subject only of all the candidates involved. In case of an outsider, he will be handed over to the police and a case is registered against him.</td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Has copied in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to the subject of the examination (theory or practical) in which the candidate is appearing.</td>
<td>Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted to appear for the remaining examinations of the subjects of that Semester/year. The Hall Ticket of the candidate is to be cancelled.</td>
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<tr>
<td>3</td>
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<tr>
<td>Impersonates any other candidate in connection with the examination.</td>
<td>The candidate who has impersonated shall be expelled from examination hall. The candidate is also debarred and forfeits the seat. The performance of the original candidate who has been impersonated, shall be cancelled in all the subjects of the examination (including practicals and project work) already appeared and shall not be allowed to appear for examinations of the remaining subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. If the imposter is an outsider, he will be handed over to the police and a case is registered against him.</td>
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<tr>
<td>4</td>
<td>Smuggles in the Answer book or additional sheet or takes out or arranges to send out the question paper during the examination or answer book or additional sheet, during or after the examination.</td>
</tr>
<tr>
<td>5</td>
<td>Uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks.</td>
</tr>
<tr>
<td>6</td>
<td>Refuses to obey the orders of the Chief Superintendent / Assistant – Superintendent / any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer-in-charge or any person on duty in or outside the examination hall of any injury to his person or to any of his relations whether by words, either spoken or written or by signs or by visible representation, assaults the officer-in-charge, or any person on duty in or outside the examination hall or any of his relations, or indulges in any other act of misconduct or mischief which result in damage to or destruction of property in the examination hall or any part of the College campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination.</td>
</tr>
<tr>
<td>7</td>
<td>Leaves the exam hall taking away answer script or intentionally tears of the script or any part thereof inside or outside the examination hall.</td>
</tr>
<tr>
<td>8</td>
<td>Possess any lethal weapon or firearm in the examination hall.</td>
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<tr>
<td>9</td>
<td><strong>If student of the college, who is not a candidate for the particular examination or any person not connected with the college indulges in any malpractice or improper conduct mentioned in clause 6 to 8.</strong></td>
</tr>
<tr>
<td>10</td>
<td><strong>Comes in a drunken condition to the examination hall.</strong></td>
</tr>
<tr>
<td>11</td>
<td><strong>Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny.</strong></td>
</tr>
<tr>
<td>12</td>
<td><strong>If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the College / University for further action to award suitable punishment.</strong></td>
</tr>
</tbody>
</table>
### JNTUH COLLEGE OF ENGINEERING HYDERABAD
#### (AUTONOMOUS)

5 Year Integrated Dual Degree Program (IDP)
(B.Tech. + M.Tech. / MBA)

#### ELECTRICAL & ELECTRONICS ENGINEERING

#### COURSE STRUCTURE
(Applicable from the batch admitted from the Academic Year 2015-16 and onwards)

<table>
<thead>
<tr>
<th>I YEAR</th>
<th>I SEMESTER</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>S.No.</strong></td>
<td><strong>Group</strong></td>
</tr>
<tr>
<td>1</td>
<td>BS</td>
</tr>
<tr>
<td>2</td>
<td>ES</td>
</tr>
<tr>
<td>3</td>
<td>HS</td>
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<tr>
<td>4</td>
<td>ES</td>
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### During Summer Vacation between III and IV Years: Industry Oriented Mini Project
### IV YEAR

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2. Reliability Engineering  
3. High Voltage Engineering | 4  | 0  | 0  | 4       |
| 3    | PGC-I | Advance Power Electronics | 4  | 0  | 0  | 4       |
| 4    | PGE-I | 1. Machine Modeling and Analysis  
2. Reactive Power Compensation and Management  
3. Gas Insulated Systems | 4  | 0  | 0  | 4       |
| 5    | PGE-II | 1. Renewable Energy Sources  
2. Electric Traction Technologies  
3. Industrial Instrumentation | 4  | 0  | 0  | 4       |
| 6    | PGE-III | 1. Modern Control Theory  
2. Embedded Systems  
3. Microcontrollers and Applications | 4  | 0  | 0  | 4       |
| 7    | PC (UG) Lab | Digital Signal Processing Lab | 0  | 0  | 3  | 2       |
| 8    | PGC-I Lab | Power Electronics and Converters Simulation Lab | 0  | 0  | 4  | 2       |
| 9    | EAC (UG) | Mini Project | 2  |    |    |         |

**Total Credits** 30

### IV YEAR

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| 3    | PGE-IV | 1. Flexible AC Transmission Systems  
2. Switched Mode Power Supplies  
3. Energy Storage Technologies | 4  | 0  | 0  | 4       |
| 4    | PGC-II Lab | Power Electronics Drives Lab | 0  | 0  | 4  | 2       |
| 5    | PC (UG) | Major Project | 14 |    |    |         |

**Total Credits** 28
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Professional Elective-I (PE-I):
1. Computer Methods in Power Systems
2. Computer Organization
3. Special Machines

Professional Elective-II (PE-II):
1. Digital Control Systems
2. Optimization Techniques
3. VLSI Design
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### Course Structure for MBA

(Applicable from the batch admitted from the Academic Year 2015-16 and onwards)

#### IV Year - I Semester

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#### IV Year - II Semester

<table>
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#### V Year - I Semester

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#### V Year - II Semester

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## Core & Electives:

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<tr>
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<tr>
<td>PGC-II</td>
<td>Human Resource Management</td>
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<td>PGE-I</td>
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<td>PGC-III core</td>
<td>Research Methodology &amp; Statistical Analysis</td>
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<td>PGC-IV core</td>
<td>Business Law &amp; Regulation</td>
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<tr>
<td>PGE-II</td>
<td>Integrated Marketing Communications / Management of Industrial Relations / Security Analysis and Portfolio Management / Enterprise Resource Planning</td>
</tr>
<tr>
<td>PGC Lab</td>
<td>Statistical Analysis Lab using SPSS / Excel</td>
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<td>PGC –V Core</td>
<td>Strategic Management</td>
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<tr>
<td>PGE-III</td>
<td>Retailing Management / Compensation &amp; Reward Management / Strategic Investment and Financing Decisions/E-Business</td>
</tr>
<tr>
<td>PGE-IV</td>
<td>Services Marketing / Management of Change / International Financial Management/Cyber Security</td>
</tr>
<tr>
<td>PGE-V</td>
<td>International Marketing / Performance Management / Derivatives / Information System Control and Audit</td>
</tr>
</tbody>
</table>

*Students are advised to take prior approval from the Mentor of the Department of H&SS before selecting and finalizing the Electives.*
Pre Requisites: NIL

Objectives:
- To train the students thoroughly in mathematical concepts of ordinary differential equations and their applications.
- To prepare students for lifelong learning and successful careers using mathematical Concepts of differential and integral calculus, ordinary differential equations and vector calculus.
- To develop the skill pertinent to the practice of the mathematical concepts including the students abilities to formulate and modeling the problems, to think creatively and to synthesize information.

Outcomes:
At the end of the course, the student will be able to:
- become familiar with the application of differential and integral calculus, ordinary differential equations and vector calculus to engineering problems.
- attain the abilities to use mathematical knowledge to analyze, formulate and solve problems in engineering applications.

UNIT–I: Differential calculus (12 lectures)
Rolle’s Mean value Theorem – Lagrange’s Mean Value Theorem – Cauchy’s mean value Theorem – (all theorems without proof but with geometrical interpretations), verification of the Theorems and testing the applicability of these theorem to the given function.
Curve tracing – Equations given in Cartesian, polar and parametric forms.
Functions of several variables – Functional dependence- Jacobian- Maxima and Minima of functions of two variables with constraints and without constraints-Methood of Lagrange multipliers.

UNIT–II: Improper Integrals, Multiple Integration (12 lectures)
Gamma and Beta Functions –Relation between them, their properties – evaluation of improper integrals using Gamma / Beta functions.
Multiple integrals – double and triple integrals – change of order of integration- change of variables (polar, cylindrical and spherical) . Finding the area of a region using Double integration and volume of a region in space using triple integration.

UNIT–III: Vector Calculus (12 lectures)

UNIT–IV: First Order Ordinary Differential Equations (10 lectures)
Linear and exact differential equations
Applications of first order differential equations – Newton’s Law of cooling, Law of natural growth and decay, orthogonal trajectories and electrical circuits

UNIT–V: Higher Order Ordinary Differential Equations (10 lectures)
Linear, homogeneous and non- homogeneous differential equations of second and higher order with constant coefficients. Non-homogeneous term of the type $e^{ax}$, Sin ax, Cos ax, and $x^n$, $e^{ax}V(x)$, $x^nV(x)$. Method of variation of parameters. Applications: Bending of beams, Electrical circuits and simple harmonic motion.
Text books:
1) HIGHER ENGINEERING MATHEMATICS BY B S GREWAL, KHANNA PUBLICATIONS.
2) ENGINEERING MATHEMATICS BY ERWIN KREYSZIG, WIELY PUBLICATIONS.
3) VECTER ANALYSIS BY GHOSG & MAITY, NEW CENTRAL BOOK AGENCY.

References:
1) ENGINEERING MATHEMATICS BY SRIMANTAPAL & SUBODH C. BHUNIA, OXFORD UNIVERSITY PRESS.
2) ADVANCED ENGINEERING MATHEMATICS BY PETER V O'NEIL, CENGAGE LEARNING.
Prerequisites:
There are no prerequisites for this course, except that anyone who wants to learn C should have analytical skills and logical reasoning.

Objectives:
1. This course starts from the basics of computers and program development.
2. It covers various concepts of C programming language
3. It introduces searching and sorting algorithms
4. It provides an understanding of data structures such as stacks and queues.

Outcomes:
At the end of the course, the student will be able to:
1. Develop C programs for computing and real life applications using basic elements like control statements, arrays, functions, pointers and strings; and data structures like stacks, queues and linked lists.
2. Implement searching and sorting algorithms

UNIT - I

Introduction to C Language – Background, Simple C programs, Identifiers, Basic data types, Variables, Constants, Input / Output, Operators, Expressions, Precedence and Associatively, Expression Evaluation, Type conversions, Bit wise operators, Statements, Simple C Programming examples.

UNIT – II
Statements – if and switch statements, Repetition statements – while, for, do-while statements, Loop examples, other statements related to looping – break, continue, go to, Simple C Programming examples.

Designing Structured Programs- Functions, basics, user defined functions, inter function communication, Scope, Storage classes-auto, register, static, extern, scope rules, type qualifiers, recursion- recursive functions, Preprocessor commands, example C programs

UNIT – III
Arrays and Strings – Concepts, using arrays in C, inter function communication, array applications, two – dimensional arrays, multidimensional arrays, C program examples. Concepts, C Strings, String Input / Output functions, arrays of strings, string manipulation functions, string / data conversion, C program examples.

Pointers – Introduction (Basic Concepts), Pointers for inter function communication, pointers to pointers, compatibility, memory allocation functions, array of pointers, programming applications, pointers to void, pointers to functions, command –line arguments.

UNIT - IV
Derived types – Structures – Declaration, definition and initialization of structures, accessing structures, nested structures, arrays of structures, structures and functions, pointers to structures, self referential structures, unions, typedef, bit fields, enumerated types, C programming examples.

Input and Output – Concept of a file, streams, standard input / output functions, formatted input / output functions, text files and binary files, file input / output operations, file status functions (error handling), C program examples.
UNIT – V

Sorting and Searching selection sort, bubble sort, insertion sort, linear and binary search methods.

Data Structures – Introduction to Data Structures, abstract data types, Linear list – singly linked list implementation, insertion, deletion and searching operations on linear list, Stacks-Operations, array and linked representations of stacks, stack applications, Queues-operations, array and linked representations.

TEXT BOOKS:
3. The C Programming Language, B.W. Kernighan and Dennis M.Ritchie, PHI/Pearson Education

REFERENCES:
6. C Programming & Data Structures,E.Balagurusamy,TMH.
7. C Programming & Data Structures, P. Dey, M Ghosh R Thereja, Oxford University Press
ENGLISH

1. INTRODUCTION:

In view of the growing importance of English as a tool for global communication and the consequent emphasis on training students to acquire communicative competence, the syllabus has been designed to develop linguistic and communicative competencies of Engineering students. The prescribed books and the exercises are meant to serve broadly as students’ handbooks.

In the English classes, the focus should be on the skills of reading, writing, listening and speaking and for this the teachers should use the text prescribed for detailed study. For example, the students should be encouraged to read the texts/selected paragraphs silently. The teachers can ask comprehension questions to stimulate discussion and based on the discussions students can be made to write short paragraphs/essays etc.

The text for non-detailed study is for extensive reading/reading for pleasure. Hence, it is suggested that they read the topics selected for discussion on their own in the class. The time should be utilized for working out the exercises given after each section, as also for supplementing the exercises with authentic materials of a similar kind for example, from newspaper articles, advertisements, promotional material, etc. However, the stress in this syllabus is on skill development, fostering ideas and practice of language skills.

2. OBJECTIVES:

a. To improve the language proficiency of the students in English with emphasis on LSRW skills.
b. To equip the students to study academic subjects more effectively using the theoretical and practical components of the English syllabus.
c. To develop the study skills and communication skills in formal and informal situations.

LEARNING OUTCOMES:

1. Use of English Language - written and spoken.
2. Enrichment of comprehension and fluency

SYLLABUS:

Listening Skills:

Objectives
1. To enable students develop their listening skills so that they may appreciate the role in the LSRW skills approach to language and improve their pronunciation
2. To equip students with necessary training in listening, so that they can comprehend the speech of people of different backgrounds and regions

Students should be given practice in listening to the sounds of the language, to be able to recognize them, to distinguish between them, to mark stress and recognize and use the right intonation in sentences.

- Listening for general content
- Listening to fill up information
- Intensive listening
- Listening for specific information
Speaking Skills:

Objectives
1. To make students aware of the role of speaking in English and its contribution to their success.
2. To enable students express themselves fluently and appropriately in social and professional contexts.
   - Oral practice
   - Describing objects/situations/people
   - Role play – Individual/Group activities (Using exercises from the five units of the prescribed text: Skills Annexe–Functional English for Success)
   - Just A Minute (JAM) Sessions.

Reading Skills:

Objectives
1. To develop an awareness in the students about the significance of silent reading and comprehension.
2. To develop the ability of students to guess the meanings of words from context and grasp the overall message of the text, draw inferences, etc.
   - Skimming the text
   - Understanding the gist of an argument
   - Identifying the topic sentence
   - Scanning
   - Inferring lexical and contextual meaning
   - Understanding discourse features
   - Recognizing coherence/sequencing of sentences

NOTE: The students will be trained in reading skills using the prescribed text for detailed study. They will be examined in reading and answering questions using ‘unseen’ passages which may be taken from authentic texts, such as magazines/newspaper articles.

Writing Skills:

Objectives
1. To develop an awareness in the students about writing as an exact and formal skill
2. To equip them with the components of different forms of writing, beginning with the lower order ones.
   - Writing sentences
   - Use of appropriate vocabulary
   - Paragraph writing
   - Coherence and cohesiveness
   - Narration / description
   - Note Making
   - Formal and informal letter writing
   - Describing graphs using expressions of comparison

TEXTBOOKS PRESCRIBED:
In order to improve the proficiency of the student in the acquisition of the four skills mentioned above, the following texts and course content, divided into Five Units, are prescribed:

For Detailed study: First Textbook: “Skills Annexe -Functional English for Success”, Published by Orient Black Swan, Hyderabad

For Non-detailed study
Second Textbook “Epitome of Wisdom”, Published by Maruthi Publications, Hyderabad.
- The course content and study material is divided into Five Units.
Unit –I

1. Chapter entitled ‘Wit and Humour’ from ‘Skills Annexe -Functional English for Success’, Published by Orient Black Swan, Hyderabad.
2. Chapter entitled ‘Mokshagundam Visvesvaraya’ from “Epitome of Wisdom”, Published by Maruthi Publications, Hyderabad.

L - Listening for Sounds, Stress and Intonation
S - Greeting and Taking Leave, Introducing Oneself and Others (Formal and Informal Situations)
R - Reading for Subject/ Theme- The Palm Islands from Epitome of Wisdom is for Reading Comprehension
W - Writing Paragraphs
G - Types of Nouns and Pronouns
V - Homonyms, Homophones & Homographs

Unit –II

1. Chapter entitled “Cyber Age” from “Skills Annexe -Functional English for Success” Published by Orient Black Swan, Hyderabad.
2. Report Writing (First & Second Textbooks)
   L - Listening for themes and facts
   S - Apologizing, interrupting, requesting and making polite conversation
   R - Reading for theme and gist- The 1 Thing Every Business Executive Must Understand about Social Media by Dave Kerpen from Skills Annexe is for Reading Comprehension
   W - Describing people, places, objects, events
   G - Verb forms
   V - Noun, Verb, Adjective and Adverb

Unit –III

1. Chapter entitled ‘Risk Management’ from “Skills Annexe -Functional English for Success” Published by Orient Black Swan, Hyderabad.
   L - Listening for main points and sub-points for note taking
   S - Giving instructions and directions; Speaking of hypothetical situations
   R - Reading for details- Sivakasi: Who to Blame for the Frequent Fire Accidents in India’s Largest Fireworks Industry Hub? by Amrutha Gayathri from Skills Annexe & Forensic Science from Epitome of Wisdom are for Reading Comprehension
   W - Note-making, Information transfer, Punctuation
   G - Present tense
   V - Synonyms and Antonyms

Unit –IV

1. Letter Writing – Writing formal letters, letter of application along with curriculum vitae (First & Second Textbooks)
2. Chapter entitled ‘The Last Leaf’ from “Epitome of Wisdom”, Published by Maruthi Publications, Hyderabad.
   L - Listening for specific details and information
   S - Narrating, expressing opinions and telephone interactions
   R - Reading for specific details and information- What I Cherish Most by V. S. Srinivasa Sastri from Skills Annexe & Choose How to Start Your Day from Epitome of Wisdom are for Reading Comprehension
   W - Writing e-mails
   G - Past and Future tenses
   V - Vocabulary - Idioms and Phrasal verbs
Unit –V

1. Chapter entitled ‘Sports and Health’ from “Skills Annexe -Functional English for Success” Published by Orient Black Swan, Hyderabad
2. Chapter entitled ‘The Convocation Speech’ by N.R. Narayanmurthy’ from “Epitome of Wisdom”, Published by Maruthi Publications, Hyderabad

L - Critical Listening and Listening for speaker’s tone/ attitude
S - Group discussion and Making presentations
R - Critical reading, reading for reference - Benefits of Physical Activity from Skills Annexe & What is meant by Entrepreneurship? from Epitome of Wisdom are for Reading Comprehension
W - Project proposals; Project Reports and Research Papers
G - Adjectives, Prepositions and Concord
V - Collocations and Technical vocabulary, Using words appropriately

Exercises from the texts not prescribed shall be used for classroom tasks.

REFERENCES:

2. Murphy’s English Grammar with CD, Murphy, Cambridge University Press.
4. Technical Communication, Meenakshi Raman, Oxford University Press
5. Practical English Usage, Michael Swan, Oxford University Press
12. Everyday Dialogues in English, Robert J. Dixson, Prentice Hall India Pvt Ltd.,
14. Basic Vocabulary Edgar Thorpe & Showick Thorpe, Pearson Education
15. An Interactive Grammar of Modern English, Shivendra K. Verma and Hemlatha Nagarajan , Frank Bros & CO

******
Pre-requisites: Nil

Course objectives:
• To provide basic concepts in engineering drawing.
• To impart knowledge about standard principles of orthographic projection of objects.
• To draw sectional views and pictorial views of solids.

Outcomes:
At the end of the course, the student will be able to:
• Preparing working drawings to communicate the ideas and information.
• Read, understand and interpret engineering drawings.

UNIT – I
INTRODUCTION TO ENGINEERING DRAWING :

UNIT- II
ORTHOGRAPHIC PROJECTIONS:

UNIT – III
Projections of Regular Solids – Auxiliary Views.

UNIT – IV
Sections or Sectional views of Right Regular Solids – Prism, Cylinder, Pyramid, Cone – Auxiliary views – Sections of Sphere. Development of Surfaces of Right Regular Solids – Prism, Cylinder, Pyramid and Cone

UNIT – V
ISOMETRIC PROJECTIONS :

TEXT BOOKS:
1. Engineering Drawing N.D. Bhatt / Charotar

REFERENCE BOOKS:
1. A Text Book of Engineering Drawing / Dhawan R K / S. Chand
JNTUH COLLEGE OF ENGINEERING HYDERABAD

IDP (B.Tech. EEE & M.Tech. /MBA) I Year I-Sem

ENGINEERING MECHANICS

Prerequisites: Nil

Objectives:
During this course, students should develop the ability to:

- Work comfortably with basic engineering mechanics concepts required for analyzing static structures.
- Identify an appropriate structural system to studying a given problem and isolate it from its environment.
- Model the problem using good free-body diagrams and accurate equilibrium equations.
- Identify and model various types of loading and support conditions that act on structural systems.
- Apply pertinent mathematical, physical and engineering mechanical principles to the system to solve and analyze the problem.
- Understand the meaning of centers of gravity (mass)/centroids and moments of Inertia using integration methods.
- Communicate the solution to all problems in an organized and coherent manner and elucidate the meaning of the solution in the context of the problem.

Outcomes:
At the end of the course, the student will be able to:

- solve problems dealing with forces in a plane or in space and equivalent force Systems.
- solve beam and cable problems and understand distributed force systems.
- solve friction problems and determine moments of Inertia and centroid using integration methods.
- understand and know how to solve three-dimension force and moment problems.
- understand and know how to use vector terminology.

UNIT – I

UNIT – II

UNIT – III
MOMENT OF INERTIA: Moment of Inertia of Areas and Masses - Transfer Formula for Moments of Inertia - Moment of inertia of composite areas and masses.

UNIT – IV

UNIT – V
TEXT BOOKS:

REFERENCES:
1. Engineering Mechanics (Statics and Dynamics) by Hibbler; Pearson Education.
COMPUTER PROGRAMMING & DATA STRUCTURES LAB

Week 1:
1. Write a C program to find the sum of individual digits of a positive integer.
2. Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate the first n terms of the sequence.
3. Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.
4. Write a C program to find the roots of a quadratic equation.

Week 2:
5. Write a C program to find the factorial of a given integer.
6. Write a C program to find the GCD (greatest common divisor) of two given integers.
7. Write a C program to solve Towers of Hanoi problem.
8. Write a C program, which takes two integer operands and one operator from the user, performs the operation and then prints the result. (Consider the operators +,-,*, /, % and use Switch Statement)

Week 3:
9. Write a C program to find both the largest and smallest number in a list of integers.
10. Write a C program that uses functions to perform the following:
    i) Addition of Two Matrices
    ii) Multiplication of Two Matrices

Week 4:
11. Write a C program that uses functions to perform the following operations:
    i) To insert a sub-string into a given main string from a given position.
    ii) To delete n Characters from a given position in a given string.
12. Write a C program to determine if the given string is a palindrome or not
13. Write a C program that displays the position or index in the string S where the string T begins, or – 1 if S doesn’t contain T.
14. Write a C program to count the lines, words and characters in a given text.

Week 5:
15. Write a C program to generate Pascal’s triangle.
16. Write a C program to construct a pyramid of numbers.
17. Write a C program to read in two numbers, x and n, and then compute the sum of this geometric progression:
   \[1+x+x^2+\ldots+1+x^n\]
   For example: if n is 3 and x is 5, then the program computes 1+5+25+125.
   Print x, n, the sum
   Perform error checking. For example, the formula does not make sense for negative exponents – if n is less than 0. Have your program print an error message if n<0, then go back and read in the next pair of numbers of without computing the sum. Are any values of x also illegal? If so, test for them too.

Week 6:
18. 2’s complement of a number is obtained by scanning it from right to left and complementing all the bits after the first appearance of a 1. Thus 2’s complement of 11100 is 00100. Write a C program to find the 2’s complement of a binary number.
19. Write a C program to convert a Roman numeral to its decimal equivalent.
Week 7:
20. Write a C program that uses functions to perform the following operations:
   i) Reading a complex number
   ii) Writing a complex number
   iii) Addition of two complex numbers
   iv) Multiplication of two complex numbers
   (Note: represent complex number using a structure.)

Week 8:
21. i) Write a C program which copies one file to another.
    ii) Write a C program to reverse the first n characters in a file.
   (Note: The file name and n are specified on the command line.)
22. i) Write a C program to display the contents of a file.
    ii) Write a C program to merge two files into a third file (i.e., the contents of the first file followed
        by those of the second are put in the third file)

Week 9:
23. Write a C program that uses functions to perform the following operations on singly linked list:
   i) Creation
   ii) Insertion
   iii) Deletion
   iv) Traversal

Week 10:
24. Write C programs that implement stack (its operations) using
   i) Arrays
   ii) Pointers
25. Write C programs that implement Queue (its operations) using
   i) Arrays
   ii) Pointers

Week 11:
26. Write a C program that implements the following sorting methods to sort a given list of integers in
    ascending order
   i) Bubble sort
   ii) Selection sort

Week 12:
27. Write C programs that use both recursive and non recursive functions to perform the following
    searching operations for a Key value in a given list of integers:
   i) Linear search
   ii) Binary search
JNTUH COLLEGE OF ENGINEERING HYDERABAD

IDP (B.Tech. EEE & M.Tech. /MBA) I Year I-Sem

L T P C
0 0 3 2

ENGLISH LANGUAGE COMMUNICATION SKILLS LAB

The Language Lab focuses on the production and practice of sounds of language and familiarises the students with the use of English in everyday situations and contexts.

Objectives
- To facilitate computer-aided multi-media instruction enabling individualized and independent language learning
- To sensitize the students to the nuances of English speech sounds, word accent, intonation and rhythm
- To bring about a consistent accent and intelligibility in their pronunciation of English by providing an opportunity for practice in speaking
- To improve the fluency in spoken English and neutralize mother tongue influence
- To train students to use language appropriately for interviews, group discussion and public speaking

Learning Outcomes
- Better Understanding of nuances of language through audio-visual experience and group activities
- Neutralization of accent for intelligibility
- Speaking with clarity and confidence thereby enhancing employability skills of the students

SYLLABUS

English Language Communication Skills Lab shall have two parts:
- a. Computer Assisted Language Learning (CALL) Lab
- b. Interactive Communication Skills (ICS) Lab

The following course content is prescribed for the English Language Communication Skills Lab

Exercise – I
CALL Lab: Introduction to Phonetics – Speech Sounds – Vowels and Consonants
ICS Lab: Ice-Breaking activity and JAM session
Articles, Prepositions, Word formation- Prefixes & Suffixes, Synonyms & Antonyms

Exercise – II
CALL Lab: Structure of Syllables - Past Tense Marker and Plural Marker – Weak Forms and Strong Forms - Consonant Clusters.
Concord (Subject in agreement with verb) and Words often misspelt- confused/misused

Exercise - III
CALL Lab: Minimal Pairs- Word accent and Stress Shifts- Listening Comprehension.
ICS Lab: Descriptions- Narrations- Giving Directions and guidelines.
Sequence of Tenses, Question Tags and One word substitutes.

Exercise – IV
CALL Lab: Intonation and Common errors in Pronunciation.
ICS Lab: Extempore- Public Speaking
Active and Passive Voice, –Common Errors in English, Idioms and Phrases

Exercise – V
CALL Lab: Neutralization of Mother Tongue Influence and Conversation Practice
ICS Lab: Information Transfer- Oral Presentation Skills
Reading Comprehension and Job Application with Resume preparation.

Minimum Requirement of infrastructural facilities for ELCS Lab:

1. Computer Assisted Language Learning (CALL) Lab:
The Computer aided Language Lab for 40 students with 40 systems, one master console, LAN facility and English language software for self-study by learners.

System Requirement (Hardware component):
Computer network with Lan with minimum 60 multimedia systems with the following specifications:
   i) P – IV Processor
      a) Speed – 2.8 GHZ
      b) RAM – 512 MB Minimum
      c) Hard Disk – 80 GB
   ii) Headphones of High quality

2. Interactive Communication Skills (ICS) Lab:
The Interactive Communication Skills Lab: A Spacious room with movable chairs and audio-visual aids with a Public Address System, a T. V., a digital stereo–audio & video system and camcorder etc.

Suggested Software:
- Cambridge Advanced Learners’ English Dictionary with CD.
- Grammar Made Easy by Darling Kindersley
- Punctuation Made Easy by Darling Kindersley
- Clarity Pronunciation Power – Part I
- Clarity Pronunciation Power – part II
- Oxford Advanced Learner’s Compass, 8th Edition
- DELTA’s key to the Next Generation TOEFL Test: Advanced Skill Practice.
- Lingua TOEFL CBT Insider, by Dreamtech
- TOEFL & GRE (KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)
- English in Mind (Series 1-4), Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge
- Raman, M & Sharma, S. 2011. Technical Communication, OUP

SUGGESTED READING:
4. Sasi Kumar, V & Dhamija, P.V. How to Prepare for Group Discussion and Interviews. Tata McGraw Hill
10. A textbook of English Phonetics for Indian Students by T. Balasubramanian (Macmillan)
DISTRIBUTION AND WEIGHTAGE OF MARKS

**English Language Laboratory Practical Examination:**

1. The practical examinations for the English Language Laboratory shall be conducted as per the University norms prescribed for the core engineering practical sessions.
2. For the Language lab sessions, there shall be a continuous evaluation during the year for 30 sessional marks and 70 semester-end Examination marks. Of the 30 marks, 20 marks shall be awarded for day-to-day work and 10 marks to be awarded by conducting Internal Lab Test(s). The year-end Examination shall be conducted by the teacher concerned with the help of another member of the staff of the same department of the same institution.

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JNTUH COLLEGE OF ENGINEERING HYDERABAD

IDP (B.Tech. EEE & M.Tech. /MBA) I Year I-Sem

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ENGINEERING WORKSHOP

Pre-requisites: Practical skill

Objectives:

- To Study of different hand operated power tools, uses and their demonstration.
- To gain a good basic working knowledge required for the production of various engineering products.
- To provide hands on experience about use of different engineering materials, tools, equipments and processes those are common in the engineering field.
- To develop a right attitude, team working, precision and safety at work place.
- It explains the construction, function, use and application of different working tools, equipment and machines.
- To study commonly used carpentry joints.
- To have practical exposure to various welding and joining processes.
- Identify and use marking out tools, hand tools, measuring equipment and to work to prescribed tolerances.
- To understanding the computer hardware and practice the Assembly of computer parts.
- To practice the process of Installation of operating system windows.

Outcomes:

At the end of the course, the student will be able to:

- Better understanding the process of assembly of computer parts and installation of different software’s.
- Study and practice on machine tools and their operations
- Practice on manufacturing of components using workshop trades including plumbing, fitting, carpentry, foundry, house wiring and welding.
- Identify and apply suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiseling.
- Apply basic electrical engineering knowledge for house wiring practice.

I. TRADES FOR EXERCISES :
(Any six trades from the following with minimum of two exercises in each trade)
1. Carpentry
2. Fitting
3. Tin-Smithy
4. Black Smithy
5. House-wiring
6. Foundry
7. Plumbing

II. Trades for Demonstration & Exposure
1. Demonstration of power tools & wiring
2. Welding
3. Machine Shop

III. IT Workshop I: Computer hardware, identification of parts, Disassembly, Assembly of computer to working condition, simple diagnostic exercises.

IT Workshop II: Installation of operating system windows and linux simple diagnostic exercises.
JNTUH COLLEGE OF ENGINEERING HYDERABAD

IDP (B.Tech. EEE & M.Tech. /MBA) I Year II-Sem

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MATHEMATICS – II
(Common to all Branches)

Pre Requisites: NIL

Objectives:

• Our emphasis will be more on conceptual understanding and application of Fourier series, Fourier, Z and Laplace transforms and solution of partial differential equations.

Outcomes:

At the end of the course, the student will be able to:

• gains the knowledge to tackle the engineering problems using the concepts of Fourier series, various transforms and partial differential equations.

UNIT–I: Linear ODE with variable coefficients and series solutions (8 lectures)
Equations reducible to constant coefficients-Cauchy’s and Legendre’s differential equations. Motivation for series solutions, Ordinary point and Regular singular point of a differential equation, Transformation of non-zero singular point to zero singular point. Series solutions to differential equations around zero, Frobenius Method about zero.

UNIT–II: Special Functions (8 lectures)
Bessel’s Differential equation, Bessel functions properties: – Recurrence relations, Orthogonality, Generating function, Trigonometric expansions involving Bessel functions.

UNIT–III: Laplace Transform (8 lectures)
Definition of Integral transform. Domain of the function and Kernel for the Laplace transforms, Laplace transform of standard functions, first shifting Theorem, Laplace transform of functions when they are multiplied or divided by “t”. Laplace transforms of derivatives and integrals of functions. – Unit step function – second shifting theorem – Dirac’s delta function, Periodic function – Inverse Laplace transform by Partial fractions( Heaviside method) Inverse Laplace transforms of functions when they are multiplied or divided by “s”, Inverse Laplace Transforms of derivatives and integrals of functions, Convolution theorem-solving differential equations by Laplace transforms

UNIT – IV: Fourier series and Fourier Transforms (8 lectures)
Definition of periodic function. Fourier expansion of periodic functions in a given interval of length, 2\pi, Determination of Fourier coefficients – Fourier series of even and odd functions – Fourier series in an arbitrary interval – even and odd periodic continuation – Half-range Fourier sine and cosine expansions.

UNIT-V: Partial Differential Equations (10 lectures)
Introduction and Formation of partial differential equation by elimination of arbitrary constants and arbitrary functions, solutions of first order linear (Lagrange) equation and non-linear equations (Charpit’s method).
Method of separation of variables for second order equations. Applications of Partial differential equations- one dimensional wave equation., Heat equation.

