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ABBREVIATIONS/DEFINITIONS

- "AC" means, Academic Council of the University.
- "BOM" means, the Board of Management of the University.
- "BOS" means, the Board of Studies of the Department.
- "CAU/AUC-option" CAU/AUC means change from Credit to Audit option / change from Audit to Credit option
- "Class/Course Committee" means, the Class/Course Committee of a class/course.
- "Course" means, a specific subject usually identified by its course-number and course-title, with a specified syllabus/course-description, a set of references, taught by some teacher(s)/course- instructor(s) to a specific class (group of students) during a specific academic-term/semester/year.
- "COE" means, the Controller of Examinations
- "Course Instructor" means, the teacher or the Course Instructor of a Course.
- "Curriculum" means the set of Course-Structure and Course-Contents.
- "DAA" means, the Dean of Academic Affairs.
- "DAAB" means Departmental Academic Appeals Board.
- "DEC/PEC" means Dissertation Evaluation Committee/Project Evaluation committee.
- "Department" means a group in the University devoted to a specific discipline also called a School. Department and School are used interchangeably.
- "DSA" means, Dean Student Affairs.
- "Faculty Advisor/Class Counsellor" means, the Faculty Advisor or the Panel of Faculty Advisors, in a Parent Department, for a group (admission-batch) of students. Also known as Class Counsellor.
- "DRPC" means Doctoral Research Programme Committee
- "Grade Card" means the detailed performance record in a term/semester/year/ programme.
- "He" means both genders "he" and "she"; similarly "his" and/or "him" includes "her" as well, in all the cases.
- "HOD" means, the Head of the Department.
- "MET" means Make-up End Term
- "MES" means Make-up End semester
- "MEY" means Make-up End Year
- "MLC" means Mandatory Learning Course.
- "Parent Department" or "Degree Awarding Department" means, the department that offers the degree programme that a student undergoes.
- "Project Guide" means, the faculty who guides the Major Project of the student.
- "RB" means Research Board
- "RPAC" means Research Progress Assessment Committee
- "Regulations" means, set of Academic Regulations.
- "TEC" means Thesis Evaluation Committee
- "University" means, Lingaya's University, Faridabad (LU)
- "VC" means, the Vice Chancellor, Lingaya's University, Faridabad.

CODE OF CONDUCT AND ETHICS FOR STUDENTS

1. Wear decent dress respecting his/her modesty as well as that of others.
2. Expected to respect and show regard for teachers, staff and fellow students.
3. Inculcate civic sense and sensitivity for environment protection.
4. Not to resort to collection of funds for any use without written permission of VC.
5. To exhibit exemplary behaviour, discipline, diligences, and good conduct and are a role model to other students.
6. Not to indulge in offences of cognizable nature.
7. Not to practice casteism, communalism.
8. Not to indulge in any other conduct unbecoming of a professional student of the University.
9. Not to outrage the status, dignity and honour of any person.
10. Not to get involved in physical assault or threat, and use of physical force against any body.
11. Not to expose fellow students to ridicule and contempt that may affect their self esteem.
12. Not to form any kind of student's Union, etc.
13. Not to take active or passive part in any form of strikes/protests.
14. To observe all safety precautions while working.
15. Not to disfigure/damage the University property, building, furniture, machinery, library books, fixtures, fittings, etc. (Damage / loss caused shall have to be made good by the students).
16. Use of mobile/video camera phones is strictly prohibited inside the examination halls, class rooms, laboratories and other working places. LU has the right to confiscate the mobile phones in case of any violation.
17. Not to indulge in ragging/teasing, smoking, gambling, use of drugs or intoxicants, drinking alcohol, rude behavior, and use of abusive language.
18. Not to resort to violence, unruly travel in buses, bullying, threatening and coercing others for undesirable act, such as preventing from attending classes, writing exam. / tests, etc etc.
19. All the students of the LU shall be under the disciplinary control of the VC.
20. Students are deemed to be under the care and guidance of parents. It is obligatory for the former to appraise their progress (given by the CC) to the parents.
21. Fine, if ever imposed, is only to improve discipline and shall be paid promptly.
22. While on campus, students have to take care of their belongings and no responsibility for any loss or damage can be held by the University.
23. Every student shall produce the I-Card on demand, and if lost, get a duplicate issued.
24. The students must attend all lectures, tutorials and practical classes in a course punctually (The attendance will be counted course-wise).
25. To abide by the rules and regulations of the University stipulated from time to time.

IMPORTANT ACADEMIC RULES BBA/MBA (Integrated) Degree Programme

GENERAL

- The Regulations may evolve and get revised/refined or updated or amended or modified or changed through approvals from the Academic Council from time to time, and shall be binding on all parties concerned, including the Students, Faculty, Staff, Departments, University Authorities and officers. Further, any legal disputes shall be limited to the legal jurisdiction determined by the location of the University and not that of any other parties.
- If, at any time after admission, it is found that a candidate had not in fact fulfilled all the requirements stipulated in the offer of admission, in any form whatsoever, including possible misinformation etc., the matter will be reported to the AC, recommending revoking the admission of the candidate.
- The LU reserves the right to cancel the admission of any student at any stage of his study programme in the University on the grounds of unsatisfactory academic performance or indiscipline or any misconduct.
- Medium of instruction shall be English.

PROGRAMME

- For full-time students, the duration of study shall be a minimum of Ten semester and a maximum of SEVEN years.
 - There is only one type of student status in the Integrated MCA Degree Programme, namely, full time
 - The course content for an. Integrated M.C.A Degree Programme will typically consist of the following components:
 - (a) Two-Letter Grade Courses
 - (i) Programme Core Courses
 - (ii) Elective Courses*
 - (iii) Major Project
 - (b) Non-Two-Letter Grade Courses
 - (i) Minor Project
 - (ii) Mandatory Learning Courses
- * Some electives may be pre-requisite for another elective course.
Note: A student has to register for the above courses at the appropriate time decided by BOS.
- The exact credits offered for the programme for the above components, the semester-wise distribution among them, as well as the syllabi of all postgraduate courses offered by the department are given in the 'Scheme of Studies and Syllabus'.
 - The Minimum Credit Requirement for the BCA, MCA Integrated Degree is 230.

MAJOR PROJECT

- The Major Project carries 16 credits and is to be completed during the 10th semester. The progress of the major project shall be monitored by the guide.

- Under special circumstances, a student can be allowed to undertake dissertation work in industry/research lab/other institute. The place of such work has to be approved by AC.
- A candidate shall submit 3 copies of the Dissertation to the HOD on or before the specified date. The Report shall be in the format prescribed by the University.
- The earliest date for the submission of Report shall be THREE weeks before the closure of the semester in which the dissertation work credits have been registered for, and is expected to be completed, or as announced by the DAA.
- Extension of time beyond the announced last date for submission of the Dissertation may be granted by the DAA on the recommendation from the HOD.

NON TWO-LETTER GRADE COURSES

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

MINOR PROJECT AND SEMINAR

- **Minor Project:**
This involves essentially to develop a case-study after collecting/going through the relevant material/ data pertaining to an organization. This course is a 2 credit course to be completed at appropriate time stipulated by BOS.
- **Seminar:**
This course is a one credit course to be completed at appropriate time stipulated by BOS. The student will make presentations on topics of academic interest.

ASSOCIATION

- Every student of the University shall be associated with the Parent Department, throughout his study period.
- The schedule of academic activities for a semester, including the dates of registration, mid-semester examinations, end-semester examination, inter-semester vacation, etc. shall be referred to as the Academic Calendar of the semester, and announced at least two weeks before the closing date of the previous semester.

PRE-REGISTRATION

- In order to facilitate proper planning of the academic activities of a semester, it is essential for the students to declare their intent to register for a course well in advance, before the actual start of the academic session, through the process of Pre-Registration, which is mandatory for all those students of second or

subsequent semester who propose to deviate from recommended scheme of studies.

- Pre-registration is an expression of intention of a student to pursue particular course(s) in the next semester. It is an information for planning for next semester. Every effort will be made to arrange for a course opted by the student. However, it is not obligatory on the part of the university to offer the course(s) and no course may be offered if the number of students opting for the course is less than 15 or 25 percent of the admission strength whichever is less.
- If a student fails to pre-register it will be presumed that he will follow suggested normal scheme of studies provided that he is progressing at a normal pace. For remaining students the HOD of the parent department will plan for courses as per the convenience of the department.

REGISTRATION TO COURSES

- Every Student after consulting his Faculty-Advisor is required to register for the approved courses with the HOD of parent department at the commencement of each semester on the days fixed for such registration as notified in the academic calendar.
- A student shall register for courses from amongst the courses being offered in the semester keeping in mind the minimum and maximum credits allowed for a degree and other requirements i.e. pre-requisite, if any, SGPA and CGPA after consulting the Faculty Advisor. No registration will be valid without the consent of HOD of the parent department.
- A student will be permitted to register in the next semester as per the suggested normal scheme only if he fulfills the following Conditions:
 - (a) Satisfied all the Academic Requirements to continue with the programme of studies without termination.
 - (b) Cleared all university, library and hostel dues and fines (if any) of the previous semester.
 - (c) Paid all required advance payments of the university and hostel for the current semester.
 - (d) Not been debarred from registering on any specific ground by the university.
- The students will be permitted to register for course(s) being offered in a semester other than his normal suggested scheme provided that the time table permits.
- The registration in the critical cases will be done as per the priority given below:
 - (a) Fulfillment of minimum credit requirement for continuation,
 - (b) The completion of programme in minimum period needed for degree, (Those who need to improve SGPA/CGPA)
 - (c) The fulfillment of pre-requisite requirement of courses.
- Students who do not register on the day announced for the purpose may be permitted LATE REGISTRATION up to the notified day in academic calendar on payment of late fee.
- REGISTRATION IN ABSENTIA will be allowed only in exceptional cases with the approval of the DAA after the recommendation of HOD through the guardian of the student.

