# B.Sc. ELECTRONICS

## SYLLABUS - 2017

**SCHOOLS OF EXCELLENCE**
**with**
**CHOICE BASED CREDIT SYSTEM (CBCS)**


**SCHOOL OF PHYSICAL SCIENCES**
**St. JOSEPH'S COLLEGE (Autonomous)**
Special Heritage Status Awarded by UGC
Accredited at 'A' Grade (3rd cycle) by NAAC
College with Potential for Excellence Conferred by UGC
DBT-STAR & DST-FIST Sponsored College
**TIRUCHIRAPPALLI - 620 002, INDIA**

# SCHOOLS OF EXCELLENCE
# WITH CHOICE BASED CREDIT SYSTEM
# (CBCS)

## UNDERGRADUATE COURSES

St. Joseph's College (Autonomous), a pioneer in higher education in India, strives to work towards the academic excellence. In this regard, it has initiated the implementation of five "Schools of Excellence" from the academic year 2014 – 15, to standup to the challenges of the 21st century.

Each School integrates related disciplines under one roof. The school system allows the enhanced academic mobility and enriched employability of the students. At the same time this system preserves the identity, autonomy and uniqueness of every department and reinforces their efforts to be student centric in curriculum designing and skill imparting. These five schools will work concertedly to achieve and accomplish the following objectives:

- Optimal utilization of resources both human and material for the academic flexibility leading to excellence.
- Students experience or enjoy their choice of courses and credits for their horizontal mobility.
- The existing curricular structure as specified by TANSCHE and other higher educational institutions facilitate the Credit-Transfer Across the Disciplines (CTAD) - a uniqueness of the choice based credit system.
- Human excellence in specialized areas
- Thrust in internship and / or projects as a lead towards research and
- The multi-discipline nature of the newly evolved structure (School System) caters to the needs of stake-holders, especially the employers.

### What is Credit system?

Weightage to a course is given in relation to the hours assigned for the course. Generally one hour per week has one credit. For viability and conformity to the guidelines credits are awarded irrespective of the teaching hours. The following Table shows the correlation between credits and hours. However, there could be some flexibility because of practicals, field visits, tutorials and nature of project work.

For UG courses, a student must earn a minimum of 150 credits as mentioned in the table below. The total number of minimum courses offered by a department are given in the course pattern.



## SUMMARY OF HOURS AND CREDITS
## UG COURSES

| Part | Semester | Specification | No. of Courses | Hours | Credits | Total Credits |
|---|---|---|---|---|---|---|
| I | I-IV | **Languages** (Tamil/Hindi/French/Sanskrit) | 4 | 16 | 12 | **12** |
| II | I-IV | **General English** | 4 | 20 | 12 | **12** |
| III | I-VI | **Core** | | | | |
| | | Theory | 11-16 | | | |
| | | Practicals | 3-6 | | | |
| | V-VI | Project Work | 1 | 90 | 60 | |
| | IV-VI | **Core Electives** | 3 | 12 | 12 | |
| | V | Self-paced Learning (Partial Online Course) | 1 | - | 2 | |
| | VI | Comprehensive Examination | 1 | - | 2 | |
| | I-VI | **Allied** | 4/6 | 24 | 20 | |
| | III & V | **Extra Credit Courses** | **2** | **-** | **(4)** | |
| | VI | **Internship** | 1 | - | 2 | **98** |
| 1V | | **Skilled Based Electives:** | | | | |
| | V | Between Schools (BS) | 1 | 2 | 2 | |
| | VI | Within School (WS) | 1 | 2 | 2 | |
| | V | **Inter Departmental Courses (IDC)** Soft Skills / NCC | 1 | 2 | 2 | |
| | | **Non-Major Courses (NMC)** | | | | |
| | I | Communicative English | 1 | - | 5 | |
| | II | Computer Literacy | 1 | 2 | 2 | |
| | III | Environmental Studies (Partial Online Course) | 1 | 2 | 2 | |
| | I-IV | **Value Education** | 4 | 8 | 8 | **23** |
| V | I-V | **SHEPHERD & Gender Studies** | - | - | | |
| | I-V | **AICUF, Fine Arts, Nature Club, NCC, NSS** | - | - | - | |
| | V | **Career Guidance & Training** | **-** | **-** | **-** | **5** |
| | | **TOTAL** | | **180** | **150** | **150 (+4 extra credits)** |

### Course Pattern

The Undergraduate degree course consists of five vital components. They are as follows:

Part -I : Languages (Tamil / Hindi / French / Sanskrit)
Part-II : General English
Part-III : Core Course (Theory, Practical, Core Electives, Allied, Project, Internship and Comprehensive Examinations)
Part-IV : SBE, NMC, Value Education, Soft Skills/National Cadet Corps and Environmental Studies (EVS)
Part-V : Community Service (SHEPHERD) and Gender Studies, AICUF, Fine Arts, Nature Club, NCC, NSS, etc.

**Non-Major Courses (NMC)**

There are three NMC's – Communicative English, Computer Literacy and Environmental Studies offered in the I, II & III Semesters respectively.

**Extra Credit Courses**

In order to facilitate the students gaining extra credits, the extra credit courses are given. There are two extra credit courses – Massive Open Online Courses (MOOC) and Skill-based Course – offered in the III and V Semesters respectively.

According to the guidelines of UGC, the students are encouraged to avail this option of enriching by enrolling themselves in the MOOC provided by various portals such as SWAYAM, NPTEL, etc. Skill based course is offered by the department apart from their regular class hours.

**Value Education Courses**

There are four courses offered in the first four semesters for the First & Second UG students.

**Non-Major Elective / Skill Based Elective**

These courses are offered in two perspectives as electives "Within School" (WS) and "Between School" (BS).

**Subject Code Fixation**

The following code system (11 characters) is adopted for Under Graduate courses:

| Year of Revision | UG Code of the Dept | Semester | Specification of the Part | Subject Category | Running no. in that part |
|---|---|---|---|---|---|
| ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| 17 | U## | *x* | *x* | *xx* | *xx* |
| **17** | **UEL** | **1** | **3** | **2** | **1** |

***For Example*** :

I B.Sc. Electronics, first semester **Basic Electronics**
The code of the paper is 17UEL130201.
Thus, the subject code is fixed for other subjects.



**Subject Category**

00 - Languages (Tamil / Hindi / French / Sanskrit)
01 - General English
02 - Core (Theory, Practical, Comprehensive Exams, Internship and Project)
03 - Core Electives
04 - Allied
05 - Extra Credit Courses
06 - Skill Based Electives (BS) & (WS)
07 - Soft Skill
08 - NMC (Communicative English, Computer Literacy/SAP)
09 - EVS (Environmental Studies)
10 - Value Education
11 - Community Service (SHEPHERD) and Gender Studies
12 - AICUF / Nature Club / Fine Arts / NCC / NSS etc.

**EXAMINATION: Continuous Internal Assessment (CIA)**

| **UG - Distribution of CIA Marks** | |
|---|---|
| **Passing Minimum: 40 Marks** | |
| Library Referencing | 5 |
| 3 Components | 35 |
| Mid-Semester Test | 30 |
| End-Semester Test | 30 |
| **CIA** | **100** |

**MID-SEM & END–SEM TEST**

Centralised – Conducted by the office of COE

1. Mid-Sem Test & End-Sem Test: (2 Hours each); will have Objective + Descriptive elements; with the existing question pattern PART-A, PART-B, and PART-C.
2. CIA Component III for UG & PG will be of 15 marks and compulsorily objective multiple choice question type.
3. The CIA Component III must be conducted by the department / faculty concerned at a suitable computer centres.
4. The 10 marks of Part-A of Mid-Sem and End-Sem Tests will comprise only: **Objective Multiple Choice Questions**; **True / False**; and **Fill-in the Blanks**.
5. The number of hours for the 5 marks allotted for Library Referencing work would be 30 hours per semester. The marks scored out of 5 will be given to all the courses of the semester.
6. English Composition once a fortnight will form one of the components for UG General English.

**SEMESTER EXAMINATION**

Testing with Objective and Descriptive questions

**Part-A: Objective MCQs only (30 Marks)**

Answers are to be marked on OMR score-sheet. The OMR score-sheets will be supplied along with the Main Answer Book. 40 minutes after the start of the examination the OMR score-sheets will be collected

**Part-B & C: Descriptive (70 Marks )**

**Part-B:** 5 x 5 = 25 marks (Inbuilt Choice);
**Part-C**: 3 x 15 = 45 marks; 3 out of 5 questions (Open Choice).

**The Accounts Paper of Commerce will have**
**Part-A**: Objective = 25
**Part-B**: Descriptive 3 x 25 = 75 marks.

**Duration of Examination must be rational;** proportional to teaching hours 90 minute-examination / 50 Marks for courses of 2/3 hours/week (all Part IV UG Courses) 3-hours examination for courses of 4-6 hours/week.

**Grading System**

**1. Grading**

The total marks will be calculated by adding both CIA and the end-semester examinations for each of the courses. The total marks thus obtained will then be graded as per details provided in the following Table-1.

From the second semester onwards, the total performance within a semester and the continuous performance starting from the first semester are indicated by Semester **Grade Point Average (GPA)** and **Cumulative Grade Point Average (CGPA)** respectively. These two are calculated by the following formulae:

$$\text{GPA} = \frac{\sum_{i=1}^{n} C_i G_i}{\sum_{i=1}^{n} C_i}, \qquad \text{WAM (Weighted Average Marks)} = \frac{\sum_{i=1}^{n} C_i M_i}{\sum_{i=1}^{n} C_i}$$

*where,* '$C_i$' is the Credit earned for the Course-*i,*
'$G_i$' is the Grade Point obtained by the student for the Course '*i*',
'M' is the marks obtained for the course '*i*', and
'*n*' is the number of Courses **Passed** in that semester.

CGPA: Average GPA of all the Courses starting from the first semester to the current semester.

**2. Classification of Final Results**

i) For each of the three parts, there shall be separate classification on the basis of the CGPA, as indicated in the following Table-2.



ii) For the purpose of declaring a candidate to have qualified for the Degree of Bachelor of Arts/Science/Commerce/Management/Literature as Outstanding/Excellent/Very Good/Good/Above average/Average, the marks and the corresponding CGPA earned by the candidate in Part-III alone will be the criterion, provided he/she has secured the prescribed passing minimum in the LCs and the ELCs.

iii) Grade in Part-IV and Part-V shall be shown separately and it shall not be taken into account for classification.

iv) Absence from an examination shall not be taken as an attempt.

**Table-1: Grading of the Courses**

| Marks Range | Grade Point | Corresponding Grade |
|---|---|---|
| 90 and above | 10 | O |
| 80 and above but below 90 | 9 | A+ |
| 70 and above but below 80 | 8 | A |
| 60 and above but below 70 | 7 | B+ |
| 50 and above but below 60 | 6 | B |
| 40 and above but below 50 | 5 | C |
| Below 40 | 0 | RA |

**Table-2: Final Result**

| CGPA | Classification of Final Results | Corresponding Grade |
|---|---|---|
| 9.00 and above | O | Outstanding |
| 8.00 to 8.99 | A+ | Excellent |
| 7.00 to 7.99 | A | Very Good |
| 6.00 to 6.99 | B+ | Good |
| 5.00 to 5.99 | B | Above Average |
| 4.00 to 4.99 | C | Average |
| Below 4.00 | RA | Re-appearance |

Credit based weighted Mark System isadopted for individual semesters and cumulative semesters in the column 'Marks Secured' (for 100).
A Pass in SHEPHERD will continue to be mandatory although the marks will not count for the calculation of the CGPA.