Text books:
1) HIGHER ENGINEERING MATHEMATICS BY B S GREWAL, KHANNA PUBLICATIONS.
2) ENGINEERING MATHEMATICS BY ERWIN KREYSZIG, WIELY PUBLICATIONS

References:
1) ENGINEERING MATHEMATICS BY SRIMANTAPAL & SUBODH C. BHUNIA, OXFORD UNIVERSITY PRESS.
2) ADVANCED ENGINEERING MATHEMATICS BY PETER V O’NEIL, CENGAGE LEARNING
BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

Pre-requisite: Nil

Objectives:

• To introduce the concept of electrical circuits and its components.
• To introduce the characteristics of various electronic devices.
• To impart the knowledge of various configurations, characteristics and applications of electrical & electronic components.

Outcomes:

At the end of the course, the student will be able to:

• To analyze and solve electrical circuits using network laws and theorems.
• To design & analyse various circuits using electronic components viz. diodes, transistors & other special purpose devices.

UNIT- I ELECTRICAL and SINGLE PHASE AC CIRCUITS


UNIT- II RESONANCE and NETWORK THEOREMS

Resonance: Series resonance and Parallel resonance circuits, concept of bandwidth and Q factor, Locus Diagrams for RL, RC and RLC Combinations for Various Parameters. Network Theorems: Thevenin’s, Norton’s, Maximum Power Transfer, Superposition, Reciprocity, Tellegen’s, Millman’s and Compensation theorems for DC and AC excitations.

UNIT- III P-N JUNCTION DIODE & DIODE CIRCUITS

P-N Junction Diode: Diode equation, Energy Band diagram, Volt-Ampere characteristics, Temperature dependence, Ideal versus practical, Static and dynamic resistances, Equivalent circuit, Load line analysis, Diffusion and Transition Capacitances. Rectifiers and Filters: P-N junction as a rectifier - Half Wave Rectifier, Ripple Factor - Full Wave Rectifier, Bridge Rectifier, Harmonic components in Rectifier Circuits, Filters – Inductor Filters, Capacitor Filters, L- section Filters, π- section Filters.

UNIT- IV BIPOLAR JUNCTION TRANSISTOR


UNIT- V JUNCTION FIELD EFFECT TRANSISTOR & SPECIAL PURPOSE DEVICES

TEXT BOOKS:

REFERENCES:
1. Introduction to Electronic Devices and Circuits-Rober T. Paynter, Pearson Education.
6. Network Theory by Sudhakar, Shyam Mohan Palli, TMH.
Prerequisites: Nil

Course Objectives:
The course primarily aims at understanding the behavior of matter in the condensed state and tries to explore the causes with reference to micro level mechanism of the solid matter. The objective of the first chapter is to study the micro level behavior of the quantum particles of the matter and their nature as wave and particle and hence to estimate the statistics of the phenomenon arising out of their nature of existence. The second chapter aims at to assess the draw backs of the free electron theory leading to the introduction of the Band Theory of Solids. In the third, fourth, fifth, sixth, seventh and tenth chapters the different natures of the solid matter are taken as the main task discuss. In the eighth chapter, it is expected to understand the basic principles behind the coherent artificial light source (LASER) with reference to their construction, mechanism, operation and classification etc. The ninth chapter is explicitly aimed at to study an advanced communication system presently ruling the world throughout i.e. Fiber Optic communication system.

Outcomes:
The understanding of properties of matter is an essential part to utilize them in various applications in different walks of life. In most of the cases, the behavior of matter as solid material body purely depends upon the internal micro level nature, structure and characters. By studying first few chapters the students as graduates can acquire the knowledge of the connection between the micro level behavior of the matter as fundamental particles and the macro level real time characters of the material bodies. The quantum mechanism in phenomena can best be understood and analyzed by estimating the statistics of the phenomena. The study of chapters on Laser and fiber optics forms basis for understanding an advanced communication system. Other chapters establish a strong foundation on the different kinds of characters of several materials and pave a way for them to use in at various technical and engineering applications.

UNIT-I


UNIT-II

UNIT-III
5. Dielectric Properties: Basic definitions, Electronic, Ionic (Quantitative) and Orientation Polarizations(Qualitative) and Calculation of Polarizabilities - Internal Fields in Solids, Clausius - Mossotti Equation, Piezo-electricity, Pyro- electricity and Ferro - electricity.

7. **Superconductivity**: Introduction to Superconductivity, Properties of Superconductors, Meissner Effect, BCS theory, Type-I and Type –II Superconductors, Magnetic Levitation and Applications of Superconductors.

**UNIT-IV**


**UNIT-V**

10. **Nanotechnology**: Origin of Nanotechnology, Nano Scale, Surface to Volume Ratio, Quantum Confinement, Bottom-up Fabrication: Sol-Gel, Precipitation, Combustion Methods; Top-Down Fabrication: Chemical Vapor Deposition, Physical Vapor Deposition, Characterization Techniques(XRD, SEM &TEM) and Applications of Nanotechnology.

**Text books:**
2. Introduction to Solid State Physics by Charles Kittel, Wiley India Pvt Ltd, 7th Edition
4. Solid State Physics by A.J. Dekker, MACMILLAN INDIA LTD.

**References:**
1. Modern Engineering Physics by Dr.K.Vijaya Kumar, Dr. S. Chandralingam, S.CHAND & COMPANY LTD
4. Introduction to Nanotechnology by Charles P.Poole, Jr.Frank Jownes, John Wiley & sons
Prerequisites: Nil

Course objectives:
To inculcate the basic concepts of Chemistry required to make the student to develop the innovative materials for the development of technological arena. The latest techniques and skills for the treatment of raw water, facing the endanger of corrosion of structures and producing the polymers in varied applications.

Outcomes:
At the end of the course, the student will be able to:

- gain knowledge of various skills to control the corrosion of huge structures. The analysis of raw water and its treatment to provide soft water. The technologies to result polymers with multiple applications are understood. The principles of electrochemistry and batteries are clearly understood by the students.

Unit-I: Water and its treatment

Unit-II: Electrochemistry and corrosion


Unit-III: High Polymers
Definition – Classification of polymers with examples – Types of polymerisation – Chain growth (free radical addition mechanism), step growth polymerization, Plastics, fibres and elastomers - definition and characteristics. Plastics – thermoplastic and thermosetting plastics, compounding of plastics. Fibre reinforced plastics. Preparation, properties and Engineering applications of PVC, Teflon, Bakelite, Nylon 6:6 and terylene (Dacron); Rubber – Natural rubber , its processing and vulcanization. Elastomers: Preparation, properties and applications of Styrene butadiene, butyl and thiokol rubbers. Conducting polymers – Classification with examples; mechanism of conduction in trans-polyacetylene and applications of conducting polymers. Biodegradable polymers – concept and advantages - Polylactic acid and its applications.
Unit-IV: Chemistry of Energy sources


Alternate Energy sources: Biodiesel - trans-esterification - advantages of biodiesel, fuel cells (H₂-O₂ and Methanol –O₂ fuel cell).

Unit-V: Batteries and Materials

Batteries: Cell and battery - Primary battery (dry cell, alkaline cell and Lithium cell). Secondary battery (lead acid, Ni-Cd and lithium ion cell)

Liquid crystal polymers: classification, characteristics and applications.

Insulators: Characteristics and applications of thermal and electrical insulators.

Nanomaterials: Introduction. Preparation of nanomaterials by top down and bottom up approaches. Carbon nano fibres, and fullerenes - Applications of nanomaterials.

Text Books:

Reference Books:
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IDP (B.Tech. EEE & M.Tech./MBA) I Year II-Sem

ENVIRONMENTAL SCIENCE

Prerequisites: NIL

Objectives:
- Creating the awareness about environmental problems among students.
- Imparting basic knowledge about the environment and its allied problems.
- Developing an attitude of concern for the environment.
- Motivating students to participate in environment protection and environment improvement.

Outcomes:
At the end of the course, it is expected that students will be able to:
- Identify and analyze environmental problems as well as the risks associated with these problems
- Understand what it is to be a steward in the environment
- Studying how to live their lives in a more sustainable manner

UNIT - I
MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES:
Definition, Scope and Importance – Need for Public Awareness.

NATURAL RESOURCES: Renewable and non-renewable resources – Natural resources and associated problems – Forest resources – Use and over – exploitation, deforestation, case studies – Timber extraction – Mining, dams and other effects on forest and tribal people – Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems - Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. - Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. - Energy resources: Growing energy needs, renewable and non-renewable energy sources use of alternate energy sources. Case studies. Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.

UNIT - II
ECOSYSTEMS: Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. - Energy flow in the ecosystem - Ecological succession. - Food chains, food webs and ecological pyramids. - Introduction, types, characteristic features, structure and function of the following ecosystem:
- Forest ecosystem
- Grassland ecosystem
- Desert ecosystem
- Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

UNIT - III

UNIT - IV
ENVIRONMENTAL POLLUTION: Definition, Cause, effects and control measures of:
- Air pollution
- Water pollution
- Soil pollution
- 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, earthquake, cyclone and landslides.

UNIT V
SOCIAL ISSUES AND THE ENVIRONMENT: From Unsustainable to Sustainable development -
Urban problems related to energy -Water conservation, rain water harvesting, watershed
management -Resettlement and rehabilitation of people; its
problems and concerns. Case Studies -Environmental ethics: Issues and possible solutions. -Climate
change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case
Studies. -Wasteland reclamation. -Consumerism and waste products. -Environment Protection Act. -
Air (Prevention and Control of Pollution) Act. -Water (Prevention and control of Pollution) Act -Wildlife
-Public awareness.

-Value Education. -HIV/AIDS. -Women and Child Welfare. -Role of information Technology in
Environment and human health. -Case Studies.

FIELD WORK: Visit to a local area to document environmental assets River /forest
grassland/hill/mountain -Visit to a local polluted site-Urban/Rural/industrial/ Agricultural Study of
common plants, insects, birds. -Study of simple cosystemspond,
river, hill slopes, etc.

TEXT BOOK:
1. Textbook of Environmental Studies for Undergraduate Courses by Erach Bharucha for University
   Grants Commission., Universities Press
2. Environmental Studies by R. Rajagopalan, Oxford University Press.

REFERENCE:
1. Textbook of Environmental Sciences and Technology by M. Anji Reddy, BS Publication.
JNTUH COLLEGE OF ENGINEERING HYDERABAD

IDP (B.Tech. EEE & M.Tech. /MBA) I Year II-Sem

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COMPUTATIONAL MATHEMATICS
(Common to all Branches)

Pre Requisites: NIL

Objectives:
• This course aims at providing the student with the concepts of matrices, numerical techniques and curve fitting.

Outcomes:
At the end of the course, the student will be able to:
• analyze engineering problems using the concepts of Matrices and Numerical Methods.

UNIT-I: Matrices and Linear Transformations
(8 lectures)

UNIT-II: Interpolation and Curve fitting
(5 lectures)

UNIT-III: Numerical techniques
(5 lectures)
Solution of Algebraic and Transcendental Equations and Linear system of equations.
Solving system of non-homogeneous equations by L-U Decomposition method(Crout’s Method)Jacobi’s and Gauss-Seidel Iteration method

UNIT- IV: Numerical Differentiation, Integration:
(5 lectures)

UNIT – V: Numerical solutions of First order differential equations
(5 lectures)

Text Books:
1) INTRODUCTORY METHODS OF NUMERICAL ANALYSIS BY SS SASTRY
2) NUMERICAL AND STATISTICAL METHODS WITH PROGRAMMING IN C BY SUJATHA SINHA AND SUBHABRADA DINDA, SCITEC PUBLISHERS.
3) NUMERICAL METHODS, PRINCIPLES, ANALYSIS AND ALGORITHMS BY SRIMANTAPAL & SUBODH C. BHUNIA, OXFORD UNIVERSITY PRESS.
References:
1) ADVANCED ENGINEERING MATHEMATICS BY ALAN JEFFERY
2) APPLIED NUMERICAL METHODS USING MATLAB BY RAO.V.DUKKIPATI, NEW AGE PUBLISHERS
3) NUMERICAL METHODS IN SCIENCE AND ENGINEERING –APRACTICAL APPROACH BY S.RAJASEKHARAN, S.CHAND PUBLICATIONS
IDP (B.Tech. EEE & M.Tech. /MBA)  w.e.f. 2015-2016 academic year

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IDP (B.Tech. EEE & M.Tech. /MBA) I Year II-Sem

BASIC ELECTRICAL & ELECTRONICS ENGINEERING LAB

PART A: ELECTRONIC WORKSHOP PRACTICE (in 3 lab sessions):

1. Identification, Specifications, Testing of R, L, C Components (Color Codes), Potentiometers, Switches (SPDT, DPDT, and DIP), Coils, Gang Condensers, Relays, Bread Boards, PCB’s

2. Identification, Specifications and Testing of Active Devices, Diodes, BJT’s, Low power JFET’s, MOSFET’s, Power Transistors, LED’s, LCD’s, SCR, UJT.

3. Study and operation of
   • Multimeters (Analog and Digital)
   • Function Generator
   • Regulated Power Supplies
   • CRO.

PART B: (For Laboratory examination – Minimum of 09 experiments to be conducted)

1. PN Junction diode characteristics A) Forward bias B) Reverse bias.
2. Zener diode characteristics and Zener as voltage Regulator
3. Input & Output characteristics of Transistor in CB / CE configuration
4. Full Wave Rectifier with & without filters
5. Input and Output characteristics of FET in CS configuration
6. Measurement of h-parameters of transistor in CB, CE, CC configurations
7. SCR Characteristics.
8. Verification of KVL and KCL.
10. Verification of Superposition and Reciprocity theorems.
11. Verification of maximum power transfer theorem. Verification on DC, verification on AC with Resistive and Reactive loads.
12. Experimental determination of Thevenin’s and Norton’s equivalent circuits and verification by direct test.
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APPLIED PHYSICS LAB

LIST OF EXPERIMENTS:

1. Study of characteristics of LED and LASER sources.
2. Magnetic field along the axis of current carrying coil-Stewart and Gee’s method.
3. Study of characteristics of p-i-n diode detectors.
4. Determination of frequency of A.C Mains-Sonometer.
5. Torsional pendulum.
8. L-C-R circuit.
9. Time constant of an R-C Circuit.
10. Characteristics of solar cell
UNIT- I: Interpolation
Programming Tasks:
A) Write a program to determine \( y \) for a given \( x \), if two arrays of \( x \) and \( y \) of same size are given (using Newton’s interpolation both forward and backward).
B) Write a program to determine \( y \) for a given \( x \), if two arrays of \( x \) and \( y \) of same size are given (using Lagrange’s interpolation).
C) Write a program to determine \( y \) for a given \( x \), if two arrays of \( x \) and \( y \) of same size are given (using Gauss interpolation).
(Selection criteria of the interpolation formula are important.)

UNIT- II: Curve fitting
Programming Tasks:
A) Write a program to find a line of best fit from the given two arrays of \( x \) and \( y \) of same size.
B) Write a program to find a curve of the form \( y = Ae^{Bx} \) from the given two arrays of \( x \) and \( y \) of same size.
C) Write a program to find a curve of the form \( y = Ax^B \) from the given two arrays of \( x \) and \( y \) of same size.
D) Write a program to find a curve of the form \( y = Ax^2 + Bx + C \) from the given two arrays of \( x \) and \( y \) of same size.

UNIT- III: Solution of Algebraic and Transcendental Equations
Programming Tasks:
A) Write a program to find the root of a given equation using bisection method.
(Write this program such that the initial values given to the system are not usable, then the system should ask us to give new set of initial values).
B) Write a program to find the root of a given equation using method of false position (regula falsi).
C) Write a program to find the root of a given equation using iteration method.
D) Write a program to find the root of a given equation using Newton Raphson method.

UNIT- IV: Linear system of equations
Programming Tasks:
A) Write a program to find the solution of given system of linear equations using L- U decomposition method.
B) Write a program to find the solution of given system of linear equations using Jacobi’s method.
C) Write a program to find the solution of given system of equations using Gauss Sidel iteration method.
D) Write a program to find the solution of given system of equations using Gauss Jordan elimination method.

UNIT-V: Numerical Differentiation, Integration and Numerical solutions of First order differential equations
Programming Tasks:
A) Write a program to evaluate definite integral using trapezoidal rule, Simpson’s 1/3rd rule and 3/8th rule.
B) Write a program to solve a given differential equation using Taylor’s series.
C) Write a program to solve a given differential equation Euler’s and modified Euler’s method.
D) Write a program to solve a given differential equation using Ruge-Kutta method.
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IDP (B.Tech. EEE & M.Tech. /MBA) II Year I-Sem

MATHEMATICS – III

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Pre Requisites: Nil

Course Objectives:
- To enable the students to understand the concepts of probability distributions, statistical
  Inferences, and testing of hypothesis.
- To enable the students to understand the key concepts of Complex functions and the calculus of
  complex functions.

Outcomes:
- The student achieves the knowledge to testing the hypothesis and form the probability
distributions to make inferences.
- The students can study some problems of engineering using the concepts of residue theorem,
  Laurent series of functions of complex variables.

UNIT-I: Single Random variables and probability distributions.
Binomial , Poisson & normal distributions and their properties. Moment generating functions of the above three distributions. and hence finding the mean and variance.

UNIT-II: Multiple Random variables, Correlation & Regression
Joint probability distributions- Joint probability mass / density function, Marginal probability mass / density functions, Covariance of two random variables, Correlation -Coefficient of correlation, The rank correlation.
Regression- Regression Coefficient, The lines of regression and multiple correlation & regression.

UNIT-III: Sampling Distributions and Testing of Hypothesis
Sampling: Definitions of population, sampling, statistic, parameter. Types of sampling, Expected values of Sample mean and variance, sampling distribution, Standard error, Sampling distribution of means and sampling distribution of variance.
Parameter estimations – likelihood estimate, interval estimations.
Testing of hypothesis: Null hypothesis, Alternate hypothesis, type I, & type II errors – critical region, confidence interval, Level of significance. One sided test, Two sided test,

Large sample tests:
(i) Test of Equality of means of two samples equality of sample mean and population mean (cases of known variance & unknown variance, equal and unequal variances)
(ii) Tests of significance of difference between sample S.D and population S.D.
(iii) Tests of significance difference between sample proportion and population proportion & difference between two sample proportions.

Small sample tests:
Student t-distribution, its properties; Test of significance difference between sample mean and population mean; difference between means of two small samples
Snedecor’s F- distribution and it’s properties. Test of equality of two population variances
Chi-square distribution, its properties, Chi-square test of goodness of fit.

UNIT-IV: Functions of Complex Variables
Radius of convergence – Expansion in Taylor’s series, Maclaurin’s series and Laurent series. Singular point – Isolated singular point – pole of order m – essential singularity

UNIT – V: Contour Integration
Evaluation of integrals of the type
(a) Improper real integrals \( \int_{-\infty}^{\infty} f(x)dx \)
(b) \( \int_{c}^{c+2\pi} f(\cos \theta, \sin \theta) d\theta \)

Conformal mapping.
Transformation of z-plane to w-plane by a function, Conformal transformation. Standard transformations- Translation; Magnification and rotation; inversion and reflection, Transformations like \( e^z \), \( \log z \), \( z^2 \), and Bilinear transformation. Properties of Bilinear transformation, determination of bilinear transformation when mappings of 3 points are given.

Text Books:
1) Fundamentals of mathematical statistics by s c gupta and v.k.kapoor
2) Probability and statistics for engineers and scientists by sheldon m.ross,academic press
3) Probability and statistics for engineering and the sciencec by jay l.devore.
4) Higher engineering mathematics by b s grewal.
5) Advanced engineering mathematics by peter v o’neil, cengage learning
6) Engineering mathematics by erwin kreyszig,10th edition wiely publications

References:
1) Mathematics for engineers series –probability statistics and stochastic process by k.b.datta and m.a s.srinivas,cengage publications
2) Probability, statistics and stochastic process by prof.a r k prasad., wiely india
3) Advanced engineering mathematics by sahanaz bathul, phi publication
4) Probability and statistics by t.k.v.iyengar &b.krishna gandhi etel
5) Mathematics for engineers series- advanced mathematics for engineers by k.b.datta and m.a s.srinivas, cengage publications
6) Advanced engineering mathematics for engineers by prof.a r k prasad., wiely india
JNTUH COLLEGE OF ENGINEERING HYDERABAD

IDP (B.Tech. EEE & M.Tech. /MBA) II Year I-Sem

ELECTROMAGNETIC FIELDS

Pre-requisite: Mathematics and physics

Objectives: Objectives of this course are

- To introduce the concepts of electric field, magnetic field.
- Applications of electric and magnetic fields in the development of the theory for power transmission lines and electrical machines.

UNIT – I  Electrostatics
Electrostatic Fields – Coulomb’s Law – Electric Field Intensity (EFI) – EFI due to a line and a surface charge – Work done in moving a point charge in an electrostatic field – Electric Potential – Properties of potential function – Potential gradient – Guass’s law – Application of Guass’s Law – Maxwell’s first law, div ( D )=ρv – Laplace’s and Poisson’s equations – Solution of Laplace’s equation in one variable. Electric dipole – Dipole moment – potential and EFI due to an electric dipole – Torque on an Electric dipole in an electric field – Behavior of conductors in an electric field – Conductors and Insulators

UNIT – II  Dielectrics & Capacitance
Behavior of conductors in an electric field – Conductors and Insulators – Electric field inside a dielectric material – polarization – Dielectric – Conductor and Dielectric – Dielectric boundary conditions – Capacitance – Capacitance of parallel plots – spherical co-axial capacitors – with composite dielectrics – Energy stored and energy density in a static electric field – Current density – conduction and Convection current densities – Ohm’s law in point form – Equation of continuity

UNIT – III  Magneto Statics
Static magnetic fields – Biot-Savart’s law – Magnetic field intensity (MFI) – MFI due to a straight current carrying filament – MFI due to circular, square and solenoid current – Carrying wire – Relation between magnetic flux, magnetic flux density and MFI – Maxwell’s second Equation. Ampere’s Law & Applications
Ampere’s circuital law and its applications viz. MFI due to an infinite sheet of current and a long current carrying filament – Point form of Ampere’s circuital law – Maxwell’s third equation, Curl (H)=Jc

UNIT – IV  Force in Magnetic fields and Magnetic Potential
Self and Mutual inductance – Neumann’s formulæ – determination of self-inductance of a solenoid and toroid and mutual inductance between a straight long wire and a square loop wire in the same plane – energy stored and density in a magnetic field. Introduction to permanent magnets, their characteristics and applications.

UNIT – V  Time Varying Fields
Time varying fields – Faraday’s laws of electromagnetic induction – Its integral and point forms – Maxwell’s fourth equation, Curl (E)=−∂B/∂t – Statically and Dynamically induced EMFs – Simple problems -Modification of Maxwell’s equations for time varying fields – Displacement current
OUTCOMES: After this course, the student gets a thorough knowledge of
- Electrostatics and magnetostatics.
- Behavior of conductors, insulators, semiconductors, dielectrics and capacitors.
- Time-varying fields, interaction between electricity and magnetism, different laws, Maxwell’s equations.
- Analysis and applications of the concepts to electrical and electronics problems.
- Analyzes and applies the concepts to real-world electrical and electronics problems and applications.

TEXT BOOKS

REFERENCE BOOKS:
4. “Electromagnetics” by Plonsy and Collin
5. “Static and Dynamic Electricity” Smyth.
JNTUH COLLEGE OF ENGINEERING HYDERABAD

IDP (B.Tech. EEE & M.Tech. /MBA) II Year I-Sem

ELECTRICAL CIRCUITS

Pre-requisite: None

Objectives: Objectives of this course are

• to introduce the basic concepts of circuit analysis, which is the foundation for all subjects of the Electrical Engineering.
• to introduce basic analysis of circuits which includes Single phase circuits, magnetic circuits, theorems, transient analysis and network topology.

UNIT – I

Network topology: Definitions – Graph – Tree, Basic cutset and Basic Tie set matrices for planar networks – Loop and Nodal methods of analysis of Networks with dependent & independent voltage and current sources - Duality & Dual networks.

UNIT – II
Three phase circuits: Phase sequence – Star and delta connection – Relation between line and phase voltages and currents in balanced systems – Analysis of balanced and Unbalanced 3 phase circuits – Measurement of active and reactive power.

UNIT – III
Transient response of the above circuits for different inputs such as step, ramp, pulse and impulse by using Laplace transforms method.

UNIT – IV
Network Parameters: Network functions driving point and transfer impedance function networks-poles and zeros –necessary conditions for driving point function and for transfer function Two port network parameters – Z, Y, ABCD and hybrid parameters and their relations– 2-port network parameters using transformed variables.

UNIT – V
Filters: Introduction to filters – low pass – high pass and band pass – RC, RL, filters- constant K and m derived filters and composite filter design

OUTCOMES: After this course, the student

• gets a thorough knowledge on basics of circuit concepts, electrical parameters, single phase and three phase circuits, magnetic circuits , resonance, locus diagrams, network topology and network theorems
• analyzes and applies the above concepts to real-world problems and applications.

TEXT BOOKS:
2. Electric Circuits by A. Chakrabarthy, Dhanipat Rai & Sons.
3. Networks and systems by D.Roy Chowdary, New age international publishers
REFERENCE BOOKS
1. Network Analysis by Vanvalkenburg, PHI.
IDP (B.Tech. EEE & M.Tech. /MBA) II Year I-Sem

**ELECTRICAL MACHINES – I**

**Pre-requisite: Electrical Circuits**

**Objectives:** Objectives of this course are,

- To study and understand different types of DC generators, Motors and Transformers, their construction, operation and applications.
- To analyze performance aspects of various testing methods.

**UNIT – I**  

**UNIT – II**  

**UNIT-III**  
Methods of Testing – direct, indirect and regenerative testing – Brake test – Swinburne’s test – Hopkinson’s test – Field’s test - separation of stray losses in a d.c. motor test.

**UNIT-IV**  
**Single phase transformers:** Types - constructional details - minimization of hysteresis and eddy current losses - EMF equation - operation on no load and on load - phasor diagrams 
Equivalent circuit - losses and efficiency – regulation - All day efficiency - effect of variations of frequency & supply voltage on iron losses.

**UNIT-V**  
OC and SC tests - Sumpner’s test - predetermination of efficiency and regulation-separation of losses test-parallel operation with equal and unequal voltage ratios - auto transformers - equivalent circuit - comparison with two winding transformers.
Polyphase transformers - Polyphase connections - Y/Y, Y/Δ, Δ/Y, Δ/Δ and open Δ

**OUTCOMES:** After this course, the student

- gets a thorough knowledge on electromechanical energy conversion
- understands construction, operation, characteristics, control techniques and testing of different types of machines
- applies the above concepts to real-world electrical and electronics problems and application.
- Know the difference of single phase and poly phase transformers.
- Know the application of various machines.
TEXT BOOKS

REFERENCE BOOKS
3. Electrical Machines – P.S. Bimbra., Khanna Publishers
6. Electrical Machines -S.K. Battacharya,
UNIT-I: SINGLE STAGE AMPLIFIERS:

UNIT –II FEEDBACK AMPLIFIERS:
Concept of feedback Amplifiers, General characteristics of negative feedback amplifiers, Effect of Feedback on Amplifier characteristics, Voltage series, voltage shunt, Current series and current shunt feedback configurations, Illustrative problems

OSCILLATORS

UNIT-III: LARGE SIGNAL AMPLIFIERS:

UNIT-IV: WAVE SHAPING:
High Pass, Low Pass RC Circuits, their response for Sinusoidal, Step, Pulse and Ramp Inputs.

CLIPPERS AND CLAMPERS
Diode Clippers, Transistor Clippers, Clipping at Two Independent Levels, Transfer Characteristics of Clippers, Comparators, Clamping Operation, Clamping Circuits using Diode with different inputs, Clamping Circuit Theorem, Practical Clamping Circuits.

UNIT V: SWITCHING CHARACTERISTICS OF DEVICES:
Diode as a Switch, Piecewise Linear Diode Characteristics, Transistor as a Switch, Breakdown Voltage Consideration of Transistor, Design of Transistor Switch, Transistor Switching Times.

MULTIVIBRATORS
Analysis and Design of Bistable, Monostable, Astable, Multivibrators and Schmitt Trigger using Transistors.

TEXT BOOKS:
2. Electronic Devices and circuits – S. Salivahanan, N. Suresh Kumar, A. Vallava Raj 2 ed., 2008, TMH.
3. Solid state Pulse Circuits – David A. Bell 4 ed., PHI

REFERENCES:
1. Introductory Electronic Devices and Circuits - Robert T. Paynter, 7 ed., 2009, PEI.
Objectives of the Course:

- To develop students' sensibility with regard to issues of gender in contemporary India.
- To provide a critical perspective on the socialization of men and women.
- To introduce students to information about some key biological aspects of genders.
- To expose the students to debates on the politics and economics of work.
- To help students reflect critically on gender violence.
- To expose students to more egalitarian interactions between men and women.

Learning Outcomes:

- Students will have developed a better understanding of important issues related to gender in contemporary India.
- Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.
- Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.
- Students will acquire insight into the gendered division of labour and its relation to politics and economics.
- Men and women students and professionals will be better equipped to work and live together as equals.
- Students will develop a sense of appreciation of women in all walks of life.
- Through providing accounts of studies and movements as well as the new laws that provide protection and relief to women, the textbook will empower students to understand and respond to gender violence.

Unit-I: UNDERSTANDING GENDER

- Gender: Why Should We Study It? (Towards a World of Equals: Unit -1)
- Socialization: Making Women, Making Men (Towards a World of Equals: Unit -2)

Unit – II: GENDER AND BIOLOGY

- Missing Women: Sex Selection and Its Consequences (Towards a World of Equals: Unit -4)
- Declining Sex Ratio. Demographic Consequences.
- Gender Spectrum: Beyond the Binary (Towards a World of Equals: Unit -10)

Unit – III: GENDER AND LABOUR

- Housework: the Invisible Labour (Towards a World of Equals: Unit -3)
- “My Mother doesn’t Work.” “Share the Load.”
- Women’s Work: Its Politics and Economics (Towards a World of Equals: Unit -7)

Unit – IV: ISSUES OF VIOLENCE

- Sexual Harassment: Say No! (Towards a World of Equals: Unit -6)
- Sexual Harassment, not Eve-teasing- Coping with Everyday Harassment- Further Reading: Chupulu.
- Domestic Violence: Speaking Out (Towards a World of Equals: Unit -8)

Thinking about Sexual Violence (Towards a World of Equals: Unit -11)
- Blaming the Victim-“I Fought for my Life…..” - Additional Reading: The Caste Face of Violence.
Unit – V: GENDER : CO-EXISTENCE
Just Relationships: Being Together as Equals (Towards a World of Equals: Unit -12)

Essential Reading:
All the Units in the Textbook, “Towards a World of Equals: A Bilingual Textbook on Gender” written by A.Suneetha, Uma Bhrugubanda, Duggirala Vasanta, Rama Melkote, Vasudha Nagaraj, Asma Rasheed, Gogu Shyamala, Deepa Sreenivas and Susie Tharu.

Note:
Since it is Interdisciplinary Course, Resource Persons can be drawn from the fields of English Literature or Sociology or Political Science or any other qualified faculty who has expertise in this field from engineering departments.

Reference Books:
The following experiments are required to be conducted compulsory experiments:

1. CE amplifier.
2. CC amplifier (Emitter Follower).
3. FET amplifier (Common Source).
4. Weinbridge and RC Phase shift Oscillator.
6. Colpitt and Hartley Oscillator.
7. Double stage RC coupled amplifier.
8. Clipper and Clampers

In addition to the above eight experiments, at least any two of the experiments from the following list are required to be conducted:

9. Transistor as a switch
10. Study of Logic gates & some applications
The following experiments are required to be conducted compulsory experiments:

1. Magnetization characteristics of DC shunt generator. Determination of critical field resistance and critical speed.

2. Load test on DC shunt generator. Determination of characteristics.

3. Load test on DC series generator. Determination of characteristics.

4. Load test on DC compound generator. Determination of characteristics.

5. Hopkinson’s test on DC shunt machines. Predetermination of efficiency.


7. Swinburne’s test and speed control of DC shunt motor. Predetermination of efficiencies.


In addition to the above eight experiments, at least any two of the experiments from the following list are required to be conducted:


The following experiments are required to be conducted compulsory experiments:

1. Basic Operations on Matrices.
2. Generation of Various Signals and Sequences (Periodic and Aperiodic), such as Unit Impulse, Unit Step, Square, Saw tooth, Triangular, Sinusoidal, Ramp, Sine.
3. Operations on Signals and Sequences such as Addition, Multiplication, Scaling, Shifting, Folding, Computation of Energy and Average Power.
4. Finding the Even and Odd parts of Signal/Sequence and Real and Imaginary parts of Signal.
5. Convolution between Signals and sequences.
6. Auto Correlation and Cross Correlation between Signals and Sequences.
8. Computation of Unit sample, Unit step and Sinusoidal responses of the given LTI system and verifying its physical realizability and stability properties.

In addition to the above eight experiments, at least any two of the experiments from the following list are required to be conducted:

11. Locating the Zeros and Poles and plotting the Pole-Zero maps in S-plane and Z-Plane for the given transfer function.
SWITCHING THEORY AND LOGIC DESIGN

UNIT I  NUMBER SYSTEMS & CODES:
Philosophy of number systems – complement representation of negative numbers-binary arithmetic –
binary codes – error detecting and error correcting codes –hamming codes.

BOOLEAN ALGEBRA AND SWITCHING FUNCTIONS:
Fundamental postulates of Boolean Algebra-Basic theorems and properties - switching functions—
Canonical and Standard forms—Algebraic simplification—digital logic gates, properties of XOR gates
–universal gates-Multilevel NAND/NOR realizations.

UNIT II  MINIMIZATION OF SWITCHING FUNCTIONS:
Map method, Prime implicants, Don’t care combinations, Minimal SOP and POS forms, Tabular
Method, Prime –implicant chart, simplification rules

COMBINATIONAL LOGIC DESIGN:
Design using conventional logic gates, Encoder, Decoder, Multiplexer, De-Multiplexer, Modular design
using IC chips, MUX Realization of switching functions Parity bit generator, Code-converters, Hazards
and hazard free realizations.

UNIT III  PROGRAMMABLE LOGIC DEVICES, THRESHOLD LOGIC:
Basic PLD’s- ROM, PROM, PLA, PLD Realization of Switching functions using PLD’s. Capabilities
and limitations of Threshold gate, Synthesis of Threshold functions, Multigate Synthesis.