- Credits will be awarded in registered courses only.

CREDIT LIMITS

- A student of the BBA/MBA (Integrated) degree programme must register for a minimum of 15 credits, and up to a maximum of 30 credits in a Semester. However, the minimum / maximum credit limit can be relaxed by the DAA on the recommendation of the HOD, only under exceptional circumstances. The maximum credits that a student can register in a Summer Term are 10.
- Professional Development courses are one credit courses each, with multiple options, to be completed at student's convenience. Some of them may be mandatory and others two-letter grade category. However, registration has to be done for all courses.

REGISTRATION- REVISION

- A student has the option to ADD courses for registration till the date specified for late registration in the Academic Calendar.
- On recommendation of the Teaching Department as well as the Parent Department, a student has the option to DROP courses from registration until two weeks after the commencement of the classes in the semester, as indicated in the Academic Calendar.
- A student can register for auditing a course, or a course can be converted from credit to audit or from audit to credit, with the consent of the Faculty Advisor and Course Instructor within two weeks after the commencement of the classes in the semester as indicated in the Academic Calendar. However, CORE Courses shall not be available for audit.

ATTENDANCE REQUIREMENTS

- LU academic programmes are based primarily on the formal teaching-learning process. Attendance in classes, participating in classroom discussions and participating in the continuous evaluation process are the most essential requirements of any academic programme.
- Attendance will be counted for each course scheduled teaching days as per the academic calendar.
- The attendance requirement for appearing in end-semester examination shall be a minimum of 75% of the classes scheduled in each course.

LEAVE OF ABSENCE

- The leave of absence must be authorized as per regulations.
- A student short of attendance in a course (less than needed after leave of absence and condonation by VC) will be awarded 'FF' grade in the course.
- All students must attend all lecture, tutorial and practical classes in a course. The attendance will be counted course wise.
- To account for approved leave of absence e.g. representing the University in sports, games or athletics; professional society activities, placement activities, NCC/NSS activities, etc. and/or any other such contingencies like medical emergencies, etc., the attendance requirement shall be a minimum of 75% of the classes scheduled in each course to appear in the examination.

- A student with less attendance in a course during a semester, in lectures, tutorials and practicals taken together as applicable, shall be awarded 'FF' grade in that course, irrespective of his academic performance, and irrespective of the nature of absence.
- If the period of leave is more than three days and less than two weeks, prior application for leave shall have to be submitted to the HOD concerned, with the recommendation of the Faculty-Advisor, stating fully the reasons for the leave requested, along with supporting documents.
- If the period of leave is two weeks or more, prior application for leave shall have to be made to the DAA with the recommendations of the Faculty-Advisor, HOD concerned stating fully the reasons for the leave requested, along with the supporting documents. The DAA may, on receipt of such application, grant leave or decide whether the student be asked to withdraw from the course for that particular semester because of long absence.
- If a student fails to apply and get sanction for absence as in two cases above, his parent/guardian may apply to the VC with reasons duly recommended by the faculty advisor, HOD and DAA and explain in person to the VC the reasons for not applying in time. The VC will consider on merit and decide to grant the leave or withdrawal from the course for that particular semester subject to any condition that he may like to impose. The decision of the VC shall be final and binding.

ABSENCE DURING EXAMINATIONS

- A student who has been absent during Mid-semester Examination due to illness and/or any exigencies may give a request for make-up examination within one week after the Mid-semester Examination to the HOD with necessary supporting documents in person. The HOD may consider such requests depending on the merits of the case, and after consultation with the course instructor, may permit the Make-up examination for the Student concerned. However, no makeup examination will be permitted if the attendance in the course is less than 60% till the date of examination.
- In case of absence from End-Semester Examination of a course(s) on Medical ground and/or other special circumstances, the student can apply for award of 'I' grade in the course(s) with necessary supporting documents and certifications by an authorized person to the HOD within one week after the End-Semester Examination. The HOD may consider the request, depending on the merit of the case, and after consultation with the Course(s) Instructor(s)/ faculty advisor may forward the case to DAA with his recommendation for the award of 'I' grade. After permission by DAA in writing, the 'I' Grade is converted into a regular double letter grade on the basis of the students' marks in Mid-semester Test and Class Work. However, if a student has scored 50% or more marks in Mid-Semester Examination plus Class work his/her marks will be increased by 50% before awarding the grade. This applies to both theory and practical courses.

COURSE CREDIT ASSIGNMENT

- Every Course comprises of specific Lecture-Tutorial-Practical (L-T-P) Schedule. The credits for various courses are shown in the Schemes of Studies & syllabus.
- The Academic Performance Evaluation of a Student shall be according to a Letter Grading System, based on the Class Performance Distribution.

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

Letters-Grade and Grade-Points

LETTER-GRADE	GRADE-POINTS	REMARKS
AA	10	
AB	9	
BB	8	
BC	7	
CC	6	
CD	5	
DD	4	
EE	2	
FF	0	Fail
I	-	Incomplete
U	-	Audited
W	-	Withdrawal
S	-	Satisfactory
N	-	Unsatisfactory

EARNED CREDITS

- This refers to the credits assigned to the programme in which a student has obtained either 'S' grade or any one of the double-letter grades 'AA', 'AB', 'BB', 'BC', 'CC', 'CD', 'DD' (but not 'EE' or 'FF'). While "0" credits will be earned in respect of a course, where obtained grade is 'FF'; it will be half the credits assigned to the course, in which obtained grade is 'EE'.

DESCRIPTION OF GRADES

- An 'AA' grade stands for outstanding performance, relative to the class which may include performance with previous batches. The Course Instructor is supposed to take utmost care in awarding of this highest double-letter grade.
- The 'DD' grade stands for marginal performance, pass in individual course but not adequate for SGPA / CGPA requirement.
- An 'EE' grade indicates that the student has attended the course but obtained less than pass marks. In this case he will earn half the credits assigned to the course.
- The 'FF' grade denotes very poor performance, i.e. failure in a course, and the Course Coordinator/Instructor is supposed to take utmost care while awarding this lowest double-letter grade.
- A student, who obtains 'FF' grade in a core course due to detention in attendance, has to repeat (re-register) course in subsequent semesters/sessions whenever the course is offered. In other cases of 'FF' Grade, a student has three options as follows:
 - Repeat the course,
Or
 - Only appear in End-Semester Examination in a subsequent semester and evaluated out of 70 marks for new grade computation.

The new grade will be computed out of 100 marks as follows:

ESE/ETE = 70 (against 50 marks for the regular students)

CW = 30, to be brought forward from the earlier Semester.

Or

- c) Get the course converted into a partially dropped course to earn two grade points but earn only half the credits meant for that course. It could be termed as two letter grade 'EE'.
- There are four possible ways of clearing backlog courses and improvement of grades: Subsequent Semester; Summer Term; Week Ends; after University hours with the following overriding conditions – (i) There will be minimum 60% of contact hours of a regular course in a semester for doing backlog in any mode, (ii) The attendance requirement shall be a minimum of 75% of the classes scheduled in each course without any condonation.
 - An 'I' grade denotes incomplete performance in any course due to absence at the End-Semester Examination (see Section "Absence during Examination").
 - 'U' grade is awarded in a course that the student opts to register for audit. It is not mandatory for the student to go through the entire regular process of evaluation in an audit course. However, the student has to go through some process of minimal level of evaluation and also the minimum attendance requirement, as stipulated by the Course Instructor and approved by the corresponding BOS, for getting the 'U' grade awarded in a course, failing which that course will not be listed in the Grade Card.
 - A 'W' grade is awarded when the student withdraws from the course. Withdrawal from a course is permitted only under extremely exceptional circumstances (like medical emergencies, family tragedies and/or other unavoidable contingencies) and has to be recommended by the HOD and approved by the DAA. However, no withdrawal is permitted after the finalization of the grades in the semester.
 - 'S'/'N' These grades are awarded for the Mandatory Learning Courses. The 'S' grade denotes satisfactory performance and completion of a course. The 'N' grade is awarded for non-completion of course requirements and the student will have to register for the course until he obtains the 'S' grade.

FEEDBACK TO STUDENTS

- A student requires feedback on the progress of his learning. For this purpose, the Instructor will conduct three quizzes for a theory course in a semester 1st before MSE-1, 2nd between MSE-1 and MSE-2 and 3rd after MSE-2. The quizzes will form a component of class work, the other components being tutorials, home assignments or any other mode.
- For a laboratory course, the continuous assessment's feed back will be given through the laboratory records which are required to be submitted after performing the experiment in the next laboratory class.

EVALUATION

Theory Course:

- The double-letter grade awarded to a student in a course other than a practical course i.e. 0-0-P course for which he has registered, shall be based on his

performance in quizzes, tutorials, assignments etc., as applicable, in addition to one Mid-Semester Examination and end-semester examination. The weightage of these components of continuous evaluation may be as follows:

End-Semester Examination (ESE) (3 hrs)	:	40%
Mid-Semester Examinations (MSE) (2×10%;1 ½ hrs each)	:	20%
3Quizzes (3×5), Tutorials, Assignments, etc. (Several over the semester)	:	30%
Attendance	:	10%
Total		<hr/> 100%

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

Laboratory Course

- The double letter grade awarded to the student in a practical course i.e. 0-0-P course is to be based on his performance in regular conduct of experiments, viva voce, laboratory report, quizzes etc. The weightage of the components of continuous evaluation may be as follows:

Conduct of Experiments (as per syllabus)	:	50%
Lab Record	:	20%
Quizzes/Viva Voice + Attendance (10%)	:	30%
Total	:	100%

Each experiment may be considered as a unit and evaluated to assess formative and cumulative performance say each of the experiments which carries 10 marks with distribution 5+2+3. Finally, the teacher looks at attendance and total earned marks in the experiments done in a Semester and awards the grades relatively.