**Declaration of Result:**

Mr./Ms. _____ has successfully completed the Under Grduate in _____ programme. The candidate's Cumulative Grade Point Average (CGPA) in Part-III is _____ and the class secured is _____ by completing the minimum of 150 credits. The candidate has acquired _____ (if any) more credits from SHEPHERD / AICUF/ Fine Arts / Sports & Games / NCC / NSS / Nature Club etc. The candidate has also acquired _____ (if any) extra credits offered by the parent department courses.

## B. Sc. Electronics

## Course Pattern - 2017 Set

| Sem | Part | | Code | Subject Title | Hr | Cr |
|---|---|---|---|---|---|---|
| I | I | Language | 17UGT110001 | Language - I (Tamil/Hindi/French/Sanskrit) | 4 | 3 |
| | II | English | 17UGE120101 | General English –I | 5 | 3 |
| | III | Core | 17UEL130201 | Basic Electronics | 6 | 4 |
| | | | @ | Electronics Practical –I | 3 | - |
| | | | @ | Workshop Practice –I | 3 | - |
| | III | Allied | 17UEL130401 | Mathematics –I | 6 | 5 |
| | IV | NMC | 17UCE140801 | Communicative English | - | 5 |
| | IV | V. Edn | 17UFC141001 | Essentials of humanity | 2 | 2 |
| | | | | Problem Solving & Discussion | 1 | - |
| | | | | **Total Credits for Semester 1** | **30** | **22** |
| II | I | Language | 17UGT210002 | Language - II (Tamil/Hindi/French/Sanskrit) | 4 | 3 |
| | II | English | 17UGE220102 | General English – II | 5 | 3 |
| | III | Core | 17UEL230202 | Electric Circuit Analysis | 5 | 4 |
| | | | 17UEL230203 | Electronics Practical –I | 3 | 4 |
| | | | 17UEL230204 | Workshop Practice –I | 3 | 4 |
| | III | Allied | 17UEL230402 | Mathematics –II | 6 | 5 |
| | IV | NMC | 17UCE240802 | Computer Literacy / SAP | 2 | 2 |
| | IV | V. Edn | 17UFC241002 | Fundamentals of Human Rights | 2 | 2 |
| | | | | **Total Credits for Semester 2** | **30** | **27** |
| III | I | Language | 17UGT310003 | Language - III (Tamil/Hindi/French/Sanskrit) | 4 | 3 |
| | II | English | 17UGE320103 | General English – III | 5 | 3 |
| | III | Core | 17UEL330205 | Digital Electronics | 6 | 4 |
| | | | @ | Electronics Practical - II | 3 | - |
| | | Allied | 17UEL330403A | Applied Physics - I (OR) | 4 | 4 |
| | | | 17UEL330403B | Applied Computer Science - I | | |
| | | | @ | Applied Physics Practical (OR) | 2 | @ |
| | | | @ | Applied Computer Science Practical | | |
| | | Extra Credit Course | 17UEL330501 | Massive Open Online Course | - | (2) |
| | IV | NMC | 17UCE340901 | Environmental studies (Partial online course) | 2 | 2 |
| | IV | V. Edn | 17UFC341003A | Formation of youth- I (OR) | 2 | 2 |
| | | | 17UFC341003B | Religious Doctrine - I | | |
| | | | | Lab equipment servicing | 2 | |
| | | | | **Total Credits for Semester 3** | **30** | **18** |
| IV | I | Language | 17UGT410004 | Language -IV (Tamil/Hindi/French/Sanskrit) | 4 | 3 |
| | II | English | 17UGE420104 | General English – IV | 5 | 3 |
| | III | Core | 17UEL430206 | Electronic Devices and Circuits | 6 | 4 |
| | | | 17UEL430207 | Electronics Practical – II | 3 | 3 |
| | | Core Elective (WS) | 17UEL430301A | Home Appliances Servicing and Repair (OR) | 4 | 4 |
| | | | 17UEL430301B | Lab Equipments Maintenance and Servicing | | |
| | III | Allied | 17UEL430404A | Applied Physics –II (OR) | 4 | 3 |
| | | | 17UEL430404B | Applied Computer Science - II | | |
| | | | 17UEL430405A | Applied Physics Practical (OR) | 2 | 2 |
| | | | 17UEL430405B | Applied Computer Science Practical | | |
| | IV | V. Edu | 17UFC441004A | Formation of youth- II (OR) | 2 | 2 |
| | | | 17UFC441004B | Religious Doctrine - II | | |
| | | | | **Total Credits for Semester 4** | **30** | **24+(2)** |



| | | | | | | |
|---|---|---|---|---|---|---|
| V | III | Core | 17UEL530208 | Microprocessors and its application | 5 | 4 |
| | | | 17UEL530209 | Linear Integrated Circuits | 5 | 4 |
| | | | 17UEL530210 | Communication System | 6 | 4 |
| | | | 17UEL530211 | Electronics Practical – III | 6 | 4 |
| | | Extra Credit Course | 17UEL530502 | Extra Credit Course | - | (2) |
| | | SPL | 17UEL530212A | Programmable Logic Controller (Partial online course) (OR) | - | 2 |
| | | | 17UEL530212B | Audio Electronics | - | |
| | III | Core Elective (WD) | 17UEL530302A | Programming in C Language (OR) | 4 | 4 |
| | | | 17UEL530302B | Computer hardware and Networks | | |
| | IV | SBE (BS) | 17UEL540601 | Entrepreneurial Electronics | 2 | 2 |
| | IV | IDC | 17USS540701A | Soft Skills | 2 | 2 |
| | | | 17USS540701A | National Cadet Corps (NCC) | | |
| | | | | **Total Credits for Semester 5** | **30** | **26** |
| VI | III | Core | 17UEL630213 | Microcontroller and its applications | 5 | 4 |
| | | | 17UEL630214 | Power Electronics | 5 | 4 |
| | | | 17UEL630215 | Sensor Technology | 5 | 3 |
| | | | 17UEL630216 | Electronics Practical – IV | 6 | 4 |
| | | | 17UEL630217 | Comprehensive Examination | - | 2 |
| | | | 17UEL630218 | Internship | - | 2 |
| | | | 17UEL630219 | Project Work | 3 | 3 |
| | | Core Elective (WD) | 17UEL630303A | Control System (OR) | 4 | 3 |
| | | | 17UEL630303B | Electronic measurement system | | |
| | IV | SBE (WS) | 17UEL640602 | Troubleshooting Computer hardware | 2 | 2 |
| | | | | **Total Credits for Semester 6** | **30** | **28** |
| I-V | V | SHEPHERD | 17UCW651101 | Community service work (SHEPHERD) & Gender Studies | | 5 |
| | | | | **Total Credits for all Semesters** | | **150+ (4)** |

* Code numbers according to the subject chosen

@ Practical examination in the following even semester.

**Programme Outcomes (POs):**

1. Undergraduate students are to be passionately engaged in initial learning with an aim to think differently as agents of new knowledge, understanding and applying new ideas in order to acquire employability/ self-employment.
2. Undergraduate students are trained to take up higher learning programmes.
3. Undergraduate students are made to be competent and socially responsible citizen of India.
4. Undergraduate students are to be exposed to technical, analytical and creative skills.
5. Undergraduate students are to be imparted with a broad conceptual background in the Biological sciences / Computing sciences / Languages and culture / Management studies / Physical sciences.

**Programme Specific Outcomes (PSOs):**

1. Critical and analytical thinking skills
2. Problem solving skills
3. Designing skills
4. Simulating skills
5. Knowledge on basic electronic components and circuits
6. Knowledge on computer hardware and maintenance
7. Entrepreneurial skills
8. Employability Enhancement

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**பருவம்: 1** **மணி நேரம்: 4**

**17UGT110001** **புள்ளிகள்: 3**

## பொதுத்தமிழ்-I

**பாடத்தின் விளைவு**

- சமூக மாற்றச் சிந்தனைகளை உள்ளடக்கிய தற்கால இலக்கியப்பரப்பை அறிதல்
- புதுக்கவிதை, சிறுகதை, உரைநடை ஆகியவற்றின் இலக்கியத்திறன் கண்டறிதல்.
- சந்திப்பிழையின்றி எழுதும் திறன் பெறுதல்.
- வாழ்க்கை வரலாற்றுக் கட்டுரைகளை வாசிக்கும் திறன் பெறுதல்.
- அன்றாடப் பயன்பாட்டிலுள்ள ஆங்கிலச்சொற்களுக்குப் பொருத்தமான சொற்களை உருவாக்கச்செய்தல்
- அரசுப்போட்டித் தேர்வுகளுக்கேற்ப தமிழ்மொழியில் பயிற்சி அளித்தல்.

**அலகு-1** மகாகவி பாரதியார் கவிதைகள்
பாரதிதாசன் கவிதைகள்
நாமக்கல் கவிஞர் கவிதைகள்
உரைநடை - முதல் மூன்று கட்டுரைகள் (12 மணி நேரம்)

**அலகு-2** பாவலரேறு பெருஞ்சித்திரனார் பாடல்கள்
கண்ணதாசன் கவிதைகள்
இலக்கிய வரலாறு (பக். 239- 300)
இலக்கணம் -வலிமிகும் இடங்கள் (14 மணி நேரம்)

**அலகு-3** சமூகக்கவிதைகள்
இலக்கிய வரலாறு (பக்.300 -362)
சிறுகதை - முதல் ஆறு சிறுகதைகள் (14 மணி நேரம்)

**அலகு-4** அரசியல் கவிதைகள்
இலக்கணம் - வலி மிகா இடங்கள் (10 மணி நேரம்)

**அலகு-5** மொழிபெயர்ப்புக்கவிதைகள்
சிறுகதை- 7 முதல் 12 முடிய உள்ள சிறுகதைகள்
உரைநடை- 4முதல் 6 முடிய உள்ள கட்டுரைகள்
(10 மணிநேரம்)

**பாடநூல்**

1. பொதுத்தமிழ்- செய்யுள் திரட்டு- தமிழாய்வுத்துறை வெளியீடு-2017-2020
2. சமூகவியல் நோக்கில் தமிழ் இலக்கிய வரலாறு, தமிழாய்வுத்துறை வெளியீடு, தூய வளனார் கல்லூரி, திருச்சிராப்பள்ளி-2
3. உரைநடை நூல் - தமிழாய்வுத்துறை வெளியீடு.
4. சிறுகதைத்தொகுப்பு : (நாட்டுடைமையாக்கப்பட்ட படைப்பாளர்களின் சிறுகதைகள்), தமிழாய்வுத்துறை வெளியீடு.