UNIT IV  SEQUENTIAL CIRCUITS – I:
Classification of sequential circuits (Synchronous, Asynchronous, Pulse mode, Level mode with
examples) Basic flip-flops-Triggering and excitation tables. Steps in synchronous sequential circuit
design. Design of modulo-N Ring and Shift counters, Serial binary adder, sequence detector.

SEQUENTIAL CIRCUITS – II
Finite state machine-capabilities and limitations, Mealy and Moore
models-minimization of completely specified and incompletely specified sequential machines, Partition
Techniques and Merger chart methods-concept of minimal cover table.

UNIT V  ALGOROTHIMIC STATE MACHINES:
Salient features of the ASM chart-Simple examples-System design using data path and control
subsystems-control implementations-examples of Weighing machine and Binary multiplier.

TEXTBOOKS

REFERENCES
1. Introduction to Switching Theory and Logic Design - F.J.Hill, G.R.Petrerson, John Wiley, 2nd
dition.
4. An Engineering Approach To Digital Design – Fletcher, PHI.
IDP (B.Tech. EEE & M.Tech. /MBA) II Year II-Sem

CONTROL SYSTEMS

Pre-requisite: Electric Circuits

Objectives: Objectives of course are

- to introduce the principles and applications of control systems in every day life
- to introduce the basic concepts of block diagram reduction, time domain analysis solutions to time invariant systems
- to understand different aspects of stability analysis of systems in frequency domain and time domain.

UNIT – I
INTRODUCTION: Concepts of Control Systems- Open Loop and closed loop control systems and their differences- Different examples of control systems- Classification of control systems, Feed-Back Characteristics, Effects of feedback. Mathematical models – Differential equations - Impulse Response and transfer functions - Translational and Rotational mechanical systems.
TRANSFER FUNCTION REPRESENTATION: Transfer Function of DC Servo motor - AC Servo motor- Synchro transmitter and Receiver, Block diagram representation of systems considering electrical systems as examples - Block diagram algebra – Representation by Signal flow graph - Reduction using mason’s gain formula.

UNIT-II

UNIT – III
STABILITY ANALYSIS: The concept of stability - Routh stability criterion – qualitative stability and conditional stability.
Root Locus Technique: The root locus concept - construction of root loci-effects of adding poles and zeros to G(s) H(s) on the root loci.
Frequency Response Analysis: Introduction, Frequency domain specifications-Bode diagrams- Determination of Frequency domain specifications and transfer function from the Bode Diagram- Phase margin and Gain margin-Stability Analysis from Bode Plots.

UNIT-IV
STABILITY ANALYSIS IN FREQUENCY DOMAIN: Polar Plots, Nyquist Plots and applications of Nyquist criterion to find the stability - Effects of adding poles and zeros to G(s)H(s) on the shape of the Nyquist diagrams.
Classical Control Design Techniques: Compensation techniques – Lag, Lead, and Lead-Lag Controllers design in frequency Domain, PID Controllers.

UNIT – V
STATE SPACE ANALYSIS OF CONTINUOUS SYSTEMS: Concepts of state, state variables and state model, derivation of state models from block diagrams, Diagonalization- Solving the Time invariant state Equations- State Transition Matrix and its Properties.

OUTCOMES: After this course, the student gets a thorough knowledge of

- Open loop and closed loop control systems.
- Modeling and transfer function derivations of translational and rotational systems.
- Represent transfer functions through block diagrams and signal flow graphs.
- Design a control systems using time domain and frequency domain techniques.
- Time response analysis, stability analysis, frequency response analysis of different ordered systems through their characteristic equation and time-domain specifications.
- Applications of concepts to electrical and electronics problems.
TEXT BOOKS

REFERENCE BOOKS
IDP (B.Tech. EEE & M.Tech. /MBA) II Year II-Sem

COURSE: POWER SYSTEMS-I

L T P C: 3 1 0 3

OBJECTIVES: Objectives of this course are
- To understand the hydro, thermal, nuclear and gas generating stations.
- To examine A.C. and D.C. distribution systems.
- To understand and compare air insulated and gas insulated substations.
- To illustrate the economic aspects of power generation and tariff methods.

UNIT- I
Thermal Power Stations: Line diagram of Thermal Power Station (TPS) showing paths of coal, steam, water, air, ash and flue gasses. - Brief description of TPS components: Economizers, Boilers, Super heaters, Turbines, Condensers, Chimney and cooling towers

Gas and Nuclear Power Stations:
- Nuclear Power Stations: Nuclear Fission and Chain reaction.
- Nuclear fuels. - Principle of operation of Nuclear reactor.-Reactor Components: Moderators, Control rods, Reflectors and Coolants. - Radiation hazards: Shielding and Safety precautions. - Types of Nuclear reactors and brief description of PWR, BWR and FBR.
- Gas Power Stations: Principle of Operation and Components (Block Diagram Approach Only)

UNIT - II
Hydroelectric Power Stations: Elements of hydro electric power station-types-concept of pumped storage plants-storage requirements, mass curve (explanation only) estimation of power developed from a given catchment area; heads and efficiencies.

Hydraulic Turbines:
- Classification of turbines, impulse and reaction turbines, Pelton wheel, Francis turbine and Kaplan turbine-working proportions, work done, efficiencies, hydraulic design - draft tube-theory- functions and efficiency.

UNIT- III
D.C. Distribution Systems: Classification of Distribution Systems.- Comparison of DC vs. AC and Under-Ground vs. Over- Head Distribution Systems.- Requirements and Design features of Distribution Systems.-Voltage Drop Calculations (Numerical Problems) in D.C Distributors for the following cases: Radial D.C Distributor fed one end and at the both the ends (equal/unequal Voltages) and Ring Main Distributor.

A.C. Distribution Systems: Voltage Drop Calculations (Numerical Problems) in A.C. Distributors for the following cases: Power Factors referred to receiving end voltage and with respect to respective load voltages.

UNIT- IV
Substations: Classification of substations
- Air insulated substations - Indoor & Outdoor substations: Substations layout showing the location of all the substation equipment.
- Bus bar arrangements in the Sub- Stations: Simple arrangements like single bus bar, sectionalized single bus bar, main and transfer bus bar system with relevant diagrams.
- Gas insulated substations (GIS) – Advantages of Gas insulated substations, different types of gas insulated substations, single line diagram of gas insulated substations, bus bar, construction aspects of GIS, Installation and maintenance of GIS, Comparison of Air insulated substations and Gas insulated substations.

UNIT- V
Economic Aspects of Power Generation: Load curve, load duration and integrated load duration curves-load, demand, diversity, capacity, utilization and plant use factors- Numerical Problems.

OUTCOMES:
- Able to demonstrate the operation of hydro, thermal, nuclear and gas generating stations.
- Understand A.C. and D.C. distribution systems.
- Able to distinguish between air and gas insulated substations.
- Compare different tariff methods and economic aspects of power generation.

TEXT BOOKS

REFERENCE BOOKS
JNTUH COLLEGE OF ENGINEERING HYDERABAD

IDP (B.Tech. EEE & M.Tech. /MBA) II Year II-Sem

ELECTRICAL MACHINES – II

Pre-requisite: Electrical Machines-I

Objectives: Objectives of this course are
• to deal with the detailed analysis of polyphase induction motors & Synchronous generators and motors
• to understand operation, construction and types of single phase motors and their applications in household appliances and control systems.
• To introduce the concept of parallel operation of synchronous generators.
• To introduce the concept of regulation and its calculations.

UNIT- I
Polyphase Induction Motors: Construction details of cage and wound rotor machines-production of a rotating magnetic field - principle of operation - rotor EMF and rotor frequency - rotor reactance, rotor current and PF at standstill and during operation.

UNIT- II
Characteristics of Induction Motors: Rotor power input, rotor copper loss and mechanical power developed and their inter relation-torque equation-deduction from torque equation - expressions for maximum torque and starting torque - torque slip characteristic - equivalent circuit - phasor diagram - crawling and cogging .-No-load Test and Blocked rotor test – Predetermination of performance - Methods of starting and starting current and Torque calculations.

Speed Control Methods: Change of voltage, change of frequency, voltage/frequency, injection of an EMF into rotor circuit (qualitative treatment only) - induction generator-principle of operation.

UNIT- III

UNIT- IV


UNIT - V

OUTCOMES: After this course, the student
• gets a thorough knowledge on construction, operation, characteristics and testing of different types of Transformers.
• to understand construction, operation, characteristics, testing and speed control methods of polyphase induction motors.
• Gets through knowledge an harmonics in generated e.m.f.
• Methods for suppression harmonics.
• applies the above concepts to real-world electrical and electronics problems and applications.

TEXT BOOKS
2. Performance and Design of AC Machines-M.G.Say.BPB Publishers

REFERENCE BOOKS
1. Electro mechanics-II (transformers and induction motors) S. Kamakashaiah Hitech publishers.
5. Electrical Machines – M.V Deshpande, Wheeler Publishing
Electrical and Electronic Measurements

Pre-requisite: Basic Electrical and Electronics Engineering.

Objectives: Objectives of this course are
- to introduce the basic principles of all measuring instruments
- to deal with the measurement of voltage, current, power factor, power, energy and magnetic measurements.

Unit I
Introduction to Measuring Instruments: Classification – deflecting, control and damping torques – Ammeters and Voltmeters – PMMC, moving iron type instruments – expression for the deflecting torque and control torque – Errors and compensations, extension of range using shunts and series resistance. Electrostatic Voltmeters - electrometer type and attracted disc type – extension of range of E.S. Voltmeters.

Unit II

Unit III

Unit IV

Unit V
Transducers: Definition of transducers, Classification of transducers, Advantages of Electrical transducers, Characteristics and choice of transducers; Principle operation of LVDT and capacitor transducers; LVDT Applications, Strain gauge and its principle of operation, gauge factor, Thermistors, Thermocouples, Piezo electric transducers, photovoltaic, photo conductive cells, photo diodes.


Outcomes: After this course, the student
- gets a thorough knowledge on, different types of measuring instruments their construction operation and characteristics
- measurements of electrical quantities through potentiometers, instrument transformers, watt meters, energy meters, DC bridges and AC bridges
- To understand the operation of different types of transducers.
• To understand the measurement of non-electrical quantities like velocity, acceleration, temperature etc.
• Applies the above concepts to real-world electrical and electronics problems and applications.

TEXT BOOKS
1. Electrical and Electronic Measurements and Instrumentation, R. K. Rajput, S. Chand & Company Ltd.

REFERENCE BOOKS
2. Electrical and Electronic Measurements, G. K. Banerjee, PHI Learning Pvt. Ltd.
3. Electrical Measurements and Measuring Instruments, Golding and Widdis, Reem Publications.
4. Electrical Measurements, Buckingham and Price, Prentice – Hall
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ELECTRICAL CIRCUITS LAB

The following experiments are required to be conducted as compulsory experiments


3. Two port network parameters – A, B, C, D parameters, Analytical verification


6. Verification of Compensation and Millman's theorem.

7. Relation between voltage and current in star and delta networks.

8. Generation of non-linear periodic waveform for square wave using clipping and Clamping. Control of average value of the output waveform

In addition to the above eight experiments, at least any two of the experiments from the following list are required to be conducted

9. Current locus diagram with RL with L – varying

10. Harmonic Analysis of non-sinusoidal waveform signals using Harmonic Analyzer and plotting frequency spectrum.

11. Determination of form factor for non-sinusoidal waveform
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IDP (B.Tech. EEE & M.Tech. /MBA) II Year II-Sem

ELECTRICAL MACHINES LAB – II

The following experiments are required to be conducted as compulsory experiments

1. O.C. & S.C. Tests on Single phase Transformer
2. Sumpner’s test on a pair of single phase transformers
3. Scott connection of transformers
4. No-load & Blocked rotor tests on three phase Induction motor
5. Regulation of a three –phase alternator by synchronous impedance & m.m.f. methods
7.Equivalent Circuit of a single phase induction motor
8. Determination of Xd and Xq of a salient pole synchronous machine

In addition to the above eight experiments, at least any two of the following experiments are required to be conducted from the following list

1. Parallel operation of Single phase Transformers
2. Separation of core losses of a single phase transformer
3. Brake test on three phase Induction Motor
4. Regulation of three-phase alternator by Z.P.F. and A.S.A methods
5. Efficiency of a three-phase alternator
6. Heat run test on a bank of 3 Nos. of single phase Delta connected transformers
8. Performance characteristics of a Schrage motor
SIMULATION OF ELECTRICAL CIRCUITS LAB

PART-A: ELECTRICAL CIRCUITS

1. Verification of Thevenin’s and Norton’s theorems.
2. Verification of Superposition and Maximum Power Transfer Theorems.
3. Verification of RMS value of complex wave.
4. Verification of Compensation Theorem.
5. Verification of Reciprocity, Millmann’s Theorems.
7. Series and Parallel Resonance.
8. Determination of Self, Mutual Inductances and Coefficient of coupling.
9. Determination of Z and Y Parameters.
10. Determination of Transmission line and hybrid parameters.
11. Measurement of Active Power for Star and Delta connected balanced loads.

PART-B: SIMULATION EXPERIMENTS

1. Simulation of DC Circuits
2. DC Transient response
3. Mesh Analysis
4. Nodal Analysis

NOTE:

- Eight experiments are to be conducted from PART-A and any two experiments from PART-B
HUMAN VALUES AND PROFESSIONAL ETHICS

Course Objectives
1. To introduce the basic concepts of universal human values
2. To familiarize the students with desirable business and professional ethics, rights and responsibilities
3. To prepare students against possible gaps and unethical practices in contemporary times
4. To sensitise the students so that they can protect themselves and the organization from the possible professional crime malpractices

Learning Outcomes
1. The students learn about diverse ethical issues rooted in society, trade, business, and environment on local as well as a global platform.
2. The students appreciate their role as a responsible citizen, professional, and as managers, advisors, experts and consultants.
3. The students will reflect and learn major values and ethics from their observations of a spiritual discourse and a visit to a business organization as a practical part of this course.

Unit I Human Values:

Unit II Professional Ethics:

Unit III Professional Responsibilities:

Unit IV Professional Rights:
Professional rights and employee rights communicating risk and public policy – Whistle blowing - Professionals / engineers as managers, advisors, experts, witnesses and consultants – moral leadership- Regulatory compliances, Monitoring and control- Mini-Cases

Unit V Ethics in global context:

Mini-projects
Project 1:
The student of this course should invariably attend (or watch on internet/any TV channel/ Youtube/ social media) two speeches of 30 minutes duration each dealing with spiritual discourse and submit a report on the contents of the lecture proceedings.

Project 2:
Visit any organization (including shops/ hotels or shopping malls in your region) of your choice and observe how the professionals perform the given job with a focus on professional ethics and human values.

References
1. Aryasri, Human Values and Professional Ethics, Maruthi Publications.
2. S B George, Human Values and Professional Ethics, Vikas Publishing.
LINEAR AND DIGITAL IC APPLICATIONS

Prerequisite: Pulse and Digital Circuits

Course Objectives:
The main objectives of the course are:
1. To introduce the basic building blocks of linear integrated circuits.
2. To teach the linear and non-linear applications of operational amplifiers.
3. To introduce the theory and applications of analog multipliers and PLL.
4. To teach the theory of ADC and DAC.
5. To introduce the concepts of waveform generation and introduce some special function ICs.
6. To understand and implement the working of basic digital circuits

Course Outcomes:
On completion of this course, the students will have:
1. A thorough understanding of operational amplifiers with linear integrated circuits.
2. Understanding of the different families of digital integrated circuits and their characteristics.
3. Also students will be able to design circuits using operational amplifiers for various applications.

UNIT -I:
Operational Amplifier

UNIT -II:
Op-Amp, IC-555 & IC 565 Applications

UNIT -III:
Data Converters
Introduction, Basic DAC techniques, Different types of DACs-Weighted resistor DAC, R-2R ladder DAC, Inverted R-2R DAC, Different Types of ADCs - Parallel Comparator Type ADC, Counter Type ADC, Successive Approximation ADC and Dual Slope ADC, DAC and ADC Specifications.

UNIT -IV:
Digital Integrated Circuits
Classification of Integrated Circuits, Comparison of Various Logic Families, CMOS Transmission Gate, IC interfacing- TTL Driving CMOS & CMOS Driving TTL, Combinational Logic ICs – Specifications and Applications of TTL-74XX & CMOS 40XX Series ICs - Code Converters, Decoders, Demultiplexers, LED & LCD Decoders with Drivers, Encoders, Priority Encoders, Multiplexers, Demultiplexers, Priority Generators/Checkers, Parallel Binary Adder/Subtractor, Magnitude Comparators.

UNIT -V:
Sequential Logic IC’s and Memories
Familiarity with commonly available 74XX & CMOS 40XX Series ICs – All Types of Flip-flops, Synchronous Counters, Decade Counters, Shift Registers. Memories - ROM Architecture, Types of ROMS & Applications, RAM Architecture, Static & Dynamic RAMs.
TEXT BOOKS:

REFERENCE BOOKS:
3. Linear Integrated Circuits and Applications – Salivahan, TMH.
JNTUH COLLEGE OF ENGINEERING HYDERABAD

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MICROPROCESSORS AND MICROCONTROLLERS

Pre-requisite: Computer programming and Data Structures

Objective: Objectives of this course are

- To familiarize with the architecture of 8086 processor, assembling language programming and interfacing with various modules.
- To understand 8051 Microcontroller concepts, architecture, programming and application of Microcontrollers.

UNIT- I


ASSEMBLY LANGUAGE PROGRAMMING OF 8086: Assembly Directives, Macro’s, Simple Programs using Assembler, Implementation of FOR Loop, WHILE, REPEAT and IF-THEN-ELSE Features.

UNIT-II

I/O INTERFACE: 8255 PPI, Various modes of operations and interface of I/O devices to 8086, A/D, D/A Converter Interfacing.

INTERFACING WITH ADVANCED DEVICES: 8086 System bus structure, Memory and I/O Interfacing with 8086, Interfacing through various IC Peripheral Chips, 8257 (DMA Controller), 8259 (Interrupt Priority Control).

UNIT-III

COMMUNICATION INTERFACE: Serial Communication Standards, USART Interfacing RS-232, IEEE-488, 20mA Current Loop, Prototyping and Trouble shooting, Software Debugging tools, MDS.

UNIT-IV

INTRODUCTION TO MICRO CONTROLLERS: Overview of 8051 Micro Controller, Architecture, I/O ports and Memory Organization, Addressing modes and Instruction set of 8051, Simple Programs using Stack Pointer, Assembly language programming of 8051


UNIT- V

INTERFACING AND INDUSTRIAL APPLICATIONS: Applications of Micro Controllers, Interfacing 8051 to LED’s, Push button, Relay’s and Latch Connections, Keyboard Interfacing, Interfacing Seven Segment Display, ADC and DAC Interfacing.

OUTCOMES: After this course, the student

- gets a thorough knowledge on, architecture, pin diagram, register and memory organizations, concept of memory segmentation, minimum and maximum mode of operations
- will be able to draw timing diagrams,
- will be able write programs, peripheral and communication interfacing of 8086 microprocessor and 8051 microcontroller
- Applies the above concepts to real-world electrical and electronics problems and applications.
TEXT BOOKS

REFERENCE BOOKS
JNTUH COLLEGE OF ENGINEERING HYDERABAD

IDP (B.Tech. EEE & M.Tech. /MBA) III Year I-Sem

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Prerequisite: Nil.

Course Objective:
- To understand the concepts and importance of economics in managerial problems
- To understand the basic financial management concepts including the principles of financial analysis

Course Outcomes:
- Students will be able to apply the principles of economics for managerial decisions.
- The students will be able to analyze the financial position of a company with the techniques of financial accounting and ratio analysis


Unit II Production & Cost Analysis: Production Function – Isoquants and Isocosts, MRTS, Least Cost Combination of Inputs, Laws of Returns, Internal and External Economies of Scale. Break-even Analysis (BEA)- Determination of Break-Even Point (simple problems) - Managerial Significance.


Unit IV Capital Budgeting: Methods and sources of raising capital - Capital Budgeting: Methods of Capital Budgeting: Payback Method, Accounting Rate of Return (ARR) and Net Present Value Method (simple problems).


TEXT BOOKS:
1. Aryasri: Managerial Economics and Financial Analysis, TMH.,

REFERENCES:
2. H. Craig Peterson & W. Cris Lewis, Managerial Economics, Pearson,
3. Lipsey & Chrystel, Economics, Oxford University Press, Domnick Salvatore: Managerial Economics In a Global Economy, Thomson.,
POWER SYSTEMS-II

Pre-requisites: Power Systems –I and Electromagnetic field theory

Objectives:
• To compute inductance and capacitance of different transmission lines.
• To understand performance of short, medium and long transmission lines.
• To examine the traveling wave performance and sag of transmission lines.
• To design insulators for over head lines and understand cables for power transmission.

UNIT- I
TRANSMISSION LINE PARAMETERS: Types of conductors - calculation of resistance for solid conductors - Calculation of inductance for single phase and three phase, single and double circuit lines, concept of GMR & GMD, symmetrical and asymmetrical conductor configuration with and without transposition, Numerical Problems. Calculation of capacitance for 2 wire and 3 wire systems, effect of ground on capacitance, capacitance calculations for symmetrical and asymmetrical single and three phase, single and double circuit lines, Numerical Problems.

UNIT- II


UNIT – III
POWER SYSTEM TRANSIENTS: Types of System Transients - Travelling or Propagation of Surges - Attenuation, Distortion, Reflection and Refraction Coefficients - Termination of lines with different types of conditions - Open Circuited Line, Short Circuited Line, T-Junction, Lumped Reactive Junctions (Numerical Problems), Bewley's Lattice Diagrams (for all the cases mentioned with numerical examples).

VARIOUS FACTORS GOVERNING THE PERFORMANCE OF TRANSMISSION LINE: Skin and Proximity effects - Description and effect on Resistance of Solid Conductors - Ferranti effect - Charging Current - Effect on Regulation of the Transmission Line. Corona - Description of the phenomenon, factors affecting corona, critical voltages and power loss, Radio Interference.

UNIT- IV
OVERHEAD LINE INSULATORS: Types of Insulators, String efficiency and Methods for improvement, Numerical Problems - voltage distribution, calculation of string efficiency, Capacitance grading and Static Shielding.

SAG AND TENSION CALCULATIONS: Sag and Tension Calculations with equal and unequal heights of towers, Effect of Wind and Ice on weight of Conductor, Numerical Problems - Stringing chart and sag template and its applications.

UNIT-V
UNDERGROUND CABLES: Types of Cables, Construction, Types of Insulating materials, Calculation of Insulation resistance and stress in insulation, Numerical Problems. Capacitance of

OUTCOMES:
- Able to compute inductance and capacitance for different configurations of transmission lines.
- Able to analyze the performance of transmission lines.
- Can understand transients phenomenon of transmission lines.
- Able to calculate sag and tension calculations.
- Will be able to understand overhead line insulators and underground cables.

TEXT BOOKS

REFERENCE BOOKS
3. Abhijit Chakrpabarti, Sunitha Halder, Power System Analysis, Operation and control, PHI, 3/e, 2010
JNTUH COLLEGE OF ENGINEERING HYDERABAD

IDP (B.Tech. EEE & M.Tech. /MBA) III Year I-Sem

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CONTROL SYSTEMS LAB

Any Eight of the following experiments are to be conducted

1. Time response of Second order system
2. Characteristics of Synchro’s
3. Programmable logic controller – Study and verification of truth tables of logic gates, simple Boolean expressions and application of speed control of motor.
4. Effect of feedback on DC servo motor
5. Transfer function of DC motor
6. Effect of P, PD, PI, PID Controller on a second order systems
7. Lag and lead compensation – Magnitude and phase plot
8. Transfer function of DC generator
9. Temperature controller using PID
10. Characteristics of magnetic amplifiers
11. Characteristics of AC servo motor

Any two simulation experiments are to be conducted using software tools

1. simulation of Op-Amp based Integrator and Differentiator circuits.
2. Linear system analysis (Time domain analysis, Error analysis).
3. Stability analysis (Bode, Root Locus, Nyquist) of Linear Time Invariant system.
4. State space model for classical transfer function– Verification.

REFERENCE BOOKS

1. Manuals of related software.
The following experiments are required to be conducted as compulsory experiments

2. Calibration of dynamometer power factor meter.
5. Dielectric oil testing using H.T. testing Kit.
7. Measurement of 3-phase reactive power with single-phase wattmeter.

In addition to the above eight experiments, at least any two of the experiments from the following list are required to be conducted

9. Calibration LPF wattmeter – by Phantom testing.
10. Measurement of 3-phase power with single watt meter and two CTs.
11. C.T. testing using mutual Inductor – Measurement of % ratio error and phase angle of given CT by Null method.
12. PT testing by comparison – V.G. as Null detector – Measurement of % ratio error and phase angle of the given PT
14. Transformer turns ratio measurement using AC bridges.
15. Measurement of % ratio error and phase angle of given CT by comparison.
The following programs are to be written for assembler and execute the same with 8086 kits

1. Programs for 16 bit arithmetic operations for 8086 (using various addressing modes)
2. Program for sorting an array for 8086.
3. Program for searching for a number or character in a string for 8086.
4. Program for string manipulations for 8086.
5. Interfacing traffic light controller using 8086.
6. Interfacing ADC and DAC to 8086.
7. Parallel communication between two microprocessor kits using 8255.
8. Serial communication between two microprocessor kits using 8251.
9. Interfacing to 8086 and programming to control stepper motor.
11. Program and verify timer/counter in 8086.
12. Program and verify interrupt handling in 8086.
13. UART operation in 8086.
14. Communication between 8086 kit and PC.
15. Interfacing LCD to 8086.
16. Interfacing Matrix/keyboard to 8086.
17. Data Transfer from peripheral to memory through DMA controller 8237/8257.

Note: Minimum of 12 experiments to be conducted.
PE-I.1 COMPUTER METHODS IN POWER SYSTEMS

Pre-requisites: Power Systems-I, Power Systems –II, Electrical Circuits and Mathematics

Objectives: Objectives this course, are
- to understand and develop $Y_{bus}$ and $Z_{bus}$ matrices
- to know the importance of load flow studies and its importance
- to understand and applications of short circuit studies
- to explain rotor angle stability of power systems

UNIT-I: POWER SYSTEM NETWORK MATRICES

UNIT–II: POWER FLOW STUDIES-I

UNIT–III: POWER FLOW STUDIES-II

UNIT–IV: SHORT CIRCUIT ANALYSIS

UNIT–V: POWER SYSTEM STABILITY ANALYSIS

OUTCOMES:
After this course, the student will be able to
- develop the $Y_{bus}$ and $Z_{bus}$ matrices
- develop load flow programs
- understand the importance of short circuit studies
- understand stability and instability power systems

TEXT BOOKS
REFERENCE BOOKS
Pre-requisite: None

Objectives: Objectives of this course are
- to deal with the basic principles of organization, operation and performance of modern-day computer systems.
- To cover all aspects of computer technology, from the underlying integrated circuit technology used to construct computer components, and to the use of parallel organization concepts in combining those components.

UNIT-1:
BASIC STRUCTURE OF COMPUTERS:
Computer Types, Functional unit, Basic concepts, Bus structures, Software, Performance, Multiprocessors and Multi computers. Decimal Arithmetic unit, Decimal Arithmetic operations, Data Representation, Fixed Point Representation, Floating Point Representation, Error Detection codes.

UNIT-II:
REGISTER TRANSFER LANGUAGE AND MICROOPERATIONS:
Register Transfer language, Register Transfer Bus and Memory Transfers, Arithmetic Micro operations, Logic micro operations, Shift micro operations, Arithmetic logic shift unit, Instruction codes, Computer Registers, Computer instructions, Instruction cycle.

UNIT–III:
MEMORY – REFERENCE INSTRUCTIONS.
Input Output and Interrupt. STACK organization. Instruction formats. Addressing modes, DATA Transfer and manipulation, Program control, Reduced Instruction set computer. MICRO PROGRAMMED CONTROL: Control memory, Address sequencing, micro program example, design of control unit Hard wired control, Micro programmed control

UNIT-IV:
THE MEMORY SYSTEM:
Basic concepts semiconductor RAM memories, Read-only memories, Cache memories performance considerations, Virtual memories secondary storage, Introduction to RAID. INPUT-OUTPUT ORGANIZATION: Peripheral Devices, Input-Output Interface, Asynchronous data transfer Modes, Priority Interrupt Direct Memory Access. Input-output processor (IOP) Serial communication; introduction to peripheral component, inter connect (PCI) bus introduction to Standard serial communication protocols like RS232, USB, IEEE 1394.

UNIT-V:
Pipelining and Vector Processing:

OUTCOMES: After this course, the student
- Evaluates necessary mathematical representations for computer operation
- Understands the arithmetic and logical operations at register level
- Evaluates memory operations, differentiate various storage devices
- Understands input and output devices of the organization
- Understands the interfacing need for multiprocessor systems and their architecture.
TEXT BOOKS:

REFERENCES:
JNTUH COLLEGE OF ENGINEERING HYDERABAD

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PE- I.3 SPECIAL MACHINES

Pre-requisites: Electrical Machines-I and Electrical Machines-II

Objectives: Objectives of this course are

- To impart knowledge on construction, principle of operation, control and performance of stepper motors
- To impart knowledge on construction, principle of operation, control and performance of switched reluctance motors
- To impart knowledge on construction, principle of operation, control and performance of Brushless DC motors
- To impart knowledge on construction, principle of operation, control and performance of linear induction motor.

UNIT-I

SPECIAL TYPES OF D.C MACHINES-I
Series booster-Shunt booster-Non-reversible boost-Reversible booster

SPECIAL TYPES OF DC MACHINES –II

UNIT -II

STEPPER MOTORS
Introduction-synchronous inductor (or hybrid stepper motor), Hybrid stepping motor, construction, principles of operation, Energisation with two phase at a time- essential conditions for the satisfactory operation of a 2-phase hybrid step motor- very slow- speed synchronous motor for servo control- different configurations for switching the phase windings-control circuits for stepping motors-an open-loop controller for a 2-phase stepping motor.

UNIT-III

VARIABLE RELUCTANCE STEPPING MOTORS
Variable reluctance ( VR ) Stepper motors, single-stack VR step motors, Multiple stack VR motors-
Open-loop control of 3-phase VR step motor-closed-Loop control of step motor, discriminator ( or rotor position sensor ) transilator, major loop-characteristics of step motor in open-loop drive – comparison between open-loop position control with step motor and a position control servo using a conventional ( dc or ac ) servo motor- Suitability and areas of application of stepper motors-5- phase hybrid stepping motor-single phase-stepper motor, the construction, operating principle torque developed in the motor.

SWITCHED RELUCTANCE MOTOR
Introduction – improvements in the design of conventional reluctance motors- Some distinctive differences between SR and conventional reluctance motors-principle of operation of SRM- Some design aspects of stator and rotor pole arcs, design of stator and rotor and pole arcs in SR motor-
etermination of L(θ)-- 8 profile –power converter for SR motor-A numerical example –Rotor sensing mechanism and logic control, drive and power circuits, position sensing of rotor with Hall problems— derivation of torque expression, general linear case.

UNIT –IV

PERMANENT MAGNET MATERIALS AND MOTORS
Introduction, Hysteresis loops and recoil line- stator frames (pole and yoke - part ) of conventional PM dc Motors, Equivalent circuit of a PM-Development of Electronically commutated dc motor from conventional dc motor.

BRUSHLESS DC MOTOR
Types of construction – principle of operation of BLDM- sensing and switching logic scheme, sensing logic controller, lockout pulses –drive and power circuits, Base drive circuits, power converter circuit-
Theoretical analysis and performance prediction, modeling and magnet circuit d-q analysis of BLDM - transient analysis formulation in terms of flux linkages as state variables-Approximate solution for current and torque under steady state -Theory of BLDM as variable speed synchronous motor (assuming sinusoidal flux distribution)- Methods or reducing Torque Pulsations, 180 degrees pole arc and 120 degree current sheet.

UNIT-V
LINEAR INDUCTION MOTOR
Development of a double sided LIM from rotary type IM- A schematic of LIM drive for electric traction development of one sided LIM with back iron-field analysis of a DSLIM fundamental assumptions.

OUTCOMES: After the course, the student
• Acquires knowledge on constructional features of Rosenberg generator, amplidyne, metadyne, etc.,
• Obtains knowledge on stepper motors and variable reluctance motors
• Will be exposed to magnetic materials and BLDC motors and linear induction motor.

TEXT BOOKS
1. K.Venkataratnam, Special electrical machines, university press.
JNTUH COLLEGE OF ENGINEERING HYDERABAD

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PE-II.1 DIGITAL CONTROL SYSTEMS

Pre-requisites: Mathematics, Control Systems

OBJECTIVES: Objectives of this course are

- to understand the fundamentals of digital control systems, z-transforms
- to understand state space representation of the control systems, concepts of controllability and observability
- to study the estimation of stability in different domains
- to understand the design of discrete time control systems, compensators, state feedback controllers, state observers through various transformations

UNIT - I
INTRODUCTION TO DIGITAL CONTROL SYSTEMS AND Z-TRANSFORMS: Introduction - Merits and Demerits of Digital Control Systems - Practical aspects of the choice of sampling rate and Multirate sampling - Basic discrete time signals - Quantization – Sampling Theorem - Data Conversions and Quantization - Sampling process - Mathematical Modeling - Data Reconstruction and Filtering of sampled signals - Zero - Order Hold (ZOH). z- Transform and Inverse z-Transform, Relationship between s - plane and z - plane - Difference equation - Solution by recursion and z-Transform - Pulse Transfer Functions of the ZOH and relationship between G(s) and G(z) - Bilinear Transformation.

UNIT- II

UNIT – III

UNIT – IV

UNIT V
DIGITAL STATE OBSERVER AND STABILITY ANALYSIS
Design of the full order and reduced order state observer, Design of Dead beat Controller - some case studies - Stability analysis of discrete time systems based on Lyapunov approach.