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

- Internship:**

The student will be have an industry linked exposure during this internship period of 6 months reproduce now.

The internship will be treated as Major Project for Evaluation purpose. The grade awarded to the student in internship will be based on his performance in professional work pertaining to the solution of real life problem, Project Report, Presentation and defending in a viva-voce. The weightage of the components of continuous evaluation may be as follows:

Professional work	:	50%
Report	:	25%
Presentation & viva-voce	:	25%
Total	:	100%

- Continuous assessment and feedback is to be through seminar professional diary and entering report at the place of work
- The University shall conduct the End-semester examination for all theory courses being taught in the semester.
- The answer books of all Mid-semester Examination and End- semester Examination will be shown to the students within three days of the last paper. It is the responsibility of the student to check this evaluation and affix his signature in confirmation.
- If the student finds some discrepancy, he should bring it to the notice of the Course Coordinator. The Course Coordinator will look into the complaint and remove the doubts of the student and proceed with the work of grading.
- If a student is not satisfied with the award of the grade after the announcement of the grades, he may appeal on a Grievance Form duly filled in along with the fee receipt for this purpose to the HOD of the parent department within one week of the following semester. The HOD will forward the form along with his recommendation based on the records of the case to DAAB within the date specified in the Academic Calendar.

SCHEME OF EXAMINATION

- The duration of examinations for a theory course will be 3 hours for End-semester Examination 1½ hours for Mid- semester Examination.
- The pattern of question paper/examination will be as under:

Theory Courses:

The University shall conduct the ESE for all theory courses being taught in the semester.

- i) There will be eight questions in all distributed over all the units in a course syllabus. The question paper will be in two parts with weightage 20 percent and 80 percent respectively. The paper setter must set the questions such that each question can be answered in about 35 minutes and the paper can be solved in 3 hours by an average student.
 - ii) Part-A will have one question of objective types with multiple choices, covering all the units in the syllabus, which will be compulsory.
 - iii) Part-B will consist of seven questions, one question from each of the seven units, and the students are required to solve any four. Out of seven any three questions will have long answers of comprehensive/ derivation/description type and the remaining four questions will be of problem solving type in order to measure ability on analysis/synthesis/application.
- If any special instruction(s) is/are required for a particular course, it/they is/are to be specified by the concerned HOD with prior approval of DAA.
- Students are allowed in the examination the use of single memory, non-programmable calculator. However, sharing of calculator is not permitted.

Laboratory Courses:

Each experiment may be considered as a unit and evaluated to assess formative and cumulative performance say each of the experiments which

carries 10 marks with distribution 5+2+3. Finally, the teacher looks at attendance and total earned marks in the experiments done in a Semester/Year and awards the grades relatively.

- **Mid-Semester Examination:**
- The question paper for Mid-Semester Examination will be made by the Course Coordinator from the topics covered till then (Test-1: from start of semester till Test-1 and Test-2, from after Test-1 till Test-2). Each Mid-Semester Examination question paper should have three questions all of which are to be solved but the questions will have internal choice and at least one of these questions must be of analytical type.
- **Note:** The Mid-Semester examination will not have multiple choice question (mcq)..

TRANSPARENCY

- The answer books of all Mid- semester Examination & End- semester Examination will be shown to the students within three days of the last paper. It is the responsibility of the student to check this evaluation and affix his signature in confirmation.
- If the student finds some discrepancy, he should bring it to the notice of the Course Coordinator. The Course Coordinator will look into the complaint and remove the doubts of the student and proceed with the work of grading.
- The entire process of evaluation shall be transparent, and the course instructor shall explain to a student the marks he is awarded in various components of evaluation.

RESULT

- The final marks and grades shall be displayed on the notice board and a student can approach the Course Instructor(s) concerned for any clarification within the period stipulated in the Academic Calendar. The process of evaluation shall be transparent and the students shall be made aware of all the factors included in the evaluation. In case of any correction, the Course Instructor shall have to incorporate the same before finalization of the grades.
- The Student's Grade Card shall contain the Letter-Grade for each registered course; along with the SGPA at the end of the semester, and the CGPA at the completion of the programme.

APPEAL FOR REVIEW OF GRADE

- The entire process of evaluation shall be transparent, and the course instructor shall explain to a student the marks he is awarded in various components of evaluation.
- In case of any grievance about the grades, the student may appeal for review of grades to the Departmental Academic Appeals Board (DAAB) before the date specified in Academic Calendar.
- The fee for such an appeal will be decided from time to time. If the appeal is upheld by DAAB, then the fee amount will be refunded to the student without interest.

- VC shall have power to quash the result of a candidate after it has been declared, if
 - (a) he is disqualified for using malpractice in the examination;
 - (b) a mistake is found in his result;
 - (c) he is found ineligible to appear in the examination

AWARD OF DIVISIONS

- The overall performance of a student will be indicated by two indices:
 - (i) **SGPA** which is the Semester Grade Point Average
 - (ii) **CGPA** which is the Cumulative Grade Point Average

SGPA for a Semester is computed as follows:

$$SGPA = \frac{\sum C_i G_i}{\sum C_i}$$

Where,

C_i denotes credits assigned to i^{th} course with double-letter grade, and G_i denotes the grade point equivalent to the letter grade obtained by the student in i^{th} course with double-letter grade, including all 'FF' grades in that semester.

CGPA is computed as follows:

$$CGPA = \frac{\sum C_i G_i}{\sum C_i}$$

Where,

C_i denotes credits assigned to i^{th} course with double-letter grade, and G_i denotes the grade point equivalent to the letter grade obtained by the student in i^{th} course for all courses with double-letter grades, including all 'FF' grades in all semesters at the end of the programme.

For CGPA calculation, the following grades are to be counted:

- (i) Grades in all core courses,
 - (ii) The best grades in the remaining eligible courses to fulfill the minimum credits requirement for a programme.
- The degree will be awarded only upon compliance of all the laid down requirements for programme as under:
 - (i) There shall be University requirement of earning a minimum credits for a degree, satisfactory completion of mandatory learning courses and other activities as per the course structure.
 - (ii) There shall be a minimum earned credit requirement on all Departmental core courses, Elective course and Major Project as specified by BOS.
 - (iii) There shall be a maximum duration for complying to the degree requirement.
 - (iv) The candidate will be placed in First Division with Honours / First Division with Distinction/First Division/Second Division which will be mentioned on the degree certificate as under:

DIVISION	CONDITIONS TO BE FULFILLED
First Division with Honours	CGPA \geq 8.5 No 'FF', N or W grade in any course during the programme.
First Division with Distinction	CGPA \geq 8.5
First Division	CGPA \geq 6.75
Second Division	CGPA \geq 5.0 but $<$ 6.75

Note: Although, there is no direct conversion from grades to marks, however, for comparison purposes percentage of marks may be assumed to be CGPA multiplied by nine.

DEGREE REQUIREMENTS

- The requirements for the BCA, MCA (Integrated) programme are as follows:
 - (a) **University Requirements:**
 - (i) Minimum Earned Credit Requirement for BCA, MCA (Integrated) degree is 230.
 - (ii) Securing a CGPA of at least 5.50 in the Course Work.
 - (iii) Satisfactory completion of Project / Seminars
 - (b) **Programme Requirements:**
Minimum Earned Credit Requirements on all Core Courses, Elective Courses and dissertation as specified by the BOS.
 - (c) The maximum duration for a student for complying to the degree requirement from the date of registration for his first semester, is SEVEN years.
 - (d) Notwithstanding above, a student can leave the programme after completion of nine trimesters if he/she so desires. Such a student will be awarded BCA degree for which the minimum credit requirement is 135.

GRADE IMPROVEMENT

- A student may be allowed to improve CGPA in an appropriate semester if his CGPA falls below 5.5.

TERMINATION FROM THE PROGRAMME

- A student shall be required to leave the University without the award of the Degree, under one or more of the following circumstances:
 - (a) If a student fails to earn the minimum credits specified below:

CHECK POINT	PERCENTAGE OF CREDITS** (%)
End of FIRST year	60*
End of SECOND year	60*
End of THIRD year	70
End of FOURTH year	70

Note 1:

- * A student may be given one more chance to cover the shortfall in the threshold at the end of first two years during the following summer terms if

s/he can fulfill the requirement by doing two courses. In case s/he fails to clear the threshold even after the summer term he has to leave the course.

- ** If at any stage, a student fails to cross the threshold with a minimum of 5.0 SGPA in any semester, he will be treated as critical case and will be advised to improve the grades.

Note 2: The period of temporary withdrawal (refer: Clause No. G8.1) is not to be counted for the above Credit Threshold.

- (b) If a student is absent for more than 4 (Four) weeks at a stretch in a Semester without sanctioned leave.
 - (c) Based on disciplinary action by the AC, on the recommendation of the appropriate committee.
- Note: Under any circumstances of termination, the conditions specified in Permanent. Withdrawal (refer: Clause No: G8.2) shall also apply.