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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester I | Course Code 17UGT110001 | | | | | Title of the Paper பொதுத்தமிழ்-1 | | | | | | | | Hours 4 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 5 | 5 | 4 | 3 | 5 | 5 | 4 | 4 | 4 | 3 | 3 | 4 | 5 | 4.2 | |
| CO2 | 5 | 5 | 5 | 3 | 4 | 5 | 4 | 5 | 4 | 3 | 3 | 4 | 5 | 4.2 | |
| CO3 | 4 | 4 | 5 | 4 | 3 | 4 | 3 | 5 | 4 | 3 | 3 | 4 | 5 | 3.9 | |
| CO4 | 5 | 5 | 4 | 4 | 4 | 5 | 5 | 5 | 4 | 3 | 5 | 5 | 5 | 4.5 | |
| CO5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 5 | 4 | 3 | 4 | 5 | 5 | 4.0 | |
| CO6 | 5 | 5 | 5 | 3 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 3 | 5 | 3.8 | |
| | | | | | | | | | | | | | Mean Overall Score | | 4.1 |

**Result: The Score for this Course is 4.1 (Very High Relationship)**

*Note:*

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

*Values Scaling:*

**Mean Score of COs** = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$ **Mean Overall Score for COs** = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$



**Semestre: I** **Hours/Week: 4**
**17UGH110001** **Credits : 3**

## HINDI-I

**Course Outcomes**

At the end of the course, a student should be able to demonstrate…

* Knowledge and understanding of Hindi Conversations
* Improvement of the writing skills.
* Knowledge of Grammar forms
* Effective communicative skills in Hindi.
* The introduction of socially relevant subjects in Modern Hindi Literature
* Appreciation the features of Modern Hindi Prose.

**Unit- I** **8 hours**

Dr Abdul Kalam, Ling Badaliye, Vachan Badaliye, Baathcheeth-Aspathal Mein

**Unit-II** **12 hours**

Hamara Rajchinha, Noun Ling, Kaarak Chinha, Chaar Baayee, Baathcheeth, Dookan Mein

**Unit-III** **12 hours**

Moun hee mantra hai, Vachan, Kaarak, Vishwamitra Ka yagna, Baathcheeth, Hotel mein

**Unit-IV** **14 hours**

Veer Shivaji, Pronoun, Danush Yagna, Baathcheeth-Maidaan mein

**Unit-V** **14 hours**

Rajatilak Kee Thaiyaree, Adjectives, Baathcheeth-Pareeksha ke baare mein

**Books Recommended**


1. Dakshina Bharathi Hindi Prachar Sabha, Thiagaraya Nagar, Chennai – 600 017, Subhodh Hindi Patamala-2, Bharath Milap, Bharath-1, 2016.
2. Ramdev, Vyakaran Pradeep, Hindi Bhavan, 63, Tagore Nagar, Allahabad 2, 2016.

**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester I | Course Code 17UGH110001 | | Title of the Paper Hindi-I | | | | | | | | Hours 4 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | Mean Score of COs |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | |
| CO1 | 4 | 4 | 4 | 3 | 4 | 2 | 2 | 2 | 3 | 4 | 4 | 3.2 |
| CO2 | 3 | 3 | 2 | 3 | 2 | 4 | 4 | 4 | 3 | 3 | 2 | 3.0 |
| CO3 | 3 | 2 | 2 | 3 | 4 | 2 | 2 | 2 | 3 | 4 | 4 | 2.8 |
| CO4 | 3 | 2 | 2 | 3 | 2 | 4 | 4 | 4 | 4 | 2 | 2 | 2.9 |
| CO5 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 3 | 3 | 3 | 3.2 |
| CO6 | 4 | 4 | 4 | 4 | 3 | 4 | 3 | 2 | 4 | 3 | 3 | 3.4 |
| | | | | | | | | | | | Mean Overall Score | 3.1 |

**Result: The Score for this Course is 3.1 (High Relationship)**



***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling*:**

| | |
|---|---|
| **Mean Score of COs** = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$ | **Mean Overall Score for COs** = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$ |

**Semestre: I** **Heures /Semaine: 4**
**17UGF110001** **Credits: 3**

## FRANÇAIS-I

**Course Outcomes**

* Introduire la langue et la culture française aux étudiants
* Comparer la culture de l'Inde et de la France
* Familiariser l'étudiant avec le vocabulaire
* la grammaire et les conversations se présenter
* Donner des informations en Français
* Conjuguer des verbes, Avoir Etre Aller Faire

**Unit-I : Al'aéroport Kamaraj domestic de Chennai** **(10 heures)**

Saluer, demander et dire le nom, présenter quelqu'un, se présenter, souhaiter la bienvenue a quelqu'un, demander et dire l'identité de quelqu'un.

**Grammaire :** Etre, s'appeler, pronoms sujets, interrogation

**Unit-II : A l'Université** **(10 heures)**

Demander comment on se porte, présenter quel qu'un, prendre congé, exprimer, l'appréciation.

**Grammaire :** Articles définis et indéfinis, genre des noms, adjectifs, présent de l'indicatif : verbes réguliers en er, être avoir, apprendre, prépositions a, en, au, aux.

**Unit-III : Au café** **(10 heures)**

Dire ce qu'on aime, donner des informations, exprimer l'admiration, demander des informations sur quelqu'un.

**Grammaire :** Adjectifs interrogatifs, présent de l'indicatif : avoir, verbes en er , savoir, qu'est ce que c'est?, adjectifs possessifs, négation ,adjectifs irréguliers

**Unit-IV : A la plage** **(15 heures)**

Proposer une sortie, accepter, refuser la proposition

**Grammaire :** phrases au singulier et au pluriel, pronom indéfini- on, il y a, adjectifs démonstratifs, négation, interrogation, présent de l'indicatif : faire, voir, aller, sortir, connaitre

**Unit-V : Un concert et chez Nalli** **(15 heures)**

Inviter, accepter, exprimer son incapacité d'accepter, complimenter, parlé au téléphone, demander le prix, protester contre le prix.

**Grammaire :** Présent de l'indicatif : verbes en er, venir, pouvoir, vouloir, articles contracte, avec, a chez, le futur, interrogation est ce que, adverbes

interrogatifs, adjectifs possessifs, accord de l'adjectif, adjectifs exclamatifs, très/trop, présent de l'indicatif : acheter-regarder, l'impératif.

**Manuel:**

1. K.Madanagobalane, **Synchronie-1**, Samhitâ Publication, 2011.

**Livre de référence:**

1. Annie Berthet /B_atrix Sampsonis/ Catherine Hugot /V_ronnique M Kizirian / Monique Waendendries, **Alter Ego A1**, Hachette, 2006.
2. Yves Loiseau/R_gineM_rieux, Connexions 1, Didier, 2011.



**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester I | Course Code 17UGF110001 | Title of the Paper French-I | | | | | | | | | | Hours 4 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | | |
| CO1 | 4 | 4 | 2 | 3 | 4 | 4 | 4 | 2 | 2 | 3 | 3 | 3.2 | |
| CO2 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 3 | 3 | 3 | 2 | 3.2 | |
| CO3 | 3 | 2 | 3 | 2 | 4 | 3 | 2 | 4 | 4 | 3 | 3 | 3.0 | |
| CO4 | 3 | 3 | 4 | 3 | 4 | 2 | 2 | 3 | 3 | 2 | 2 | 2.8 | |
| CO5 | 3 | 3 | 4 | 3 | 4 | 3 | 3 | 3 | 4 | 5 | 2 | 3.4 | |
| CO6 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 4 | 3 | 3.1 | |
| | | | | | | | | | | Mean Overall Score | | 3.1 | |

**Result: The Score for this Course is 3.1 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semester: I** **Hours/Week: 4**

**17UGS110001** **Credits : 3**

## SANSKRIT-I

**Course Outcomes**

At the end of the course, a student should be able to demonstrate…

* Knowledge and understanding of basic Sanskrit grammar
* Knowledge and understanding of essential Sanskrit vocabulary
* Introduction of the writing skills
* Introduction of Sanskrit Aksharas.
* Introduction of Present tense forms
* Implementation of good thoughts from Subashitani

**Unit-I** **8 hours**

Akharavivaranam – Svaras & Vyanjanaani – Samyukta Aksharani.

**Unit-II** **12 hours**

Shabdadayah – Aakaaraanta, ikaar aantah. ukaaraantah.

Shabdadayah – Aakaaraanta, iikaar aantah. uukaaraantah.

**Unit-III** **12 hours**

Anuvaada Prayogah.

**Unit- IV** **14 hours**

Lat Lakarh – Parasmai – Pada Prayogah = Vakyarupah.

**Unit-V** **14 hours**

Subhaashitaani

**Books Recommended**


1. Kulapathy, K. M., Saral Sanskrit Balabodh, Bharathiya Vidya Bhavan, Munshimarg, Mumbai-400 007, 2014
2. R.S. Vadhyar & Sons, Book-Sellers and Publishers, Kalpathi, Palghat-678003, Kerala, SOuth India, Shabdha Manjari, 2014
3. Balasubramaniam R., Samskrita Akshara Siksha, Vangals Publication, 14th Main Road, JP Nagar, Bangalore -78, 2015.




**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester I | Course Code 17UGS110001 | | | | | Title of the Paper Sanskrit-I | | | | | | Hours 4 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | | |
| CO1 | 5 | 3 | 5 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 4 | | 3.1 |
| CO2 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | | 3.3 |
| CO3 | 4 | 3 | 3 | 4 | 4 | 3 | 4 | 4 | 3 | 3 | 4 | | 3.1 |
| CO4 | 4 | 3 | 3 | 4 | 3 | 3 | 4 | 4 | 3 | 3 | 4 | | 3.0 |
| CO5 | 4 | 4 | 4 | 3 | 4 | 4 | 3 | 3 | 3 | 4 | 4 | | 3.1 |
| CO6 | 5 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 4 | | 3.1 |
| | | | | | | | | | Mean Overall Score | | | | 3.1 |

**Result: The Score for this Course is 3.1 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semester: I** **Hours/Week: 5**
**17UGE120101** **Credits: 3**

## GENERAL ENGLISH-I

**Course Outcome**

* Introduce themselves to the others
* Narrate simple experiences in a coherent manner
* Understand the underlying meaning in the text
* Describe accurately what he/she observes and experiences
* Converse with friends about their likes and dislikes
* Write leave letters using the appropriate format and language

**Unit-I:**

01. Personal Details
02. Positive Qualities
03. Listening to Positive Qualities
04. Relating and Grading Qualities
05. My Ambition
06. Abilities and Skills
07. Self-Improvement Word Grid
08. What am I doing?
09. What was I doing?
10. Unscramble the Past Actions
11. What did I do yesterday?

**Unit-II:**

12. Body Parts
13. Actions and Body Parts
14. Value of Life
15. Describing Self
16. Home Word Grid
17. Unscramble Building Types
18. Plural Form of Naming Words
19. Irregular Plural Forms
20. Plural Naming Words Practice
21. Whose Words?