OUTCOMES: After this course, the student

- will be able to map S-plane and Z-plane, do state-space analysis
- will be able to do stability analysis in S-domain and Z-domains
- will be able to do stability analysis through bilinear transformation and R-H criteria,
- to design of discrete-time control systems, design of lag, lead, lead-lag compensators, design of PID controllers and design of state feedback controllers and observers,
- applies the above concepts to real-world electrical and electronics problems and applications.
TEXT BOOKS

REFERENCE BOOKS
JNTUH COLLEGE OF ENGINEERING HYDERABAD

IDP (B.Tech. EEE & M.Tech. /MBA) III Year II-Sem

PE- II.2 OPTIMIZATION TECHNIQUES

Pre-requisites: Electrical Circuits, Electronic Devices and Circuits

OBJECTIVES: Objectives of this course are

- to introduce various optimization techniques i.e classical, linear programming, transportation problem, simplex algorithm, dynamic programming
- constrained and unconstrained optimization techniques for solving and optimizing an electrical and electronic engineering circuits design problems in real world situations.
- to explain the concept of Dynamic programming and its applications to project implementation.

UNIT – I


UNIT – II

Transportation Problem: Finding initial basic feasible solution by north – west corner rule, least cost method and Vogel’s approximation method – testing for optimality of balanced transportation problems.

UNIT – III
UNCONSTRAINED NONLINEAR PROGRAMMING: One dimensional minimization methods, Classification, Fibonacci method and Quadratic interpolation method

Unconstrained Optimization Techniques: Univariant method, Powell’s method and steepest descent method.

UNIT – IV

UNIT – V

OUTCOMES: After this course, the student will be able to

- explain the need of optimization of engineering systems
- understand optimization of electrical and electronics engineering problems
- apply classical optimization techniques, linear programming, simplex algorithm, transportation problem
- apply unconstrained optimization and constrained non-linear programming and dynamic programming
- formulate optimization problems.
TEXT BOOKS

REFERENCE BOOKS
UNIT- I: INTRODUCTION
Introduction to IC Technology – MOS, PMOS, NMOS, CMOS & Bjt-CMOS technologies- Oxidation, Lithography, Diffusion, Ion implantation, Metallization, Encapsulation, Probe testing, Integrated Resistors and Capacitors.
BASIC ELECTRICAL PROPERTIES: Basic Electrical Properties of MOS and BiCMOS Circuits: Ids-Vds relationships, MOS transistor threshold Voltage, gm, gds, figure of merit wo; Pass transistor, NMOS Inverter, Various pull ups, CMOS Inverter analysis and design, Bi-CMOS Inverters, CMOS Nanotechnology

UNIT - II: VLSI CIRCUIT DESIGN PROCESSES

UNIT - III: GATE LEVEL DESIGN
Logic Gates and Other complex gates, Switch logic, Alternate gate circuits, Basic circuit concepts, Sheet Resistance RS and its concept to MOS, Area Capacitance Units, Calculations - Delays, Driving large Capacitive Loads, Wiring Capacitances, Fan-in and fan-out, Choice of layers.
SUBSYSTEM DESIGN: Subsystem Design, Shifters, Adders, ALUs, Multipliers, Parity generators, Comparators, Zero/One Detectors, Counters, High Density Memory Elements.

UNIT - IV: SEMICONDUCTOR INTEGRATED CIRCUIT DESIGN
PLAs, FPGAs, CPLDs, Standard Cells, Programmable Array Logic, Design Approach.

UNIT - V: CMOS TESTING

TEXTBOOKS:

REFERENCES:
POWER ELECTRONICS

Pre-requisite: Electronic Devices and Circuits

Objective: Objectives of this course are
- to introduce the basic concepts of power semiconductor devices, types, operation and characteristics
- to understand the operation of converters and choppers and their analysis
- to understand the operation of AC voltage controllers and inverters

UNIT – I
POWER SEMICONDUCTOR DEVICES AND COMMUTATION CIRCUITS: Thyristors - Silicon Controlled Rectifiers (SCR’s) - BJT - Power MOSFET - Power IGBT and their characteristics and other thyristors - Basic theory of operation of SCR - Static characteristics – Turn-on and Turn-off methods- Dynamic characteristics of SCR - Turn on and Turn off times - Salient points.

UNIT – II
SINGLE PHASE HALF WAVE CONTROLLED CONVERTERS: Phase control technique - Single phase Line commutated converters - Half wave controlled converters with Resistive, RL load and RLE load - Derivation of average load voltage and current - Active and Reactive power inputs to the converters without and with Free wheeling Diode - Numerical problems
SINGLE PHASE FULLY CONTROLLED CONVERTERS: Fully controlled converters, Mid point and Bridge connections with Resistive, RL loads and RLE load - Derivation of average load voltage and current – Line commutated inverters, semi-converters, active and Reactive power inputs to the converters, Effect of source inductance – Expressions of load voltage and current - Numerical problems.

UNIT – III

UNIT – IV
Morgan’s chopper – Jones chopper - Oscillation choppers (Principle of operation only) -waveforms — AC Chopper – Problems

UNIT – V
OUTCOMES: After this course, student will be able to
• understand the operation and characteristics of various types of semiconductor devices
• analyze the operation and characteristics of various single-phase converters, three-phase converters and choppers
• analyze the operation and performance of AC voltage controllers and inverters

TEXT BOOKS
1. P.S.Bhimbra, Power Electronics, Khanna publications.

REFERENCE BOOKS
5. Power Electronics, M. S. Jamil Asghar, PHI Private Limited.
SWITCH GEAR AND PROTECTION

Pre-requisites: Power Systems –I and Power Systems - II

Objectives: Objectives of this course are
- to introduce protection equipment like Circuit Breakers and Relays
- to introduce protection of Generators, Transformers and feeder bus bars from over voltages and other hazards.
- To emphasize Neutral for overall protection.

UNIT - I
Description and Operation of following types of circuit breakers: Minimum Oil Circuit breakers, Air Blast Circuit Breakers, Vacuum and SF6 circuit breakers.

UNIT – II
ELECTROMAGNETIC AND STATIC RELAYS: Principle of Operation and Construction of Attracted armature, Balanced Beam, induction Disc and Induction Cup relays.
Types of Over Current Relays: Instantaneous, DMT and IDMT types.
Application of relays: Over current/ under voltage relays, Direction relays, Differential Relays and Percentage Differential Relays.
Universal torque equation, Distance relays: Impedance, Reactance and Mho and Off-Set Mho relays, Characteristics of Distance Relays and Comparison. Static Relays: Static Relays verses Electromagnetic Relays.

UNIT – III
PROTECTION OF POWER EQUIPMENT: Protection of generators against Stator faults, Rotor faults, and Abnormal Conditions. Restricted Earth fault and Inter-turn fault Protection. Numerical Problems on % Winding Unprotected.
Protection of Bus bars – Differential protection.

UNIT – IV

UNIT - V

OUTCOMES: After this course, the student
- gets a thorough knowledge on, various types of protective devices (circuit breakers, relays etc..) and their co-ordination, protection of generators, transformers, feeders, bus-bars, through different types of protective devices, overvoltage protection, lightening, concept of earthing and grounding
- applies the above concepts to real-world electrical and electronics problems and applications.
TEXT BOOKS

REFERENCE BOOKS
1. Introduction
The introduction of the Advanced Communication Skills Lab is considered essential at 3rd year level. At this stage, the students need to prepare themselves for their careers which may require them to listen, read, speak and write in English both for their professional and interpersonal communication in the globalised context.

The proposed course should be a laboratory course to enable students to use ‘good’ English and perform the following:
- Gathering ideas and information to organise ideas relevantly and coherently.
- Engaging in debates.
- Participating in group discussions.
- Facing interviews.
- Writing project/research reports/technical reports.
- Making oral presentations.
- Writing formal letters.
- Transferring information from non-verbal to verbal texts and vice-versa.
- Taking part in social and professional communication.

2. Objectives:
This Lab focuses on using multi-media instruction for language development to meet the following targets:
- To improve the students’ fluency in English, through a well-developed vocabulary and enable them to listen to English spoken at normal conversational speed by educated English speakers and respond appropriately in different socio-cultural and professional contexts.
- Further, they would be required to communicate their ideas relevantly and coherently in writing.
- To prepare all the students for their placements.

Learning Outcomes
- Accomplishment of sound vocabulary and its proper use contextually.
- Flair in Writing and felicity in written expression.
- Enhanced job prospects.
- Effective Speaking Abilities

3. Syllabus:
The following course content to conduct the activities is prescribed for the Advanced Communication Skills (ACS) Lab:
1. Activities on Fundamentals of Inter-personal Communication and Building Vocabulary -
   Starting a conversation – responding appropriately and relevantly – using the right body language – Role Play in different situations & Discourse Skills- using visuals - Synonyms and antonyms, word roots, one-word substitutes, prefixes and suffixes, study of word origin, business vocabulary, analogy, idioms and phrases, collocations & usage of vocabulary.
2. Activities on Reading Comprehension –General Vs Local comprehension, reading for facts, guessing meanings from context, scanning, skimming, inferring meaning, critical reading & effective googling.
4. Activities on Presentation Skills – Oral presentations (individual and group) through JAM sessions/seminars/PPTs and written presentations through posters/projects/reports/ e-mails/assignments etc.
5. Activities on Group Discussion and Interview Skills – Dynamics of group discussion, intervention, summarizing, modulation of voice, body language, relevance, fluency and organization of ideas and rubrics for evaluation- Concept and process, pre-interview planning, opening strategies, answering strategies, interview through tele-conference & video-conference and Mock Interviews.

4. Minimum Requirement:
The Advanced Communication Skills (ACS) Laboratory shall have the following infra-structural facilities to accommodate at least 35 students in the lab:
- Spacious room with appropriate acoustics
- Round Tables with movable chairs
- Audio-visual aids
- LCD Projector
- Public Address system
- T. V, a digital stereo & Camcorder
- Headphones of High quality


6. Suggested Software:
The software consisting of the prescribed topics elaborated above should be procured and used.
- Oxford Advanced Learner’s Compass, 8th Edition
- DELTA’s key to the Next Generation TOEFL Test: Advanced Skill Practice.
- Lingua TOEFL CBT Insider, by Dreamtech
- TOEFL & GRE (KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)
- The following software from ‘train2success.com’
  - Preparing for being Interviewed
  - Positive Thinking
  - Interviewing Skills
  - Telephone Skills
  - Time Management

7. Books Recommended:

DISTRIBUTION AND WEIGHTAGE OF MARKS:

Advanced Communication Skills Lab Practicals:
1. The practical examinations for the ACS Laboratory practice shall be conducted as per the University norms prescribed for the core engineering practical sessions.
2. For the English Language lab sessions, there shall be continuous evaluation during the year for 25 sessional marks and 50 End Examination marks. Of the 25 marks, 15 marks shall be awarded for day-to-day work and 10 marks to be awarded by conducting Internal Lab Test(s). The End Examination shall be conducted by the teacher concerned, by inviting the External Examiner from outside. In case of the non-availability of the External Examiner, other teacher of the same department can act as the External Examiner.

Mini Project: As a part of Internal Evaluation
1. Seminar/ Professional Presentation
2. A Report on the same has to be prepared and presented.
   * Teachers may use their discretion to choose topics relevant and suitable to the needs of students.
   * Not more than two students to work on each mini project.
   * Students may be assessed by their performance both in oral presentation and written report.
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POWER ELECTRONICS LAB

Any eight experiments should be conducted
1. Study of Characteristics of SCR, MOSFET & IGBT
2. Gate firing circuits for SCR’s
3. Single Phase AC Voltage Controller with R and RL Loads
4. Single Phase fully controlled bridge converter with R and RL loads
5. Forced Commutation circuits (Class A, Class B, Class C, Class D & Class E)
6. DC Jones chopper with R and RL Loads
7. Single Phase Parallel, inverter with R and RL loads
8. Single Phase Cycloconverter with R and RL loads
9. Single Phase Half controlled converter with R load
10. Three Phase half controlled bridge converter with R-load
11. Single Phase series inverter with R and RL loads
12. Single Phase Bridge converter with R and RL loads
13. Single Phase dual converter with RL loads

Any two simulation experiments should be conducted
15. Simulation of resonant pulse commutation circuit and Buck chopper.
16. Simulation of single phase Inverter with PWM control.

REFERENCE BOOKS
2. User’s manual of related softwares
3. Reference guides of related softwares
4. Rashid, Spice for power electronics and electric power, CRC Press
JNTUH COLLEGE OF ENGINEERING HYDERABAD

IDP (B.Tech. EEE & M.Tech. /MBA) III Year II-Sem

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MICROCONTROLLERS LAB

The following programs are to be written for assembler and execute the same with 8051 kit

1. Programs for 16 bit arithmetic operations for 8051 (using various addressing modes)
2. Program for sorting an array for 8051.
3. Program for searching for a number or character in a string for 8051.
4. Program for string manipulations for 8051.
5. Interfacing traffic light controller using 8051.
6. Interfacing ADC and DAC to 8051.
7. Parallel communication between two microcontroller kits using 8255.
8. Serial communication between two microcontroller kits using 8251.
9. Interfacing to 8051 and programming to control stepper motor.
11. Program and verify timer/counter in 8051.
12 Program and verify interrupt handling in 8051.
13. UART operation in 8051.
14. Communication between 8051 kit and PC.
15. Interfacing LCD to 8051.
16. Interfacing Matrix/keyboard to 8051.
17. Data Transfer from peripheral to memory through DMA controller 8237/8257.

Note: Minimum of 12 experiments to be conducted
Prerequisite: Mathematics

OBJECTIVES: Objectives of this course are
• to deal with the fundamentals of signal analysis
• to introduce the concepts of Fourier series, Fourier transforms, Laplace transforms, Z-transforms, linear time invariant systems
• to introduce discrete Fourier series, discrete Fourier transform, fast Fourier transform
• to introduce filters and their design aspects

UNIT – I
INTRODUCTION: Introduction to Digital Signal Processing: Sampling process, Discrete time signals & sequences, linear shift invariant systems, stability and causality, Linear constant coefficient difference equations, Frequency domain representation of discrete time signals and systems.

UNIT – II
DISCRETE FOURIER SERIES: Properties and theorems of discrete Fourier series, DFS representation of periodic sequences.
DISCRETE FOURIER TRANSFORMS: Properties of DFT, linear convolution of sequences using DFT, Computation of DFT. Relation between Z-transform and DFS.
FAST FOURIER TRANSFORMS: Fast Fourier transforms (FFT) - Radix-2 decimation in time and decimation in frequency FFT Algorithms, Inverse FFT, and FFT for composite number.

UNIT – III

UNIT – IV
FIR DIGITAL FILTERS: Characteristics of FIR Digital Filters, frequency response. Design of FIR Digital Filters using Window Techniques - Frequency Sampling technique, Comparison of IIR & FIR filters.

UNIT – V
INTRODUCTION TO DSP PROCESSORS: Introduction to programmable DSPs: Multiplier and Multiplier Accumulator (MAC), Modified Bus Structures and Memory Access schemes in DSPs Multiple access memory, multiport memory, On-Chip Peripherals - All the above with an example of TMS320CXX processors.

OUTCOMES: After this course, the student
• gets a thorough knowledge on signal analysis by various mathematical tools viz., Fourier transforms, Laplace transforms, Z-transforms, Discrete Fourier Transform, Fast-Fourier transforms
• understands importance of filters, their design methodology and necessary mathematical analysis
• gets knowledge of DSP processors, architecture and programming skills

TEXT BOOKS
REFERENCE BOOKS
DE(UG) - III.1: HVDC TRANSMISSION

Prerequisite: Power Electronics and Power Systems

Course Objectives:
- To Comprehend the conversion principles of HVDC Transmission
- Analysis of 3, 6, 12 pulse converters, rectifier and inverter operations of HVDC converters
- To identify the different types of Harmonics and reduction by using Filters
- To comprehend interaction between HVAC and DC systems in various aspects
- To appreciate the reliable MTDC systems and protection of HVDC system

Course Outcomes: Upon the completion of this course, the student will be able to
- To find the applications of HVDC transmission in the power system with the acquired knowledge.
- To analyze different converter topologies viz. 3, 6 and 12 Pulse converters and understand it’s control aspects.
- To understand the filter configuration for Harmonics in HVDC systems.
- To appreciate the reliable Multi terminal HVDC system.
- To have knowledge on the Protection of HVDC systems against Transient over voltages and over currents.

UNIT-I: INTRODUCTION
General consideration, Power Handling Capabilities of HVDC Lines Basic Conversion principles, static converter configuration.

UNIT-II: STATIC POWER CONVERTERS
3-pulse, 6-pulse, and 12-pulse converters, converter station and Terminal equipment, commutation process, Rectifier and inverter operation, equivalent circuit for converter – special features of converter transformers. Harmonics in HVDC Systems, Harmonic elimination, AC and DC filters. VSC based HVDC and Hybrid HVDC systems. Back to back thyristor converter system.

UNIT-III: CONTROL OF HVDC CONVERTERS AND SYSTEMS
Constant current, constant extinction angle and constant ignition angle control Individual phase control and equidistant firing angle control DC power flow control. Interaction between HV AC and DC systems – Voltage interaction Harmonic instability problems and DC power modulation.

UNIT-IV: MTDC SYSTEMS & OVER VOLTAGES
Series parallel and series parallel systems their operation and control.
Over voltages due to disturbances on DC side, over voltages due to DC and AC side line faults.

UNIT-V: CONVERTER FAULTS & PROTECTION
Converter faults, over current protection – valve group, and DC line protection over voltage protection of converters, surge arresters.

TEXT BOOKS:
2. J. Arillaga HVDC Transmission Peter Peregrinus Ltd. London UK 1983

REFERENCES:
DE(UG) - III.2: RELIABILITY ENGINEERING

Prerequisite: None

Course Objectives:
- To comprehend the concept of Reliability and Unreliability
- Derive the expressions for probability of failure, Expected value and standard deviation of Binomial distribution, Poisson distribution, normal distribution and Weibull distributions.
- Formulating expressions for Reliability analysis of series-parallel and Non-series parallel systems
- Deriving expressions for Time dependent and Limiting State Probabilities using Markov models.

Learning Outcomes: Upon the completion of this course, the student will be able to
- Apply fundamental knowledge of Reliability to modeling and analysis of series-parallel and Non-series parallel systems.
- Solve some practical problems related with Generation, Transmission and Utilization of Electrical Energy.
- Understand or become aware of various failures, causes of failures and remedies for failures in practical systems.

Unit I:

Unit II:

Unit III:
Classification of engineering systems: series, parallel and series-parallel systems- Expressions for the reliability of the basic configurations.
Reliability evaluation of Non-series-parallel configurations: Decomposition, Path based and cutest based methods, Deduction of the Paths and cutsets from Event tree.

Unit IV:
Discrete Markov Chains: General modeling concepts, stochastic transitional probability matrix, time dependent probability evaluation and limiting state probability evaluation of one component repairable model. Absorbing states.

UNIT-V:
Approximate system Reliability analysis of Series systems, parallel systems with two and more than two components, Network reduction techniques. Minimal cutest/failure mode approach.

TEXT BOOKS:

REFERENCES:
DE(UG) - III.1: HIGH VOLTAGE ENGINEERING

Prerequisite: Power Systems and Electrical & Electronics Instrumentation

Course Objectives:

- To distinguish the Gaseous, liquid and solid dielectric behavior under High Voltages.
- To understand the generation methods of High A.C, DC & Impulse Voltages required for various application.
- To apply the measuring techniques of High AC, DC & Impulse voltages and currents.
- To identify the testing techniques for High Voltage Equipment.

Course Outcomes: Upon the completion of this course, the student will be able to

- Know conduction and breakdown in gases, liquids and solids dielectrics and different applications of the insulating materials in electrical power apparatus.
- Know the insulation testing of various components in power systems for different voltages, viz. power frequency, high frequency, switching or lightning impulses.
- Interpret the necessity to measure the voltages and currents accurately, ensuring perfect safety to the personnel and equipment.
- Obtain the necessary condition for all the electrical equipment capable of withstanding the over voltages.

UNIT- I: INTRODUCTION TO HIGH VOLTAGE ENGINEERING

Electric Field Stresses, Gas / Vacuum as Insulator, Liquid Dielectrics, Solids and Composites, Estimation and Control of Electric Stress, Numerical methods for electric field computation, Surge voltages, their distribution and control, Applications of insulating materials in transformers, rotating machines, circuit breakers, cable power capacitors and bushings.

UNIT- II: BREAK DOWN IN DIELECTRIC MATERIALS

Gases as insulating media, collision process, Ionization process, Townsend’s criteria of breakdown in gases, Paschen’s law. Liquid as Insulator, pure and commercial liquids, breakdown in pure and commercial liquids. Intrinsic breakdown, electromechanical breakdown, thermal breakdown, breakdown of solid dielectrics in practice, Breakdown in composite dielectrics, solid dielectrics used in practice.

UNIT-III: GENERATION & MEASUREMENT OF HIGH VOLTAGES & CURRENTS


UNIT-IV: OVER VOLTAGES & INSULATION CO-ORDINATION

Natural causes for over voltages – Lightning phenomenon, Overvoltage due to switching surges, system faults and other abnormal conditions, Principles of Insulation Coordination on High voltage and Extra High Voltage power systems.

UNIT- V: TESTING OF MATERIALS & ELECTRICAL APPARATUS


TEXT BOOKS:

REFERENCES:
3. High Voltage Engineering, Theory and Practice by Mazen Abdel Salam, Hussein Anis, Ahdan El-Morshedy, Rosghdy Radwan, Marcel
Prerequisite: Power Electronics

Course Objectives:
- To understand various advanced power electronics devices.
- To describe the operation of multi level inverters with switching strategies for high power applications.
- To comprehend the design of resonant converters and switched mode power supplies.

Course Outcomes:
After taking this course, student will be able to:
- Develop and analyze various converter topologies.
- Design AC or DC switched mode power supplies.

UNIT I: MODERN POWER SEMICONDUCTOR DEVICES
Modern power semiconductor devices – Insulated Gate Bipolar Transistor (IGBT) –MOSFET-MOS
Turn off Thyristor (MTO) – Emitter Turn Off Thyristor (ETO) – Integrated Gate-Commutated Thyristor
(IGCTs) – MOS-controlled thyristors(MCTs) – Power integrated circuits (PICs) – symbol, structure and
equivalent circuit – comparison of their features.

UNIT II: RESONANT PULSE INVERTERS
Resonant pulse inverters – series resonant inverters – series resonant inverters with unidirectional
switches – series resonant inverters with bidirectional switches – analysis of half bridge resonant
inverter – evaluation of currents and voltages of a simple resonant inverter – analysis of half bridge
and full bridge resonant inverter with bidirectional switches – Frequency response of series resonant
inverters – for series loaded inverter – for parallel loaded inverter – For series and parallel loaded
inverters – parallel resonant inverter – Voltage control of resonant inverters – class E resonant
inverter – class E resonant rectifier – evaluation of values of C’s and L’s for class E inverter and Class
E rectifier – numerical problems.

UNIT III: RESONANT CONVERTERS
Resonant converters – zero current switching resonant converters – L type ZCS resonant converter –
M type ZCS resonant converter – zero voltage switching resonant converters – comparison between
ZCS and ZVS resonant converters – Two quadrant ZVS resonant converters – resonant dc-link

UNIT IV: MULTILEVEL INVERTERS
Multilevel concept – Classification of multilevel inverters – Diode clamped Multilevel inverter –
principle of operation – main features – improved diode Clamped inverter – principle of operation –
Flying capacitors multilevel inverter-principle of operation – main features – cascaded multilevel
inverter – principle of operation – main features – Multilevel inverter applications – reactive power
compensation – back to back intertie system – adjustable drives - Switching device currents – dc link
capacitor voltage balancing – features of Multilevel inverters – comparisons of multilevel converters.

UNIT V: D.C & A.C POWER SUPPLIES
DC power supplies – classification - switched mode dc power supplies – fly back Converter – forward
converter – push-pull converter – half bridge converter – Full bridge converter – Resonant d c power
supplies – bidirectional power supplies – Applications.
AC power supplies – classification – switched mode ac power supplies – Resonant AC power
supplies – bidirectional ac power supplies – multistage conversions – control circuits – applications.
Introduction – power line disturbances – power conditioners – Uninterruptible Power supplies –
applications.

TEXT BOOKS:
Prerequisite: Electrical Machines

Course Objectives:
- Identifying the methods and assumptions in modeling of machines.
- Recognize the different frames for modeling of AC machines.
- To write voltage and torque equations in state space form for different machines.

Learning Outcomes: At the end of the course, the student is able to:
- Develop the mathematical models of various machines like, induction motor and Synchronous machines using modeling equations.
- Analyze the developed models in various reference frames.

UNIT-I:

UNIT-II:
Mathematical model of separately excited DC motor and DC Series motor in state variable form – Transfer function of the motor - Numerical problems.

UNIT-III:
Liner transformation – Phase transformation (a, b, c to α, β, o) – Active transformation (α ,β, o to d, q).
Circuit model of a 3 phase Induction motor – Linear transformation - Phase Transformation – Transformation to a Reference frame – Two axis models for induction motor - dq model based DOL starting of Induction Motors

UNIT-IV:

UNIT-V:
Circuits model of a 3ph Synchronous motor – Two axis representation of Synchronous Motor.
Voltage and current Equations in state – space variable form – Torque equation - dq model based short circuit fault analysis- emphasis on voltage, frequency and recovery time.

TEXT BOOKS:
2. Analysis of electric machinery and Drives systems - Paul C. Krause, Oleg wasynezuk, Scott D. Sudhoff.
3. Thyristor control of Electric Drives - Vedam Subranmanyam.
4. Power System Stability and Control – Prabha Kundur, EPRI.

REFERENCES:
Prerequisite:

Course Objectives:
- To identify the necessity of reactive power compensation
- To describe load compensation
- To select various types of reactive power compensation in transmission systems
- To illustrate reactive power coordination system
- To characterize distribution side and utility side reactive power management.

Course Outcomes: Upon the completion of this course, the student will be able to
- Distinguish the importance of load compensation in symmetrical as well as unsymmetrical loads
- Observe various compensation methods in transmission lines
- Construct model for reactive power coordination
- Distinguish demand side reactive power management & user side reactive power management

UNIT-I: LOAD COMPENSATION
Objectives and specifications – reactive power characteristics – inductive and capacitive approximate biasing – Load compensator as a voltage regulator – phase balancing and power factor correction of unsymmetrical loads- examples.

UNIT-II: STEADY–STATE REACTIVE POWER COMPENSATION IN TRANSMISSION SYSTEM
Uncompensated line – types of compensation – Passive shunt and series and dynamic shunt compensation – examples

UNIT-III: REACTIVE POWER COORDINATION
Objective – Mathematical modeling – Operation planning – transmission benefits – Basic concepts of quality of power supply – disturbances- steady –state variations – effects of under voltages – frequency –Harmonics, radio frequency and electromagnetic interferences

UNIT-IV: DEMAND SIDE MANAGEMENT
Load patterns – basic methods load shaping – power tariffs- KVAR based tariffs penalties for voltage flickers and Harmonic voltage levels

UNIT-V: USER SIDE REACTIVE POWER MANAGEMENT
KVAR requirements for domestic appliances – Purpose of using capacitors – selection of capacitors – deciding factors – types of available capacitor, characteristics and Limitations

TEXT BOOKS:

REFERENCES:
PGE – I.3: GAS INSULATED SYSTEMS

Prerequisite: Switch Gear and Protection

Course objectives:
- To know the GIS concepts and principles
- To choose Air Insulated Substation and GIS
- To demonstrate the design and constructional aspects of GIS
- To analyze transient phenomenon, problems and diagnostic methods in GIS

Course Outcomes: Upon the completion of this course, the student will be able to
- Know the advantages of GIS systems over air insulated systems
- Observe constructional design features of GIS design
- Discriminate the problems and design diagnostic methods of GIS

UNIT-I: INTRODUCTION TO GIS AND PROPERTIES OF SF₆
Characteristics of GIS - Introduction to SF₆ - Physical properties - Chemical properties - Electrical properties - Specification of SF₆ gas for GIS application - Handling of SF₆ gas before use - Safe handling of SF₆ gas in electrical equipment - Equipment for handling the SF₆ Gas - SF₆ and environment.

UNIT-II: LAYOUT OF GIS STATIONS
Advancement of GIS station - Comparison with Air Insulated Substation - Economics of GIS - User Requirements for GIS - Main Features for GIS - Planning and Installation components of a GIS station.

UNIT-III: DESIGN AND CONSTRUCTION OF GIS STATION

UNIT-IV: FAST TRANSIENT PHENOMENA IN GIS
Introduction - Disconnector Switching in Relation to Very fast Transients-Origin of VFTO-Propagation and Mechanism of VFTO-VFTO Characteristics - Effects of VFTO - Testing of GIS for VFTO.

UNIT-V: SPECIAL PROBLEMS IN GIS AND GIS DIAGNOSTICS

TEXT BOOKS:

REFERENCES:
JNTUH COLLEGE OF ENGINEERING HYDERABAD

IDP (B.Tech. EEE & M.Tech. /MBA) IV Year I-Sem

PGE – II.1: RENEWABLE ENERGY SOURCES

Prerequisite: None

Course Objectives:
- To recognize the awareness of energy conservation in students
- To identify the use of renewable energy sources for electrical power generation
- To collect different energy storage methods
- To detect about environmental effects of energy conversion

Course Outcomes: Upon the completion of this course, the student will be able to
- find different renewable energy sources to produce electrical power
- estimate the use of conventional energy sources to produce electrical energy
- role-play the fact that the conventional energy resources are depleted
- arrange Store energy and to avoid the environmental pollution

UNIT-I:
Photo voltaic power generation ,spectral distribution of energy in solar radiation, solar cell configurations, voltage developed by solar cell, photo current and load current, practical solar cell performance, commercial photo voltaic systems, test specifications for PV systems, applications of super conducting materials in electrical equipment systems.

UNIT-II:
Principles of MHD power generation, ideal MHD generator performance, practical MHD generator, MHD technology.
Wind Energy conversion: Power from wind, properties of air and wind, types of wind Turbines, operating characteristics.

UNIT-III:
Tides and tidal power stations, modes of operation, tidal project examples, turbines and generators for tidal power generation.
Wave energy conversion: properties of waves and power content, vertex motion of Waves, device applications. Types of ocean thermal energy conversion systems Application of OTEC systems examples,

UNIT-IV:
Miscellaneous energy conversion systems: coal gasification and liquefaction, biomass conversion, geothermal energy, thermo electric energy conversion, principles of EMF generation, description of fuel cells, Co-generation and energy storage, combined cycle co-generation, energy storage.
Global energy position and environmental effects: energy units, global energy position.

UNIT-V:
Types of fuel cells, H₂-O₂ Fuel cells, Application of fuel cells – Batteries, Description of batteries, Battery application for large power. Environmental effects of energy conversion systems, pollution from coal and preventive measures steam stations and pollution, pollution free energy systems.

TEXT BOOKS:

REFERENCES:
PGE-II.2: ELECTRIC TRACTION TECHNOLOGIES

Prerequisite: None

Course Objectives:

- To be able to understand various systems of track electrification, power supply system and mechanics of electric train.
- To understand various motors used in the electric traction and their converters.

Course Outcomes:

Upon the completion of this course, the student will be able to

- Distinguish the importance of single and three phase traction system.
- Observe various Traction mechanics
- Construct model HV arrangements, Semiconductor converter controlled drives.

UNIT – I
TRACTION SYSTEMS: Electric drives - Advantages & disadvantages - System of track electrification - DC, 1-Phase low frequency, 3-Phase low frequency and composite systems, Problems of 1-phase traction system - Current unbalance, Voltage unbalance, Production of harmonics, Induction effects, Booster transformer - Rail connected booster transformer. Comparison between ac and dc systems.

UNIT – II
TRACTION MECHANICS: Types of services, Speed - time curves - Construction of quadrilateral and trapezoidal speed time curves, Average & schedule speeds. Ttractive effort - Speed characteristic, Power of traction motor, specific energy consumption - Factors affecting specific energy consumption, Coefficient of adhesion, slip - Factors affecting slip, magnetically suspended trains.

UNIT – III
POWER SUPPLY ARRANGEMENTS: High voltage supply, Constituents of supply system - Substations, Feeding post, Feeding & sectioning arrangements, Remote control center, Design considerations of substations, Over head equipment - principle of design of OHE, Polygonal OHE - Different types of constructions, Basic sag & tension calculations, Dropper design, Current collection gear for OHE.

UNIT – IV

UNIT – V
SEMICONDUCTOR CONVERTER CONTROLLED DRIVES: Advantages of 25KV of AC Traction - Control of d.c. motors - single and two stage converters, Control of ac. motors - CSI fed squirrel cage induction motor, PWM VSI induction motor drive, D.C. traction — Chopper controlled d.c. motors, composite braking, Diesel electric traction — D.C. generator fed d.c. series motor, Alternator fed d.c. series motor, Alternator fed squirrel cage induction motor, Locomotive and axle codes..Introduction to new technologies in super speed electric locomotives.

TEXT BOOKS:

REFERENCE:
1. www.siemens.com/mobility/locomotives
2. www.abb.com/railway
JNTUH COLLEGE OF ENGINEERING HYDERABAD

IDP (B.Tech. EEE & M.Tech. /MBA) IV Year I-Sem

PGE-II.3: INDUSTRIAL INSTRUMENTATION

Prerequisite: None

Course Objectives:
- To study the characteristics of instruments
- Analyze the various types of transducers
- Principle of operation and selection of transducers depends on their applications.
- Basic knowledge of displacement, strain, pressure, temperature, flow, level, density, and viscosity measurements.

Course Outcomes:
After completion of this course, the students will be able to
- Select the transducers and their types, usage and operation and different characteristics of transducers.
- Calibrate the various instruments and application of various instruments to different fields.
- Implement process techniques, instrumental setups as well as controlling and monitoring of various processes in the industries.

UNIT – I: INTRODUCTION:
Introduction to Instrumentation system - Static and Dynamic characteristics of Instruments - Principles of transducers.

UNIT- II: MEASUREMENT OF DISPLACEMENT & STRAIN:
Displacement and proximity gauges - Linear Variable Differential Transformer (LVDT) - Measurement of strain: Strain Gauge - unbalanced Wheatstone bridge.