WITHDRAWAL FROM PROGRAMME

Temporarily:

- A student who has been admitted to a degree programme of the University may be permitted to withdraw temporarily, for a period of one semester or more, on the grounds of prolonged illness or grave calamity in the family, etc., provided:
 - (i) He applies to the LU stating fully the reasons for withdrawal together with supporting documents and endorsement from his parent / guardian
 - (ii) There are no outstanding dues or demands, from the Departments / LU/ Hostels / Library and any other centers;
 - (iii) Scholarship holders are bound by the appropriate Rules applicable to them.
 - (iv) The decision of the VC of the LU regarding withdrawal of a student is final and binding.
- Normally, a student will be permitted only one such temporary withdrawal during his tenure as a student and this withdrawal will not be counted for computing the duration of study.

Permanently:

Any student who withdraws permanently admission before the closing date of admission for the Academic Session is eligible for the refund of fee as per the University rules. Once the admission for the year is closed, the following conditions govern withdrawal of admission:

- A student who wants to leave the LU for good, will be permitted to do so (and take Transfer Certificate from the LU, if needed), only after clearing all the dues for the remaining duration of the course.
- A student who has received any scholarship, stipend or other form of assistance from the LU shall repay all such amounts, in addition, to those mentioned in clause No. G8.2 (a) above.
- The decision of the VC regarding all aspects of withdrawal of a student shall be final and binding.

**SCHEME OF STUDIES
BCA, MCA (Integrated) Degree Programme**

2nd Year
Semester-III

THEORY				
Sl. No.	Course No	Course Name	Periods	Cr
			L-T-P	
1	CA-1201	Operating Systems	3-1-0	4
2	CA-1202	Computer Graphics	3-1-0	4
3	CA-1203	Core Java	3-0-0	3
4	CA-1204	Computer Architecture	3-0-0	3
5	CA-1205	Design and Analysis of Algorithms	3-1-0	4
6	CA-1206	Multimedia Technologies	3-1-0	4

PRACTICAL / DRAWING / DESIGN				
Sl. No.	Course No.	Course Name	Periods	Cr
			L-T-P	
1	CA-1252	Computer Graphics Lab	0-0-2	1
2	CA-1253	Core Java Lab	0-0-2	1
3	CA-1256	Multimedia Technologies Lab	0-0-2	1
4	PD-292	Effective Communications**	0-0-2	1
5	PD-191	Co-Curricular Activities		1*

TOTAL CONTACT HOURS	TOTAL CREDITS
18-4-8(30)	26

FINAL EVALUATION IN GRADES

(L-T-P-Cr) – Lectures-Tutorials-Practicals-Credits, CW – Class Work

MSE – Mid-Semester Exam, ESE – End-Semester Exam

*One credit to be earned in Semester-IV through Co-curricular Activities outside contact hours.

However, a student is to register for this course in both the semesters of second year.

**PD-292 Effective Communications is mandatory learning course.

2nd Year
Semester-IV

THEORY				
Sl. No.	Course No	Course Name	Periods	Cr
			L-T-P	
1	CA-1209	Information Technology Management	3-1-0	4
2	CA-1302	Software Engineering Principles	3-1-0	4
3	CA-1211	Rapid Application Development	3-0-0	3
4	CA-1203	Internet and Web Development	3-0-0	3
5	CA-1207	Unix and Shell Programming	3-0-0	3
6	CA-1208	Applied Numerical Techniques	3-0-0	3

PRACTICAL / DRAWING / DESIGN				
Sl. No.	Course No.	Course Name	Periods	Cr
			L-T-P	
1	CA-1261	Rapid Application Development Lab	0-0-2	1
2	CA-1257	Unix and Shell Programming Lab	0-0-2	1
3	CA-1253	Internet and Web Development Lab	0-0-2	1
4	PD-293	Intra and Inter Personal Skills	0-0-2	1
5	PD-291	Co-Curricular Activities		1*

TOTAL CONTACT HOURS	TOTAL CREDITS
18-2-8(28)	24+1*

FINAL EVALUATION IN GRADES

(L-T-P-Cr) – Lectures-Tutorials-Practicals-Credits CW – Class Work

MSE – Mid-Semester Exam ESE – End-Semester Exam

*One credit to be earned in Semester-IV through Co-curricular Activities outside contact hours

However, a student is to register for this course in both the semesters of second year.

**PD-292 Effective Communications is mandatory learning course

IMPORTANT NOTES

1. Laboratory Courses are being offered as distinct courses (0-0-3) without being mixed with lecture components.
2. Conduct of Lab Courses:
 - a. At least ten experiments/programs/exercises are to be performed in a term.
 - b. It is expected that more experiments/programs/exercises are designed and set as per the scope of the syllabus, which may be added to the above list.
 - c. One or more than one experiments/programs/exercises may be performed in one lab period in order to utilize the time properly.
 - d. The scheme of operation is to be approved by HOD.
3. Students are allowed in the examination the use of single memory, non-programmable calculator. However, sharing of calculator is not permitted.

DETAILED SYLLABUS (2nd Year)

CA-1201	OPERATING SYSTEMS	L T P	Cr
		3 1 0	4

OBJECTIVE

To provide the knowledge of internals, different types and purpose of operating systems

PRE-REQUISITES

Knowledge of computer organization and architecture, programming skills

1. **INTRODUCTION:** Introduction to Operating System Concepts (including Multitasking; multiprogramming; multi user; Multithreading; etc.); Types of Operating Systems: Batch operating system; Time-sharing systems; Various Operating system services; architecture; System programs and calls.
2. **PROCESS MANAGEMENT AND THREADS:** Process concept; Life cycle and implementation of process; process scheduling; operation on processes; CPU scheduling; scheduling criteria; scheduling algorithms -First Come First Serve (FCFS); Shortest-Job-First (SJF); Priority Scheduling; Round Robin(RR); Multilevel Queue Scheduling.
3. **MEMORY MANAGEMENT:** Logical & Physical Address Space; swapping; contiguous memory allocation; non-contiguous memory allocation paging and segmentation techniques; segmentation with paging; virtual memory management - Demand Paging & Page-Replacement Algorithms;.
4. **FILE SYSTEM:** Different types of files and their access methods; directory structures; various allocation methods; disk scheduling and management.
5. **PROCESS-SYNCHRONIZATION & DEADLOCKS:** Critical Section Problems; Mutual exclusion with busy waiting; semaphores; methods for handling deadlocks: deadlock prevention; avoidance and detection; deadlock recovery; Classical IPC problems: Dining philosophers problem; readers-writers problem.
6. **I/O SYSTEMS:** I/O Hardware; Device Controllers; Interrupt Handlers; Device Drivers; Application I/O Interface; Kernel; Transforming I/O requests; Performance Issues.
7. **LINUX/UNIX SYSTEM AND WINDOWS NT OVERVIEW:** LINUX/UNIX Architecture; UNIX and file system management; Basic commands of LINUX/UNIX.

TEXT BOOKS

Silberchatz et al, "Operating System Concepts", 5th edition, Addison-Wesley, 1998.

REFERENCE BOOKS

1. A. Tanenbaum, "Modern Operating Systems", Prentice-Hall, 1992
2. William Stallings, "Operating Systems Internals and Design Principles", 4th edition, Prentice-Hall, 2001
3. Dhamdhare, "Operating system", 2nd Edition, Tata McGraw Hill.

4. Madnik, Donovan, "Operating Systems", Tata McGraw Hill.
5. Deitel, "Operating Systems", Addison-Wesley, 1990
6. Sumitabha Das, "Unix- Concept and applications", Tata McGraw Hill, 2002

CA-1202	COMPUTER ARCHITECTURE & ORGANIZATION	L T P	Cr
		3 1 0	4

OBJECTIVE

To provide basic knowledge of internals of microprocessor, its architecture, components, terminologies, etc. at minute level and ultimately about the working of a digital computer hardware as a whole

PRE-REQUISITES

Knowledge of data structures, microprocessors and interfacing

1. **INTRODUCTION TO DIGITAL COMPUTER:** Functions and Block Diagram of Computer; Types of Software – System software /Application software / Utility Software. Compilers; Interpreters; Assemblers; Linker; Loader & Programming Language Paradigm.
2. **DATA REPRESENTATION AND BOOLEAN ALGEBRA:** Binary; Octal; HEX and their inter-conversion; 1's and 2's complement. Binary Arithmetic; Number Systems – BCD; EBCDIC; ASCII; De-Morgan's Theorem; Duality Theorem; Boolean Algebra Rules; Postulates/Laws; Logic Circuits; NOT; AND; OR; NAND; NOR; XOR; XNOR.
3. **COMBINATIONAL & SEQUENTIAL CIRCUITS:** Half Adder; Full Adder; Binary Adder and Subtractor; Decoder / Encoder; Multiplexer / Demultiplexer; Sequential Circuits: Flip Flops - SR; D; JK; Master – Slave; Shift Registers; Counters: Synchronous as well as Asynchronous Counter.
4. **MEMORY SYSTEM:** Memory Hierarchy; Primary Memory – DRAM; SDRAM; DDR; RDRAM. ROM; PROM; EPROM; EEPROM; Concepts of Auxiliary; Associative; Cache and Virtual Memory; DMA; DMA Transfer modes should be covered.
5. **CPU ORGANIZATION:** CPU Building Blocks; CPU Registers and BUS Characteristics; Registers & System Bus Characteristics. Interface Basics (Only Block Diagram) + Local Bus features & Types should be covered. Addressing Modes; Interrupts: Concepts and types; Instruction and Execution Interrupt cycle; Hardwired and Micro Program control.
6. **PROCESSOR ARCHITECTURE:** Clock Speed; Processing Power and Buses of a Microprocessor; Components of Microprocessor; I/O Ports; 16-Bit (80286) Architecture; 32-Bit (80486) Architecture.
7. **MULTI-PROCESSOR ORGANIZATION:** Parallel Processing; Concept and Block Diagram; Types (SISD; SIMD; MIMD; MISD).