**Unit-III:**

22. Plural Forms of Action Words



23. Present Positive Actions
24. Present Negative Actions
25. Un/Countable Naming Words
26. Recognition of Vowel Sounds
27. Indefinite Articles
28. Un/Countable Practice
29. Listen and Match the Visual
30. Letter Spell - Check
31. Drafting Letter

**Non-Detailed:**

**"The Merchant of Venice" from *Six Tales From Shakespeare***

**Unit-IV:**

32. Friendship Word Grid
33. Friends' Details
34. Guess the Favourites
35. Guess Your Friend
36. Friends as Guests
37. Introducing Friends
38. What are We Doing?
39. What is (s)he / are they Doing?
40. Yes / No Question
41. What was s/he doing?
42. Names and Actions
43. True Friendship
44. Know your Friends
45. Giving Advice/Suggestions
46. Discussion on Friendship
47. My Best Friend

**Non-Detailed:**

**"The Taming of the Shrew" from *Six Tales From Shakespeare***

**Unit-V:**

48. Kinship Words
49. The Odd One Out
50. My Family Tree
51. Little Boy's Request

52. Occasions for Message
53. Words denoting Place
54. Words denoting Movement
55. Phrases for Giving Directions
56. Find the Destination
57. Giving Directions Practice
58. SMS Language
59. Converting SMS
60. Writing Short Messages
61. Sending SMS
62. The family debate
63. Family Today

**Non-Detailed**: **"The Tempest" from *Six Tales From Shakespeare***

**Textbook**


1. Joy, J.L. & Peter, F.M. *Let's Communicate 1*, New Delhi, Trinity Press, 2014. Print.


**Non-Detailed Text**


1. Dodd, E F. *Six Tales From Shakespeare*. London: Macmillan, 1987. Print. (First three tales)


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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester I | Course Code 17UGE120101 | | | | | | Title of the Paper General English-I | | | | | | | | Hours 4 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 4 | 3 | 4 | 4 | 4 | | 5 | 4 | 4 | 4 | 3 | 3 | 4 | 4 | | 3.80 |
| CO2 | 4 | 3 | 4 | 4 | 4 | | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | | 4.10 |
| CO3 | 4 | 3 | 4 | 4 | 4 | | 3 | 3 | 4 | 4 | 3 | 3 | 4 | 4 | | 3.60 |
| CO4 | 4 | 3 | 2 | 4 | 4 | | 4 | 4 | 3 | 3 | 5 | 5 | 4 | 4 | | 3.80 |
| CO5 | 4 | 3 | 4 | 4 | 4 | | 4 | 4 | 3 | 3 | 4 | 4 | 5 | 5 | | 3.90 |
| CO6 | 5 | 4 | 4 | 3 | 3 | | 4 | 4 | 3 | 4 | 4 | 5 | 4 | 4 | | 3.90 |
| | | | | | | | | | | | | | | Mean Overall Score | | 3.85 |

**Result: The Score for this Course is 3.85 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semester I** **L P C**
**17UEL130201** **6 - 4**

## BASIC ELECTRONICS

**Course Outcomes**

1. Classify various bands in materials and waveforms
2. Demonstrate functioning of passive circuits
3. Demonstrate PN diode based circuit and its function
4. Demonstrate Transistors based circuit and its function
5. Classify various optoelectronics devices
6. Demonstrate FET based circuit and its function

**UNIT-I: Electrical Theory (12 Hrs)**

The structure of an atom- Classification of materials based on band theory - Intrinsic, extrinsic Semiconductor -The unit of charge - Electric current - Potential difference - Power-signals - AC, DC, Pulsed DC waveform - Triangular waveforms - Saw tooth waveforms -Trigger pulse.

**UNIT-II: Resistance, Capacitance, Inductance & Their Circuits (15 Hrs)**

Introduction - Ohms law - Resistance - Basic definitions - Resistor color code - Calculating resistor value - Resistor parameters - Connecting resistors together.Capacitance: Capacitance and charge - Dielectric materials of a capacitor-Voltage rating of a capacitor - Energy stored in capacitors -Types of capacitors - Characteristics of capacitors - Charging and Discharging of a capacitor - Capacitor in parallel - Capacitor in series. Construction of Inductor - Inductance-factors affecting inductance -Time constant of an inductor - Power and energy in an inductor -Inductor in series and parallel - self inductance

**UNIT-III: Semiconductor Diode (15 Hrs)**

Introduction PN - junction - PN junction formation - Depletion region formation - Barrier potential-Biasing of a PN - junction diode -VI characteristics of a diode - Diode resistance-Static and dynamic resistance of a diode-Diode comparison-Diode specification-Type of diodes-Rectifier circuits using diodes -Half wave rectifier - Full wave rectifier.

**UNIT-IV: Transistors (15 Hrs)**

Introduction- Construction- Transistor biasing -VI characteristics -Operation of NPN transistor in active region- Operation of PNP transistor in active region- Circuit symbol and conventions-transistor configuration-Transistor-Darlington pair of transistor-Transistor specification parameters-



Applications of BJT.Introduction to FET-Classification- Construction-Operation.

**UNIT-V: Opto-Electronics (15 Hrs)**

LED-construction-operation principle of LED- Calculating an LED resistor value-Application of LED-Advantages and disadvantages of LED-LDR operation-Photodiode: construction – principle - application- PIN Diode - Solar cell -Operation - Phototransistor -construction - Application

**BOOKS FOR STUDY:**


1. R.Y. Borse, “Basic electronic Devices and circuits”, First edition 2012, Adhyayan publishers & Distributors, New Delhi.
2. R.Y. Borse, “Basic electronic passive components” , First edition 2014, Adhyayan publishers & Distributors -New Delhi


**BOOKS FOR REFERENCE:**


1. Theraja B.L. “Basic electronics” 3rd edition, 2012, S. Chand & Co.
2. David Bell. “Electronic devices and circuits”2007, PHI
3. Mehta V.K “Principles of Electronics”, S. Chand & Co., 2005
4. Forrest.M.Mims, “Getting Started in Electronics”, E- book, 2000


**SECTION :**

| UNIT | BOOK | SECTIONS |
|---|---|---|
| I | 1 | 1.2,1.4 lecture notes |
| II | 2 | 1.1,1.1.1, 1.11, 1.13, 1.6, 1.6.2, 2.3, 2.5, 2.9, 2.10, 2.13-2.14, 3.2-3.5, 3.7, 3.18-3.19 (lecture notes – self inductance) |
| III | 1 | 1.5.1-1.5.4.4, table 1.2, 3.1-3.3.1,3.4, 3.5.1 |
| IV | 1 | 4.1 - 4.2.13 |
| V | 1 | 2.3,2.3.3, 2.3.7-2.4.6,(lecture notes- solar cell, operation, phototransistor construction, application) |

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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester I | Course Code 17UEL130201 | | | | | Title of the Paper: BASIC ELECTRONICS | | | | | | | | Hours 6 | Credits 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 5 | 4 | 2 | 4 | 5 | 4 | 4 | 5 | 4 | 4 | 4 | 3 | 2 | | 3.8 |
| CO2 | 5 | 4 | 2 | 3 | 5 | 4 | 4 | 5 | 4 | 4 | 4 | 3 | 2 | | 3.8 |
| CO3 | 5 | 4 | 2 | 3 | 5 | 4 | 4 | 5 | 4 | 4 | 4 | 3 | 2 | | 3.8 |
| CO4 | 5 | 4 | 2 | 3 | 5 | 4 | 4 | 5 | 4 | 4 | 4 | 3 | 2 | | 3.8 |
| CO5 | 5 | 4 | 2 | 4 | 5 | 4 | 4 | 5 | 4 | 4 | 4 | 3 | 2 | | 3.8 |
| CO6 | 5 | 4 | 2 | 3 | 5 | 4 | 4 | 5 | 4 | 4 | 4 | 3 | 2 | | 3.8 |
| | | | | | | | | | | | | | Mean Overall Score | | 3.8 |

**Result: The Score for this Course is 3.8 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semester I** **L P C**
**17UEL130401** **6 - 5**

## Allied: MATHEMATICS-1

**Course Outcomes**

1. Applications of matrices and the properties of matrices in their major discipline.
2. Basic concepts of matrices
3. Techniques in differential Equations
4. Application of differential equations in the field of Electronics.
5. Interpretation of data analysis in the field of Electronics.
6. Use of probability in their major discipline.
7. Use of probability distribution techniques in their major discipline.
8. Applications of statistical measures

**Unit I: Matrices and Determinants:**

Solutions of system of linear equations - Using Cramer's rule- Eigen values and Eigen vectors of a matrix - Cayley Hamilton's Theorem (Without proof). (Chapter I, pages 40-43,131-138,152-156)

**Unit II: Differential Equations:**

Second order differential equations - all the types of equations including constant coefficients and particular integral when X is of the form x, sinax and cosax. (Chapter V, pages 534-570).

**Unit III: Statistics:**

Measures of Central tendency: Mean, Median, Mode (Direct method only) - Measures of variation: Range, Standard deviation (Chapter 9, Pages 124-170, Chapter 10- pages 241-245,259-267)

**Unit IV: Probability :**

Probability - Conditional probability - Baye's theorem (Problems only) (Chapter 18, Pages 737-768 )

**Unit V: Theoretical of Distribution :**

Applications of Binomial distributions, Poisson distributions, Normal distributions. (Problems only) (Chapter 19, Pages 769-802).

**Textbook**

1. M.K. Venkataraman, Engineering Mathematics (Vol II), Third Edition, The National Publishing Co., Madras, 1988. (Unit I & II)
2. R.S.N. Pillai and Bagavathi, Statistics- Theory and Practice, S. Chand and Co. Ltd., New Delhi 2014. ( Unit III,IV & V)

## Reference


1. Ancillary Maths, Book II, 1999 Edition, S. Narayanan and T.K. Manickavasagam pillai.
2. P.R. Vittal, Mathematical Statistics, Margham Pub., Chennai, 2004.
3. J.N. Kapur and H.C. Saxena. Mathematical Statistics 20th Edition, S.Chand & Co Ltd. New Delhi, 2010.




**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester I | Course Code 17UEL130401 | | | | | Title of the Paper: MATHEMATICS-I | | | | | | | | Hours 6 | Credits 5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 5 | 4 | 1 | 4 | 5 | 5 | 5 | 4 | 2 | 2 | 4 | 4 | 2 | | 3.6 |
| CO2 | 5 | 4 | 1 | 4 | 5 | 5 | 5 | 4 | 2 | 2 | 4 | 4 | 2 | | 3.6 |
| CO3 | 5 | 4 | 1 | 4 | 5 | 5 | 5 | 4 | 2 | 2 | 4 | 4 | 2 | | 3.6 |
| CO4 | 5 | 4 | 1 | 4 | 5 | 5 | 5 | 4 | 2 | 2 | 4 | 4 | 2 | | 3.6 |
| CO5 | 5 | 4 | 1 | 4 | 5 | 5 | 5 | 4 | 2 | 2 | 4 | 4 | 2 | | 3.6 |
| CO6 | 5 | 4 | 1 | 4 | 5 | 5 | 5 | 4 | 2 | 2 | 4 | 4 | 2 | | 3.6 |
| CO7 | 5 | 4 | 1 | 4 | 5 | 5 | 5 | 4 | 2 | 2 | 4 | 4 | 2 | | 3.6 |
| CO8 | 5 | 4 | 1 | 4 | 5 | 5 | 5 | 4 | 2 | 2 | 4 | 4 | 2 | | 3.6 |
| | | | | | | | | | | | Mean Overall Score | | | | 3.6 |

**Result: The Score for this Course is 3.6 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semester I** **Hours/Week:2**
**17UFC141001** **Credits: 2**

## ESSENTIALS OF HUMANITY

**Course Outcome**

1. To ensure creating awareness among the youth on human values.
2. To ensure educating the youth, the basic principles of value education.
3. To ensure the process of analyzing, appreciating and personalizing values as our own.
4. To ensure that students develop various dimensions of human personality.
5. To ensure the youth empowering the gender sensitization, gender differences and gender roles.
6. To ensure preparing the students for the smooth transfer from the stage of teenage to earlier adulthood.