UNIT – III: MEASUREMENT OF TEMPERATURE:
Thermocouples - Resistance Temperature Detector (RTD) - Thermistors and radiation pyrometer.

UNIT- IV : MEASUREMENT OF FLOW:
Measurement of level: Capacitance based and Float based method. Differential pressure flow meters - variable area flow meters- variable reluctance flow meters - Turbine flow meter - Ultrasonic flow meter (Both transit time and Doppler Shift) - Electromagnetic flow meter and mass flow meter.

UNIT – V: MEASUREMENT OF PRESSURE & OTHER QUANTITIES:
Elastic transducers- Low pressure measurement-McLeod and ionization gauge-Load cell - Torque Cell - pH probe and viscosity measurement - Basics of Data transmission - Synchro and Servo motor - Pneumatic and Hydraulic Instrumentation system.

TEXT BOOK:
1. E. Doeblin, "Industrial Instrumentation"- CRC Press
2. A.K.Sawhney, Course in Electrical and Electronics Measurements and Instrumentation, Dhanpat Rai & Company
PGE – III.1: MODERN CONTROL THEORY

Prerequisite: Control Systems

Course Objectives:
- To explain the concepts of basics and modern control system for the real time analysis and design of control systems.
- To explain the concepts of state variables analysis.
- To study and analyze non linear systems.
- To analyze the concept of stability for non-linear systems and their categorization.
- To apply the comprehensive knowledge of optimal theory for Control Systems.

Course Outcomes:
Upon completion of this course, students should be able to:
- Various terms of basic and modern control system for the real time analysis and design of control systems.
- To perform state variables analysis for any real time system.
- Apply the concept of optimal control to any system.
- Able to examine a system for its stability, controllability and observability.
- Implement basic principles and techniques in designing linear control systems.
- Formulate and solve deterministic optimal control problems in terms of performance indices.
- Apply knowledge of control theory for practical implementations in engineering and network analysis.

UNIT I: Mathematical Preliminaries and State Variable Analysis:

UNIT II: Controllability and Observability:
General concept of controllability – Controllability tests, different state transformations such as diagonalization, Jordan canonical forms and Controllability canonical forms for Continuous-Time Invariant Systems – General concept of Observability – Observability tests for Continuous-Time Invariant Systems – Observability of different State transformation forms.

UNIT III: State Feedback Controllers and Observers:
State feedback controller design through Pole Assignment, using Ackermann’s formula – State observers: Full order and Reduced order observers.

UNIT IV: Non-Linear Systems:
UNIT V: Stability Analysis:

TEXT BOOKS:
1. M.Gopal, Modern Control System Theory, New Age International - 1984
2. Ogata, K, Modern Control Engineering, Prentice Hall - 1997

REFERENCES:
Prerequisite: Microprocessors and Interfacing Devices

Course Objectives:
- To emphasize the general embedded system concepts, design of embedded hardware and software development tools
- To explain the basics of real time operating and embedded systems
- To describe key issues such as CPU scheduling, memory management, task synchronization, and file system in the context of real-time embedded systems.

Course Outcomes: Upon the completion of this course, the student will be able to
- To analyze and design embedded systems and real-time systems
- Define the unique design problems and challenges of real-time systems
- Identify the unique characteristics of real-time operating systems and evaluate the need for real-time operating system
- Explain the general structure of a real-time system and understand and use RTOS to build an embedded real-time system
- Gain knowledge and skills necessary to design and develop embedded applications based on real-time operating systems.

UNIT-I: OVERVIEW OF EMBEDDED SYSTEM

UNIT-II: PROCESSOR & MEMORY ORGANIZATION
Structural units in a processor, Processor selection, Memory devices, Memory selection, Memory Allocation & Map, Interfacing.

UNIT-III: DEVICES, DEVICE DRIVERS & BUSES FOR DEVICE NETWORKS
I/O devices, Timer & Counter devices, Serial Communication, Communication between devices using different buses. Device drives, Parallel and serial port device drives in a system, Interrupt servicing mechanism, context and periods for context switching, Deadline and Interrupt Latency.

UNIT-IV: PROGRAMMING & MODELING CONCEPTS
Program elements, Modeling Processes for Software Analysis, Programming Models, Modeling of Multiprocessor Systems, Software algorithm Concepts, design, implementation, testing, validating, debugging, Management and maintenance, Necessity of RTOS.

UNIT-V: HARDWARE AND SOFTWARE CO-DESIGN
Embedded system design and co-design issues in software development, design cycle in development phase for Embedded System, Use of ICE & Software tools for development of ES, Issues in embedded system design.

TEXTBOOKS:
1. Embedded systems: Architecture, programming and design by Rajkamal, TMH
2. Embedded system design by Arnold S Burger, CMP

REFERENCES:
1. An embedded software primer by David Simon, PEA
2. Embedded systems design: Real world design be Steve Heath; Butterworth Heinenann, Newton mass USA 2002
3. Data communication by Hayt.
PGE – III.3: MICROCONTROLLERS AND APPLICATIONS

Prerequisite: Microprocessors and Interfacing Devices

Course Objectives:
• To relate the basic architecture and addressing modes of a microcontroller.
• To explain the principles of top down design to microcontroller software development
• To demonstrate assembly language programs for the advanced Microcontroller, assembly language code for high-level language structures such as IF-THEN-ELSE and DO-WHILE
• To analyze a typical I/O interface and to discuss timing issues
• To identify different types of memory used in microcontrollers

Course Outcomes: Upon the completion of this course, the student will be able to
• Distinguish types of computers & microcontrollers,
• know 8-Bit, 16- Bit & 32 Bit advanced Microcontrollers.
• Develop Real time Applications of Microcontrollers & Demonstrate RTOS for Microcontrollers.
• Translate Hardware applications using Microcontrollers.

UNIT-I: OVERVIEW OF ARCHITECTURE & MICROCONTROLLER RESOURCES

UNIT-II: 8051- MICROCONTROLLERS INSTRUCTION SET
Basic assembly language programming – Data transfer instructions – Data and Bit-manipulation instructions – Arithmetic instructions – Instructions for Logical operations on the test among the Registers, Internal RAM, and SFRs – Program flow control instructions – Interrupt control flow.

UNIT-III: REAL TIME CONTROL
INTERRUPTS: Interrupt handling structure of an MCU – Interrupt Latency and Interrupt deadline – Multiple sources of the interrupts – Non-maskable interrupt sources – Enabling or disabling of the sources – Polling to determine the interrupt source and assignment of the priorities among them – Interrupt structure in Intel 8051.
TIMERS: Programmable Timers in the MCU’s – Free running counter and real time control – Interrupt interval and density constraints.

UNIT-IV: SYSTEMS DESIGN

UNIT-V: REAL TIME OPERATING SYSTEM FOR MICROCONTROLLERS:
Real Time operating system – RTOS of Keil (RTX51) – Use of RTOS in Design – Software development tools for Microcontrollers.

TEXT BOOKS:

REFERENCES:
6. Microprocessors, Nilesh B. Bahadure, PHI Learning PVT. Ltd.
JNTUH COLLEGE OF ENGINEERING HYDERABAD

IDP (B.Tech. EEE & M.Tech. /MBA) IV Year I-Sem

DIGITAL SIGNAL PROCESSING LAB

The Programs shall be implemented in Software (Using MATLAB / Lab View / C Programming/ Equivalent) and Hardware (Using TI / Analog Devices / Motorola / Equivalent DSP processors).

1. Generation of Sinusoidal Waveform / Signal based on Recursive Difference Equations
2. To find DFT / IDFT of given DT Signal
3. To find Frequency Response of a given System given in Transfer Function/Differential equation form.
4. Implementation of FFT of given Sequence
5. Determination of Power Spectrum of a given Signal(s).
7. Implementation of HP FIR Filter for a given Sequence/Signal
8. Implementation of LP IIR Filter for a given Sequence/Signal
9. Implementation of HP IIR Filter for a given Sequence/Signal
10. Generation of Sinusoidal Signal through Filtering
11. Generation of DTMF Signals
12. Implementation of Decimation Process
13. Implementation of Interpolation Process
14. Implementation of I/D Sampling Rate Converters
15. Audio application such as to plot a Time and Frequency display of Microphone plus a Cosine using DSP. Read a .wav file and match with their respective spectrograms.
16. Noise Removal: Add noise above 3 KHz and then remove, interference suppression using 400 Hz tone.
17. Impulse Response of First order and Second Order Systems.

Note: - Minimum of 12 experiments has to be conducted.
PGC-I Lab: POWER ELECTRONICS AND CONVERTERS SIMULATION LAB

Course Objectives:
Upon successful completion of the lab students will be familiar with:
- Simulation of various AC-AC, AC-DC, DC-DC, DC-AC converter topologies
- Modeling and simulation of industrial drives

Course Outcomes:
At the end of the course, the student should be able to:
- Simulate AC-AC Converters
- Simulate AC-DC Converters
- Simulate DC-DC Converters
- Simulate DC-AC Converters
- Model and Simulate DC drives fed by power electronics converters
- Model and Simulate AC drives fed by power electronics converters

2. Single phase semi converter using RL and E loads.
3. Three-phase full converter using RL and E loads.
4. Three-phase semi converter using RL and E loads.
7. Three-phase inverter with PWM controller.
8. DC-DC Converters.

**Note:** Use any two suitable software's for each simulation.
HSS (UG): MANAGEMENT SCIENCE

Objective
The course introduces the basic concepts of Management Science and Operations Management and its application to business. The topics include human resource management, project and strategic management; the course develops problem solving and spreadsheet skills, an invaluable tool for modern business.

Learning outcome
- To enable students to gain an insight into different managerial decisions using standard techniques and problem structuring methods
- Students will be able to gain an understanding of the core concepts of Management Science and Operations Management;
- To understand the management issues in different functional areas of management namely operations and Human resources, strategy, marketing and project management.


Unit IV Project Management (PERT/CPM): Network Analysis, Programme Evaluation and Review Technique (PERT), Critical Path Method (CPM), Identifying critical path, Probability of Completing the project within given time, Project Cost Analysis, Project Crashing (simple problems).


TEXTBOOKS:
REFERENCES:
JNTUH COLLEGE OF ENGINEERING HYDERABAD

IDP (B.Tech. EEE & M.Tech./MBA) IV Year II-Sem

PGC - II: POWER ELECTRONIC CONTROL OF DC DRIVES

Prerequisite: Power Electronics

Course Objectives:
• To introduce drive system, characteristics of drive, and operating modes of drive
• To comprehend the principle operation of phase control & Chopper controlled of dc drives.
• To design a current and speed controllers to achieve closed loop operation of dc drives.

Learning Outcomes: After taking this course, student will be able to:
• Perform simulations of phase or chopper controlled dc drive both for open loop and closed loop operations.
• Choose proper gain values for speed and current controllers.
• Distinguish the difference between PWM controller and hysteresis controller.

UNIT–I: SINGLE-PHASE RECTIFIERS CONTROLLED DC MOTOR
Separately excited DC motors with rectified single-phase supply – single-phase semi converter and single phase full converter for continuous and discontinuous modes of operation – power and power factor.

UNIT–II: THREE-PHASE RECTIFIERS CONTROLLED DC MOTOR
Three-phase semi-converter and Three phase full converter for continuous and discontinuous modes of operations – power and power factor - Addition of Freewheeling diode – Three phase double converter.
Three phase controlled bridge rectifier with passive load impedance, resistive load and ideal supply – Highly inductive load and ideal supply for load side and supply side quantities, shunt capacitor compensation, three phase controlled bridge rectifier inverter.

UNIT–III: PHASE, CURRENT & SPEED CONTROLLED DC DRIVE

UNIT–IV: CHOPPER CONTROLLED DC MOTOR DRIVES
Principle of operation of the chopper – Chopper with other power devices – model of the chopper – input to the chopper – steady state analysis of chopper controlled DC motor drives – rating of the devices – Pulsating torque.

UNIT–V: FOUR QUADRANT OPERATION OF DC DRIVES
Introduction to Four quadrant operation – Motoring operations, Electric Braking – Plugging, Dynamic and Regenerative Braking operations. Four quadrant operation of D.C motors by single phase, three phase dual converters and Choppers – Closed loop operation of DC motor.

TEXT BOOKS:

REFERENCES:
Prerequisite: Power Electronics and Power Systems

Course Objectives:
• To develop the understanding of uncompensated lines and their behavior under heavy loading conditions.
• To understand the concept and importance controllable parameters of FACTS controllers.
• To emphasize the objectives of Shunt compensation, and basic operation of SVC and STATCOM.
• To analyze the functioning of series controllers like GCSC, TSSC and TCSC

Course Outcomes: Upon the completion of this course, the student will be able to
• Choose proper controller for the specific application based on system requirements
• Understand various systems thoroughly and their requirements
• Interpret the control circuits of Shunt Controllers SVC & STATCOM for various functions viz. Transient stability Enhancement, voltage instability prevention and power oscillation damping
• Detect the Power and control circuits of Series Controllers GCSC, TSSC and TCSC

UNIT-I: FACTS CONCEPTS
Transmission interconnections power flow in an AC system, loading capability limits, Dynamic stability considerations, importance of controllable parameters basic types of FACTS controllers, benefits from FACTS controllers.

UNIT-II: VOLTAGE SOURCE CONVERTERS
Single phase three phase full wave bridge converters transformer connections for 12 pulse 24 and 48 pulse operation. Three level voltage source converter, pulse width modulation converter, basic concept of current source Converters, and comparison of current source converters with voltage source converters.

UNIT-III: STATIC SHUNT COMPENSATION
Objectives of shunt compensation, mid-point voltage regulation voltage instability prevention, improvement of transient stability, Power oscillation damping, Methods of controllable VAR generation, variable impedance type static VAR generators switching converter type VAR generators hybrid VAR generators.

UNIT-IV: SVC AND STATCOM
The regulation and slope transfer function and dynamic performance, transient stability enhancement and power oscillation damping operating point control and summary of compensator control.

UNIT-V: STATIC SERIES COMPENSATORS
Concept of series capacitive compensation, improvement of transient stability, power oscillation damping, and functional requirements of GTO thyristor controlled series capacitor (GSC), thyristor switched series capacitor (TSSC), and thyristor controlled series capacitor (TCSC) Control schemes for GSC TSSC and TCSC.

TEXT BOOKS:

REFERENCES:
JNTUH COLLEGE OF ENGINEERING HYDERABAD

IDP (B.Tech. EEE & M.Tech. /MBA) IV Year II-Sem

PGE – IV.2: SWITCHED MODE POWER SUPPLIES

Prerequisite: Power Electronic Devices and circuits

Course Objectives:
• To apply the basic concepts of power electronics for designing converters.
• Design and implement practical circuits for UPS, SMPS etc.

Learning Outcomes: After taking this course, student will be able to:
• Design converter system for electrical applications
• Understand and design SMPS.

UNIT – I
BASIC CONVERTER CIRCUITS:
Buck Regulator, Buck- Boost Regulator, Boost Regulator, Cuk Converters and Resonant Converters. Choice of switching frequency.

UNIT – II
ISOLATED SMPS:

UNIT – III
CONTROL ASPECTS
PWM Controllers, Isolation in feedback loop, Power Supplies with multiple output. Stability analysis using Bode Diagrams.

UNIT – IV
DESIGN CONSIDERATIONS
Selection of output filter capacitor, Selection of energy storage inductor, Design of High Frequency Inductor and High frequency Transformer, Selection of switches. Snubber circuit design, Design of driver circuits.

UNIT – V
ELECTRO MAGNETIC INTERFERENCE (EMI)
EMI Filter Components, Conducted EMI suppression, Radiated EMI suppression, Measurement.

PROTECTION
Over current protection, Over voltage protection, Inrush current protection.

THERMAL MODEL

TEXT BOOKS:

References:
2. M.H.Rashid, Power Electronics. Prentice-Hall of India
IDP (B.Tech. EEE & M.Tech. /MBA) IV Year II-Sem

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PGE-IV.3: ENERGY STORAGE TECHNOLOGIES

Prerequisite: Power Systems

Course Objectives:
• To know about the Demand for Energy Storage.
• To study the roles of electrical energy storage technologies in electricity.
• To analyze the features of energy storage systems.

Course Outcomes:
At the end of the course the student will be able to:
• Evaluate various techniques for storing electrical energy.
• Understand the features of storage systems and apply them for conventional power generation, grid operation & service.

UNIT-I:
THE ROLE OF ELECTRICAL ENERGY STORAGE TECHNOLOGIES IN ELECTRICITY USE:
Characteristics of electricity, Electricity and the role of EES, High generation cost during peak-demand periods, Need for continuous and flexible supply, Long distance between generation and consumption, Congestion in power grids, Transmission by cable, Emerging needs for EES, More renewable energy, less fossil fuel, Smart Grid uses, The role of electrical energy storage technologies, The role from the viewpoint of a utility, The role from the viewpoint of consumers, The role from the viewpoint of generators of renewable energy.

UNIT-II:
TYPES AND FEATURES OF ENERGY STORAGE SYSTEMS: Classification of EES systems, Mechanical storage systems, Pumped hydro storage (PHS), Compressed air energy storage (CAES), Flywheel energy storage (FES), Electrochemical storage systems, Secondary batteries, Lead-Acid Batteries, Lithium-Ion Batteries, Flow batteries, Other Batteries in Development, Chemical energy storage, Hydrogen (H2), Synthetic natural gas (SNG), Electrical storage systems, Double-layer capacitors (DLC), Superconducting magnetic energy storage (SMES),Thermal storage systems, Standards for EES, Technical comparison of EES technologies.

UNIT-III:
APPLICATIONS OF EES: Present status of applications, Utility use (conventional power generation, grid operation & service), Consumer use (uninterruptable power supply for large consumers), EES installed capacity worldwide, New trends in applications, Renewable energy generation, Smart Grid, Smart Microgrid, Smart House, Electric vehicles,

UNIT-IV:
MANAGEMENT AND CONTROL HIERARCHY OF EES: Internal configuration of battery storage systems, External connection of EES systems, Aggregating EES systems and distributed generation (Virtual Power Plant),“Battery SCADA” – aggregation of many dispersed batteries.

DEMAND FOR ENERGY STORAGE: Growth in Variable Energy Resources, Relationship between balancing services and variable energy resources, Energy Storage Alternatives, Variable Generator Control, Demand Management, Market Mechanisms, Longer Term Outlook.


UNIT-V:
FORECAST OF EES MARKET POTENTIAL BY 2030: EES market potential for overall applications, EES market estimation by Sandia National Laboratory (SNL), EES market estimation by the Boston Consulting Group (BCG), EES market estimation for Li-ion batteries by the Panasonic Group, EES
market potential estimation for broad introduction of renewable energies, EES market potential estimation for Germany by Fraunhofer, Storage of large amounts of energy in gas grids, EES market potential estimation for Europe by Siemens, EES market potential estimation by the IEA, Vehicle to grid concept, EES market potential in the future

**TEXT BOOKS:**
1. Techno-Economic Analysis of Different Energy Storage Technologies, Hussein Ibrahim and Adrian Ilinca
3. Energy Storage, Yves Brunet (Editor), May 2013, Wiley-ISTE

**REFERENCES:**
1. andreasoberhofer@gmx.de
2. www.ecofys.com/com/publications
3. www.iec.ch
PGC-II: POWER ELECTRONICS AND DRIVES LAB

Course Objectives:
Upon successful completion of the lab students will be familiar with:
- Speed control techniques of DC and AC drives
- Gate drive circuit configurations for converter circuits
- Advanced converter topologies
- Open loop and closed loop speed control analysis of AC and DC drives

Course Outcomes:
At the end of the course, the student should be able to:
- Know the speed control strategies of AC and DC drives
- Design speed, current controllers for AC and DC drives
- Get the knowledge on multi-level inverter/converter topologies
- Perform the open loop and closed loop speed control analysis of AC and DC drives
- Design the gate driver circuits for converter topologies
- Know the complete study of advanced converter technologies.

1. Speed control of separately excited DC Motor Drive with 1 quadrant chopper
2. Speed control of separately excited DC Motor Drive with 4 quadrant chopper.
3. Speed control of BLDC Motor Drive.
4. Multi-level inverter based AC Induction Motor Drive control equipment.
5. Speed control of 3-phase wound rotor Induction Motor Drive.
7. Speed control of 5-phase Induction Motor Drive.
8. Speed control of 3-phase Induction Motor Drive using V/F control.
9. Speed control of 3-phase Induction Motor Drive using Vector Control technique.
10. Speed Measurement and closed loop control using PMDC Motor Drive.
11. Speed measurement and closed loop control of PMDC Motor Drive with thyristor circuit.
12. Matrix Converter
13. Speed measurement and closed loop control of IGBT used single 4 quadrant chopper for PMDC Motor Drive.

Note: Any ten experiments can be conducted.
Prerequisite: Power Electronics

Course Objectives:
- To understand principle operation of scalar control of ac motor and corresponding speed-torque characteristics
- To comprehend the vector control for ac motor drive (IM and SM)
- To explain the static resistance control and Slip power recovery drive
- To explain synchronous motor drive characteristics and its control strategies
- To comprehend the brushless dc motor principle of operation.

Learning Outcomes: After taking this course, student will be able to:
- Develop induction motor for variable speed operations using scalar and vector control techniques.
- Identify the difference between the rotor resistance control and static rotor resistance control method and significance of slip power recovery drives.
- Develop controllers for synchronous motor and variable reluctance motor.

UNIT-I: INTRODUCTION
Introduction to motor drives – Torque production – Equivalent circuit analysis – Speed – Torque Characteristics with variable voltage operation Variable frequency operation constant v/t operation – Variable stator current operation – Induction motor characteristics in constant torque and field weakening regions.

UNIT-II: STATOR SIDE CONTROL OF INDUCTION DRIVES

UNIT–III: ROTOR SIDE CONTROL OF INDUCTION DRIVES


UNIT–IV: CONTROL OF SYNCHRONOUS MOTOR DRIVES
Synchronous motor and its characteristics – Control strategies – Constant torque angle control – Unity power factor control – Constant mutual flux linkage control.


UNIT–V: VARIABLE RELUCTANCE MOTOR DRIVE
Variable Reluctance motor drive – Torque production in the variable reluctance motor Drive characteristics and control principles – Current control variable reluctance motor service drive.

BRUSHLESS DC MOTOR DRIVES: Three phase full wave Brushless dc motor – Sinusoidal type of Brushless dc motor- current controlled Brushless dc motor Servo drive.
TEXT BOOKS:

REFERENCES:
JNTUH COLLEGE OF ENGINEERING HYDERABAD

IDP (B.Tech. EEE & M.Tech. /MBA) V Year I-Sem

PGE - V.1: DYNAMICS OF ELECTRICAL MACHINES

Prerequisite: Machine Modeling and Analysis

Course Objectives:
- To introduce generalized modeling electrical machines
- To analyze different electrical machines with dynamic modeling

Learning Outcomes: After taking this course, the student will be able to:
- Understand the basic mathematical analysis of electrical machines and its characteristics.
- Understand behavior of electrical machines under steady state and transient state.
- Understand dynamic modeling of electrical machines.

UNIT-I: BASIC MACHINE THEORY

UNIT-II: ELECTRODYNAMICAL EQUATION & THEIR SOLUTIONS
Spring and Plunger system - Rotational motion – mutually coupled coils – Lagrange’s equation – Application of Lagrange’s equation solution of Electro dynamical equations.

UNIT-III: DYNAMICS OF DC MACHINES

UNIT-IV: INDUCTION MACHINE DYNAMICS

UNIT-V: SYNCHRONOUS MACHINE DYNAMICS

TEXT BOOKS:
Prerequisite: Power Systems

Course Objectives:
Upon successful completion of the course the students will be familiar with:
• To introduce the characteristics of various types of renewable energy sources and converters.
• To explain the importance of storage and sizing of hybrid systems.
• To introduce the control issues of isolated systems.
• To explain the harmonics, power quality, voltage imperfections, power injection issues on the grid by integrating renewable energy sources.

Course Outcomes:
At the end of the course, the student should be able to:
• Identify the characteristics of renewable energy sources and converters.
• Analyze the importance of storage and sizing of hybrid systems.
• Realize the problems related to isolated systems.
• Analyze the challenges faced by the grid by integrating renewable energy sources.

UNIT-I:
REVIEW OF CHARACTERISTICS OF POWER SOURCES: Basic review of power generation from wind - Solar PV - Thermal - Small hydro - Biomass power strategies in each of these energy conversion systems - Review of maximum power point tracking techniques in solar PV and wind (perturb & observe, hill climbs, incremental conductance).

UNIT-II:
CONVERTER TOPOLOGIES: DC/DC converter (buck, boost, buck boost) - DC/AC inverters (sine, triangular, PWM techniques) - Phase locked loop for inverters.

UNIT-III:
HYBRID SYSTEMS: Advantages of hybrid power systems - Importance of storage in hybrid power systems - Design of hybrid power system based on load curve - Sizing of hybrid power systems.

UNIT-IV:
ISOLATED SYSTEMS: Control issues in isolated systems for voltage and frequency - Small signal stability in isolated power systems - Importance of storage and dump load in isolated systems.

UNIT-V:
 ISSUES IN INTEGRATION OF RENEWABLE ENERGY SOURCES: Overview of challenges in integrating renewable sources to the grid - Impact of harmonics on power quality - Need to maintain voltage within a band and fluctuations in voltage because of renewable integration - Power inverter and converter technologies - Mechanism to synchronize power from renewable sources to the grid - Overview of challenges faced in designing power injection from offshore generation sources - Challenges in modeling intermittent nature of renewable power in a power system.

TEXT BOOKS:
2. Renewable Energy Integration Challenges and Solutions Series: Green Energy and Technology Hossain, Jahangir,Mahmud, Apel (Eds.)
JNTUH COLLEGE OF ENGINEERING HYDERABAD

IDP (B.Tech. EEE & M.Tech. /MBA) V Year I-Sem

PGE - V.3: SMART GRID TECHNOLOGIES

Prerequisite: None

Course Objectives:
- To group various aspects of the smart grid,
- To defend smart grid design to meet the needs of a utility
- To select issues and challenges that remain to be solved
- To analyze basics of electricity, electricity generation, economics of supply and demand, and the various aspects of electricity market operations in both regulated and deregulated environment.

Course Outcomes: Upon the completion of this course, the student will be able to
- Analyze the structure of an electricity market in either regulated or deregulated market conditions.
- know the advantages of DC distribution and developing technologies in distribution
- Discriminate the trade-off between economics and reliability of an electric power system.
- Differentiate various investment options (e.g. generation capacities, transmission, renewable, demand-side resources, etc) in electricity markets.
- Analyze the development of smart and intelligent domestic systems.

UNIT–I: INTRODUCTION

SMART GRID TO EVOLVE A PERFECT POWER SYSTEM: Introduction- Overview of the perfect power system configurations- Device level power system- Building integrated power systems- Distributed power systems- Fully integrated power system-Nodes of innovation.

UNIT–II: DC DISTRIBUTION AND SMART GRID
AC Vs DC sources-Benefits of and drives of DC power delivery systems - Powering equipment and appliances with DC-Data centers and information technology loads - Future neighborhood-Potential future work and research.


UNIT–III: DYNAMIC ENERGY SYSTEMS CONCEPT
Smart energy efficient end use devices-Smart distributed energy resources - Advanced whole building control systems- Integrated communications architecture - Energy management-Role of technology in demand response- Current limitations to dynamic energy management-Distributed energy resources-Overview of a dynamic energy management-Key characteristics of smart devices- Key characteristics of advanced whole building control systems-Key characteristics of dynamic energy management system.

UNIT–IV: ENERGY PORT AS PART OF THE SMART GRID:
Concept of energy - Port, generic features of the energy port.


MARKET IMPLEMENTATION: Framework-factors influencing customer acceptance and response - program planning - monitoring and evaluation.

UNIT–V: EFFICIENT ELECTRIC END–USE TECHNOLOGY ALTERNATIVES
Existing technologies – lighting - Space conditioning - Indoor air quality - Domestic water heating - hyper efficient appliances - Ductless residential heat pumps and air conditioners - Variable refrigerant flow air conditioning-Heat pump water heating - Hyper efficient residential appliances - Data center energy efficiency- LED street and area lighting - Industrial motors and drives - Equipment retrofit and replacement - Process heating - Cogeneration, Thermal energy storage - Industrial energy
management programs - Manufacturing process-Electro-technologies, Residential, Commercial and industrial sectors.

**TEXT BOOKS:**

**REFERENCES:**
PGE - VI.1: AI TECHNIQUES AND APPLICATIONS TO ELECTRICAL ENGINEERING

Prerequisite: None

Course Objectives:
- To locate soft commanding methodologies, such as artificial neural networks, Fuzzy logic and genetic Algorithms.
- To observe the concepts of feed forward neural networks and about feedback neural networks.
- To practice the concept of fuzziness involved in various systems and comprehensive knowledge of fuzzy logic control and to design the fuzzy control.
- To analyze genetic algorithm, genetic operations and genetic mutations.

Course Outcomes: Upon the completion of this course, the student will be able to
- Understand feed forward neural networks, feedback neural networks and learning techniques.
- Understand fuzziness involved in various systems and fuzzy set theory.
- Develop fuzzy logic control for applications in electrical engineering.
- Develop genetic algorithm for applications in electrical engineering.

UNIT – I: ARTIFICIAL NEURAL NETWORKS

UNIT- II: ANN PARADIGMS

UNIT – III: FUZZY LOGIC

UNIT – IV: GENETIC ALGORITHMS

UNIT–V: APPLICATIONS OF AI TECHNIQUES

TEXT BOOKS:

REFERENCES:
JNTUH COLLEGE OF ENGINEERING HYDERABAD

IDP (B.Tech. EEE & M.Tech. /MBA) V Year I-Sem

PGE - VI.2: SOLAR PHOTO VOLTAIC SYSTEMS

Pre-requisite: None

OBJECTIVES: Objectives of this course are
- To introduce photovoltaic systems
- To deal with various technologies of solar PV cells
- To understand details about manufacture, sizing and operating techniques
- To have knowledge of design considerations.

OUTCOMES: After this course, the student will be able to
- Identify photovoltaic system components and system types
- Calculate electrical energy and power
- Correctly size system components, design considerations of solar equipment
- Design a basic grid-tie PV system.

UNIT – I

UNIT – II
SOLAR CELLS: Manufacture of Solar Cells-Technologies, Design of Solar cells, Photovoltaic modules, Design requirements, encapsulation systems, manufacture, power rating, hotspot effect, Design qualifications.

UNIT – III
PROTECTION AND MEASUREMENTS: Flat plate arrays, support structures, module interconnection and cabling, lightning protection, Performance measurement – using natural sun light and simulator, determination of temperature coefficients, internal series resistance, curve correction factor.

UNIT - IV
PHOTOVOLTAIC SYSTEMS: Photovoltaic systems- types- general design considerations- system sizing-battery sizing- inverter sizing-design examples – Balance of PV systems.

UNIT – V
MAXIMUM POWER POINT TRACKERS: Maximum power point trackers-algorithms- perturb and observe-incremental conductance method, hill climbing method, hybrid and complex methods, data based and other approximate methods, instrument design, other MPP techniques-Grid interactive PV system.

TEXT BOOKS:
1. Generating electricity from Sun, F.C.Treble, Pergamon Press
2. Photovoltaic systems: Analysis and design, A.K.Mukherjee, Nivedita Thakur, PHI 2011
Pre-requisites:
2. Electrical Machines-I.
3. Electrical Machines-II.
4. Power Electronics

Course Objectives:
Objectives of this course are to:
• Introduce the fundamental concepts, principles, analysis and design of hybrid and electric vehicles
• Introduce the various aspects of hybrid and electric drive train such as their configuration, types of electric machines that can be used, energy storage devices, etc.

Course Outcomes:
After this course, the student will be able to
• Get knowledge on hybrid electric vehicles
• Compare the advantages and disadvantages of hybrid electric vehicles over conventional vehicles
• Compare the merits and demerits of hybrid electric trains over electrical trains
• Know the different energy storage techniques
• Discuss the electric population, motor drive technologies
• Analyze the different types of energy management strategies

UNIT-I:
Introduction to Hybrid Electric Vehicles: History of hybrid and electric vehicles, social and environmental importance of hybrid and electric vehicles, impact of modern drive-trains on energy supplies.
Conventional Vehicles: Basics of vehicle performance, vehicle power source characterization, transmission characteristics, and mathematical models to describe vehicle performance.

UNIT-II:
Hybrid Electric Drive-trains: Basic concept of hybrid traction, introduction to various hybrid drive-train topologies, power flow control in hybrid drive-train topologies, fuel efficiency analysis.
Electric Drive-trains: Basic concept of electric traction, introduction to various electric drive-train topologies, power flow control in electric drive-train topologies, fuel efficiency analysis.

UNIT-III:
Electric Propulsion unit: Introduction to electric components used in hybrid and electric vehicles, Configuration and control of DC Motor drives, Configuration and control of Induction Motor drives, configuration and control of Permanent Magnet Motor drives, Configuration and control of Switch Reluctance Motor drives, drive system efficiency.

UNIT-IV:
Sizing the drive system: Matching the electric machine and the internal combustion engine (ICE), Sizing the propulsion motor, sizing the power electronics, selecting the energy storage technology, Communications, supporting subsystems
UNIT-V:
Energy Management Strategies: Introduction to energy management strategies used in hybrid and electric vehicles, classification of different energy management strategies, comparison of different energy management strategies, implementation issues of energy management strategies.

TEXT BOOKS:

REFERENCES:
JNTUH COLLEGE OF ENGINEERING HYDERABAD

IDP (B.Tech. EEE & M.Tech. /MBA) V Year I-Sem

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PG-OE.1: POWER QUALITY

Prerequisite: Power Systems

Course Objectives:
• To Study the basics of power quality, power quality problems and power quality standards,
• To Study about the characteristics of non-linear loads
• To Study Voltage, Current, Power and Energy measurements and analysis methods of Laplace’s, Fourier and Hartley and Wavelet Transforms
• To Study the analysis and conventional mitigation methods
• To Study about various devices used to enhance power quality.