TEXT BOOKS

Carpinelli, John D, "Computer Systems Organization & Architecture", Addison Wesley, 2001

REFERENCE BOOKS

1. Morris, Mano, "Computer System Architecture", Prentice Hall of India, 1999.
2. Malvino, "Digital Computer Electronics".
4. Jotwani, "Computer system Organisation", Tata McGraw Hill
5. V. Rajaraman and Radhakrishnan, "Introduction to Digital Computer Design".
6. W. Stalling, "Computer Organization and Architecture".

CA-1203	INTERNET AND WEB DEVELOPMENT	LTP	Cr
		300	3

OBJECTIVE

To impart knowledge about handling the latest web development tools and techniques

1. **INTRODUCTION TO THE INTERNET, THE WORLD WIDE WEB:** the idea of hypertext and hyper media; how the web works: HTTP; HTML and URLs; how the browser works: MIME types; plug-ins and helper applications; the standards: HTML; XML; XHTML and the W3C; functionality of Macromedia DreamWeaver.
2. **HYPertext MARKUP LANGUAGE:** the anatomy of an HTML document; marking up for structure and style: basic page markup; absolute and relative links; ordered and unordered lists; embedding images and controlling appearance; table creation and use; frames; nesting and targeting; descriptive markup.
3. **SEPARATING STYLE FROM STRUCTURE WITH STYLE SHEETS:** internal style specifications within HTML; External linked style specification using CSS; page and site design considerations.
4. **CLIENT SIDE PROGRAMMING:** introduction to the JavaScript syntax; the JavaScript object model; event handling; output in JavaScript; forms handling; miscellaneous topics such as cookies; hidden fields; and images; applications.
5. **SERVER SIDE PROGRAMMING:** introduction to server side technologies ASP/JSP; programming languages for server side scripting; configuring the server to support ASP/JSP; applications;
6. **OTHER DYNAMIC CONTENT TECHNOLOGIES:** introduction to ASP & JSP; Delivering multimedia over web pages; the VRML idea; the Java phenomenon-applets and servelets; issues and web development.
7. **INTRODUCTION TO MICROSOFT .NET TECHNOLOGY AND ITS COMPARISON WITH THE COMPETING TECHNOLOGIES.**
- 8.

TEXT BOOK

Frank Boumpery, Cassandra Greer, Dave Raggett, Jenny Raggett, Sebastian Schnitzenbaumer & Ted Wugofski, "Beginning XHTML", WROX press (Indian Shroff Publ. SPD) 1st edition, 2000

REFERENCE BOOKS

1. Chuck Musciano, Bill Kennedy, "HTML & XHTML: The Definitive Guide", 4th Edition, 2000
2. Web Technologies, Achyut S Godbole , Atul Kahate, Tata McGraw Hill, 2003
3. Scott Guelich, Shishir Gundararam, Gunther Birzniek, "CGI Programming with Perl 2/e", O'Reilly
4. Doug Tidwell, James Snell, Pavel Kulchenko, "Programming Web services", O'Reilly
5. Raj Kamal, "Internet and Web Technologies", Tata McGraw Hill, 2002

CA-1204	COMPUTER GRAPHICS	L T P	Cr
		3 0 0	3

OBJECTIVE

Students completing this course are expected to be able to:

- Write programs that utilize the OpenGL graphics environment.
- Use polygonal and other modeling methods to describe scenes.
- Understand and be able to apply geometric transformations.
- Create basic animations.
- Understand scan-line, ray-tracing, and radiosity rendering methods

PRE-REQUISITES

Knowledge of computer programming

1. **INTRODUCTION:** What is Computer Graphics; Computer Graphics Applications; Computer Graphics Hardware and software; Two dimensional Graphics Primitives: Points and Lines; Line drawing algorithms: DDA; Bresenham's; Circle drawing algorithms: Bresenham's circle drawing; mid point circle drawing algorithm; Polygon filling algorithm; boundary filled algorithm; scan-line algorithm; flood fill algorithm.
2. **TWO DIMENSIONAL VIEWING:** The 2-D viewing pipeline; windows; viewports; window to view port mapping; Clipping: point; clipping line (algorithms); Sutherland-Cohen algorithm.
3. **POLYGON CLIPPING ALGORITHM:** Sutherland-Hodgeman polygon clipping algorithm; Homogeneous coordinate system; Two dimensional transformations: transformations; translation; scaling; rotation; reflection; shearing; transformation; composite transformation.
4. **THREE DIMENSIONAL GRAPHICS:** Three dimensional graphics concept; Matrix representation of 3-D Transformations; Composition of 3-D transformation; Viewing in 3D: Projections; types of projections.
5. **HIDDEN SURFACE REMOVAL:** Introduction to hidden surface removal. The Z- buffer algorithm; scanline algorithm; area sub-division algorithm.
6. **REPRESENTING CURVES AND SURFACES:** Parametric representation of curves: Bezier curves; B-Spline curves. Parametric representation of surfaces.
7. **ILLUMINATION, SHADING, IMAGE MANIPULATION:** Illumination models; shading models for polygons; shadows; transparency.

TEXT BOOK

Pradeep Bhatia, "Computer Graphics", 2nd Edition, I K Publishers, 2009.

REFERENCE BOOKS

1. James D. Foley, Andeies van Dam, Stevan K. Feiner and Johb F. Hughes, "Computer Graphics Principles and Practices", 2nd Edition, Addison Wesley, 2000.
2. Donald Hearn and M. Pauline Baker, "Computer Graphics" , 2nd Edition, Prentice Hall of India, 1999.
3. David F. Rogers, "Procedural Elements for Computer Graphics", Tata McGraw Hill, Second Edition, 2001.
4. N. Krishnamurthy, "Introduction to Computer Graphics", Tata McGraw Hill, 2002.

CA-1205	DESIGN & ANALYSIS OF ALGORITHMS	L T P	Cr
		3 1 0	4

OBJECTIVE

To relay the theoretical and practical aspects of design of algorithms

PRE-REQUISITES

Knowledge of fundamentals of basic computer programming for implementing algorithms.

1. **MATHEMATICAL PRELIMINARIES:** Role of algorithm in computing; mathematical preliminaries; review of growth functions; solution of difference equations; analysis in terms of space and time complexity.
2. **SORTING:** Insertion sort; merge sort; heap sort; quick sort; radix sort, bucket sort, bubble sort, selection sort.
3. **ADVANCED DATA STRUCTURES:** Stack; queue; linked list; binary search trees; red black trees.
4. **DYNAMIC PROGRAMMING:** Matrix multiplications; longest common subsequence.
5. **GREEDY ALGORITHMS** Activity selection; Huffman coding ; task scheduling problem.
6. **ELEMENTARY GRAPH ALGORITHM:** Representation of graph; breadth-first search; depth first search; topological sort; strongly connected components.
7. **MINIMUM SPANNING TREE:** Growing a minimum spanning tree; Kruskal & Prims algorithms.

TEXT BOOK

Cormen Thomas H., Leiserson Charles E. and Rivest Ronald L., "Introduction to Algorithms", Tata McGraw Hill, 1990.

REFERENCE BOOKS

1. A. V. Aho, J. E. Hopcroft, J. D. Ullman, "The Design and Analysis of Computer Algorithms", Addison Wesley, 1998.
2. Ellis Horowitz and Sartaz Sahani, "Computer Algorithms", Galgotia Publications, 1999.
3. D. E. Knuth, "The Art of Computer Programming", 2nd Ed., Addison Wesley, 1998

CA-1206	MULTIMEDIA TECHNOLOGIES	L T P	Cr
		3 1 0	4

OBJECTIVE

To provide basic knowledge of image compression, audio, video, sound, virtual reality, intelligent multimedia systems etc

PRE-REQUISITES

Knowledge of computer graphics, programming, 3D geometry

1. **BASICS OF MULTIMEDIA TECHNOLOGY:** Computers; communication and entertainment; multimedia an introduction; framework for multimedia systems; multimedia devices; CD- Audio; CD-ROM; CD-I; presentation devices and the user interface; multimedia presentation and authoring; professional development tools;
2. **LAN AND MULTIMEDIA:** internet; World Wide Web & multimedia distribution network: ATM & ADSL; multimedia servers & databases; vector graphics; 3D graphics programs; animation techniques; shading; anti aliasing; morphing; video on demand.
3. **IMAGE COMPRESSION & STANDARDS:** Making still images; editing and capturing images; scanning images; computer color models; color palettes; vector drawing; 3D drawing and rendering; JPEG: objectives and architecture; DCT encoding and quantization; statistical coding; predictive lossless coding; performance; overview of other image file formats as GIF; TIFF; BMP; PNG; etc.
4. **AUDIO:** Digital representation of sound; time domain sampled representation; method of encoding the analog signals; sub-band coding; Fourier method; transmission of digital sound; digital audio signal processing; stereophonic and quadraphonic signal processing; editing sampled sound; MPEG Audio; audio compression and decompression; brief survey of speech recognition and generation; audio synthesis; musical instrument digital interface
5. **VIDEO:** digital video and image compression; MPEG motion video compression standard; DVI technology; time base media representation and delivery.
6. **VIRTUAL REALITY:** Applications of multimedia; intelligent multimedia system; desktop virtual reality; VR operating system; virtual environment displays and orientation making; visually coupled system requirements; intelligent VR software systems.