**Unit-I**

**Principles of Value Education** - Introduction - Value Education- Characteristics of Values – Kinds of Values

**Unit-II**

**Development of Human Personality** - Personality traits - Theories of Personality - Discovering self- Defense mechanism - Power of positive thinking

**Unit-III**

**Dimensions of Human Development** - Physical development – Intellectual development - Emotional development - Social Development – Moral development - Spiritual development

**Unit-IV**

**Responsible Parenthood** - Human sexuality - Sex and love - Becoming a spouse - Responsible Parenthood

**Unit-V**

**Gender Equality and Empowerment -** Historical perspective - Education & economic development -Crimes against Women-Women's rights

**Text Book:**

**Essentials of Humanity**, Department of Foundation course, St.Joseph's College, Tiruchirappalli-2, 2016.

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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester I | Course Code 17UFC141001 | | | | | Title of the Paper ESSENTIALS OF HUMANITY | | | | | | | | Hours 2 | Credits 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 3 | 1 | 5 | 4 | 3 | 5 | 4 | 5 | 5 | 5 | 5 | 4 | 3 | | 4.0 |
| CO2 | 2 | 1 | 5 | 5 | 3 | 5 | 4 | 5 | 5 | 5 | 5 | 4 | 3 | | 4.0 |
| CO3 | 2 | 1 | 5 | 5 | 4 | 5 | 4 | 4 | 5 | 5 | 5 | 5 | 3 | | 4.1 |
| CO4 | 2 | 2 | 5 | 4 | 2 | 5 | 4 | 4 | 5 | 4 | 5 | 5 | 5 | | 4.0 |
| CO5 | 5 | 2 | 5 | 5 | 2 | 5 | 4 | 4 | 5 | 5 | 4 | 4 | 4 | | 4.2 |
| CO6 | 2 | 1 | 5 | 5 | 4 | 4 | 4 | 5 | 5 | 4 | 4 | 4 | 3 | | 3.8 |
| | | | | | | | | | | | | Mean Overall Score | | | 4.0 |

**Result: The Score for this Course is 4.0 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**பருவம்: 2** **மணி நேரம்: 4**

**17UGT210002** **புள்ளிகள்: 3**

## பொதுத்தமிழ்-II

**பாடத்தின் விளைவு**

- சமூக மாற்றச் சிந்தனைகளை உள்ளடக்கிய தற்கால இலக்கியப்பரப்பை அறிதல்
- பக்தி இலக்கியங்களின் வழி இறையியல் கோட்பாடுகளை அறிதல்
- உரைநடைக் கட்டுரை எழுதும் திறன் பெறுதல்- இலக்கணமரபுகளை அறிதல்
- பல்வேறு சமயங்களின் வாழ்வியல் கருத்துக்களை அறிந்து பின்பற்றுதல்
- காப்பியங்களில் உள்ள சமுதாயக் கருத்துக்களை அறிந்துகொள்ளுதல்.
- இதிகாசங்கள் உணர்த்தும் நீதிகளை அறியச்செய்தல்.
  அரசுப்போட்டித் தேர்வுகளுக்கேற்ப பொதுக்கட்டுரைகளும் மொழிப்பயிற்சியும் மாணவர்களுக்கு அளித்தல்.

**அலகு: 1** **(12 மணி நேரம்)**

சிலப்பதிகாரம் - அந்திமாலைச் சிறப்பு செய்காதை
இலக்கிய வரலாறு - சைவம் வளர்த்த தமிழ் முதல் புராணங்கள் முடிய.
இலக்கணம் - எழுத்திலக்கணம்

**அலகு: 2** **(12 மணி நேரம்)**

மணிமேகலை - உலக அறவி புக்க காதை
பெரியபுராணம் - தடுத்தாட்கொண்ட புராணம்

**அலகு: 3** **(12 மணி நேரம்)**

கம்பராமாயணம் - கும்பகர்ணன் வதைப்படலம்
உரைநடை - 7 முதல் 9 முடிய உள்ள கட்டுரைகள்

**அலகு: 4** **(12 மணி நேரம்)**

சீறாப்புராணம் - மானுக்குப் பிணை நின்ற படலம்
இலக்கணம் - சொல்லிலக்கணம்
இலக்கிய வரலாறு - தமிழ் இலக்கண நூல்கள் முதல் சிற்றிலக்கியங்கள் முடிய.

**அலகு: 5** **(12 மணி நேரம்)**

இரட்சணிய யாத்திரிகம் - மரணப்படலம்
உரைநடை - 10 முதல் 12 வரையிலான கட்டுரைகள்

**பாடநூல்:**


1. செய்யுள் திரட்டு, தமிழாய்வுத்துறை வெளியீடு, 2017-10
2. சமூகவியல் நோக்கில் தமிழ் இலக்கிய வரலாறு, தமிழாய்வுத்துறை வெளியீடு, தூய வளனார் கல்லூரி, திருச்சிராப்பள்ளி-2
3. உரைநடை நூல் - தமிழாய்வுத்துறை வெளியீடு.




**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester II | Course Code 17UGT210002 | | | | | Title of the Paper பொதுத்தமிழ்-II | | | | | | | | Hours 4 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 5 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 4 | 4 | 2 | 4 | 4 | 4.2 | |
| CO2 | 4 | 5 | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 4 | 3 | 4 | 3 | 4.4 | |
| CO3 | 5 | 5 | 4 | 4 | 5 | 5 | 5 | 5 | 4 | 3 | 3 | 4 | 3 | 4.3 | |
| CO4 | 5 | 5 | 4 | 3 | 4 | 5 | 5 | 5 | 4 | 3 | 3 | 4 | 3 | 4.1 | |
| CO5 | 5 | 5 | 4 | 3 | 4 | 5 | 5 | 5 | 4 | 3 | 3 | 4 | 3 | 4.1 | |
| CO6 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 4 | 3 | 3 | 4 | 3 | 4.1 | |
| | | | | | | | | | | | | | Mean Overall Score | | 4.2 |

**Result: The Score for this Course is 4.2 (Very High Relationship)**

*Note:*

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

*Values Scaling:*

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semestre: II** **Hours/Week: 4**

**17UGH210002** **Credits : 3**

## HINDI-II

**Course Outcomes**

At the end of the course, a student should be able to demonstrate…

- their effective communicative skills in Hindi
- the introduction of socially relevant subjects in Modern Hindi Literature
- to appreciate the features of Modern Hindi one act plays and short stories
- the ability to fill in application forms Hindi
- use Hindi vocabulary and grammar patterns in a culturally proper ways.
- the ability to write about famous Hindi authors .

**Unit-I** **8 hours**

Paeeksha, Lekak Parichaya, Khani kee Basha – Shyli, Verb, Dhathu, Artha likiye ulte Shabda likiye.

**Unit- II** **12 hours**

Lekak Parichaya Ekanki kee, Basha Shyli, Ander Nagaree, Sankalan Traya, Pareek shaka Khani ke paatra, Kal, Vachya.

**Unit-III** **12 hours**

Chief Kee daavath, Ekanki ke Paatra, Ekankikaar, Ne ka Prayog, Adverb

**Unit- IV** **14 hours**

Do Kalakar, Bahoo kee Vidha, Kahaanikaar, Prepositions, conjunctions

**Unit-V** **14 hours**

Kahani ke paatra, Ekanke ke paatra, lekak parichaya, Interjunctions, Avikari Shabda

**Books Recommended**


1. Dakshina Bharath Hindi Prachara Sabha, Thiagaraya Nagar, Chennai - 600 017, Subodh Hindi Patamala-2, Ekanki, Hindi, 2016.
2. Ram Dev Hindi Bhavan, Vyakaran Pradeep, 63, Tagore Nagar, Alahabad, 2, 2013.




**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester II | Course Code 17UGH210002 | | | | | Title of the Paper Hindi-II | | | | | | Hours 4 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | | |
| CO1 | 4 | 4 | 4 | 3 | 4 | 3 | 2 | 3 | 4 | 4 | 4 | | 3.5 |
| CO2 | 3 | 3 | 2 | 3 | 2 | 4 | 4 | 3 | 3 | 2 | 2 | | 2.8 |
| CO3 | 3 | 2 | 2 | 3 | 4 | 2 | 4 | 4 | 2 | 3 | 4 | | 3.0 |
| CO4 | 3 | 2 | 2 | 3 | 3 | 4 | 3 | 3 | 4 | 3 | 3 | | 3.0 |
| CO5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 4 | 3 | | 3.1 |
| CO6 | 4 | 4 | 4 | 4 | 3 | 4 | 3 | 3 | 3 | 3 | 2 | | 3.3 |
| | | | | | | | | | | Mean Overall Score | | | 3.1 |

**Result: The Score for this Course is 3.1 (High Relationship)**

*Note:*

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

*Values Scaling:*

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semestre: II** **Heures /Semaine: 4**
**17UGF210002** **Credits: 3**

## FRANÇAIS-II

**Course Outcomes**

* Faire connaissance des journaux, des courriels, des lettres
* Comprendre les conversations téléphoniques.
* Décrire quelque chose
* Demander son chemin
* Parler des activités du week-end
* Accepter, refuser, exprimer la certitude.

**Unit-I: Nouvelles de L'inde** **(10 heures)**

Montrer son inquiétude, s'excuser, exprimer son appréciation, décrire quelqu'un, décrire quelque chose

**Grammaire:** Présent : verbes en er,-ir, le futur, interrogation totale, féminin d'autres adjectifs.

**Unit-II: A la gare Central station** **(10 heures)**

Réserver des billets, demander des renseignements, donner des renseignements

**Grammaire:** pronoms compléments d'objet direct, présent l'impératif :payer ,partir/sortir, l'impératif, expression du temps, construction avec infinitif

**Unit-III : Un lit dans la Cuisine** **(10 heures)**

Donner des ordres, localiser, bire qu'une proposition est stupide ou bizarre

**Grammaire :** Verbes en er-ranger, mettre impératif, il faut, devoir +infinitif, prépositions de lieu

**Unit-IV: Pierre apprend a conduire et mangez –vous correctement ?** **(15 heures)**

Rassurer, exprimer l'indirection exprimer l'autorisation, avertir, demander des informations sur les habitudes de quelqu'un, offrir a manger ou a boire, accepter, refuser, exprimer la certitude.

**Grammaire:** impératif-être, avoir, savoir, pronoms compléments d'objet indirect, le passe compose avec avoir expression de la quantité-articles partitifs, adverbes, pronoms directs et indirects, pronom en, présent des verbes –manger, boire ,offrir ,prendre, la condition avec si.