Course Outcomes: After taking this course, the student will be able to:
• Know the different characteristics of electric power quality in power systems,
• Learn about the applications of non-linear loads,
• Know the applications of Hartley and Wavelet Transforms,
• Learn how to mitigate the power quality problems
• Learn about the application of FACTS device on DG side.

UNIT-I: INTRODUCTION
Introduction of the Power Quality (PQ) problem, Terms used in PQ: Voltage, Sag, Swell, Surges, Harmonics, over voltages, spikes, Voltage fluctuations, Transients, Interruption, overview of power quality phenomenon, Remedies to improve power quality, power quality monitoring.

UNIT-II: LONG & SHORT INTERRUPTIONS

Short interruptions: definition, origin of short interruptions, basic principle, fuse saving, voltage magnitude events due to re-closing, voltage during the interruption, monitoring of short interruptions, difference between medium and low voltage systems. Multiple events, single phase tripping – voltage and current during fault period, voltage and current at post fault period, stochastic prediction of short interruptions.

UNIT III: SINGLE AND THREE-PHASE VOLTAGE Sag CHARACTERIZATION
Voltage sag – definition, causes of voltage sag, voltage sag magnitude, and monitoring, theoretical calculation of voltage sag magnitude, voltage sag calculation in non-radial systems, meshed systems, and voltage sag duration.

Three phase faults, phase angle jumps, magnitude and phase angle jumps for three phase unbalanced sags, load influence on voltage sags.

UNIT-IV: POWER QUALITY CONSIDERATIONS IN INDUSTRIAL POWER SYSTEMS
Voltage sag – equipment behavior of Power electronic loads, induction motors, synchronous motors, computers, consumer electronics, adjustable speed AC drives and its operation. Mitigation of AC Drives, adjustable speed DC drives and its operation, mitigation methods of DC drives.

UNIT-V: MITIGATION OF INTERRUPTIONS & VOLTAGE SAGS
Overview of mitigation methods – from fault to trip, reducing the number of faults, reducing the fault clearing time changing the power system, installing mitigation equipment, improving equipment immunity, different events and mitigation methods. System equipment interface – voltage source converter, series voltage controller, shunt controller, combined shunt and series controller.

Power Quality and EMC Standards:
Introduction to standardization, IEC Electromagnetic compatibility standards, European voltage characteristics standards, PQ surveys.
TEXT BOOKS:

REFERENCES:
PG-OE.2: PROGRAMMABLE LOGIC CONTROLLERS AND APPLICATIONS

Prerequisite: None

Course Objectives:
- To provide and ensure a comprehensive understanding of using advanced controllers in measurement and control instrumentation.
- To illustrate about data acquisition - process of collecting information from field instruments.
- To analyze Programmable Logic Controller (PLC), IO Modules and internal features.
- To Comprehend Programming in Ladder Logic, addressing of I/O.
- To apply PID and its Tuning.

Course Outcomes: Upon the completion of this course, the student will be able to
- Describe the main functional units in a PLC and be able to explain how they interact.
- They should know different bus types used in automation industries.
- Development of ladder logic programming for simple process.

UNIT-I:
PLC Basics PLC system, I/O modules and interfacing CPU processor programming equipment programming formats, construction of PLC ladder diagrams, devices connected to I/O modules.

UNIT-II:
PLC Programming input instructions, outputs, operational procedures, programming examples using contacts and coils. Drill-press operation.
Digital logic gates programming in the Boolean algebra system, conversion examples Ladder diagrams for process control Ladder diagrams and sequence listings, ladder diagram construction and flow chart for spray process system.

UNIT-III:
PLC Registers: Characteristics of Registers module addressing holding registers input registers, output registers. PLC Functions Timer functions and industrial applications counters counter function industrial applications, Architecture functions, Number comparison functions, number conversion functions.

UNIT-IV:
Data handling functions: SKIP, Master control Relay Jump Move FIFO, FAL, ONS, CLR and Sweep functions and their applications. Bit Pattern and changing a bit shift register, sequence functions and applications, controlling of two axes and three axis Robots with PLC, Matrix functions.

UNIT-V:
Analog PLC operation: Analog modules and systems Analog signal processing multi bit data processing, analog output application examples, PID principles position indicator with PID control, PID modules, PID tuning, PID functions

TEXT BOOKS:

REFERENCES:
PG-OE.3: ENERGY EFFICIENT TECHNOLOGIES

Prerequisite: Power Systems

Course Objectives:
- To have basic concepts of Electrical systems, motors, generating systems.
- To illustrate the application of Electrical systems in PF improvement scheme
- To illustrate the application of pumps and pumping system.

Course Outcomes:
Upon the completion of this course, the student will be able to
- Understand the advantages of Electrical system and its basic components.
- Understand the implementation of Energy Efficient Technologies in Electrical Systems

UNIT-I:
ELECTRICAL SYSTEM: Electricity billing, Electrical Load Management and maximum demand control, Power factor improvement and its benefit, Selection and location of capacitors, Performance assessment of PF capacitors, Distribution and Transformer losses.

UNIT-II:
ELECTRIC MOTORS: Types, Losses in Electric Motors, motor efficiency, factors affecting motor performance, rewinding and motor replacement issues, energy saving opportunities with energy efficient motors.
LIGHTING SYSTEM: Light source, choice of lighting, luminance requirements, and energy conservation avenues. Energy efficient lightning controls, comparison of sodium vapor, halogen, CFL and LED lamps.

UNIT-III:
COMpressed AIR SYSTEM: Types of air compressors, compressor efficiency, efficient compressor operation, compressed air system components, capacity assessment, leakage test, factors affecting the performance and savings opportunities.
HVAC AND REFRIGERATION SYSTEM: Vapor compression refrigeration cycle, refrigerants, coefficient of performance, capacity, factors affecting refrigeration and air-conditioning system performance and saving opportunities, vapor absorption refrigeration system - working principle, types and comparison with vapor compression system, saving potential Fans and Blowers: Types, performance evaluation, efficient system operation, flow control strategies and energy conservation opportunities.

UNIT-IV:
PUMPS AND PUMPING SYSTEM: TYPES, performance evaluation, efficient system operation, flow control strategies and energy conservation opportunities.
COOLING TOWER: Types and performance evaluation, efficient system operation, flow control strategies, energy saving opportunities, Assessment of cooling tower.

UNIT-V:
ENERGY EFFICIENT TECHNOLOGIES IN ELECTRICAL SYSTEMS: Maximum Demand Controllers, automatic power factor controllers, energy efficient motors, soft starters with energy saver, variable speed drives, energy efficient transformers, electronic ballast, occupancy sensors, energy saving potential of each technology. Calculation of energy frequency ratio in the performance of star ratings.
TEXT BOOKS:

REFERENCE:
7. www.bee-india.nic.in (Guide on Energy Efficient room Air conditioners)
PG-OE.4: OPTIMIZATION TECHNIQUES

Prerequisite: None

Course Objectives:
• To understand the theory of optimization methods and algorithms developed for solving various types of optimization problems.
• To develop an interest in applying optimization techniques in problems of Engineering and Technology
• To apply the mathematical results and numerical techniques of optimization theory to concrete Engineering problems.

Course Outcomes:
Upon the completion of this course, the student will be able to
• Know basic theoretical principles in optimization
• Formulate optimization models and obtain solutions for optimization;
• Apply methods of sensitivity analysis and analyze post processing of results

UNIT – I
INTRODUCTION AND CLASSICAL OPTIMIZATION TECHNIQUES:

CLASSICAL OPTIMIZATION TECHNIQUES

UNIT – II
LINEAR PROGRAMMING

UNIT – III
TRANSPORTATION PROBLEM
Finding initial basic feasible solution by north – west corner rule, least cost method and Vogel’s approximation method – testing for optimality of balanced transportation problems.

UNCONSTRAINED NONLINEAR PROGRAMMING:
One – dimensional minimization methods: Classification, Fibonacci method and Quadratic interpolation method

UNIT – IV
UNCONSTRAINED OPTIMIZATION TECHNIQUES
Univariate method, Powell’s method and steepest descent method.

CONSTRAINED NONLINEAR PROGRAMMING:
Characteristics of a constrained problem, Classification, Basic approach of Penalty Function method; Basic approach of Penalty Function method; Basic approaches of Interior and Exterior penalty function methods. Introduction to convex Programming Problem.
UNIT – V
DYNAMIC PROGRAMMING:

TEXT BOOKS:

REFERENCES:
4. Linear Programming by G. Hadley
PG-OE.5: ENERGY GENERATION FROM WASTE

Prerequisite: None

Course Objectives:
- To understand the theory of Nonconventional energy sources.
- To develop an interest in applying energy generation from waste and solve problems of Engineering and Technology.

Course Outcomes:
Upon the completion of this course, the student will be able to
- Apply fundamental knowledge of NCPG to Generate Energy from Waste.
- Solve some related practical problems.
- Understand or become aware of various failures, causes of failures and remedies for failures in practical systems.

UNIT-I:

UNIT-II:
Land Fill method of Solid waste disposal Land fill classification, Types, methods and Sitting consideration, Layout and preliminary design of landfills: Composition, characteristics, generation, Movement and control of landfill leach ate and gases, Environmental monitoring system for land fill gases.

UNIT-III:

UNIT-IV:
Biogas production, Land fill gas generation and utilization, Thermo-chemical conversion: Sources of energy generation, Gasification of waste using Gasifiers, Briquetting, Utilization and advantages of briquetting, Environmental benefits of Bio-chemical and Thermo-chemical conversion.

UNIT–V:

TEXT BOOKS:
4. "E-waste in India: Research unit, Rajya Sabha Secretariat, New Delhi, June 2011”

REFERENCES:
4. AD Bhide, BB Sundaresan, Solid Waste Management in Developing Countries, INSDOC, New Delhi,1983 FUEL CELL AND
5. Google books:
   (i) e-waste Management: From waste to Resource Klaus Hieronymi, Ramzy Kahnat, Eric williams Tech. & Engg.-2013(Publisher: Earthscan 2013).
   (ii) What is the impact of E-waste: Tamara Thompson
   (iii) E-waste poses a Health Hazard: Sairudeen Pattazhy
6. Web links :
   www.unep.org
   www.routledge.com
   www.amazon.com
   www.bookdepository.com
   www.ecoactiv.com
**IDP (B.Tech. EEE & M.Tech. /MBA)**  
**w.e.f. 2015-2016 academic year**

**JNTUH COLLEGE OF ENGINEERING HYDERABAD**

**IDP (B.Tech. EEE & M.Tech. /MBA) III Year I-Sem**  
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**DISASTER MANAGEMENT**  
**OPEN ELECTIVE-I**

**Pre Requisites:** NIL

**Course Objectives:**  
The subject provide different disasters, tools and methods for disaster management

**Course Outcomes:**  
Estimate, perform quantity survey & valuate various engineering works

**UNIT 1 : Understanding Disaster**  
Concept of Disaster  
Different approaches  
Concept of Risk  
Levels of Disasters  
Disaster Phenomena and Events (Global, national and regional)

**Hazards and Vulnerability**  
Natural and man-made hazards; response time, frequency and for ewarning levels of different hazards  
Characteristics and damage potential of natural hazards; hazard assessment  
Dimensions of vulnerability factors; vulnerability assessment  
Vulnerability and disaster risk  
Vulnerabilities to flood and earthquake hazards

**UNIT 2 : Disaster Management Mechanism**  
Concepts of risk management and crisis managements  
Disaster Management Cycle  
Response and Recovery  
Development, Prevention, Mitigation and Preparedness  
Planning for Relief

**UNIT 3: Capacity Building**  
Capacity Building: Concept  
Structural and Nonstructural Measures  
Capacity Assessment; Strengthening Capacity for Reducing Risk  
Counter-Disaster Resources and their utility in Disaster Management  
Legislative Support at the state and national levels

**UNIT 4: Coping with Disaster**  
Coping Strategies; alternative adjustment processes  
Changing Concepts of disaster management  
Industrial Safety Plan; Safety norms and survival kits  
Mass media and disaster management

**UNIT 5: Planning for disaster management**  
Strategies for disaster management planning  
Steps for formulating a disaster risk reduction plan  
Disaster management Act and Policy in India  
Organizational structure for disaster management in India  
Preparation of state and district disaster management plans
Text Books

References
JNTUH COLLEGE OF ENGINEERING HYDERABAD

IDP (B.Tech. EEE & M.Tech. /MBA) III Year I-Sem

NON CONVENTIONAL POWER GENERATION
OPEN ELECTIVE-I

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Pre-requisite: Nil.

Objectives:
- To introduce various types of renewable technologies available.
- The technologies of energy conversion from these resources and their quantitative analysis.

Outcomes:
- The student will be able analyse solar thermal and photovoltaic systems and related technologies for energy conversion.
- Wind energy conversion and devices available for it.
- Biomass conversion technologies.
- Geo thermal resources and energy conversion principles and technologies.
- Power from oceans (thermal, wave, tidal) and conversion and devices.
- Fundamentals of fuel cells and commercial batteries.

UNIT - I

UNIT - II

UNIT - III

UNIT - IV

UNIT - V

TEXT BOOKS
REFERENCE BOOKS
2. F.C. Treble, Generating Electricity from Sun.
4. S.P. Sukhatme, Solar Energy Principles and Application - TMH
JNTUH COLLEGE OF ENGINEERING HYDERABAD

IDP (B.Tech. EEE & M.Tech. /MBA) III Year I-Sem

ELECTRICAL ENGINEERING MATERIALS
OPEN ELECTIVE-I

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3 0 0 3

Pre-requisites: Nil

Objectives: To understand the importance of various materials used in electrical engineering and obtain a qualitative analysis of their behavior and applications.

OUTCOMES: Will be able to
- Understand various types of dielectric materials, their properties in various conditions.
- Evaluate magnetic materials and their behavior.
- Evaluate semiconductor materials and technologies.
- Materials used in electrical engineering and applications.

UNIT- I
DIELECTRIC MATERIALS: Dielectric as Electric Field Medium, leakage currents, dielectric loss, dielectric strength, breakdown voltage, breakdown in solid dielectrics, flashover, liquid dielectrics, electric conductivity in solid, liquid and gaseous dielectrics, Ferromagnetic materials, properties of ferromagnetic materials in static fields, spontaneous, polarization, curie point, anti-ferromagnetic materials, piezoelectric materials, pyroelectric materials.

UNIT – II
MAGNETIC MATERIALS: Classification of magnetic materials, spontaneous magnetization in ferromagnetic materials, magnetic Anisotropy, Magnetostriction, diamagnetism, magnetically soft and hard materials, special purpose materials, feebly magnetic materials, Ferrites, cast and cermet permanent magnets, ageing of magnets. factors effecting permeability and hysteresis

UNIT – III
SEMICONDUCTOR MATERIALS: Properties of semiconductors, Silicon wafers, integration techniques, Large and very large scale integration techniques (VLSI).

UNIT – IV
MATERIALS FOR ELECTRICAL APPLICATIONS: Materials used for Resistors, rheostats, heaters, transmission line structures, stranded conductors, bimetals fuses, soft and hard solders, electric contact materials, electric carbon materials, thermocouple materials. Solid, Liquid and Gaseous insulating materials, Effect of moisture on insulation.

UNIT – V
SPECIAL PURPOSE MATERIALS: Refractory Materials, Structural Materials, Radioactive Materials, Galvanization and Impregnation of materials, Processing of electronic materials, Insulating varnishes and coolants, Properties and applications of mineral oils, Testing of Transformer oil as per ISI

TEXT BOOKS
3. TTTI Madras: Electrical Engineering Materials
JNTUH COLLEGE OF ENGINEERING HYDERABAD

IDP (B.Tech. EEE & M.Tech. /MBA) III Year I-Sem

L T P C
3 0 0 3

NANO-TECHNOLOGY
OPEN ELECTIVE-I

Pre-requisites: Nil

OBJECTIVES:
To enable the student to understand fundamentals of nano materials and technologies for these materials and their manufacturing, applications in various fields.

OUTCOMES:
• To evaluate electronic structural studies of nano materials and different synthesis methods to obtain nano structures.
• Understand characterization techniques through various measurements to study electrical, mechanical,thermal properties of nano materials.
• Applications of nano materials for specific purposes like MEMS, NEMS, nano electronics, energy storage.

UNIT - I
Background of Nanotechnology: Scientific Revolutions, Nanotechnology and Nanomachines - The Periodic Table, Atomic Structure, Molecules and Phases, Energy, Molecular and Atomic size, Surfaces and Dimensional Space, Top down and Bottom up approach.

UNIT - II

UNIT - III
Nanopowders and Nanomaterials: Preparation, Plasma arcing, chemical vapor deposition, Sol-gels, Electrodeposition, Ball milling, using natural nanoparticles, Applications of nanomaterials.

UNIT - IV
Nanoelectronics: Approaches to nanoelectronics, Fabrication of integrated circuits, MEMS, NEMS, Nano circuits, Quantum wire, Quantum well, DNA-directed assembly and application in electronics.

UNIT - V

TEXT BOOKS
1. Introduction to Nanoscience and Nanotechnology Gabor L. Hornyak, NanoThread, Inc., Golden, Colorado, USA; H.F. Tibbals, University of Texas Southwestern Medical Center, Dallas, USA; Joydeep Dutta, Asian Institute of Technology, Pathumthani, Thailand; John J. Moore, Colorado School of Mines, Golden, USA
2. Introduction to Nanotechnology by Charles P. Poole Jr and Frank J.Owens Wiley India Pvt Ltd.
3. Introduction to Nanoscience and Nanotechnology, Chatopadhyaya.K.K, and Banerjee A.N,
4. Introduction to nano tech by phani kumar
5. Introduction to Nano Technology by Charles P. Poole Jr and Frank J. Owens. Wiley India Pvt Ltd.
JNTUH COLLEGE OF ENGINEERING HYDERABAD

IDP (B.Tech. EEE & M.Tech. /MBA) III Year I-Sem

**OPERATIONS RESEARCH**

OPEN ELECTIVE-I

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**Prerequisites:** None

**Objectives:**
Understanding the mathematical importance of development of model in a particular optimization model for the issue and solving it.

**Outcomes:**
Understanding the problem, identifying variables & constants, formulas of optimization model and applying appropriate optimization Techniques

**UNIT – I**
**ALLOCATION:** Linear Programming Problem - Formulation – Graphical solution – Simplex method – Artificial variables techniques: Two–phase method, Big-M method; Duality Principle.

**UNIT – II**

**UNIT – III**
SEQUENCING – Introduction – Flow –Shop sequencing – n jobs through two machines – n jobs through three machines – Job shop sequencing – two jobs through ‘m’ machines-graphical model
REPLACEMENT: Introduction – Replacement of items that deteriorate with time – when money value is not counted and counted – Replacement of items that fail completely- Group Replacement.

**UNIT – IV**
THEORY OF GAMES: Introduction –Terminology-– Solution of games with saddle points and without saddle points- 2 x 2 games –m x 2 & 2 x n games - graphical method – m x n games - dominance principle.
INVENTORY: Introduction – Single item, Deterministic models – Types - Purchase inventory models with one price break and multiple price breaks –Stochastic models – demand discrete variable or continuous variable – Single Period model with no setup cost.

**UNIT – V**

**TEXT BOOK** :
2. Operations Research/A.C.S.Kumar/Yesdee

**REFERENCE BOOKS** :
1. Operations Research: Methods and Problems / Maurice Saseini, Arhur Yaspan and Lawrence Friedman
4. Introduction to O.R/Hillier & Libermann (TMH).
5. Introduction to O.R /Taha PHI
JNTUH COLLEGE OF ENGINEERING HYDERABAD

IDP (B.Tech. EEE & M.Tech./MBA) III Year I-Sem

BASICS OF THERMODYNAMICS
OPEN ELECTIVE-I

Pre-requisite: Engineering Chemistry and Physics

Course Objective: To understand the treatment of classical Thermodynamics and to apply the First and Second laws of Thermodynamics to engineering applications

Course Outcomes:
At the end of the course, the student should be able to
• Understand and differentiate between different thermodynamic systems and processes
• Understand and apply the laws of Thermodynamics to different types of systems undergoing various processes
• Understand and analyze the Thermodynamic cycles

UNIT – I
Introduction: Basic Concepts:

UNIT II

UNIT – III

UNIT IV
Atmospheric air - Psychrometric Properties – Dry bulb Temperature, Wet Bulb Temperature, Dew point Temperature, Specific Humidity, Relative Humidity, saturated Air, Vapour pressure, Degree of saturation – Adiabatic Saturation,Psychrometric chart.

UNIT - V
Power Cycles : Otto, Diesel cycles - Description and representation on P–V and T-S diagram, Thermal Efficiency, Mean Effective Pressures on Air standard basis
Refrigeration Cycles:
Bell-Coleman cycle, Vapour compression cycle-performance Evaluation.

TEXT BOOKS:
1. Engineering Thermodynamics / PK Nag /TMH, III Edition
2. Thermodynamics / C.P.Arora.

REFERENCE BOOKS:
1. Thermodynamics – An Engineering Approach – Yunus Cengel & Boles /TMH
3. Thermodynamics – J.P.Holman / McGrawHill
4. Engineering Thermodynamics – Jones & Dugan
FABRICATION PROCESSES
OPEN ELECTIVE-I

Prerequisites: Nil

Objectives:
Understand the philosophies of various Manufacturing process.

Outcomes:
For given product, one should be able identify the manufacturing process.

UNIT – I
Casting : Steps involved in making a casting – Advantage of casting and its applications; Patterns - Pattern making, Types, Materials used for patterns, pattern allowances and their construction; Properties of moulding sands.
Methods of Melting - Crucible melting and cupola operation – Defects in castings;

UNIT – II
Welding: Classification – Types of welds and welded joints; Gas welding - Types, oxy-fuel gas cutting. Arc welding, forge welding, submerged arc welding, Resistance welding, Thermit welding.
Inert Gas Welding _ TIG Welding, MIG welding, explosive welding, Laser Welding; Soldering and Brazing; Heat affected zone in welding. Welding defects – causes and remedies; destructive and non-destructive testing of welds.

UNIT – III
Hot working, cold working, strain hardening, recovery, recrystallisation and grain growth.
Types of presses and press tools. Forces and power requirement in the above operations.

UNIT – IV
Extrusion of Metals : Basic extrusion process and its characteristics. Hot extrusion and cold extrusion - Forward extrusion and backward extrusion – Impact extrusion – Extruding equipment – Tube extrusion and pipe making, Hydrostatic extrusion. Forces in extrusion

UNIT – V

TEXT BOOKS :
1. Manufacturing Technology / P.N. Rao/TMH

REFERENCE BOOKS :
1. Production Technology / R.K. Jain
2. Metal Casting / T.V Ramana Rao / New Age
4. Welding Process / Parmar /
5. Production Technology /Sarma P C /
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IDP (B.Tech. EEE & M.Tech. /MBA) III Year I-Sem

ELECTRONIC MEASURING INSTRUMENTS
OPEN ELECTIVE-I

Note: No detailed mathematical treatment is required.

Prerequisite : Nil

Course Objectives:

- It provides an understanding of various measuring systems functioning and metrics for performance analysis.
- Provides understanding of principle of operation, working of different electronic instruments viz. signal generators, signal analyzers, recorders and measuring equipment.
- Provides understanding of use of various measuring techniques for measurement of different physical parameters using different classes of transducers.

Course Outcomes:
On completion of this course student can be able to

- Identify the various electronic instruments based on their specifications for carrying out a particular task of measurement.
- Measure various physical parameters by appropriately selecting the transducers.
- Use various types of signal generators, signal analyzers for generating and analyzing various real-time signals.

Unit-I:

Unit-II:
Signal Generators: AF, RF Signal Generators, Sweep Frequency Generators, Pulse and Square wave Generators, Function Generators, Arbitrary Waveform Generator, and Specifications.

Unit-III:

Unit-IV:
Recorders: X-Y Plotter, Curve tracer, Galvanometric Recorders, Servo transducers, pen driving mechanisms, Magnetic Recording, Magnetic recording techniques.

Unit-V:
Transducers: Classification, Strain Gauges, Bounded, unbounded; Force and Displacement Transducers, Resistance Thermometers, Hotwire Anemometers, LVDT, Thermocouples, Synchros, Special Resistance Thermometers, Digital Temperature sensing system, Piezoelectric Transducers, Variable Capacitance Transducers, Magneto Strictive Transducers.

TEXT BOOKS:
REFERENCES:
JNTUH COLLEGE OF ENGINEERING HYDERABAD

IDP (B.Tech. EEE & M.Tech./MBA) III Year I-Sem

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OBJECT ORIENTED PROGRAMMING THROUGH JAVA
OPEN ELECTIVE-I

Prerequisites
1. A course on “Computer Programming & Data Structures”

Objectives
1. Introduces object oriented programming concepts using the Java language.
2. Introduces the principles of inheritance and polymorphism; and demonstrates how they relate to the design of abstract classes
3. Introduces the implementation of packages and interfaces
4. Introduces exception handling, event handling and multithreading
5. Introduces the design of Graphical User Interface using applets and swings

Outcomes
1. Develop applications for a range of problems using object-oriented programming techniques
2. Design simple Graphical User Interface applications

UNIT I:
Object oriented thinking and Java Basics– Need for OOP paradigm, summary of OOP concepts, coping with complexity, abstraction mechanisms. A way of viewing world – Agents, responsibility, messages, methods, History of Java, Java buzzwords, data types, variables, scope and life time of variables, arrays, operators, expressions, control statements, type conversion and casting, simple java program, concepts of classes, objects, constructors, methods, access control, this keyword, garbage collection, overloading methods and constructors, method binding, inheritance, overriding and exceptions, parameter passing, recursion, nested and inner classes, exploring string class.

UNIT II:
Inheritance, Packages and Interfaces – Hierarchical abstractions, Base class object, subclass, subtype, substitutability, forms of inheritance- specialization, specification, construction, extension, limitation, combination, benefits of inheritance, costs of inheritance. Member access rules, super uses, using final with inheritance, polymorphism- method overriding, abstract classes, the Object class. Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing packages, differences between classes and interfaces, defining an interface, implementing interface, applying interfaces, variables in interface and extending interfaces, Exploring java.io.

UNIT III:
Exception handling and Multithreading– Concepts of exception handling, benefits of exception handling, Termination or resumptive models, exception hierarchy, usage of try, catch, throw, throws and finally, built in exceptions, creating own exception sub classes.
String handling,Exploring java.util.Differences between multi threading and multitasking, thread life cycle, creating threads, thread priorities, synchronizing threads, inter-thread communication, thread groups, daemon threads, Enumerations, auto boxing, annotations, generics.

UNIT IV:
Event Handling: Events, Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes. The AWT class hierarchy, user interface components- labels, button, canvas, scrollbars, text components, check box, check box groups, choices, lists panels – scroll pane, dialogs, menu bar, graphics, layout manager – layout manager types – border, grid, flow, card and grid bag.

UNIT V:
Applets – Concepts of Applets, differences between applets and applications, life cycle of an applet, types of applets, creating applets, passing parameters to applets.

TEXT BOOKS:
1. Java the complete reference, 7th edition, Herbert Schildt, TMH.
2. Understanding OOP with Java, updated edition, T. Budd, Pearson Education.

REFERENCES:
2. Introduction to Java programming, Y. Daniel Liang, Pearson Education.
3. An introduction to Java programming and object oriented application development, R.A. Johnson-Thomson.
Prerequisites
1. Familiarity with the theory and use of coordinate geometry and of linear algebra such as matrix multiplication.
2. A course on “Computer Programming and Data Structures”

Objectives
1. The aim of this course is to provide an introduction of fundamental concepts and theory of computer graphics.
2. Topics covered include graphics systems and input devices; geometric representations and 2D/3D transformations; viewing and projections; illumination and color models; animation; rendering and implementation; visible surface detection;

Outcomes
1. Acquire familiarity with the relevant mathematics of computer graphics.
2. Be able to design basic graphics application programs, including animation
3. Be able to design applications that display graphic images to given specifications

UNIT-I:
Introduction: Application areas of Computer Graphics, overview of graphics systems, video-display devices, raster-scan systems, random scan systems, graphics monitors and work stations and input devices
Output primitives: Points and lines, line drawing algorithms (Bresenham’s and DDA Algorithm), midpoint circle and ellipse algorithms
Filled area primitives: Scan-line polygon fills algorithm, boundary-fill and flood-fill algorithms

UNIT-II:
2-D geometrical transforms: Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems
2-D viewing: The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen-Sutherland and Cyrus-beck line clipping algorithms, Sutherland –Hodgeman polygon clipping algorithm, Polygon Filling

UNIT-III:
3-D object representation: Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-Spline curves, Bezier and B-Spline surfaces. Basic illumination models, polygon rendering methods.

UNIT-IV:
3-D Geometric transformations: Translation, rotation, scaling, reflection and shear transformations, composite transformations.
3-D viewing: Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping.

UNIT-V:
Computer animation: Design of animation sequence, general computer animation functions, raster animation, computer animation languages, key frame systems, motion specifications.
Visible surface detection methods: Classification, back-face detection, depth-buffer, scan-line, depth sorting, BSP-tree methods, area sub-division and octree methods
Text Books:
3. Computer Graphics, Steven Harrington, TMH

References:
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IDP (B.Tech. EEE & M.Tech. /MBA) III Year I-Sem

ENGINEERING MATERIALS
OPEN ELECTIVE-I

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Pre requisites: Nil

Course Objectives:
1. To gain an knowledge about the uses and application of various ferrous metals and alloys.
2. To gain an knowledge about the uses and application of various non ferrous alloys.
3. To gain an knowledge about the uses and application of various ceramics, polymers and composites for different engineering applications.

Course Outcomes:
At the end of the course, student would be able to recommend
1. Ferrous metals and alloys for a given engineering applications and service condition.
2. Non ferrous alloys for a given engineering applications and service condition.
3. Ceramics, Polymers and composites for a given engineering applications and service condition.

UNIT-I

UNIT-II
NONFERROUS ALLOYS: Introduction, properties and applications, Aluminum Alloys, Magnesium Alloys, Copper Alloys and Titanium Alloys.

UNIT-III
CERAMIC MATERIALS: Introduction, Properties and Applications of Ceramics, Glasses and Refractories.

UNIT-IV
POLYMERS: Introduction, Classification of Polymers, Polymerization, Degree of Polymerization, Typical Thermoplastics and Thermosets.

UNIT-V
COMPOSITES: Introduction, Classification, Properties and Applications of Polymer matrix, Metal Matrix Ceramic Matrix and Laminar composites.

TEXT / REFERENCE BOOKS:
JNTUH COLLEGE OF ENGINEERING HYDERABAD

IDP (B.Tech. EEE & M.Tech. /MBA) III Year I-Sem

METALLURGY FOR NON METALLURGISTS
OPEN ELECTIVE-I

Pre requisites: Nil

Course Objectives:
1. To describe the basic principles of metallurgy and the importance of metallurgy in various discipline of engineering.
2. Gain a thorough knowledge about heat treatment of steels.
3. Gain a knowledge about properties and uses of cast irons and non ferrous metals.
4. Gain a working knowledge of basic testing methods for metals.

Course Outcomes:
At the end of the course Student would be able
1. To use and apply metallurgy in his own branch of engineering.
2. The student will be able to justify the various testing methods adopted for metals.

UNIT-I
Introduction: Crystal structure and defects, Crystal structure of metals, Classification of steels, Carbon steels

UNIT-II
Heat Treatment of Steels: The Iron carbon systems, Common phases in steels, Annealing, Normalizing, Hardening and tempering

UNIT-III
Cast irons: Properties and applications of Ductile irons, Malleable irons, Compacted graphite iron.

UNIT-IV
Non Ferrous Metals: Properties and applications of Light Metals (Al , Be, Mg, Ti), Super alloys

UNIT-V

TEXT BOOKS
2. Introduction to Physical Metallurgy – SH Avner, TATA Mc GRAW HILL ,1997
3. Metallurgy for Engineers- Clark and Varney
4. Mechanical Metallurgy – G. E. Dieter

REFERENCE BOOKS
1. Engineering Physical Metallurgy and Heat treatment – Y Lakhtin
   Foundations of Materials Science and Engineering – WF Smith
Objective:
To expose the students to various types of industrial pollutions and controlling techniques.

OUTCOME:
The student will be able learn the sources of air, water pollution and also their treatment methods

UNIT-I
Introduction to industrial pollution and types of pollution from chemical industries, Effects of pollution as environment and ecosystems-global warming-green house effect; Environmental legislatures-standards and guidelines.

UNIT –II
Air pollution- Meteorological aspects of pollution dispersion-adiabatic lapse rate-Environmental lapse rate-Turbulence and stability of atmosphere, Richardson number-Plume raise-plume behavior and characteristics, effective stack height. Major air pollutants and their sources, measurement of air pollutants

UNIT -III

UNIT -IV
Introduction to water pollution – water pollutants classification – characteristics of liquid effluents from fertilizer, pulp & paper and petroleum industries, estimation of oxygen demands – DO, BOD, COD, TOC – BOD curves, oxygen sag curve – modeling of BOD curves


UNIT-V

Text books:
1. Pollution control in process industries by S.P. Mahajan TMH.,1985

References:
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IDP (B.Tech. EEE & M.Tech. /MBA) III Year II-Sem

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ESTIMATION, QUANTITY SURVEY & VALUATION
OPEN ELECTIVE -II

Pre Requisites:
Concrete Technology, RC Design, Design of Steel Structure

Course Objectives:
The subject provides the process of estimations required for various work in construction. To have knowledge of using SOR & SSR for analysis of rates on various works.

Course Outcomes:
Able to provide control steps for disaster mitigation steps

UNIT – I

UNIT – II
Detailed Estimates of Buildings - Reinforcement bar bending and bar requirement schedules

UNIT – III
Earthwork for roads and canals.

UNIT – IV
Rate Analysis – Working out data for various items of work over head and contingent charges.

UNIT-V

NOTE : NUMBER OF EXERCISES PROPOSED :
1. Three in flat Roof & one in Sloped Roof
2. Exercises on Data – three Nos.