7. APPLICATIONS OF ENVIRONMENT IN VARIOUS FIELDS.

TEXT BOOK

Villamil and Molina, "An Introduction to Multimedia", MacMillan, 1997

REFERENCE BOOKS

1. Lozano, "Multimedia: Sound & Video", Prentice Hall of India (Que), 1997
3. Ranjan Parekh, "Principle of Multimedia", Tata McGraw Hill
4. Villamil and Molina, "Multimedia: Production, Planning and Delivery", Que, 1997
5. Sinclair, "Multimedia on the PC", BPB Publications
6. Tay Vaughan, "Multimedia: Making It Work", Fifth edition, Tata McGraw Hill, 1994
7. James E Shuman, "Multimedia in Action", Wadsworth Publications, 1997
8. Jeff Coate Judith, "Multimedia in Practice", Prentice Hall of India, 1995
9. John F. Koegel, "Multimedia Systems", Addison Wesley Ltd.
10. Halsall and Fred, "Multimedia Communications", Addison Wesley, 2001

CA-1207	UNIX & SHELL PROGRAMMING	LTP	Cr
		3 0 0	3

OBJECTIVE

To introduce to the students the in-depths of Unix operating system structure and function, as well as to acquaint them with programming using Shell commands, and handling advanced concepts like semaphores.

1. **UNIX UTILITIES:** introduction to UNIX file system; vi editor; file handling utilities; security by file permissions; process utilities; disk utilities; networking commands; cp; mv; ln; rm; unlink; mkdir; rmdir; du; df; mount; umount; find; ps; who; w; finger; arp; ftp; telnet; rlogin; text processing utilities and backup utilities; detailed commands to be covered are cat; tail; head; sort; nl; uniq; grep; egrep; fgrep; cut; paste; join; tee; pg; comm.; cmp; diff; tr; awk; tar; cpio.
2. **PROBLEM SOLVING APPROACHES IN UNIX:** Using single commands; using compound commands; shell scripts; C programs; building own command library of programs; working with the Bourne shell : what is a shell; shell responsibilities; pipes and input redirection; output redirection; shell script examples.
3. **UNIX FILES:** UNIX file structure; directories; files and devices; system calls; library functions; usage of open; creat; read write; close; lseek; stat; fstat; octl; umask; dup; dup2; the standard I/O (fopen; fclose; fflush; fseek; fgetc; getc; getchar; fputc; putc; putchar; fgets; gets); formatted I/O; stream errors; streams and file descriptors; file and directory maintenance (chmod; chown; unlink; link; symlink; mkdir; rmdir; chdir; getcwd).
4. **UNIX PROCESS AND SIGNALS:** what is process; process structure; starting new process; waiting for a process; zombie process; process control; process identifiers;

system call interface for process management-fork; vfork; exit; wait; waitpid; exec; system.

5. **INTERPROCESS COMMUNICATION OVERVIEW:** introduction to IPC; IPC between processes on a single computer system; IPC between process on different systems; file and record locking; other UNIX locking techniques; pipes; FIFO; streams and messages.
6. **MESSAGE QUEUES:** UNIX system-V messages; UNIX kernel support for message; UNIX APIs for messages client/server example.
7. **SEMAPHORES:** UNIX system-V semaphores; UNIX kernel support for semaphores; Unix APIs for semaphores; Shared Memory- UNIX system-V shared memory.

TEXT BOOK

W. R. Stevens, "Unix Network Programming", Pearson/PHI.

REFERENCE BOOKS

1. Sumitabha Dass,"Unix Concepts and Application", 3rd Edition, Tata McGraw Hill.
2. Rochkind, M.J., "Advanced Unix Programming", 2nd Edition, Pearson Education.

CA-1208	APPLIED NUMERICAL TECHNIQUES	L T P	Cr
		3 0 0	3

OBJECTIVE

To provide a foundation for numerical computing for scientific and engineering applications

PRE-REQUISITES

Knowledge of Basic Mathematics involving differentiation, integration, differential equations, linear equations, etc.

1. **ERRORS IN NUMERICAL CALCULATIONS:** Introduction; Numbers and their accuracy; Absolute; Relative and percentage errors and their analysis; Truncation errors; General formula; Error calculation for inverse problem.
2. **SOLUTION OF NON-LINEAR EQUATIONS:** Bisection method; Regula-Falsi method; Secant method; Newton-Raphson method; Fixed point method; Initial approximation and convergence criteria.
3. **SOLUTION OF LINEAR SYSTEMS:** Gauss elimination method; Gauss-Jordan method; UV factorization, Jacobi's method; Gauss-Seidal method.
4. **INTERPOLATION & CURVE FITTING:** Introduction to interpolation; Newton's forward; Backward formula; Sterling formula.
5. **NUMERICAL DIFFERENTIATION AND INTEGRATION:** Derivatives from differences tables; Numerical differentiation formulas, Newton-cotes integration formulae; Trapezoidal rule; Simpson's rule.
6. **SOLUTION OF DIFFERENTIAL EQUATIONS:** Taylor's series method; Euler and modified Euler's method; Runge-Kutta method; Milne's prediction corrector method.

7. **SOLUTION OF PARTIAL DIFFERENTIAL EQUATIONS:** Finite difference approximation; Solution of Laplace equation (standard 5 point formula) one-dimensional heat equation (Schmidt method, Cranck-Nicolson method; Dufort & Frankel method and wave equation.

TEXT BOOK

S S Shastry, "Introductory Methods of Numerical Analysis", PHI, 2007

REFERENCE BOOKS

1. M K Jain, S R K Iyengar, R K Jain, "Numerical Methods for Scientific and Engineering Computation", New Age International Publishers, 3rd Edition, 1996
2. B S Grewal, "Numerical Methods in Engineering and Science", Khanna Publishers, 2005
3. V. Rajaraman, "Computer Oriented Numerical Methods"

CA-1209	INFORMATION TECHNOLOGY MANAGEMENT	L T P	Cr
		3 1 0	3

OBJECTIVE

To equip students with knowledge about handling various IT related activities such as taking decisions under varied situations, handling of resources, etc.

1. **NATURE AND FUNCTIONS OF MANAGEMENT:** importance of management; definition of management; management process; roles of manager; management - a science or art; management - a profession.
2. **PLANNING:** nature of planning; importance of planning; types of planning – steps on planning, meaning of decision, types of decisions
3. **DECISION MAKING:** meaning of decision; types of decisions; Organization: span of management; principles of organizing; departmentalization.
4. **DIRECTION:** requirements of effective direction; motivation; importance of communication; purposes of communication; formal communication; informal communication; barriers to communication; principles of effective communication.
5. **LEADERSHIP:** difference between a leader and a manager; characteristics of leadership; functions of a leader; approaches to leadership; effective leadership; leadership style in Indian organizations.
6. **MANAGERIAL CONTROL:** steps in a control process; need for control; types of control methods; essentials of effective control systems.
7. **SOCIAL RESPONSIBILITIES OF BUSINESS:** meaning of social responsibility; social responsibilities of business towards different groups.

TEXT BOOK

PC Tripathi, PN Reddy, "Principles of Management", 2nd Edition, Tata McGraw-Hill.

REFERENCE BOOK

CA-1210	COMPUTER NETWORKS	L T P	Cr
		3 1 0	4

OBJECTIVE

To have a fundamental understanding of the design, performance and state of the art of wireless_communication systems, Topics covered include state of the art wireless standards and research and thus changes substantially form one offering of this course to the next

- OSI REFERENCE MODEL AND NETWORK ARCHITECTURE:** Introduction to Computer Networks; Example networks ARPANET; Internet; Private Networks; Network Topologies: Bus-; Star-; Ring-; Hybrid-; Tree -; Complete -; Irregular – Topology.
- TYPES OF NETWORKS:** Local Area Networks; Metropolitan Area Networks; Wide Area Networks; Layering architecture of networks; OSI model; Functions of each layer; Services and Protocols of each layer
- TCP/IP:** Introduction; History of TCP/IP; Layers of TCP/IP; Protocols; Internet Protocol; Transmission Control Protocol; User Datagram Protocol; IP Addressing; IP address classes; Subnet Addressing; Internet Control Protocols; ARP; RARP; ICMP; Application Layer; Domain Name System; Email – SMTP; POP; IMAP; FTP; NNTP; HTTP; Overview of IP version 6.
- LOCAL AREA NETWORKS:** Introduction to LANs; Features of LANs; Components of LANs; Usage of LANs; LAN Standards; IEEE 802 standards; Channel Access Methods; Aloha; CSMA; CSMA/CD; Token Passing; Ethernet; Layer 2 & 3 switching; Fast Ethernet and Gigabit Ethernet; Token Ring; LAN interconnecting devices: Hubs; Switches; Bridges; Routers; Gateways.
- WIDE AREA NETWORKS:** Introduction of WANs; Routing; Congestion Control; WAN Technologies; Distributed Queue Dual Bus (DQDB); Synchronous Digital Hierarchy (SDH)/ Synchronous Optical Network (SONET); Asynchronous Transfer Mode (ATM); Frame Relay; Wireless Links.
- INTRODUCTION TO NETWORK MANAGEMENT:** Remote Monitoring Techniques: Polling; Traps; Performance Management; Class of Service; Quality of Service; Security management; Introduction to Network Operating Systems: Client-Server infrastructure; Windows NT/2000.
- INTRODUCTION TO SOCKET PROGRAMMING:** Introduction to Socket, Socket structure, TCP/IP Socket, Client side and Server Side Programming.

TEXT BOOK

Behrouz A. Forouzan, “Data Communications and Networking”, Tata McGraw Hill.

REFERENCE BOOKS

- Andrew S. Tanenbaum, “Computer Networks”, 4th Edition, Pearson Education/Prentice Hall of India, 2003.