**Unit-V: Ils ont eu tort tous les deux !et Comment as-tu passe le weekend** **(10 heures)**

Demander son chemin, indiquer le cheminin a quelqu'un, reprocher / conseiller, parler des activités du week-end, demander a quelqu'un de se taire

**Grammaire:** le passe compose, adverbes mots interrogatifs, le passe compose avec être, faire du….pouvoir, vouloir.

**Manuel:**

1. K. Madanagobalane, **Synchronie -1**, Samhitâ publication, 2011.

**Livre de référence:**

1. Annie Berthet / B_atrix Sampsonis / Catherine Hugot / V_ronnique M kizirian / Monique Waendendries, **Alter Ego A1**, Hachette, 2006
2. Yves Loiseau / R_gine M-rieux, Connexions 1, Didier ,2011

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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester II | Course Code 17UGF210002 | Title of the Paper French-II | | | | | | | | | | Hours 4 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | | |
| CO1 | 4 | 4 | 2 | 3 | 4 | 3 | 3 | 2 | 2 | 3 | 3 | | 3.0 |
| CO2 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 2 | 2 | 2 | 3 | | 2.8 |
| CO3 | 3 | 2 | 3 | 2 | 4 | 3 | 3 | 2 | 2 | 3 | 3 | | 2.7 |
| CO4 | 3 | 3 | 4 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | | 3.2 |
| CO5 | 3 | 3 | 4 | 3 | 4 | 2 | 4 | 4 | 4 | 4 | 5 | | 3.6 |
| CO6 | 3 | 4 | 3 | 3 | 3 | 3 | 4 | 4 | 3 | 4 | 4 | | 3.5 |
| | | | | | | | | | | | Mean Overall Score | | 3.1 |

**Result: The Score for this Course is 3.1 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semester: II** **Hours/Week: 4**
**17UGS210002** **Credits : 3**

## SANSKRIT-II

**Course Outcomes**

At the end of the course, a student should be able to demonstrate…

* knowledge and understanding of basic Sanskrit grammar
* knowledge and understanding of essential Sanskrit vocabulary
* knowledge and understanding of the appropriateness of basic Sanskrit structures and expressions in a given context
* the ability to understand short passages in written Sanskrit on everyday topics
* the ability to produce short passages in written Sanskrit on everyday topics
* introduction of basic grammar (Avyaya Imperfect tense and Sandirules. Samasah.)

**Unit-I** **8 hours**

Visheshanaah
Saravanaama shabdas.

**Unit-II** **12 hours**

Sandhi Niyamaah Abhyaasah.(Guna, Visarga, Dirgha, Vrddhi)

**Unit-III** **12 hours**

Lang lakaarah. Kriyapadaani

**Unit-IV** **14 hours**

Gopala Vimshathi. (1-10) slokas.

**Unit-V** **14 hours**

Avyayas, Tatpurusha, Karma dhaaraya samaasah.

**Books Recommended**


1. Paundrapuram Ashram, Srirangam -620 006. Gopalavimshathi, 2014
2. R.S. Vadhyar & Sons, book – Sellers and Publishers, Kalpathi, Palghat-678 003, Kerala, Southe India, Shabdha Manjari, 2014
3. Kulapthy, K. M., Saral Sanskrit Balabodh, Bharathiya Vidya Bhavan, Munshimarg, Mumbai - 400007, 2014


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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester II | Course Code 17UGS210002 | | | | | Title of the Paper Sanskrit-II | | | | | | Hours 4 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | | |
| CO1 | 5 | 3 | 5 | 4 | 4 | 3 | 3 | 3 | 4 | 4 | 3 | | 3.2 |
| CO2 | 4 | 3 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 4 | 3 | | 3.0 |
| CO3 | 4 | 3 | 3 | 4 | 4 | 3 | 3 | 3 | 4 | 4 | 3 | | 3.0 |
| CO4 | 4 | 3 | 3 | 4 | 3 | 3 | 3 | 4 | 4 | 4 | 3 | | 3.0 |
| CO5 | 4 | 4 | 4 | 3 | 4 | 3 | 4 | 4 | 4 | 3 | 4 | | 3.2 |
| CO6 | 5 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 4 | 4 | 3 | | 3.2 |
| | | | | | | | | | | | Mean Overall Score | | 3.1 |

**Result: The Score for this Course is 3.1 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\textbf{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \textbf{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semester: II** **Hours/Week: 5**

**17UGE220102** **Credits: 3**

## GENERAL ENGLISH-II

**Course Outcome**

* Ask open-ended questions in real-life situations
* Use polite expressions in appropriate ways
* Use correct punctuation marks and capital letters
* Use appropriate vocabulary
* Put ideas into a cohesive paragraph
* Develop positive self-esteem and thereby communicate effectively

**Unit-I**

01. Education Word Grid
02. Reading Problems and Solutions
03. Syllabification
04. Forms for Expressing Quality
05. Expressing Comparison
06. Monosyllabic Comparison
07. Di/polysyllabic Comparison
08. The best monosyllablic Comparison
09. The best di/polysyllabic Comparison
10. Practising Quality Words

**Non-Detailed:**

**"Julius Caesar" from *Six Tales From Shakespeare***

**Unit –II:**

11. Wh Words
12. Yes/No Recollection
13. Unscramble Wh Questions
14. Wh Practice
15. Education and the Poor
16. Controlled Role play
17. Debate on Education
18. Education in the Future
19. Entertainment Word Grid
20. Classify Entertainment Wordlist
21. Guess the Missing Letter

22. Proverb-Visual Description
23. Supply Wh Words
24. Rearrange Questions
25. Information Gap Questions

**Unit-III:**

26. Asking Questions
27. More about Actions
28. More about Actions and Uses
29. Crime Puzzle
30. Possessive Quiz
31. Humourous News Report
32. Debate on Media and Politics
33. Best Entertainment Source

**Unit-IV:**

34. Career Word Grid
35. Job-Related Wordlist
36. Who's Who?
37. People at Work
38. Humour at Workplace
39. Profession in Context
40. Functions and Expressions
41. Transition Fill-in
42. Transition Sord Selection
43. Professional Qualities
44. Job Procedures
45. Preparing a Resume
46. Interview Questions
47. Job Cover Letter Format
49. E-mailing an Application
50. Mock Interview

**Non-Detailed:**

**"King Lear" from *Six Tales From Shakespeare***

**Unit-V:**

51. Society Word Grid
52. Classify Society Wordlist



53. Rearrange the Story
54. Storytelling
55. Story Cluster
56. Words Denoting Time
57. Expressing Time
58. What Can You Buy?
59. Noise Pollution
60. Positive News Headlines
61. Negative News Headlines
62. Matching Conditions
63. What Whould You Do?
64. If I were the Prime Minister
65. My Dream Country

**Non-Detailed: "Macbeth" from *Six Tales From Shakespeare***

**Textbook**

1. Joy, J.L. & Peter, F.M. *Let's Communicate 2*, New Delhi: Trinity Press, 2014. Print.

**Non-Detailed Text**

1. Dodd, E F. *Six Tales From Shakespeare*. London: Macmillan, 1987. Print. (Last three tales)

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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester II | Course Code 17UGE120102 | | | | | Title of the Paper General English-II | | | | | | | | Hours 5 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 5 | 4 | 4 | 4 | 4 | 5 | 4 | 4 | 3 | 3 | 3 | 4 | 4 | | 3.9 |
| CO2 | 4 | 3 | 4 | 4 | 4 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 3 | | 4.0 |
| CO3 | 4 | 3 | 4 | 4 | 4 | 3 | 3 | 4 | 4 | 3 | 3 | 4 | 4 | | 3.6 |
| CO4 | 4 | 3 | 3 | 4 | 4 | 4 | 4 | 3 | 3 | 5 | 5 | 4 | 4 | | 3.8 |
| CO5 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 4 | 4 | 5 | 5 | | 3.9 |
| CO6 | 5 | 4 | 4 | 3 | 3 | 4 | 4 | 3 | 4 | 4 | 5 | 4 | 4 | | 3.9 |
| | | | | | | | | | | | | | Mean Overall Score | | 3.8 |

**Result: The Score for this Course is 3.8 (High Relationship)**

*Note:*

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

*Values Scaling:*

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semester II** **L P C**
**17UEL230202** **5 - 4**

## ELECTRIC CIRCUIT ANALYSIS

**Course Outcomes:**

1. Ability to understand and solve network problems
2. Understand and apply circuit theorems to complex network analysis
3. Acquire knowledge on sinusoidal steady state analysis
4. Acquire knowledge on transient analysis of passive circuits
5. Ability to understand implications of coupled circuits
6. Understand electrical isolation and magnetic coupling in coupled circuits

**UNIT-I: DC Circuit Analysis** **(10 Hrs)**

Kirchhoff's voltage law, Kirchhoff's current law -Network graphs - Mesh analysis- Nodal analysis - Source Transformation technique. Network Topology: Tree - Co-Tree - Incidence matrix - Tie set-Cut set-Duality of network.

**UNIT-II: Network Theorems** **(15 Hrs)**

Star-Delta Transformation- Superposition Theorem-Thevenin's Theorem-Norton's Theorem-Reciprocity Theorem- Compensation Theorem- Maximum power transformation Theorem-Tellegen's Theorem, Millman's Theorem (Problems in relevant topics).

**UNIT-III: Sinusoidal Steady State Analysis** **(15 Hrs)**

Sinusoidal Steady state analysis: Average and RMS values of periodic waveform-Form factor and Peak factor-Characteristics of sinusoids-The complex forcing function- Phasor relationship for R, L, C-Impedance-Admittance- Phasor Diagrams. AC Circuit Power Analysis: Average power-Reactive power-Apparent power-power factor-Power Triangle involving R,L, and C. Analysis of series and parallel RL,RC and RLC circuit. Frequency response: Parallel resonance-series resonance-Q factor, impedance and bandwidth of the resonant circuit.

**UNIT-IV: Transients** **(10 Hrs)**

Steady state and Transient response- DC response of an RL, RC and RLC circuit, AC transient response of RL,RC,RLC series. State variable methods of circuit analysis.

**UNIT-V: Coupled Circuits** **(10 Hrs)**

Magnetically coupled circuits: Mutual inductance -Coefficient of coupling- Ideal transformer -analysis of multi winding coupled circuits -series connection of couple inductors. Dot convention rule - Tuned circuits -single tuned -double tuned coupled circuits (Problems in relevant topics).

**BOOK FOR STUDY:**

1. A.Sudhakar,Shymmohan S Palli,"Circuits & Networks Analysis and Synthesis", 3rd Edition,(2007) Tata McGraw -Hill publishing company Ltd.