Text Books:
2. Estimating and Costing by G.S. Birdie

Reference books:
2. I. S. 1200 (Parts I to XXV – 1974/ method of measurement of building and Civil Engineering works – B.I.S.)
3. Estimation, Costing and Specifications by M. Chakraborti; Laxmi publications.
Pre-requisite: Power systems-I and Power Systems-II

Objectives:
Objectives of this course are

- To emphasize the estimating and costing aspects of all electrical equipment, installation and designs to analyze the cost viability.
- To design and estimation of wiring,
- To design overhead and underground distribution lines, substations and illumination design.

OUTCOMES:
Students are in a position to Understand the design considerations of electrical installations.

- To design electrical installation for buildings and small industries.
- To identify and design the various types of light sources for different applications.

UNIT - I
DESIGN CONSIDERATIONS OF ELECTRICAL INSTALLATIONS:
Electric Supply System, Three phase four wire distribution system, Protection of Electric Installation against over load, short circuit and Earth fault, Earthing, General requirements of electrical installations, testing of installations, Indian Electricity rules, Neutral and Earth wire, Types of loads, Systems of wiring, Service connections, Service Mains, Sub-Circuits, Location of Outlets, Location of Control Switches, Location of Main Board and Distribution board, Guide lines for Installation of Fittings, Load Assessment, Permissible voltage drops and sizes of wires, estimating and costing of Electric installations.

UNIT - II
ELECTRICAL INSTALLATION FOR DIFFERENT TYPES OF BUILDINGS AND SMALL INDUSTRIES:
Electrical installations for residential buildings – estimating and costing of material, Electrical installations for commercial buildings, Electrical installations for small industries.

UNIT - III
OVERHEAD AND UNDERGROUND TRANSMISSION AND DISTRIBUTION LINES:
Introduction, Supports for transmission lines, Distribution lines – Materials used, Underground cables, Mechanical Design of overhead lines, Design of underground cables.

UNIT - IV
SUBSTATIONS:
Introduction, Types of substations, Outdoor substation – Pole mounted type, Indoor substations – Floor mounted type.

UNIT – V
DESIGN OF ILLUMINATION SCHEMES:
Introduction, Terminology in illumination, laws of illumination, various types of light sources, Practical lighting schemes LED, CFL and OCFL differences.

TEXT BOOKS
2. Design of Electrical Installations, Er. V. K. Jain, Er. Amitabh Bajaj, University Science Press.
REFERENCE BOOKS
IDP (B.Tech. EEE & M.Tech. /MBA) III Year II-Sem

ENERGY STORAGE SYSTEMS
OPEN ELECTIVE-II

Pre-requisite: None

Objectives:
Objectives of this course are
• To enable the student to understand the need for energy storage, devices and technologies available and their applications.

OUTCOMES: After this course, the student
• Can analyze the characteristics of energy from various sources and need for storage
• Can classify various types of energy storage and various devices used for the purpose
• Can apply the same concepts to real time problems.

UNIT - I
Electrical Energy Storage Technologies: Characteristics of electricity, Electricity and the roles of EES, High generation cost during peak-demand periods, Need for continuous and flexible supply, Long distance between generation and consumption, Congestion in power grids, Transmission by cable.

UNIT - II

UNIT - III
Features of Energy Storage Systems: Classification of EES systems , Mechanical storage systems, Pumped hydro storage (PHS), Compressed air energy storage (CAES), Flywheel energy storage (FES), Electrochemical storage systems, Secondary batteries, Flow batteries, Chemical energy storage, Hydrogen (H2), Synthetic natural gas (SNG).

UNIT - IV
Types of Electrical Energy Storage systems: Electrical storage systems, Double-layer capacitors (DLC), Superconducting magnetic energy storage (SMES), Thermal storage systems , Standards for EES, Technical comparison of EES technologies.

UNIT - V
Applications: Present status of applications, Utility use (conventional power generation, grid operation & service) , Consumer use (uninterruptable power supply for large consumers), New trends in applications , Renewable energy generation, Smart Grid, Smart Micro grid, Smart House, Electric vehicles, Management and control hierarchy of storage systems, Internal configuration of battery storage systems, External connection of EES systems , Aggregating EES systems and distributed generation (Virtual Power Plant), Battery SCADA—aggregation of many dispersed batteries.

TEXT BOOKS

REFERENCE BOOKS:
UNIT – I
INTRODUCTION: Definition – Trends - Control Methods: Standalone , PC Based ( Real Time Operating Systems, Graphical User Interface , Simulation) - Applications: identification of sensors and actuators in Washing machine, Automatic Camera, Engine Management, SPM, Robot, CNC, FMS, CIM.


UNIT – II
PRECISION MECHANICAL SYSTEMS: Modern CNC Machines – Design aspects in machine structures, guideways, feed drives, spindle and spindle bearings, measuring systems, control software and operator interface, gauging and tool monitoring.

ELECTRONIC INTERFACE SUBSYSTEMS: TTL, CMOS interfacing - Sensor interfacing – Actuator interfacing – solenoids , motors Isolation schemes- opto coupling, buffer IC’s - Protection schemes – circuit breakers, over current sensing, resetable fuses, thermal dissipation - Power Supply - Bipolar transistors / MOSFETs

UNIT – III
ELECTROMECHANICAL DRIVES: Relays and Solenoids - Stepper Motors - DC brushed motors – DC brushless motors - DC servo motors - 4-quadrant servo drives , PWM’s - Pulse Width Modulation – Variable Frequency Drives, Vector Drives - Drive system load calculation.


UNIT – IV

UNIT – V

TEXT BOOKS
2. Mechatronics by M.D.Singh, J.G.Joshi PHI.
3. Mechatronics HMT

REFERENCE BOOKS
2. Michel B. Histand and David G. Alciatore,"
Prerequisites: None

Course outcomes:
After doing this course, student should be in position to
1. Understand Turbo Jet Propulsion System
2. Analyze the flight performance
4. Learn the Aero thermo chemistry of the combustion products
5. Understand the physics of Solid propellant rocket engine, Liquid Rocket Propulsion System & Ramjet and Integral Rocket Ramjet Propulsion System:

Unit - I:
Turbo Jet Propulsion System:
Gas turbine cycle analysis – layout of turbo jet engine. Turbo machinery- compressors and turbines, combustor, blade aerodynamics, engine off design performance analysis.

Flight Performance:
Forces acting on vehicle – Basic relations of motion – multi stage vehicles.

Unit - II:
Principles of Jet Propulsion and Rocketry:
Fundamentals of jet propulsion, Rockets and air breathing jet engines – Classification – turbo jet , turbo fan, turbo prop, rocket (Solid and Liquid propellant rockets) and Ramjet engines.

Nozzle Theory and Characteristics Parameters:
Theory of one dimensional convergent – divergent nozzles – aerodynamic choking of nozzles and mass flow through a nozzle – nozzle exhaust velocity – thrust, thrust coefficient, $A_c / A_t$ of a nozzle, Supersonic nozzle shape, non-adapted nozzles, summer field criteria, departure from simple analysis – characteristic parameters – 1) characteristic velocity, 2) specific impulse 3) total impulse 4) relationship between the characteristic parameters 5) nozzle efficiency, combustion efficiency and overall efficiency.

Unit - III: Aero Thermo Chemistry of The Combustion Products:

Solid Propulsion System:

Unit - IV:
Solid propellant rocket engine – internal ballistics, equilibrium motor operation and equilibrium pressure to various parameters. Transient and pseudo equilibrium operation, end burning and burning grains, grain design. Rocket motor hardware design. Heat transfer considerations in solid rocket motor design. Ignition system, simple pyro devices.

Liquid Rocket Propulsion System:
Liquid propellants – classification, Mono and Bi propellants, Cryogenic and storage propellants, ignition delay of hypergolic propellants, physical and chemical characteristics of liquid propellant. Liquid propellant rocket engine – system layout, pump and pressure feed systems, feed system components. Design of combustion chamber, characteristic length, constructional features, and chamber wall stresses. Heat transfer and cooling aspects. Uncooled engines, injectors – various types, injection patterns, injector characteristics, and atomization and drop size distribution, propellant tank design.
Unit - V: Ramjet and Integral Rocket Ramjet Propulsion System:
Fuel rich solid propellants, gross thrust, gross thrust coefficient, combustion efficiency of ramjet engine, air intakes and their classification – critical, super critical and sub-critical operation of air intakes, engine intake matching, classification and comparison of IIRR propulsion systems.

TEXT BOOKS:

REFERENCE BOOKS:
1. Rocket propulsion –Sutton
2. Gas Turbines /Cohen, Rogers & Sarvana Muttoo/Addision Wesley & Longman.
3. Gas Turbines-V.Ganesan /TMH.
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IDP (B.Tech. EEE & M.Tech. /MBA) III Year II-Sem

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ERGONOMICS
OPEN ELECTIVE-II

Prerequisites: None

Objectives:
Provide a broad based introduction to ergonomic principles and their application in the design of work, equipment and the workplace. Consideration is given to musculo-skeletal disorders, manual handling, ergonomic aspects of the environment as well as to the social and legal aspects.

Course Outcomes:
On completing this course successfully the student will be able to:
• understand and apply ergonomic principles to the creation of safer, healthier and more efficient and effective activities in the workplace;
• understand ergonomic risk assessments and appropriate control measures;
• understand the causes of upper limb disorders and how to reduce them;
• appreciate workplace layout and equipment design;
• appreciate environmental aspects of good ergonomic design.

UNIT I

UNIT II

UNIT III

UNIT IV

UNIT V

Text books
1. Introduction to Ergonomics(Third Edition)/ R.S.Bridger/CRC Press , Taylor & Francis Group

References
1. Human factors in Engineering and Design/E.J.McCormick/ TMH Edison
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MECHATRONICS
OPEN ELECTIVE-II

Pre-requisites: None.

Course objectives:
• They should be able to link up mechanical and electronics.

Outcomes:
• Develop a relationship between mechanical elements and electronics elements for proper functioning of mechanical systems.

UNIT – I
INTRODUCTION: Definition – Trends - Control Methods: Standalone , PC Based ( Real Time Operating Systems, Graphical User Interface , Simulation ) - Applications: identification of sensors and actuators in Washing machine, Automatic Camera, Engine Management, SPM, Robot, CNC, FMS, CIM.


UNIT – II
PRECISION MECHANICAL SYSTEMS :
Modern CNC Machines – Design aspects in machine structures, guideways, feed drives, spindle and spindle bearings, measuring systems, control software and operator interface, gauging and tool monitoring.
Note: (text book: Mechatronics HMT – chapter 5)

ELECTRONIC INTERFACE SUBSYSTEMS :
TTL, CMOS interfacing - Sensor interfacing – Actuator interfacing – solenoids , motors Isolation schemes- opto coupling, buffer IC’s - Protection schemes – circuit breakers , over current sensing , resetable fuses , thermal dissipation - Power Supply - Bipolar transistors / mosfets

UNIT – III
ELECTROMECHANICAL DRIVES :
Relays and Solenoids - Stepper Motors - DC brushed motors – DC brushless motors - DC servo motors - 4-quadrant servo drives , PWM’s - Pulse Width Modulation – Variable Frequency Drives, Vector Drives - Drive System load calculation.

UNIT – IV
PROGRAMMABLE LOGIC CONTROLLERS :

UNIT – V
PROGRAMMABLE MOTION CONTROLLERS :
TEXT BOOKS:
2. Mechatronics/M.D.Singh/J.G.Joshi/PHI.

REFERENCE:
2. Michel B. Histand and David G. Alciatore, “
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IDP (B.Tech. EEE & M.Tech. /MBA) III Year II-Sem

PRINCIPLES OF ELECTRONIC COMMUNICATIONS
OPEN ELECTIVE-II

Prerequisite : Nil

Course Objectives:
The objective of this subject is to:
• Introduce the students to modulation and various analog and digital modulation schemes.
• They can have a broad understanding of satellite, optical, cellular, mobile, wireless and telecom concepts.

Course Outcomes:
By completing this subject, the student can
• Work on various types of modulations.
• Should be able to use these communication modules in implementation.
• Will have a basic understanding of various wireless and cellular, mobile and telephone communication systems.

Unit 1:
Introduction: Need for Modulation, Frequency translation, Electromagnetic spectrum, Gain, Attenuation and decibels.

Unit 2:

Unit 3:
Telecommunication Systems: Telephones Telephone system, Paging systems, Internet Telephony.
Networking and Local Area Networks: Network fundamentals, LAN hardware, Ethernet LANs, Token Ring LAN.

Unit 4:
Satellite Communication: Satellite Orbits, satellite communication systems, satellite subsystems, Ground Stations Satellite Applications, Global Positioning systems.

Unit 5:
Cellular and Mobile Communications: Cellular telephone systems, AMPS, GSM, CDMA, WCDMA.
Wireless Technologies: Wireless LAN, PANs and Bluetooth, ZigBee and Mesh Wireless networks, Wimax and MANs, Infrared wireless, RFID communication, UWB.

Text Books:
2. Kennady, Davis, Electronic Communications systems, 4e, TMH, 1999

Reference Books:
Prerequisites
1. A Course on “Network Security and Cryptography”

Objectives
1. The purpose of the course is to educate on cyber security and the legal perspectives of cyber crimes and cyber offenses.
2. Introduce tools and methods for enhancing cyber security.
3. Topics include: cyber crimes, cyber offenses, cyber crimes on mobile and wireless devices, tools and methods to prevent cyber crimes, legal perspectives of cyber crimes and cyber security, computer forensics, Intellectual Property Rights and cyber terrorism.

Outcomes
1. Demonstrate the knowledge of cyber security and understand the Indian and Global Act concerning cyber crimes.
2. Employ security and privacy methods in the development of modern applications such that personal data is protected; and provide safe Internet usage.

UNIT-I
Introduction to Cybercrime:
Introduction, Cybercrime and Information security, who are cyber criminals, Classification of Cyber crimes, Cybercrime: The legal Perspectives and Indian Perspective, Cybercrime and the Indian ITA 2000, A Global Perspective on Cyber crimes.
Cyber offenses: How Criminals Plan Them

UNIT-II
Cybercrime: Mobile and Wireless Devices
Tools and Methods Used in Cyber Crime:
Introduction, Proxy services and Anonymizers, Phishing, Password Cracking, Keyloggers and Spywares, Virus and Worms, Trojan Horses and Backdoors, Steganography, DoS and DDoS Attacks, SQL Injection, Buffer Overflow, Attacks on Wireless Networks.

UNIT III
Cyber crimes and Cyber Security: the Legal Perspectives Introduction
Cyber Crime and Legal Landscape around the world, Why Do We Need Cyber laws: The Indian Context, The Indian IT Act, Challenges to Indian Law and Cybercrime Scenario In India, Digital signatures and the Indian IT Act, Amendments to the Indian IT Act, Cybercrime and Punishment Cyber law, Technology and Students: Indian Scenario.

Understanding Computer Forensics
Introduction, Historical background of Cyber forensics, Digital Forensics Science, The Need for Computer Forensics, Cyber Forensics and Digital evidence, Forensics Analysis of Email, Digital Forensics Lifecycle, Chain of Custody concept, Network Forensics, Approaching a computer, Forensics Investigation, Challenges in Computer Forensics, Special Tools and Techniques Forensics Auditing.
UNIT IV
Cyber Security: Organizational Implications
Introduction, cost of cyber crimes and IPR issues, web threats for organizations, security and privacy implications, social media marketing: security risks and perils for organizations, social computing and the associated challenges for organizations.

Cybercrime and Cyber terrorism: Introduction, intellectual property in the cyberspace, the ethical dimension of cyber crimes the psychology, mindset and skills of hackers and other cyber criminals

UNIT V
Cybercrime: Illustrations, Examples and Mini-Cases
Examples:
Official Website of Maharashtra Government Hacked, Indian Banks Lose Millions of Rupees, Parliament Attack, Pune City Police Bust Nigerian Racket, e-mail spoofing instances.

Mini-Cases:
The Indian Case of online Gambling, An Indian Case of Intellectual Property Crime, Illustrations of Financial Frauds in Cyber Domain, Digital Signature-Related Crime Scenarios.

Text book:

Reference book:
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IDP (B.Tech. EEE & M.Tech. /MBA) III Year II-Sem

DATABASE MANAGEMENT SYSTEMS
OPEN ELECTIVE-II

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Prerequisites
1. A course on “Advanced Data Structures”

Objectives
1. To understand the basic concepts and the applications of database systems.
2. To master the basics of SQL and construct queries using SQL.
3. Topics include data models, database design, relational model, relational algebra, transaction control, concurrency control, storage structures and access techniques.

Outcomes
1. Gain knowledge of fundamentals of DBMS, database design and normal forms
2. Master the basics of SQL for retrieval and management of data.
3. Be acquainted with the basics of transaction processing and concurrency control.
4. Familiarity with database storage structures and access techniques

UNIT I:
Database System Applications: database system Vs. file system, view of data, data abstraction, instances and schemas, data models, the ER model, relational model, other models, database languages, DDL, DML, database access for application programs, database users and administrator, transaction management, database system structure, storage manager, the query processor, history of database systems, data base design and ER diagrams, beyond ER design entities, attributes and entity sets, relationships and relationship sets, additional features of ER model, concept design with the ER Model, conceptual design for large enterprises.

UNIT II:
Introduction to the Relational Model: integrity constraint over relations, enforcing integrity constraints, querying relational data, introduction to views, destroying/altering tables and views, form of basic SQL query, examples of basic SQL queries, introduction to nested queries, correlated nested queries, set comparison operators, aggregation operators, NULL values, comparison using null values, logical connectivity’s, AND, OR and NOT, impact on SQL constructs, outer joins, disallowing NULL values, complex integrity constraints in SQL, triggers and active data bases, Oracle, SQL Server, DB2.

UNIT III:
Relational Algebra: Selection and projection, set operations, renaming, Joins, Division, Examples of Algebra overviews, Relational calculus, Tuple relational Calculus, Domain relational calculus, Expressive Power of Algebra and calculus.
Schema refinement: Problems caused by redundancy, decompositions, problems related to decomposition, reasoning about functional dependencies, FIRST, SECOND, THIRD normal forms, BCNF, lossless join decomposition, dependency preserving decomposition, schema refinement in database design, multi valued dependencies, FOURTH normal form, FIFTH normal form.

UNIT IV:
UNIT V:

Text Books:

References:
2. Fundamentals of Database Systems, Elmasri Navratae Pearson Education
3. Introduction to Database Systems, C.J. Date Pearson Education
4. Oracle for Professionals, The X Team, S.Shah and V. Shah, SPD.
5. Database Systems Using Oracle: A Simplified guide to SQL and PL/SQL,Shah,PHI.
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L T P C
3 0 0 3

CORROSION ENGINEERING
OPEN ELECTIVE-II

Pre-requisites: NIL

Course Objectives:
1. To demonstrate electrometallurgy principles in deposition winning and the efficiency of the bath.
2. To determine corrosion rate/ resistance of metals and alloys.
3. To explain corrosion protection methods and tests.

Course Outcomes:
At the end of the course the student will be able:
1. To gain knowledge in various types of electrolytic cells and the processes taking place in them.
2. To obtain knowledge about the importance of controlling corrosion and its prevention measures.
3. The course is useful for higher studies, R&D, and also for getting into jobs in industries.

UNIT - I
Introduction, Electro Chemistry principles, electrochemical reactions, Polarization, passivity, environmental effects (oxygen, oxidizers, velocity, temperature, corrosive concentration, Galvanic coupling).

UNIT - II

UNIT - III
Intergranular corrosion: Sensitization, weld decay, Knife-Line attack, Stress corrosion cracking: crack morphology, stress effects, environmental factors, metallurgical factors, Erosion corrosion: cavitation damage, fretting corrosion, Corrosion fatigue.

UNIT - IV

UNIT - V
Modern theory and applications of corrosion: Introduction, free energy, cell potentials, emf series, applications of thermodynamics to corrosion, Corrosion rate expressions and measurements, corrosion testing.

Text / Reference Books:
JNTUH COLLEGE OF ENGINEERING HYDERABAD

IDP (B.Tech. EEE & M.Tech. /MBA) III Year II-Sem

TESTING OF MATERIALS
OPEN ELECTIVE-II

Pre-requisites: NIL

Course Objectives:
1. To gain and understanding of the response of various metals under the application of stress and/or
temperature.
2. To build necessary theoretical background of the role of lattice defects in governing both elastic and
plastic properties of metals will be discussed.
3. Obtain a working knowledge of various hardness testing machines BHN, VHN, RHN
4. Obtain a working knowledge of creep and fatigue and analysis of data.

Course Outcomes:
At the end of the course the student will be able to:
1. Classify mechanical testing of ferrous and non-ferrous metals and alloys.
2. Recognize the importance of crystal defects including dislocations in plastic deformation.
3. Identify the testing methods for obtaining strength and hardness.
4. Examine the mechanisms of materials failure through fatigue and creep

UNIT – I
Introduction, Importance of testing
Hardness Test: Methods of hardness testing – Brinell, Vickers, Rockwell hardness tests.
The Impact Test: Notched bar impact test and its significance, Charpy and Izod Tests, fracture toughness
testing - COD and CTOD tests, significance of transition temperature curve.

UNIT - II
The Tension Test: Engineering stress-strain and True stress-strain curves. Tensile properties, conditions
for necking. Stress-Strain diagrams for steel, Aluminum and cast iron.

UNIT - III
Fatigue Test: Introduction, Stress cycles, S-N Curve, Effect of mean stress, Mechanism of fatigue
failure, Effect of stress concentration, size, surface condition and environments on fatigue.

UNIT – IV
Creep and Stress Rupture: Introduction, The creep curve, Stress-rupture test, Structural changes during
creep, Mechanism of creep deformation, theories of creep. Fracture at elevated temperature.

UNIT – V
NDT: Principle, Operation, Advantages and Limitations of Liquid Penetrant, Magnetic Particle, Radio
graphy and Ultrasonic tests.

TEXT / REFERENCE BOOKS:
1. Mechanical Metallurgy – G. E. Dieter
2. Mechanical behavior - Ed. Wulf.
Objectsives:
- To know the Classification of solid waste and characterization of the same
- Understand the sense of onsite handling storage and collection systems including transportation
- Understand the different processing technologies of solid waste.

Outcomes:
The student will be able to
- Apply the knowledge of characterization of waste and develop a suitable management plan
- Assess the cost of transportation and laboratory processing of solid waste
- Identify hazardous nature of waste if any and can suggest suitable dumping methods.
- Suggest processing waste for material for energy recovery.

Unit I
Introduction: Definition, characteristics and perspectives of solid waste. Types of solid waste.
Physical and chemical characteristics. Variation of composition and characteristics. Municipal, industrial, special and hazardous wastes.


Unit II

Unit III

Unit IV

Unit V
Case studies: Major industries and management methods used in typical industries – Coal fired power stations, textile industry, oil refinery, distillery, sugar industry, and radioactive waste generation units.

Text Books:

Reference Books:
MARKETING MANAGEMENT
PG CORE-I

(Students must read textbook. Faculty are free to choose any other cases)

Course Aim: The aim of the Marketing Management Course is to provide students the marketing skills and enable them:

- To understand the basic marketing trends through case studies.
- To familiarise with basic concepts of marketing mix and strategies
- To get oriented to the tools required to help develop and implement marketing strategies.

Learning outcome:
The students would be able to describe key marketing concepts, theories and techniques for analyzing a variety of marketing situations.
By reading text and relating the concepts through cases the student would be able to understand the importance and role of marketing in a global environment.
They will be able to analyze markets and design customer driven strategies and will be able to communicate the decisions towards business development with superior customer value.

Case 1: Bata (Rajendra.P Maheshwari page no: 03)
Case 2: Mahindra Scooters (Arun Kumar page no: 89).
Case 3: Ready Meal Manufactures (Adrian palmer, page no: 70).
Case 4: Santoor –(lamb Hair– page no : 238).
Case 5: Drawing on data, searching for insight (Adrian palmer – Page no: 175).

Case 1: Small New Phones (Adrian palmer-  page no: 296).

Case 1: (Segmentation) Zee TV (lamb, Hair page no 212).
Case 2: (Targeting) Kellogg’s (lamb, Hair page no 300 )
Case 3: (Positioning) Nimbooz (S. Neelamegham page no 225).

4. Distribution Decisions, Promotion & Communication Strategies : Marketing Channels, Channel intermediates and functions, channel structure, channel for consumer products, business and industrial products, alternative channel, channel strategy decisions. The promotional mix, advertising, public relations, sales promotion, personal selling, marketing communication- communication process, communication promotion mix, factors effecting the promotion mix.
Case 1: Barista (Arun Kumar – page no:33).
Case 2: Nano Car (lamb, Hair – page no:52)
Case 4: TESCO (Adrian palmer page no : 388 )
Case 5: Hero Motor Corp (lamb, Hair Page no:446)
5. Pricing Decisions & Personal Communication - Importance of price, cost determinant of price, markup pricing, profit maximization pricing, break even pricing, pricing strategy, ethics of pricing strategy, product line pricing, WOM, Rural marketing, BOP, relationship Marketing, Digital marketing, Social marketing, post modern marketing, market sustainability and ethics, Global marketing.
   Case 1: Coca Cola(lamb, Hair – page no: 112).
   Case 4: Compact car (Arun Kumar page no :369)
   Case 5: Chick (lamb, Hair Page no:650)
   Case 6: Nokia (Neelamegham page no – 645).
   Case 8: Airtel (Arun – page no: 901)
   Case 9: Beer Marketing (Adrian palmer page no:529)

Textbook:
   Journal : MICA Communications Review – A Marketing Communications Journal, Mudra Institute of Communications, Ahmedabad.
   Business Game
   Music2Go Marketing: (Marketing Management Simulation Game), TMH, 2013. You can play on any computer with internet (Rs.150/- per year-better buy and play).
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IDP (B.Tech. EEE & M.Tech. / MBA) IV Year I-Sem

HUMAN RESOURCE MANAGEMENT
PG CORE-II

(LTTPC)
4 0 0 4

(Students must read textbook. Faculty are free to choose any other cases)

Course Aim:
To understand various terms in HRM and be able to manage the human resources of an organization effectively and efficiently.

Learning Outcome:
Students should be able to understand the basic HR concepts. They will be able to understand the process of recruitment, selection, performance appraisal, training & development, compensation and employee retention approaches and strategies.

Unit-I:

Case: Social Surveyors in Flood-hit Areas (Gary Dessler page no 160)
Case: Finding people who are passionate about what they do (Gary Dessler page no 195)
Case: HR, CULTURE and Business Results Success at Google, Scripps and UPS (Robert L Mathis P.No. 35)
Case: Religious Accommodation (Robert L Mathis P. No. 118)
Case: Mitsubishi Believes in EEO-Now (Robert L Mathis P. No. 119)


Case: Reinventing the wheel at apex door Company (Gary Dessler page no 309)
Case: Xerox Focuses on HR (Robert L Mathis P. No. 79)
Case: where do you find the Bodies? (Robert L Mathis P. No. 79)
Case: The Reluctant Receptionist (Robert L Mathis P. No. 159)
Case: Accenture –Retaining for Itself (Robert L Mathis P. No.193)
Case: Recruiting at Kia (Robert L Mathis P. No. 231)
Case: Strategic Selection: A Review of Two Companies (Robert L Mathis P. No.267)

Unit-III:

Case: Training Crucial for Hotels (Robert L Mathis P. No. 307)
Case: performance management improvements for Bristol-Myers Squibb (Robert L Mathis P. No. 393)
Case: Just Another Job (Robert L Mathis P. No. 647)
Case: The Dilemma Within (Robert L Mathis P. No. 667)
Case: Performance Appraisal at Cola Magic Drinks (Robert L Mathis P. No. 671)
Case: Appraising the secretaries at Sweet water U? (Gary Dessler page no 349)

Case: Salary inequities at ACME Manufacturing (Gary Dessler page no 429)
Case: HR Contributes at CSSCO (Robert L Mathis P. No. 36)
Case: Compensation changes at JC Penny (Robert L Mathis P. No. 435)
Case: Benifiting Connie (Robert L Mathis P. No. 507)


Case : The New Safety and Health Program (Gary Dessler page no 623)
Case : Full Disclosure on Sex Offenders? (Robert L Mathis P. No. 231)
Case : Wal-Mart and Watching Its “Union Prevention” (Robert L Mathis P. No. 629)

REFERENCES:
SALES AND DISTRIBUTION

PG Elective-I (Marketing)

(Students must read textbook. Faculty are free to choose any other cases)

Aim: The aim of this course is to enable students to the sales and distribution processes with particular focus on Sales Management and Sales Personnel, the role of Distribution Channels and enabling them to manage Channel partners.

To expose students to the tools and strategies necessary for designing, motivating and evaluating sales & distribution management systems.

Learning outcomes:

- The student should be able to manage the sales force and distribution processes through sales planning and Budgeting.
- The Students should be able to understand & appreciate the diverse variables affecting the sales & distribution function and analyse their impact on the sales and distribution processes.

1. **Introduction to Sales Management**: Evolution of Sales Management, importance of Sales Management, types of Selling, difference between Selling and Marketing, Modern Day Sales Activities, Selling Skills, Selling Strategies, Selling Process.

   *Case*: Plastic Industries, Inc., The role of Personal Selling in creating Market. (Richard R.Still page no 104,105)

   *Case*: United air flow manufacturer of households appliances sales persons job. (Richard R.Still page no 115 to 118)

2. **Sales Planning and Budgeting**: Sales planning process, sales forecasting methods, sales budgeting process, methods used for deciding sales budget, types of quotas and quota setting procedure, reasons for establishing or revising sales territories, routing and scheduling sales persons, market cost analysis.

   *Case*: Augsburg Wiesel Ltd, manufacturer of table ware, establishment of sales territories (Richard R Still, Page no 603 to 605)

   *Case*: Midland office engineering, establishment of sales budgeting program, (Richard R Still, page no 588 to 589)

3. **Sales Force Management**: Recruitment and selection of the sales force, training the sales force, sales force motivation, sales force compensation, sales force control and evaluation.

   *Case*: 1 Adjusting Compensation Plan to Motivate Sales Representatives (K.Sridhara Batt, page no 576 to 577)

   *Case*: 2 Sales Force Strategy at Life Insurance Corporation (K.Sridhara Batt, page no 579)

4. **Introduction to Distribution Management**

   Definition of Distribution Management, need for Distribution Channels, Distribution Channels for Rural Markets, designing the Marketing Channels, Motivating and Evaluating Channel Members, Capturing the Customer requirements

   *Case*: 1 Fed Ex’s Value Chain Solutions, (K.Sridhara Batt page no 618 to 620)

   *Case*: 2 The National Handloom Development Corporation. (Tapan K. Panda, Sunil Sahadev page no. 504)
5. **Managing Channel Institutions**

Managing Channel Information Systems, Managing Retailers, Wholesalers, Franchisers, Designing Channel Systems, reasons for Channel Conflicts, Managing Conflict, Managing International Channel of Distribution, Ethical issues in Sales and Distribution Management

*Case: 1* Kinetic Engineering Company, Handling Channel Conflict, (Krishna K Havaldar, Vasant page no 461)

*Case: 2* Indian Ayurveda Pharmacy Limited, (Tapan K. Panda, Sunil Sahad page no 719)

**Textbook**


**Journal:** MICA Communications Review – A Marketing Communications Journal, Mudra Institute of Communications, Ahmedabad.

**Business Game:** Music2Go Marketing: (Marketing Management Simulation Game), TMH, 2013.

You can play on any computer with internet (Rs.150/- per year-better buy and play).

Music2Go is a *Principles of Marketing/Marketing Management* simulation game, where the students are required to formulate and implement their own Sales and Marketing Campaign. This helps the students to have a hands – on business experience in the classroom – experiential learning at its best.
Course Objectives:
1. To provide the students information on the Career opportunities in training, important concepts and meanings, Integrating strategy and training.
2. To enable the students to understand the design of training, implementation
3. To introduce the knowledge of evaluation of training programs in the organization.

Learning Outcome:
1. The student will be familiar with how to do training need analysis
2. Students will be able to learn various training methods, design training programs, implement training programs.
3. They also gain the knowledge to evaluate the effectiveness of training programs.

1. Training in organizations: Trends in training, Career opportunities in training, important concepts and meanings, Integrating OD, strategy and training, understand motivation and performance, aligning training design with learning process.
   Case: Taking Charge at Domtar : What it takes for a turnaround? (Nick Blanchard)
   Case :LG Electronics ((Nick Blanchard)
   Case :The wilderness training lab((Nick Blanchard)

2. Need Analysis and Training design: The Training Need Analysis (TNA) Model, TNA and Design, organizational constraints, developing objectives, Facilitation of learning and training transfer to the job, design theory.
   Case : Developing a training package at westcan (Nick Blanchard)
   Case : The Training program (Fabrics Inc.) (Nick Blanchard)

3. Training methods: Matching methods with outcomes, lectures and demonstrations , games and simulations, OJT, computer based training,(CBT).
   Case : Training & Development at Godrej. (Nick Blanchard)

4. Implementation & Evaluation of Training: Development of training, implementation, transfer of training, major players in training & development, rational for evaluation, resistance to training evaluation, types of evaluation.
   Case : Jack goes to training. (Nick Blanchard)
   Case 3 : Training designed to change behavior and attitude. (Nick Blanchard)

5. Areas of organizational Training: Orientation training, diversity training, sexual harassment training, team training, cross functional teams, cross cultural training, training for talent management and competency mapping.
   Case 4: The competent employee. (Nick Blanchard)

Textbook:

References:
JNTUH COLLEGE OF ENGINEERING HYDERABAD

IDP (B.Tech. EEE & M.Tech. / MBA) IV Year I-Sem

FINANCIAL MANAGEMENT
PG Elective-I (Finance)

(Students must read textbook. Faculty are free to choose any other cases)
*The students need Discounting Table and Annuity tables for the examination

Course Aim: To give an overview of the functions of a financial manager in the commercial world with a particular focus on the concepts and theories of corporate finance.

Learning Outcome:
The students will gain skills to understand, evaluate and resolve the problems confronted by the financial managers. They will gain in insight into the decision making process of a financial manager based on timely, relevant and reliable financial and non-financial information. This course will further help the students to understand the diligent use of resources efficiently, effectively and economically.