2. William Stallings, "Data and Computer Communication", 5th Edition, Prentice Hall of India, 1997.
3. James F. Kurose, Keith W. Ross, "Computer Networking: A Top-Down Approach Featuring the Internet", 2nd Edition, Pearson Education, 2003.
4. D. E. Comer, "Internetworking with TCP/IP", Volume 1, 3rd Edition, Prentice Hall of India, 1995.

CA-1211	RAPID APPLICATION DEVELOPMENT	LTP	Cr
		3 0 0	3

The course on RAD focuses on building applications within a very short time period. After successful completion of this course the students will be able to obtain a firm foundation on RAD concepts and methodologies and acquire sufficient working knowledge in RAD tools.

PRE-REQUISITES

Knowledge of programming in C, C++, JAVA

1. **INTRODUCTION TO RAPID APPLICATION DEVELOPMENT:** Definition, history; effect of mistakes on development schedule; importance; modern rapid life cycle model; modern RAD.
2. **ISSUE IN RAPID APPLICATION DEVELOPMENT:** Characteristics; strategy; constraints; advantages and disadvantages; customer oriented development; different RAD tools: open source versus licensed software builder; Easy Eclipse, Net Beans, Anjuta, Glade, Visual Studio .Net, etc.
3. **RAPID APPLICATION DEVELOPMENT PROJECT ESTIMATION:** Estimation processes; size estimation; effort estimation; schedule estimation; estimation refinement.
4. **SCHEDULING A RAPID APPLICATION DEVELOPMENT PROJECT:** overlay optimistic scheduling, schedule pressure: beating schedule pressure; invent option for mutual option.
5. **TEAM WORK:** Importance to RAD; effective team building; reason for failure; long term team building team structure.
6. **RAPID APPLICATION DEVELOPMENT BEST PRACTICES:** Daily build & smoke test; Agile methods, reuse; miniature milestones; throwaway prototyping; goal setting; developing full Project using RAD.
7. **APPLICATION DEVELOPMENT:** Installing a FOSS based IDE; configuration; GUI building, integrating application with a database; XML; web based application development; debugging.

TEXT BOOK

McConnell Steven, "Rapid Development", WB Publishers and Distributors, Microsoft Press, 2001.

REFERENCE BOOKS

1. Martin James, "Rapid Application Development", Macmillan Col Div, 1991.

2. James M. Kerr, Richard Hunter, "Inside RAD: How to Build a Fully-Functional System in 90 Days or Less", McGraw-Hill, 1993.
3. Steve McConnell, "Rapid Development: Taming Wild Software Schedules", Microsoft Press Books, 1996
4. Ken Schwaber, " Agile Project Management with Scrum", Microsoft Press Books, 1996.
5. Steve McConnell," Professional Software Development: Shorter Schedules, Higher Quality Products, More Successful Projects, Enhanced Careers", Microsoft Press Books, 2003.

CA-1212	CORE JAVA	L T P	Cr
		3 0 0	3

OBJECTIVE

To relay the theoretical and practical knowledge of Advanced Java programming language

PRE-REQUISITES

Basic Knowledge of programming language and object oriented programming

1. **INTRODUCTION TO JAVA & PRINCIPLES OF OBJECT ORIENTED PROGRAMMING:** Basic Concepts of OOP and it's Benefits; Application of OOP; The Creation of Java; Importance of Java for the Internet; Java's Magic: The Byte-code; Features of Java.
2. **DATA TYPE, ARRAY & STRINGS:** Data types & Operators available in java; Control Structures: if, while, do while, for, switch; Break & Continue Statement; Arrays and Strings: Arrays, Arrays of Characters; String handling Using String Class; Operations on String Handling Using; String Buffer Class.
3. **OBJECT-ORIENTATION:** Object-Oriented Programming in Java, Java Program Structure. Defining of a Class, Definition of Methods, Constructors, Creating Objects of a Class, Assigning Object Reference Variables, The keyword "this", Defining and Using a Class, Automatic Garbage Collection. Extending Class and Inheritance: Using Existing Classes, Class Inheritance, Choosing Base Class, Access Attributes, Polymorphism, Multiple Levels of Inheritance, Abstraction through Abstract Classes, Using Final Modifier, the Universal Super class-Object Class.
4. **PACKAGE & INTERFACES:** Understanding Packages, Defining a Package, Packaging up your Classes, Adding Classes from a Package to your Program, Understanding CLASSPATH, Standard Packages, Access Protection in Packages, Concept of Interface. Exception Handling: The Idea behind Exceptions, Types of Exceptions, Dealing with Exceptions, Exception Objects, Defining Your Own Exceptions, Checked and Unchecked Exceptions.
5. **MULTITHREADING PROGRAMMING:** The Java Thread Model, Understanding Threads, The Main Thread, Creating a Thread: extending Thread and implementing Runnable, Creating Multiple Threads, Thread Priorities, Synchronization, Deadlocks inter-thread communication, Deadlocks.

Input/Output in Java: I/O Basic, Byte and Character Structure, I/O Classes, Reading Console Input, Writing to Console Output, Reading and Writing on Files, Random Access Files, Storing and Retrieving Objects from File. Stream Benefits.

6. **CREATING APPLETS IN JAVA:** Applet basics; applets architecture; applet life cycle; simple applet display methods; requesting repainting; using the status window; the html applet tag; passing parameters to applets.
7. **JAVA DATA BASE CONNECTIVITY (JDBC):** Database Connectivity- Relation Databases; JDBC API; Reusing Database Objects; Transactions; Advance Techniques. Java Utilities (java.util Package) The Collection Framework : Collections of Objects; Collection Types; Sets Sequence Map; Understanding Hashing; Use of Array List & Vector.

TEXT BOOK

Balaguruswamy , E., “Programming with Java”, Tata Mcgraw Hill.

REFERENCE BOOKS

1. Horetmann Cay and Cornell Gary, “Core Java™ 2, Volume II – Advanced Features”, 7th Edition, Pearson Publisher, 2004.
2. Horetmann Cay and Cornell Gary, “Core Java Volume – I”, Pearson Education.
3. Callway Dustin R., “Inside Servlets”, Pearson Education.
4. Goodwill James and Bryan Morgan, “Developing Java Servlets”, Techmedia.
5. “Java Server Programming, Volume I and II”, Wrox Press

CA-1253	INTERNET AND WEB DEVELOPMENT LAB	L T P	Cr
		0 0 2	1

LIST OF EXPERIMENTS

1. Sending and receiving mails.
2. Chatting on the net.
Using FTP and Tel net server.
3. Using HTML Tags (table, form, image, anchor etc.).
Making a Web page of your college using HTML tags.
4. Create a web page using frames.
5. Create a web page which contain all lists.
6. Create a web page which contain all physical level tags.
7. Create a web page which contain all Logical level tags.
8. Create a web page which contain all text controls tags of html.
9. Create a web page which contain an image, border that image and use that image as hyperlink.
10. Write a java script program for addition, multiplication, displaying a message using Function.
11. Write a java script program for event handling (onclick).
12. Write a java script program for window event handling.
13. Write a java script program for image event handling.
14. Write a java script program for creating an object date and time.

REFERENCE BOOKS

1. Holzner Steven, "XHTML Black Book", 2000.
2. Godbole Achyut S. and Kahate Atul, "Web Technologies", Tata McGraw Hill, 2003.

CA-1254	COMPUTER GRAPHICS LAB	L T P	Cr
		0 0 2	1

LIST OF EXPERIMENTS

1. Write a program for 2D line as raster graphics display using Bresenhem line drawing algorithm
2. Write a program for 2D line drawing as raster graphics display using DDA line drawing algorithm
3. Write a program for circle drawing as raster graphics display using mid point circle drawing algorithm
4. Write a program for polygon filling as raster graphics display using
 - a) Boundary fill algorithm
 - b) Flood fill algorithm
5. Write a program for line clipping
6. Write a program for polygon clipping
7. Write a program for display 3D object as 2D raster graphics display using perspective transformation
8. Write a program for rotation for 3D object about arbitrary axis
9. Write a program for creating a Bezier Curve

REFERENCE BOOKS

1. Pradeep Bhatia, "Computer Graphics", 2nd Edition, I K Publishers, 2009.
2. Computer Graphics by Donald Hearn and M. Pauline Baker, 2nd Edition, Prentice Hall of India, 1999
3. Procedural Elements for Computer Graphics, David F. Rogers, Tata McGraw Hill, Second Edition, 2001

CA-1256	MULTIMEDIA TECHNOLOGIES LAB	L T P	Cr
		0 0 2	1

LIST OF EXPERIMENTS

1. Write a program to justify a text entered by the user on both the left and right hand side. For example, the text "An architect may have a graphics program to draw an entire building but be interested in only ground floor", can be justified in 30 columns as shown below. An architect may have a Graphics programs draw an entire building but be interested in only ground floor.
2. Study the notes of a piano and stimulate them using the key board and store them in a file.
3. Write a program to read a paragraph and store it to a file name suggested by the author.

4. Devise a routine to produce the animation effect of a square transforming to a triangle and then to a circle.
5. Write a program to show a bitmap image on your computer screen.
6. Write a program to play “wave” or “midi” format sound files.

REFERENCE BOOKS

1. Adobe: Creative Team, “Adobe Flash CS4 Professional Classroom in a Book”, Adobe Press, 2008.
2. Jennifer Smith and Aquent Creative Team, “Photoshop CS4 Digital Classroom”, Wiley, 2008.