**BOOKS FOR REFERENCE:**

1. Paranjothi, S.R, "Electric Circuit Analysis", 4th edition, New Age International.2011
2. B.L. TherajaA.k. Theraja "A Textbook of Electrical Technology" S. Chand & Company Ltd 2005.
3. Robert L. Boylstad, "Introductory Circuit Analysis", 13th Edition, Pearson, 2015

**SECTIONS:**

| UNIT | BOOK | SECTIONS |
|---|---|---|
| I | 1 | 1.2,1.4 lecture notes |
| II | 2 | 1.1,1.1.1, 1.11, 1.13, 1.6, 1.6.2, 2.3, 2.5, 2.9, 2.10, 2.13-2.14, 3.2-3.5, 3.7, 3.18-3.19 (lecture notes – self inductance) |
| III | 1 | 1.5.1-1.5.4.4, table 1.2, 3.1-3.3.1,3.4, 3.5.1 |
| IV | 1 | 4.1 - 4.2.13 |
| V | 1 | 2.3,2.3.3, 2.3.7-2.4.6,(lecture notes- solar cell, operation, phototransistor construction, application) |



**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester II | Course Code 17UEL230202 | | | | Title of the Paper: ELECTRIC CIRCUIT ANALYSIS | | | | | | | | Hours 5 | Credits 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | |
| CO1 | 4 | 4 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 2 | 4 | 3.6 |
| CO2 | 4 | 4 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 2 | 4 | 3.6 |
| CO3 | 4 | 4 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 2 | 4 | 3.6 |
| CO4 | 4 | 4 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 2 | 4 | 3.6 |
| CO5 | 4 | 4 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 2 | 4 | 3.6 |
| CO6 | 4 | 4 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 2 | 4 | 3.6 |
| | | | | | | | | | | | | Mean Overall Score | | 3.6 |

**Result: The Score for this Course is 3.6 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semester II** **L P C**
**17UEL230203** **- 3 4**

**Electronics Practical-I:**
**ELECTRONICS AND NETWORK CIRCUIT CHARACTERISTICS**

**Course Outcomes**

1. Able to understand the network theorems by practical experiments.
2. Able to know the characteristics of basic electronic components

**List of Experiments (Any sixteen experiments)**

1. Verification of ohm's law
2. Study of Series and parallel connection of resistance in circuits
3. Study of series and parallel connection of capacitor in circuits.
4. Study of RC time constant using DC source
5. Study of Diode characteristics
6. Study Half wave rectifier with and without filter
7. Study Full wave rectifier with and without filter
8. Study of opto electronic devices (photodiode, phototransistor, LDR, LED)
9. Verification of Kirchhoff's voltage law
10. Verification of Kirchhoff's current law.
11. Branch voltage identification using Mesh analysis
12. Node current measurement using Nodal analysis
13. Verification of Thevenin's theorem
14. Verification of Norton's theorem
15. Verification of Superposition theorem
16. Verification of Compensation theorem
17. Verification of Reciprocity theorem
18. Verification of Maximum power transformation theorem
19. Study of sinusoidal steady state analysis of series RC and LC
20. Study of steady state analysis of series RLC circuit.
21. Study of transient analysis of series RC and LC
22. Study of transient analysis of series RLC circuit.
23. Study of load current and load voltage in star delta transformation.



**Semester II** **L P C**
**17UEL230204** **- 3 4**

**WORKSHOP PRACTICE-I**

**Course Outcomes**

1. Ability to understand and get the hands on experience about the electronics components used in the electronics laboratory.

**List of Practices (Any sixteen experiments)**

1. Electronic components identification
2. Resistance color code calculation and verification
3. Study the function of CRO and Function Generator
4. Study the function of Multimeter and LCR meter
5. Soldering and de-soldering the components in PCB layout.
6. Construction of power supply-I (single supply)
7. Construction of Power supply-II (Dual supply)
8. Cabinet making for power supply.
9. Construction and testing of LED's in serial and parallel
10. PCB layout preparation using software. (pcb track width and copper square area calculation)
11. PCB Layout design and etching.
12. SMD component Soldering and De-soldering
13. Transformer Identification and troubleshooting
14. Construction of Transformer-less power supply
15. Hobby circuit - I
16. Hobby circuit - II
17. Hobby circuit - III
18. House wiring-I (fitting switches, AC pin sockets and indicator lamp in switch box)
19. House wiring-II (Two way switches, circuit breaker-ELCB, MCB)
20. PC hardware assembling
21. Audio system assembling (amplifier and speaker)
22. Mobile phone troubleshooting
23. Study of SMPS power supply
24. Simple emergency lamp with 12V battery

**Semester II** **L P C**
**17UEL230402** **6 - 5**

**Allied:**

**MATHEMATICS-II**

**Course Outcomes**

1. Basic ideas of correlation
2. Basic concepts of curve fitting
3. Applications of curve fitting and correlation
4. Numerical methods and its application.
5. Ideas of Laplace transforms in the field of Electronics.
6. Ideas of Fourier series in their major discipline.
7. Basic concepts of Trigonometry
8. Use of trigonometry in their major discipline of Electronics

**Unit I: Correlation**

Correlation coefficient- Rank correlation - curve fitting by least square methods - Fitting a straight line (No derivation, Numerical problems only) (Chapter 12, Pages 396-410) (Chapter 15, Pages 602-608)

**Unit II:Numericals methods:**

Solving algebraic and transcendental equations : Bisection Method - Newton-Raphson method. Solving simultaneous equations - Gauss elimination-Iteration methods - Gauss-Seidal Methods (problems only). (Chapter III, Section 5, Chapter IV, Section 1,6) (pages 81-85,97-106,113-120,140-146)

**Unit III: Laplace Transforms:**

Laplace Transforms - Definition- properties - the inverse transforms - solving differential equations using Laplace transforms (simple problem only) (Chapter VII pages 289-311)

**Unit IV: Fourier Series:**

Fourier series - Even and odd functions - properties of odd and even functions - Half range Fourier series (Omitting general interval). (Chapter II, 123-149)

**Unit V:Trignometry:**

Expansion of cosnq and sin nq - Powers of sines and cosines of q in terms of functions of multiples of q. (Chapter 5- sec 5.1- 5.4, pages: 220- 242).



**Textbook**

1. R.S.N. Pillai and Bagavathi, Statistics- Theory and Practice, S. Chand and Co. Ltd., New Delhi 2014. ( Unit I)
2. M.K.Venkataraman, Numerical Methods in science and Engineering, 2nd Edition, the National Publishing Co., Madras 1987 (For Units II)
3. Narayanan and Manickavachagam Pillai, Ancillary Maths, Book II , S. Viswanathan Pvt. Ltd., Madras (For unit III &IV).
4. Ancillary Mathematics, Vol - I, 2009 Edition, S. Narayanan, R. Hanumantha Rao, T.K. Manicavachagom Pillay, Kandaswamy (For unitV)

**Reference Books:**

1. Dr. P. R. Vittal, Allied Mathematics (In single volume) Margham Publications, Reprint 2003.
2. P. Kandasamy, K. Thilagavathy, K. Gunavathy, Numerical Methods, S. Chand & Company Ltd, Reprint 1999.

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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester II | Course Code 17UEL230402 | | | | | Title of the Paper: MATHEMATICS-II | | | | | | | | Hours 6 | Credits 5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 5 | 5 | 1 | 4 | 3 | 4 | 5 | 4 | 2 | 2 | 4 | 4 | 3 | 3.5 | |
| CO2 | 5 | 5 | 1 | 4 | 3 | 4 | 5 | 4 | 2 | 2 | 4 | 4 | 3 | 3.5 | |
| CO3 | 5 | 5 | 1 | 4 | 3 | 4 | 5 | 4 | 2 | 2 | 4 | 4 | 3 | 3.5 | |
| CO4 | 5 | 5 | 1 | 4 | 3 | 4 | 5 | 4 | 2 | 2 | 4 | 4 | 3 | 3.5 | |
| CO5 | 5 | 5 | 1 | 4 | 3 | 4 | 5 | 4 | 2 | 2 | 4 | 4 | 3 | 3.5 | |
| CO6 | 5 | 5 | 1 | 4 | 3 | 4 | 5 | 4 | 2 | 2 | 4 | 4 | 3 | 3.5 | |
| CO7 | 5 | 5 | 1 | 4 | 3 | 4 | 5 | 4 | 2 | 2 | 4 | 4 | 3 | 3.5 | |
| CO8 | 5 | 5 | 1 | 4 | 3 | 4 | 5 | 4 | 2 | 2 | 4 | 4 | 3 | 3.5 | |
| | | | | | | | | | | | | | Mean Overall Score | 3.5 | |

**Result: The Score for this Course is 3.5 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semester II** **Hours/Week: 2**
**17UCE240802A** **Credit: 2**

## COMPUTER LITERACY

**Course Outcomes**

1. Understand the basics of Computer Systems
2. Familiar with the applications of MS-Office / HTML & CSS
3. Know the statistical data analysis using R
4. Aware the latest trends and technologies such as Mobile Computing, Big Data and Analytics, Cloud Computing.
5. Understand the concepts of social networking sites.
6. Knowledge in Cyber Crime and Cyber Ethics.

**Unit-I: Computer System**

Computer - An Introduction - Hardware Components - Input and Output Technologies - Computer Hierarchy- Software Fundamentals - Systems Software and Os- Application Software- Software Licensing - Open Systems- Open Source Software- Programming Languages- Information Systems- General It Trends.

**Unit-II: (For Non-CS)**

**Microsoft Word**: Introduction - Word Environment - Opening and Creating a New Document - Saving Documents - Proofing Features - Printing a Document - Formatting Text - Working with Shapes and Lists - Line and Paragraph Spacing- Working with Tables - Columns and Ordering- Working with Pictures- Working with Headers and Footers - Using Indents and Tabs - Using Mail Merge.

**Microsoft Excel**: Introduction - Document Creation - Renaming a worksheet - Office user interface - Open a New Workbook - Columns, Rows, and Cells - Selecting a cell - - Basic data entry, fill handle - - Insert columns - Arithmetic Calculations & Formulas - Excel Formulas- Calculate with Functions - Function Library - Graphs and Charts - Printing the Document.

**Microsoft Powerpoint**: Starting PowerPoint - Working with Slides - Applying Theme - Animation- Transitions – Views.

**Unit-II: (For CS)**

**HTML:** Introduction - HTML generations – HTML Tags – Headings – Paragraphs – Comments – Line Breaks – Formatting Tags – Hyperlinks – Images – Lists – Tables – Frames – Forms.

**CSS:** Introduction – Use of External Style Sheet – Defining Styles – Use Relative Sizing – Use Numbered Value for Color.

**Unit-III: Statistical Data Analysis**

Introduction - R Programming Language - Basic R Commands - Univariate and Bivariate Statistical Measures - Graphic Representation of Statistical Data - Lab Exercise.

**Unit-IV: SMAC**

Introduction - Understanding the Enterprise of Tomorrow - Social Networking - Mobile Computing - Big Data and Analytics - Cloud Computing

**Unit-V: Cyber Crime**

Definition - List of Cyber Crimes - Cyber Ethics- Unethical Behaviour - Securing information privacy and confidentiality - Internet Ethics - Indian Information Technology Act - Advantages of Cyber Laws - National e-Governance Plan (NeGP) - eCommerce - Electronic Fund Transfer (EFT)

**Book for Study**

1. Department of Foundation Course, "Computer Literacy", St. Joseph's College, 2017.

**Books for Reference**

1. Alexis Leon, "Introduction to computers", Vikas Publishing House Pvt. Ltd., New Delhi, 2008.
2. Alexis Leon and Mathew Leon, "Introduction to computers with Ms Office 2000", Tata McGraw Hill Publishing Co. Ltd., New Delhi, 2005.