1. The Finance Function: Nature and Scope; Evolution of finance function – Its new role in the contemporary scenario – Goals of finance function – maximizing vs. satisfying; Profit vs. Wealth vs. Welfare; the Agency relationship and costs; Risk-Return trade off; Concept of Time Value of Money – Future Value and Present value and the basic valuation model.

2. The Investment Decision: Investment decision process- Project generation, project evaluation, project selection and project Implementation. Developing Cash Flow; Data for New Projects; Capital Budgeting Techniques –Traditional and DCF methods. The NPV vs. IRR Debate; Approaches for reconciliation. Capital budgeting decision under conditions of risk and uncertainty. Cost of capital: Concept and measurement of cost of capital, Debt vs. Equity, cost of equity, preference shares, equity capital and retained earnings, weighted average cost of capital and marginal cost of capital. Importance of cost of capital in capital budgeting decisions.


4. Dividend Decisions: Dividends and value of the firm - Relevance of dividends, the MM hypothesis, Factors determining Dividend Policy-dividends and valuation of the firm-the basic models. Declaration and payment of dividends. Bonus shares. Rights issue, share-splits, Major forms of dividends – Cash and Bonus shares. The theoretical backdrop – Dividends and valuation; Major theories centered on the works of GORDON, WALTER and LITNER. A brief discussion on dividend policies of Indian companies. Working Capital Management: Components of working capital, gross vs. net working capital, determinants of working capital needs, the operating cycle approach. Planning of working capital, Financing of working capital through Bank finance and Trade Credit – Recommendations of Tandon and Daheja Committee on Working Capital. Cases.

Textbook

References:
7. IM Pandey, Cases in Financial Management, TMH 2/e 2012
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IDP (B.Tech. EEE & M.Tech. / MBA) IV Year I-Sem

MANAGEMENT INFORMATION SYSTEM (MIS)
PG Elective – I (SYSTEMS)

Course Objectives
1. To provide students basic concepts of MIS and IS models
2. To explain integration process of MIS with Enterprise Resource Planning (ERP)
3. To provide a practical framework for Information System operations and management

Learning Outcomes
1. Students learn different models of MIS and their applicability in various business resource requirement plans
2. Students learn user training, operations, control, troubleshooting and maintenance aspects of MIS
3. Students will appreciate what is the successful design and implementation of MIS in business departments and operations


References
SOFT SKILLS LAB
(Activity-based)

- To improve the fluency of students in English
- To facilitate learning through interaction
- To illustrate the role of skills in real-life situations with case studies, role plays etc.
- To train students in group dynamics, body language and various other activities which boost their confidence levels and help in their overall personality development
- To encourage students develop behavioral skills and personal management skills
- To impart training for empowerment, thereby preparing students to become successful professionals

INTRODUCTION
Definition and Introduction to Soft Skills – Hard Skills vs Soft Skills – Significance of Soft/Life/Self Skills – Self and SWOT Analysis and

1. Exercises on Productivity Development
   - Effective/ Assertive Communication Skills (Activity based)
   - Time Management (Case Study)
   - Creativity & Critical Thinking (Case Study)
   - Decision Making and Problem Solving (Case Study)
   - Stress Management (Case Study)

2. Exercises on Personality Development Skills
   - Self-esteem (Case Study)
   - Positive Thinking (Case Study)
   - Emotional Intelligence (Case Study)
   - Team building and Leadership Skills (Case Study)
   - Conflict Management (Case Study)

3. Exercises on Presentation Skills
   - Netiquette
   - Importance of Oral Presentation – Defining Purpose- Analyzing the audience- Planning outline and preparing the Presentation- Individual & Group Presentation- Graphical Organizers- Tools and Multi-media Visuals
   - One Minute Presentations (Warming up)
   - PPT on Project work- Understanding the Nuances of Delivery- Body Language – Closing and Handling Questions – Rubrics for Individual Evaluation (Practice Sessions)

4. Exercises on Professional Etiquette and Communication
   - Role-Play and Simulation- Introducing oneself and others, Greetings, Apologies, Requests, Agreement & Disagreement….etc.
   - Telephone Etiquette
   - Active Listening
   - Group Discussions (Case study)- Group Discussion as a part of Selection Procedure- Checklist of GDs
   - Analysis of Selected Interviews (Objectives of Interview)
   - Mock-Interviews (Practice Sessions)
   - Job Application and Preparing Resume
   - Process Writing (Technical Vocabulary) – Writing a Project Report- Assignments
5. Exercises on Ethics and Values
Introduction — Types of Values - Personal, Social and Cultural Values - Importance of Values in Various Contexts
• Significance of Modern and Professional Etiquette – Etiquette (Formal and Informal Situations with Examples)
• Attitude, Good Manners and Work Culture (Live Examples)
• Social Skills - Dealing with the Challenged (Live Examples)
• Professional Responsibility – Adaptability (Live Examples)
• Corporate Expectations

Note:
• Hand-outs are to be prepared and given to students.
• Training plan will be integrated in the syllabus.
• Topics mentioned in the syllabus are activity-based.

SUGGESTED SOFTWARE:
The following software from ‘train2success.com’
- Preparing for being Interviewed,
- Positive Thinking,
- Interviewing Skills,
- Telephone Skills,
- Time Management
- Team Building,
- Decision making

SUGGESTED READING
12. The Hindu Speaks on Education by the Hindu Newspaper
Course Aim: To understand the basic statistical tools for interpretation of quantitative and qualitative data.

Learning Outcome: Students will be able to apply the principles of research methodology for the research design for the various mini and major projects of the MBA programme. They will be able to analyse the data statistically.


2. Tabulation, Graphical presentation of data: Histogram, Diagrammatic representation of data: Bar diagram, Multiple Bar diagram, Sub-divided Bar Diagram, Pie Diagram, Measures of Central Tendency: Mean, Median and Mode. Measures of Dispersion: Range, Standard deviation and Variance, Coefficient of variation, Measure of Skewness.

3. Linear Correlation and Regression Analysis: Covariance, Pearson’s Correlation Coefficient, Scatter plot, Spearman’s rank Correlation Coefficient, Regression lines.


5. Time Series and Data Analysis: Fitting a trend line to a time series, Method of least Squares and Method of Moving Averages, Measure of Seasonal Variation.

Textbook

References:
BUSINESS LAW AND REGULATION
PG CORE-IV

(Students must read textbook along with cases. Faculty are free to choose any other cases)

Course Aim: The aim of this course is to enable students understand legal and regulatory framework for doing business in India.

Learning Outcome: After going through the text and case lets in terms of various court judgements, the students should be able to understand the formalities involved in incorporating a company and the nuances related to the Law of Contract. The student will also be able to know the implications of direct and indirect taxes, negotiable instruments Act and also about the cyber laws.


5. Cyber Crime and the Legal Landscape-the world-Why do we need cyber laws in the indian context-The indina IT act-challenges to indian Law and cyber crime scenarion in india. (Refer Nina Godbole & Sunit Belapure)

Textbook:
1. RSN Pillai, Bagavathi, Business Law, S.Chand, 2013.

References
INTEGRATED MARKETING COMMUNICATION
PG Elective-II (Marketing)

(Students must read textbook. Faculty are free to choose any other cases)

Aim: The aim of this course is to a) enable students to understand management of marketing communication, marketing mix and ethical aspects of marketing communication b) choose a marketing communications mix to achieve the communications and behavioral objectives of the IMC campaign plan.

Learning outcome
- The student should be able to design innovative integrated marketing communication strategies for a given product or service using social media
- Students will able to create an integrated marketing communications plan to promote IMC strategies and to measure their effectiveness.

   Case: Cadbury Manages a Crisis with Integrated Marketing Communications (Kruti Shah page no 59)

2. Budgeting, Objectives and Evaluation of IMC: Setting Communication Objectives, DAGMAR Approach to setting objectives and measuring advertising effectiveness, allocating the Marketing Communication Budget, Conducting research to measure communication effectiveness, Post-Testing tools and techniques, Evaluating other promotional tools and IMC.
   Case: The Premium Milk Food Private Ltd. (Kruti Shah page no 820)
   Case: Archias, Advertizing (Jaishri Jethwaney, Shruthi Jain, Oxford, page no 195)

3. Marketing Communication Mix I:
   Creative Execution in Advertising, Decision in Print, Execution on Radio, Execution on online and television, getting that ‘Big Idea’ of creativity.
   Case: Tata Salt (Part I,II,III) (Kruti Shah page no 282,284,310-311,367-372)

4. Marketing Communication Mix II:
   Case: Amul taste of India (Kruti Shah page no 793)
   Case: Rasha Prankees promotion (Kruti Shah page no 600)

5. Regulation, Social and Ethical Aspects of Advertising and Promotion:
   Case: Surrogate advertising (Jai shri Jethwaney page no 475-480)
   Case: The Unilever experience (Jai shri Jethwaney page no 606)
Textbook:


Business Game: AdSim Advertising: (Advertising & Promotion Simulation Game), TMH, 2013. You can play on any computer with internet (Rs.150/- per year-better buy and play).

AdSim is a simulation game for the Advertising & Promotion course, where the students are required to formulate and implement their own Advertising and Promotion campaign. This helps the students to have an hands-on business experience in the classroom – experiential learning at its best.

References:

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MANAGEMENT OF INDUSTRIAL RELATIONS
PG Elective – II (HR)

(Students must read textbook. Faculty are free to choose any other cases)

Course objectives:

1. The aim of the course is to enable HR elective students develop awareness towards labour laws.
2. The students will be introduced, how to deal with legal problems emanating from employer and employee relations in organizations.
3. To introduce the students with the concept of collective bargaining, employee welfare, wage policy act.

Learning Outcomes:

1. The student understands the industrial relations, its importance in HR
2. Various Labour Laws like Factories Act, Wage and Bonus Act and Dispute Preventive and Corrective Mechanisms are learnt.
3. They will also understand the role of Trade Unions, Settlement of disputes, Collective Bargaining, Wage Policy.

   Case 1. Let us get back to work (p.no. 720, C.B.Mamoria)
   Case 2. A case of complicated multi-union manoeuvres (J.A. Kulkarni)
   Case 1. Stop the shouting game please (p.no. 760, C.B.Mamoria)
   Case 2. The dish ends ltd. (p.no.07, J.A. Kulkarni)
   Case 1.who is to be blammed (p.no. 685, C.B.Mamoria)
   Case 1. Rules and regulations still guide actions at UPS (p.no. 37, C.B.Mamoria)
   Case 1. Organizations and unions working as partners (p.no. 738, C.B.Mamoria)

Textbook:

• Mamoria, Mamoria, Gankar “Dynamics of Industrial Relations” Himalaya Publishing House.2012.

Cases:

References:
1. Dr K S Anandram “Cases in Personnel Management Industrial Relations and Trade Relations” Everest, 2012.
IDP (B.Tech. EEE & M.Tech. / MBA) w.e.f. 2015-2016 academic year

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SECURITY ANALYSIS PORTFOLIO MANAGEMENT
PG Elective-II (Finance)
(Students must read textbook. Faculty are free to choose any other cases)

Course Aim: To Understand the investment alternatives, process and portfolio management

Learning Outcome: The objective of this course is to provide the conceptual and Practical understanding of Stock markets Equity & Bond Valuation, Cash market and also Mutual funds.

1. a) Investment Environment in India, overview of Indian financial system securities trading in stock markets, investment alternatives, the investment management process.
   b) Security Analysis: Fundamental Analysis, Technical Analysis, EMH (Efficient Market Hypothesis)
2. Portfolio Analysis: The returns and risks from investing- Markowitz portfolio Theory, Mean-variance approach, portfolio selection-efficient portfolios, The single index model-capital asset pricing model, arbitrage pricing theory.
4. (a) Equity Valuation : Equity Analysis & Valuation, Balance sheet Analysis equity valuation models, intrinsic value & market price, The P/E Ratio & Earnings multiplier Approach, CAGR, Price/Book value, Price/ Sales ratio, Economic Value Added (EVA) and MVA.

Textbooks:
2. Journals : Vikalpa, IIMA, IIMB Review, Decision, IIMC, Vision, MDI.
3. Business Game : Stock-Trak: (Finance Simulation Game), TMH, 2013- You can play on any computer with internet (Rs.150/- per year-better buy and play).

Stock-Trak is the most comprehensive, Online investment simulation game for Finance students to trade on Stocks, bonds, mutual funds, options, futures, spots, future options and international stocks with virtual money. This game is created specifically for classroom use and students can play this game 24*7 to give them hands-on experience on Investments.

References:
2. ZVI Bodie, AlexKane, Alan J Marcus : Investments, TMH, 2012.
JNTUH COLLEGE OF ENGINEERING HYDERABAD

IDP (B.Tech. EEE & M.Tech. / MBA) IV Year II-Sem

ENTERPRISE RESOURCE PLANNING
PG Elective – II (SYSTEMS)
(Students must read textbook. Faculty are free to choose any other cases)

Course Objectives
1. To provide students the foundations of ERP planning and system options
2. To provide framework of general and specialized modules of ERP
3. To provide students a risk-benefit analysis of ERP system

Learning Outcomes
1. Students understand a) integration of various ERP modules with each other and with Business Environment b) the issues in operation and implementation of a successful ERP system and c) how to face the challenges associated with the present and future ERP systems.

1. Introduction to ERP- Foundation for Understanding ERP systems-Buisiness benefits of ERP-The challenges of implenting ERP system-ERP modules and Historical Developement.
   Case: Response top RFP for ban ERP system (Mary Sumner).

   Case: Atlantic Manufacturing (Mary Sumner).

3 ERP system Installation Options- IS/IT Management results-Risk Identification analysis-System Projects- Demonstnation of the system-Failre method-system Architecture & ERP (David L.Olson)
   Case: DataSolutiions & Technology Knowledge (Mary Sumner).

   Case: atalntic manufacturing (Mary Sumner).

5 ERP – Produciton and Material Managment-Control process on produciton and manufacturign-Produciton module in ERP- supply chain Managmeent & e-market place-e-businesss & ERP-e supply chian & ERP- Future directions for ERP.
   Case: HR in atalntic manufacturing. (Mary Sumner).

Textbook:

References:
JNTUH COLLEGE OF ENGINEERING HYDERABAD

IDP (B.Tech. EEE & M.Tech. / MBA) IV Year II-Sem

STATISTICAL ANALYSIS LAB USING SPSS / EXCEL

Course aim: The course aims is to understand MS Excel for applying statistical tools learnt in RMSA.

Learning Outcome: The learning outcome is that the students should be able to:
- Analyse the data to draw inference for decision making.
- Understand application of statistical measures of central tendency.
- Understand application of ANOVA.
- Analyse trends.
- Test hypotheses.

Syllabus - PART A

About EXCEL
2. Getting started with excel: Opening a blank or new workbook, general organization.
4. Highlights and main functions: Data, review, view, add-ins.
5. Using the Excel help function.

General EXCEL Lessons
6. Customizing the Quick Access Toolbar.
7. Creating and Using Templates.
9. Formatting Data and Using the Right Mouse Click.
12. Manipulating Data, using Data Names and Ranges, Filters and Sort and Validation Lists.
13. Data from External Sources.
15. Basic Formulas and Use of Functions.

ADVANCED EXCEL LESSONS
19. Advanced Formulas and Functions.
20. Advanced Worksheet Features.

PART B – STATISTICAL TOOLS FOR EXECUTION USING EXCEL

I. Tabulation, bar diagram, Multiple Bar diagram, Pie diagram, Measure of central tendency: mean, median, mode, Measure of dispersion: variance, standard deviation, Coefficient of variation.
II. Correlation, regression lines.
III. t-test, F-test, ANOVA one way classification, chi square test, independence of attributes.
IV. Time series: forecasting Method of least squares, moving average method.
V. Inference and discussion of results.

Text

References:
Course Aim:
The aim of this subject is to enable the students develop a holistic perspective about Strategic management of an organization

Learning Outcome:
By reading the text and discussing the cases students should be able to understand how to scan internal and external environment of an organization, understand different types of strategies and structures, strategies of the competitors, turnaround strategies, global strategies and strategic control. With that knowledge they would be able to formulate strategies, change strategies if necessary and implement strategies. They will also be able to evaluate strategies and take corrective steps.

Unit-I:
Case:Bharti Airtel (Hitt & Irelandpage no 4).
Case: ITC Limited (Hitt & Irelandpage no 30).

Unit-II:
Formulation of Strategic Actions: Business level strategy-Effectively managing relationships with Customers-the purpose of Business strategy. Competitive Rivalry and Dynamics - A Model of Competitive Rivalry-Competitor Analysis-Drivers of Competitive actions and responses-Competitive rivalry and dynamics.
Case:Bajaj Auto limited (Hitt & IrelandPage no 80).
Case: Coca cola Vs Pepsi in India (Hitt & Irelandpage. no108)

Unit-III:
Corporate level Strategy-Levels of Diversifications and reasons-Value creating diversifications. Strategic Acquisitions & Restructuring - Popularity of Mergers & Acquisitions strategies, problems in achieving Acquisition Success-Restructuring.
Case: Foster’s Group Diversification into the Wine Business (Hitt & IrelandPage 150)
Case: Merger and Acquisition Activity during a Global Crisis: Global and in India (Hitt & Ireland page 154) Focus : Troubles in the Godrej –P & G Alliance(Hitt & Irelandpage. no 223)

Unit-IV:
Global Strategy-Identifying International Opportunities and international Strategies-Strategic competitive Outcomes and risk in an international Environment. Corporate Implications for strategy-Strategic Alliances-corporate level cooperative strategy, Competitive risk with Cooperative strategies.
Case: Entry into India & China by Foreign Firms and Indian/Chinese Firms Reaching for Global markets (Hitt & Irelandpage. no 176).
Case: Using Cooperative Strategies at IBM (Hitt & Ireland page 206)

Unit-V:
Structure and Controls with Organizations-Organizational Structure and controls, Evolutionary Patterns of strategy and organizational structure. Leadership Implications for Strategy - Entrepreneurial Implications for Strategy. Fundamental principles of Ethics, Professional Ethics, Ethics of Finance & Accounting professionals, Cyber crimes, Ethics & Human rights
Case 1 CISCO’s Evolution of Strategy and Structure. (Hitt & Irelandpage. no 256)
Case 2 selecting a new CEO (Hitt & Irelandpage no 282)
Case 3 The Continuing innovation revolution at Amazon: The kindle and E-books(Hitt & Ireland page 304)
REFERENCES:

- Hitt & Ireland and Manikutty," Strategic Management: A South Asian Perspective": Cengage Learning, 9e, 2012
- Adrian & Alison” Strategic Management: Theory & Application” Oxford UniversityPress, 2010.
- C.L.Bansal, Business and Corporate Laws, 1/e, Excel Books, 2006
Retailing Management

PG Elective-III (Marketing)

(Students must read textbook. Faculty are free to choose any other cases)

Course Aim: The main aim of this course is a) to enable students to gain an insight into retailing industry and shopping environment. b) to familiarize them with concepts of Retailing through cases and motivate them to go for a career in retailing industry.

Learning outcome:
a. To enable the students to link Modern Retailing Concepts to cases and understand the present Retailing Trends.
b. To facilitate the students to be able to managing retail operations efficiently and effectively.

1. Introduction to Retail Management - Meaning of Retail & Retailing, History, types, functions, utilities, theories of retailing, e-tailing, structure of Indian retail industry, retailing in Asia, global retailing, retailing in Europe, service retailing, FDI retailing, Rural marketing, ethics in retailing.
   Case: The Classic story. (Aditya page no 283)
   Case: The Panwallah. (Aditya Prakash page no 287)

2. Understanding Shoppers & Shopping - Shopping Environment, shopping in a Socio Cultural Contest, shopping process shopping behaviour, demographics of Indian shoppers, psychographic profile of Indian shoppers, lifestyle of Indian shoppers, shopping patterns in India.
   Case: Multinational Fast Food Chains in India. Retail Management (Suja Nair page no 474)
   Case: Changing Indian Consumers. (Aditya page no 258)
   Case: Tanishq. (Suja Nair page no 440)

3. Delivering Value through Retail Functions - Classification of formats, ownership-based, store based, non-store based, other retail formats, Value Based Model of store format choice, attribute based model of store format choice, the competitive market place, Marketing Structure, the demand side of retailing, non price decisions, types of competition, evolution of retail competition, future changes in retail competition.
   Case: Nirula’s. (Suja Nair page no 448)
   Case: Hot Breads. (Suja Nair page no 452)
   Case: McDonalds India. (Suja Nair page no 459)
   Case: Automobile and Niche Marketing (Dr. Harjit Singh page no 417)

   Case: Café Coffee Day. (Suja Nair page no 434)
   Case: Shoppers stop. (Suja Nair page no 470)

5. Retail Buying & Managing Retail Operations- objectives of buying, organization buying, retailing buying behaviour, models of buying behaviour, buyer-responsibilities, merchandising & assortment plans-merchandise plan, merchandise plan for basic stocks retail buying groups, negotiations in retail, contract in retail, store layout & design, merchandise display-fixtures, positioning of merchandise, materials & finishes – floors, interior walls, ceilings, lightings, music, graphics-exterior signage, interior signage, layouts for e-tailers.
   Case: Godrej and Boyee’s. (Suja Nair page no 466)
Textbook


References:
5. Dr. Harjit Singh, Retail Management a global perspective text and cases, S.Chand, 2011.
JNTUH COLLEGE OF ENGINEERING HYDERABAD

SERVICES MARKETING
PG Elective-IV (Marketing)

(Students must read textbook. Faculty are free to choose any other cases)

Course Aim:
To facilitate the students about the concepts of Services Marketing through cases.

Learning Objective: The objective of the course is to provide a deeper insight into the Marketing Management of companies offering Services as product. The students will be able to understand the characteristics of services, understand consumer behaviour in services, align service design and standards, delivering service, managing services promises.

   - Case 1: The United Indian Bank (Govind Apte Page no 55-56)
   - Case 2: Online air travel: Expedia, Orbitz and Travelocity lead the pack (John E.G.Bateson Page no 82-83)

2. Focus on the Consumer: Consumer behaviour in services, Consumer expectations in service, consumer perceptions of service, Understanding Consumer Requirements-listening to customers through research, building customer relationships, service recovery.
   - Case 1: The Crestwood Inn, (John E.G.Bateson Page no 320-321)
   - Case 2: Population growth and the urban poor (Vinnie Jauhari, Kirti Dutta Page no 106-108)

3. Aligning Service Design and Standards: Service innovation and design-challenges, types of service innovations, stages in service innovation and development, service blueprinting, high performance service innovations, new Service Development Processes, Customer defined service standards-factors, types, and development, Physical Evidence and the Services cape.
   - Case 1: Physical evidence a case of KF. (Vinnie Jauhari Page 236-238).
   - Case 2: IT Trainers Limited. (Govind Apte Page no 186).

4. Delivering and Performing Service: Employee’s roles in service delivery, customer’s roles in service delivery, delivering service through intermediaries and electronic channels, managing demand and capacity.
   - Case 2: Total Assurance Ltd. (Govind Apte Page 207-208).

5. Managing Service Promises: Integrated services marketing communications-need for coordination, five categories of strategies to match service promises with delivery, Pricing of Services-three key ways that service prices are different for customers, approaches to pricing services, pricing strategies that link to the four value definitions.

Textbook

   Journal : MICA Communications Review – A Marketing Communications Journal, Mudra Institute of Communications, Ahmedabad.
References

12. Dr. B. Balaji, Services Marketing and Management, S.Chand, 2012.
JNTUH COLLEGE OF ENGINEERING HYDERABAD

IDP (B.Tech. EEE & M.Tech. / MBA) V Year I-Sem

INTERNATIONAL MARKETING
PG Elective-V (Marketing)

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(Students must read textbook. Faculty are free to choose any other cases)

Course Aim: To enable the student understand the Global Markets, formulate of Global Marketing Strategies and Implement.

Learning Objective: The objective of the course is to provide a deeper insight into the global marketing management, environment of global markets, assessing global market opportunities, developing and implementing global marketing strategies.

   Case: 1 Starbucks –going Global fast. (Philip, John, Prashant Text )

   Case: 1 IKEA Catalogue. (Svend & Madhurima -Pearson page no 242)
   Case: 2 Mc. Donalds and obesity. (Philip John Prashant Text )

   Case:1 Reliance Entertainment(Svend & Madhurima, Pearson page no 312)
   Case:2 Mahindra & Mahindra (Svend & Madhurima,Pearson page no 356)
   Case:3. IMAX corporation (Svend & Madhurima, Pearson page no 412)

   Case:1 Harley-Davidson:-Price level (Svend & Madhurima,pearson page no 510)
   Case:2 Mc Donalds Great Britain –the Turnaround (Text page no 793)

5. Implementing Global marketing strategies: Negotiation with customers and selection method, E-Marketing channels organization & controlling of the global marketing programme.
   Case: 1 NTT DOCOMO (Svend & Madhurima,Pearson page no 709)

Textbook


References

4. Dr.Gajender Sharma- International Marketing-1st edition-Excel Books-2010

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IDP (B.Tech. EEE & M.Tech. / MBA) V Year I-Sem

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COMPENSATION & REWARD MANAGEMENT
PG Elective – III (HR)

(Students must read textbook. Faculty are free to choose any other cases)

Course Aim:
It enables the student understand the concepts issues and challenges of compensation and reward management.

Learning Outcome:
The student understands how to design the compensation for various levels of jobs in the organization, designing the compensation for special groups. Government and legal issues in compensation design.

   Case: So you want to lead an orchestra (George T Milkovich page no 72)
   Case: Job Evaluation at whole foods (George T Milkovich page no 125)

2. Defining Competitiveness, Designing pay levels, Mix and pay structures, pay for performance.
   The Evidence pay for performance plans.
   Case: Burger Boy(George T Milkovich page no 249)
   Case: Incentives in the club House(George T Milkovich page no 279)

   Case: Merit pay: Making policies and practices that work (George T Milkovich page no 319)

4. Compensation of Special Groups, Union role in wage and Salary administration. International pay systems.
   Case: Compensation of special groups (George T Milkovich page no 443)
   Case: Coke and IBM(George T Milkovich page no 491)

5. Government and legal issues in compensation Public sector pay Management: Making it work.
   Case: Communicating by copier(George T Milkovich page no 575)

Textbook:

References:
Course Aim:
The course enables the student to understand the concept change management. This will help them to emerge as leaders in the organizations.

Learning Outcome:
The student understands the need to bring change, how to design change in the organizations, role of leadership in change management, change communication and resistance to change and the role of HR in change management.

1. Managing Change Conundrums, Organizational change classifications, History and organizational change. The role of paradigms and perspectives. External and Internal change contexts.
   Case: Changing times at Factory Bank (Mark Hughes page no 70)

2. Organizational design and change, strategic level change, Group and team level change, and Individual level change. Organizational Structure. Organizational Culture and Management of Change.
   Case: Restructuring at Flexco (Adrian page no 57)
   Case: Cultural change at Dupont Nylone (Adrian page no 65)

3. The leadership of Change, Change communication, resistance to change, Organizational learning, power, politics and Organizational change. Ethics and Managing Change, Change Agents and Agency.
   Case: Funding crisis at Musicians in the community (Mark Hughes page no 221)

   Case: Recruitment and Selection at Unicol (Adrian page no 117)
   Case: Reward Management at Midland Main Line - Strategic Reward Management (Adrian page no 191).

   Case: Downsizing at Energy Co (Adrian page no 268)
   Case: Evaluating a possible change to training methods at telesales Incorporated (Adrian page no 300)

Textbook:

References:
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PERFORMANCE MANAGEMENT
PG Elective - V (HR)
(Students must read textbook. Faculty are free to choose any other cases)

Course Aim:
To give an understanding about performance management and reward system linked with performance.

Learning Outcome:
The students can understand the importance of performance Management, Performance Appraisals, Reward System, and other performance related concepts.

   Case: Performance Management at Network Solutions, Inc (Herman Aguinis page no 26)
   Case: Performance Management at the University of Ghana (Herman Aguinis page no 48)

   Case: Accountabilities, Objectives and Standards (Herman Aguinis page no 113)
   Case: Evaluating the appraisal form used by a Grocery Retailer (Herman Aguinis page no 145)

   Case: Implementation of 360 degree feedback system at Ridge intellectual (Herman Aguinis page no 204)
   Case: Was Robert Eaton A Good Coach (Herman Aguinis page no 233)

   Case: Possible Illegal Discrimination at Tractors, Inc. (Herman Aguinis page no 265)
   Case: Team Performance Management at Duke University Health systems. (Herman Aguinis page no 283)

5. Relevant Performance related concepts: Benchmarking, Six Sigma, Competency Mapping, Balance Scorecard, Coaching and Mentoring Pygmalion effect, Job Analysis.
   Case: BHEL EVA Incentive Schemes: (B D Singh page no 589)
   Case: The TCS Approach and experience (B D Singh page no 601)
   Case: NTPC Performance Management System (B D Singh page no 632)
   Case: Performance Management system (PMS) at Bharti Telecom (B D Singh page no 663)

Textbook.

Reference
Aim:
To develop an understanding of the role of financial strategy, in the investing, financing and resource allocation decisions within an organization. To develop an understanding of the various strategies that are in use to trade off risk and return.

Learning Outcome:
To explain the role and nature of investment and financial strategies and its relationship to maximization of wealth/shareholders value. To examine various risk models in capital budgeting. To evaluate the motives for financial implications of mergers and acquisitions and lease financing. To discuss the impact of general and specific inflation on financial and investment strategy decisions.


2. Types of Investments and disinvestments: Project abandonment decisions, Evidence of IRR. Multiple IRR, Modified IRR, Pure, simple and mixed investments. Lorie Savage Paradox. Adjusted NPV and impact of inflation on capital budgeting decisions.

3. Critical analysis of appraisal techniques: Discounted pay back, post pay back, surplus life and surplus pay back, Bail-out pay back, Return on Investment, Equivalent Annual Cost, Terminal Value, single period constraints, multi-period capital constraint and an unresolved problem, NPV mean variance analysis, Hertz Simulation and Hillier approaches. Significance of information and data bank in project selections.


Textbooks:

References:
1. Prasanna Chandra: Financial Management, 8/e, TMH, 2012
JNTUH COLLEGE OF ENGINEERING HYDERABAD

IDP (B.Tech. EEE & M.Tech. / MBA) V Year I-Sem

INTERNATIONAL FINANCIAL MANAGEMENT
PG Elective – IV (Finance)

(Students must read textbook. Faculty are free to choose any other cases)

Course Aim:
To give an understanding about MNC Financial Management.

Learning Outcome:
The objective of the course is to provide students with a broad view of International Monetary Systems and its understanding to enable a global manager to do business in a global setting. The prerequisite for the course is Financial Accounting and Analysis and Financial Management.

1. International Financial Management: An overview, Importance, nature and scope, International Business Methods, Recent changes and challenges in IFM
2. International Flow of Funds: Balance of Payments (BoP), Fundamentals of BoP, Accounting components of BOP, Factors affecting International Trade flows, Agencies that facilitate International flows. Indian BoP Trends. International Monetary System: Evolution, Gold Standard, Bretton Woods’s system, the flexible exchange rate regime, evaluation of floating rates, the current exchange rate arrangements, the Economic and Monetary Union (EMU).

Textbooks:

References:
7. Reid. W.Click& Joshua D.Coval, PHI 2012
Aim:
To give an understanding about the derivatives in stock, commodity and Forex markets.

Learning Outcome:
The objective of this course is to make students efficient in the area of Derivatives, giving them the knowledge of basics in Derivatives, Future Markets, Option Strategies, etc.


(b) Basic Option Strategies, Advanced Option Strategies, Trading with Options, Hedging with Options, Currency Options.


Textbooks:

References:
Course Aim:
It enables the student understand the concepts of Electronic Business.

Learning Outcome:
The student understands E-Business, its Models, E-Business plans, E-Business Application and Securing E-Business

   Case : Barnes & Noble nad Amazon. Com (Ref 1- Kulkarni).

   Case: B2C model at Aradhana Tours. ( Ref 1 Kulkarni)

   Case” FLOP (ref 1 :Kulkarni)

   Case Nokia ( Ref 1 Kulkarni)

   Case: Asmi Agencies-e-market ( Ref 1 Kulkarni)

Textbook:

Reference
JNTUH COLLEGE OF ENGINEERING HYDERABAD

IDP (B.Tech. EEE & M.Tech. / MBA) V Year I-Sem

CYBER SECURITY
PG Elective – IV (SYSTEMS)

(Students must read textbook. Faculty are free to choose any cases)

Course Aim:
It enables the student to understand Cyber crime, Tools and methods used in cyber crime and Cyber Security.

Learning Outcome:
The student understands the cyber crimes. Computer forensic system, and Cyber Security.


2. Tools and methods used in cyber crime-Proxy servers and Anonymizers-Phishing-Password cracking-Key loggers and Spywares-Virus and worms-Trojan Horse and Backdoors-Steganography-SQL Injection-Buffer overflow-Attacks on wireless network.

3. Understanding computer forensic-Historical background of cyber forensic-Forensic analysis of e-mail-Digital forensic life cycle-Network forensic-Setting up a computer forensic Laboratory-Relevance of the OSI 7 Layer model to computer Forensic-Computer forensic from compliance perspectives.


Textbook:

Reference:
JNTUH COLLEGE OF ENGINEERING HYDERABAD

IDP (B.Tech. EEE & M.Tech. / MBA) V Year I-Sem

INFORMATION SYSTEM CONTROL AND AUDIT
PG Elective – V (SYSTEMS)

(Students must read textbook. Faculty are free to choose any other cases)

Course Aim:
It enables the student understand the concepts of Information System and Control.

Learning Outcome:
The student understands the audit standards, Audit Process, Computer assistance Audit tools, Managing Audit tools and Strategy and Standards for Auditing.

1. Audit and review the role of Information Technology-Audit standards-Importance of audit standard independence- AICPA proannouncements- The need for IT audit function- role of the IT auditor-Legal implications.
   Cases.

   Cases.

   Cases.

   Cases.

   Cases.

Textbook:

Reference:
- D P Dube, V P Gulati, Information System Audit and Assurance – Includes case studies and checklists from the banking industry, TMH, 2008.