CA-1257	UNIX & SHELL PROGRAMMING LAB	L T P	Cr
		0 0 2	1

LIST OF EXPERIMENTS

1. Write a shell script to generate a multiplication table.
2. Write a shell script that copies multiple files to a directory.
3. Write a shell script that counts that number of lines and words present in a given file.
4. Write a shell script that displays the list of all files in the given directory.
5. Write a shell script (small calculator) that adds, subtracts, multiplies and divides the given two integers. There are two division options: one returns the quotient and the other returns remainder. The script requires 3 arguments: The operation to be used and two integer numbers. The options are add (-a), subtract (-s), multiply (-m), quotient (-c) and remainder (-r).
6. Write a shell script to reverse the rows and columns of a matrix.

REFERENCE BOOK

Rockkind, M.J., “Advanced Unix Programming”, 2nd Edition, Pearson Education.

CA-1261	RAPID APPLICATION DEVELOPMENT LAB	L T P	Cr
		0 0 2	1

LIST OF EXPERIMENTS

1. Study of development environment on Linux using GTK+/QT toolkit using Anjuta/Glade/KDevelop
2. Create a GUI for finding the types of roots of a quadratic equation, using GTK/QT
3. Create a GUI for finding the Income tax for current financial year, using GTK/QT. The given values are Basic Salary (BS), Dearness Allowance (DA), House Rent Allowance (HRA), City Compensatroy Allowance (CCA) and Other Allowances (OA).
4. Write a simple program to build a GTK/QT based GUI to read and display the data picked up from a plain text file/XML/any database including openoffice/postgresql/mysql/msql

5. Write a simple program to build a GTK/QT based GUI that has a preferences window with two tabs (color/font) and an alternate window that can come up (showing "Exiting from the application" in title and "welcome to GUI programming in linux" using the select font and color) when the user exits..
6. Write a simple program to build a GTK/QT based GUI for accepting a text and change its font/font size/color as selected by the user from different options contained in the list.
7. Write a simple program to build a GTK/QT based GUI to provide functionality of paint brush.
8. Write a simple program to build a GTK/QT based GUI to apply following functions on a photograph loaded from file system: blur, sharpen, change contrast/brightness/color values.
9. Write a simple program to build a GTK/QT based calculator.
10. Write with the help of GTK+/QT a program to display an error message, whenever an illegal operation is performed
11. Create a simple database using any RDBMS and connect with a GUI based frontend to manipulate the data values.
12. Write a simple program to build a GTK/QT based GUI for showing the calendar and managing the meetings
13. Write a simple program to build a GTK/QT based GUI for displaying the chess board / snake and ladder game
14. Write a simple program to build a GTK/QT based GUI for playing the .mov files
15. Write a simple program to build a GTK/QT based GUI for accepting a text file and show the following counts: no. of lines, words, characters, white spaces, special characters, numbers.
16. Write a simple program to build a GTK/QT based GUI which will show randomly generated letters/characters and accept them in an adjacent text box. at the end of one minute it will show the total number of correct words entered.

REFERENCE BOOKS

1. Mark Mitchell, Jeffrey Oldham, Alex Samuel, Jeffery Oldham, "Advanced Linux Programming", New Riders, ISBN 0735710430
3. Rochkind Marc J., "Advanced UNIX Programming", 2nd Edition, Addison-Wesley Professional Computing Series, ISBN 0131411543
4. "Advanced Programming in the UNIX Environment" First Edition by W. Richard Stevens ISBN # 0201563177, Addison-Wesley Professional Computing Series
5. McConnell Steve, "Code Complete: A Practical Handbook of Software Construction", Microsoft Press, ISBN 0735619670
6. Stevens W. Richard, Bill Fenner, Andrew M. Rudoff, "UNIX Network Programming, Volume 1: Sockets

CA-1262	CORE JAVA LAB	LTP	Cr
		0 0 2	1

LIST OF EXPERIMENTS

1. To find the sum of odd integers between 1 and 99

2. Program for printing Hello World as output
3. Program from getting input from Keyboard.
4. Program for calling A method using Class Instance
5. Program for catching exception in the program
6. Program for getting address and name of the computer
7. Program for deleting a text file
8. Program for making connection between client and server.
9. Write a Java program that calculates and prints the simple interest using the formula: $\text{simple interest} = \text{PNR}/100$ Input values P, N, R should be accepted as command line input as below, e.g. java Simple interest 5 10 15
10. Write a program that print prime numbers between 1 to n. Number n should be accepted as command line input.
11. Create an User-defined exception class using the extends keyword. Write a constructor for this class that takes a string argument and stores it inside the object with a string handle. Write a method that prints out the stored string. Create a try-catch clause to exercise the created exception.
12. Create a Java program using thread
13. Create an Applet to display a string "I am in the centre" in Courier font, with size 30 and style and italic. This text should be centered both horizontally and vertically.
14. Create an applet to obtain the list of fonts available with the current Java working environment.
15. Write an animation applet that makes an image appear from left to right, in stages.
16. Create a simple, non-editable combo box with a list of items, when selected one of the items, will display the string to the console and also printing the string which is being deselected, i.e., the string which already been selected.
17. Use socket programming to design a client/server application that takes the password as input and checks whether it is correct. The program should print the appropriate message.
18. Develop a java program for Database connectivity.
19. Using RMI develop a client ,server frame

REFERENCE BOOKS

1. "Java Server Programming, Volume I and II", Wrox Press.
2. Herbert Schildt, "The Complete Reference", Java Seventh Edition.

PD-292	EFFECTIVE COMMUNICATION	L T P	Cr
		0 0 2	1

OBJECTIVE

To acquaint the students with the basics of effective spoken and written English and enhance their reading, listening, and communication skills.

1. **COMMUNICATION:** Importance; barriers and types of communication; methods to develop effective communication skills.
2. **GRAMMAR:** Parts of speech; subject/verb agreement; tenses; error correction; business idioms; Indianism in English; frequently mispronounced words; exercises.
3. **SPOKEN ENGLISH:** Vowel and consonant sounds; syllables and syllabic stress; conversational skills; extempore; JAM.
4. **READING & LISTENING SKILLS:** Reading with comprehension; story reading; passage reading; newspaper reading; listening and active listening; barriers to listening; effective listening and types of listening; exercises.
5. **WRITING SKILLS:** Importance of writing skills; how to develop writing skills; writing exercises i.e., essay writing, reviews, reports, etc.
6. **NON VERBAL COMMUNICATION:** History; kinesics; postures; gestures; functions; importance and challenges of non verbal communication.
7. **BUSINESS COMMUNICATION:** Business letters and messages; business reports; presentation skills; do's & don'ts; personal journal.

TEXT BOOK

Wren and Martin, "High School Grammar", Paperback, 2000

REFERENCE BOOKS

1. Condrell Jo, & Bough, Bennie, "101 Ways to Improve Your Communication Skills Instantly", 4th Edition, Paperback, 2005
2. Rai S. M., Rai Urmila, "Communication Skills", Students Edition, Himalaya, 2007.
3. Connor J. D. O, "Better English Pronunciation" Cambridge. 2nd Edition, Paperback, Cambridge University Press, 2008
4. Raina Arjun, "Speak Easy Voice And Accent Training Manual", Paperback (Special India Edition, Full Circle
5. Guffey Mary Ellen, "Business Communication" 3rd Edition, South – Western College Publishing, 2000

NOTE:

One trainer per lecture and two trainers per practical session. Classroom with board/projector for PPT and video clips will be required.

PD-293	INTRA & INTER-PERSONAL SKILLS	L T P	Cr
		0 0 2	1

OBJECTIVE

To acquaint the students with the understanding of self development through good inter-personal skills for effective social communication in order to succeed in maintaining relationships in professional and social environments. This module will also help at learning group discussions and interview skills to enable employability and professional fit.

1. **SELF AWARENESS:** Development of our self image; social comparison; significant others; self esteem; self confidence.
2. **ASSERTIVENESS & CONFIDENCE:** Assertiveness; being confident; strategies to make assertive NO easier; dealing with emotions; difference between being aggressive and being assertive.
3. **TEAM BUILDING & TEAM WORK:** The team concept; elements of team work; stages of team formation; effective team; essential building blocks of effective teams; team player's style; team tasks; exercises.
4. **LEADERSHIP SKILLS:** Leadership skills and styles; motivating people; understanding abilities; delegating tasks; managing people; overcoming hurdles; exercises.
5. **INTERVIEW SKILLS:** Why an interview; the first step to a successful interview; resumes that make an impact; the interview process; the interview preparation checklist; interviewing skills; putting your best foot forward; common interview mistakes; one on one HR interviews (two for each student).
6. **GROUP DISCUSSION SKILLS:** Meaning of a GD; types; role of a moderator; do's and don'ts; mock GDs on general, knowledge based and abstract topics.
7. **THE ART OF CONVERSATION:** Skills to strike a conversation; sustaining conversation; communicating across cultures; conflict management.

TEXT BOOK

Haddon, F. Peter, "Mastering Personal and Interpersonal Skills", Viva Books Pvt. Ltd., 2003

REFERENCE BOOKS

1. Schuller, Robert H., "Tough Times Never Last But Tough People Do", Orient Paperbooks, 1988
2. Bolton, Robert, "People Skills", Touchstone Books, 1986
3. Jansaz, De Suzanne, " Interpersonal Skills in Organizations", 3rd Edition, McGraw Hill Education (Asia), 2009
4. Fontana, David, "Social Skills at Work", Universities Press, 2000
5. Burns, James Mac Gregor, "Leadership", Harper Perennial, 1982
6. Harris, Godfrey, "Art of Conversation", Jaico Publishing House, 2002
7. Ganguly, Anand, "Group Discussions and Interviews", Ramesh Publishing House, 2008

Notes: One trainer per lecture and two trainers per practical session. Classroom with board/projector for PPT and video clips will be required.