**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester II | Course Code 17UCE240802A | | | | | Title of the Paper COMPUTER LITERACY | | | | | | | | Hours 2 | Credits 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 5 | 5 | 4 | 4 | 5 | 5 | 4 | 3 | 4 | 3 | 4 | 4 | 4 | 4.15 | |
| CO2 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 4.08 | |
| CO3 | 4 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 3.77 | |
| CO4 | 5 | 5 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 4.15 | |
| CO5 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 4.15 | |
| CO6 | 5 | 5 | 5 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4.31 | |
| | | | | | | | | | | | | | Mean Overall Score | | 4.10 |

**Result: The Score for this Course is 4.1 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semester II** **Hours/Week: 2**
**17UFC241002** **Credits: 2**

## FUNDAMENTALS OF HUMAN RIGHTS

### Course Outcome

1. To ensure acquiring the knowledge about the historical background of human rights.
2. To ensure sensitizing the young the values of human rights.
3. To ensure the importance of human rights in the Indian context.
4. To ensure learning the fundamental duties in the constitution of India.
5. To ensure educating the youth in respecting and protecting the rights of every other human being.
6. To ensure teaching the youth on the vulnerabilities of women and children.

### Unit-I

Introduction, Classification of Human Rights, Scope of Human Rights, Characteristics of Human Rights, and Challenges for Human Rights in the 21st Century.

### Unit-II

Human Rights in Pre-World War Era, Human Rights in Post-World War Era, Evolution of International Human Rights Law - the General Assembly Proclamation, Institution Building, Implementation and the Post Cold War Period. The ICC.

### Unit-III

Introduction, Classification of Fundamental Rights, Salient Features of Fundamental Rights, and Fundamental Duties

### Unit-IV

Women's Human Rights, Issues related to women's rights, and Rights of Women's and Children

### Unit-V

Human Rights Violations, Human Rights Violations in India - the Human Rights Watch Report, January 2012, Human Rights Organizations.

### Text Book:

1. **Techniques of social Analysis: Fundamentals of Human Rights,** Department of Foundation course, St.Joseph's College, Tiruchirappalli, 2015.



**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester II | Course Code 17UFC241002 | | | | | Title of the Paper FUNDAMENTALS OF HUMAN RIGHTS | | | | | | | | Hours 2 | Credits 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 5 | 1 | 5 | 5 | 2 | 4 | 4 | 5 | 5 | 4 | 4 | 5 | 5 | 4.2 | |
| CO2 | 4 | 1 | 5 | 4 | 2 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 4.0 | |
| CO3 | 5 | 1 | 5 | 5 | 2 | 5 | 5 | 4 | 4 | 4 | 5 | 5 | 5 | 4.2 | |
| CO4 | 4 | 1 | 5 | 5 | 2 | 2 | 4 | 3 | 5 | 5 | 4 | 4 | 5 | 3.8 | |
| CO5 | 5 | 1 | 5 | 4 | 1 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4.1 | |
| CO6 | 3 | 1 | 5 | 4 | 1 | 4 | 3 | 5 | 5 | 3 | 4 | 4 | 5 | 3.6 | |
| | | | | | | | | | | | | Mean Overall Score | | 3.9 | |

**Result: The Score for this Course is 3.9 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**பருவம்: 3** **மணி நேரம்: 4**

**17UGT310003** **புள்ளிகள்: 3**

## பொதுத்தமிழ்-III

**பாடத்தின் விளைவு**

- செம்மொழியாம் தமிழ் மொழியின் சிறப்பை அறிதல்.
- பண்டை இலக்கியங்கள் உணர்த்தும் அறக்கருத்துகளை அறிதல்
- புதினம் வாயிலாகத் தற்காலச் சமுதாயச் சிக்கல்களையும், அதற்கான தீர்வுகளையும் ஆராயும் திறன் பெறுதல்
- மானுட வாழ்வில் அகம், புறம் பற்றிய பாகுபாட்டை தமிழ்ச்செய்யுள் வாயிலாக அறிதல்.
- தமிழர்களின் ஈகையும் வீரமும் எடுத்துரைக்கும் புறச்செய்திகளை அறிதல்
- நீதிநூல்கள் மனித வாழ்வை செம்மைப்படுத்தும் பாங்கினை உணர்த்துதல்.

**அலகு: 1** **(12 மணி நேரம்)**

நெடுநல்வாடை (முழுமையும்)

**அலகு: 2** **(12 மணி நேரம்)**

குறுந்தொகை - பாடல்கள் - (32, 323, 305, 290, 168)
யாப்பிலக்கணம் (வெண்பா, ஆசிரியப்பா)

**அலகு: 3** **(12 மணி நேரம்)**

கலித்தொகை - பாடல்கள் - (குறிஞ்சிக்கலி-15, பாலைக்கலி-9, மருதக்கலி-15, நெய்தற்கலி-22, முல்லைக்கலி-07)
இலக்கிய வரலாறு - முதற்பாகம் ('தமிழ் மொழியின் தொன்மையும சிறப்பும' முதல் 'சங்க தொகை நூல்கள்' முடிய) புதினம்.

**அலகு: 4** **(12 மணி நேரம்)**

பதிற்றுப்பத்து - பாடல்கள் (12, 24,)
புறநானூறு - பாடல்கள் (46, 86, 122, 214, 246)
அணியிலக்கணம்

**அலகு: 5** **(12 மணி நேரம்)**

திருக்குறள் - ஈகை, ஆள்வினை உடைமை, நிறை அழிதல் ஆகிய அதிகாரங்கள்
நாலடியார் - இளமை நிலையாமை(11), பிறன்மனை நயவாமை(82), பெருமை(185), அறிவின்மை(254), காமநுதலியல்.(391).
இலக்கிய வரலாறு - சங்க இலக்கியங்களின் தனித்தன்மைகள் முதல் இரட்டைக் காப்பியங்கள் முடிய

**பாடநூல்கள்:**


1. செய்யுள் திரட்டு, தமிழாய்வுத் துறை வெளியீடு (2017-2020).
2. சமூகவியல் நோக்கில் தமிழிலக்கிய வரலாறு, தமிழாய்வுத்துறை வெளியீடு, 2014.
3. புதினம் (ஒவ்வொரு கல்வியாண்டும் ஒவ்வொரு புதினம்). காணாமல் போன கவிதை (2017-18).




**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester III | Course Code 17UGT310003 | | | | | Title of the Paper பொதுத்தமிழ்-III | | | | | | | | Hours 5 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 5 | 5 | 5 | 4 | 5 | 5 | 4 | 5 | 5 | 5 | 4 | 4 | 5 | 4.6 | |
| CO2 | 5 | 5 | 4 | 3 | 4 | 5 | 4 | 5 | 5 | 5 | 4 | 4 | 5 | 4.4 | |
| CO3 | 5 | 5 | 5 | 3 | 4 | 5 | 5 | 5 | 5 | 5 | 4 | 3 | 5 | 4.5 | |
| CO4 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 4.8 | |
| CO5 | 5 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 3 | 3 | 5 | 4.3 | |
| CO6 | 5 | 5 | 5 | 3 | 4 | 5 | 5 | 5 | 5 | 5 | 4 | 3 | 5 | 4.5 | |
| | | | | | | | | | | | | | Mean Overall Score | | **4.5** |

**Result: The Score for this Course is 4.5 (Very High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semestre: III** **Hours/Week: 4**
**17UGH310003** **Credits: 3**

## HINDI-III

**Course Outcomes**

At the end of the course, a student should be able to demonstrate…

* the ability to enable the students to complete the pre-reading task to comprehend the local and global issues in the lessons.
* the ability to enable the students to complete the post-reading task centering on Grammar and Skill Development.
* the relevance of Bhakthi Movement in Hindi Literature.
* the ability to imagine and write poems.
* the ability to quote poetry in Speeches.
* the ability to write friendly and formal letters.

**Unit-I** **8 hours**

Tera Sneh Na Kho oon, Kavi Parichaya, Patra Likne ke Kaaran, Patra Kee Avashyakatha, Sandhi keeiye, Vigrah Keejiye

**Unit-II** **12 hours**

Ek boondh, Tera Sneh Na Kho oon kavitha kee manovygnaik stiti, Chutti Patra, Sandhi

**Unit-III** **12 hours**

Ekloondh Kavitha Ka Uddeshya, Kabir Ke Dohe, Nagar Palika ko Patra, Samas

**Unit-IV** **14 hours**

Vimal Indu Kee Vishal Kiranen, Rahim Ke Dohe, Naukari Keliye Avedan Patra, Upasarga

**Unit-V** **14 hours**

Thulasi ke Dohe, Kitab Maangne Keliye Patra, Pratyaya, Kaviparichaya

**Books Recommended**


1. Dakshina Bharath Hindi Prachara Sabha, Thiagaraya Nagar, Subodh Hindi, Paatamala-3, Chennai-600 017, Hindi, 2016.
2. DBHP Sabha, T.Nagar, Chennai-600 017, Abihav Patralekhan, 2016
3. Ram Dev, Vyakaran Pradeep, Hindi Bhavan, 63 Tagore Nagar, Alahabad 2, 2016.


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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester III | Course Code 17UGH310003 | | | | | Title of the Paper Hindi-III | | | | | | Hours 4 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | | |
| CO1 | 4 | 4 | 4 | 3 | 4 | 3 | 3 | 3 | 4 | 4 | 4 | | 3.6 |
| CO2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 5 | 3 | 5 | | 3.0 |
| CO3 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 4 | 3 | 3 | 3 | | 3.2 |
| CO4 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | | 2.9 |
| CO5 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 4 | | 3.2 |
| CO6 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | 3.3 |
| | | | | | | | | | | Mean Overall Score | | | 3.2 |

**Result: The Score for this Course is 3.2 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semestre: III** **Heures /Semaine: 4**
**17UGF310003** **Credits : 3**

## FRANÇAIS-III

**Course Outcomes**

* Comparer la culture de l'Inde et de la France
* Familiariser l'étudiant avec le vocabulaire, la grammaire et les conversations
* Connaître des journaux, des courriels, des lettres
* Parler des projets de vacances
* Exprimer l'étonnement
* Parler de ses projets d'avenir, exprimer l'opposition.

**Unit-I: Un entretien et Au restaurant (10 heures)**

Demander des informations personnelles à quelqu'un, donner des informations, répondre à une proposition. Réserver une table, demander la carte, commander, apprécier les plats, demander l'addition.

**Grammaire:** Imparfait, Imparfait et passé composé, expression du temps, expression de la conséquence.Le futur, présent des verbes peser, rejoindre, le passé récent, le présent progressif, le futur proche, Restriction-ne…que, moi aussi…

**Unit-II : Enfin les vacances ! et Un autre institut (10 heures)**

Raconter son emploi du temps quotidien, parler des projets de vacances, exprimer l'étonnement. Rassurer/consoler, s'indigner

**Grammaire:** Verbes pronominaux, pronom y, quelqu'un/ne…personne, quelque chose/ne…rien, ne…jamais, Déjà/ne…pas encore, chacun, adjectifs indéfinis.Pronoms relatifs, impératif, indicateurs de temps : de…a, a partir de….jusqu'a, depuis, pendant.

**Unit-III : Un Indien célèbre visite la France et Qui dépense plus? (10 heures)**

Demander des informations sur quelqu'un, demander une opinion, donner son opinion. Dire à quelqu'un d'être prudent, faire des reproches à quelqu'un, se justifier.

**Grammaire:** Pronoms relatifs composés, pronoms compléments d'objet directs et indirectes, opposition savoir/Connaitre, connecteurs chronologiques, nombre ordinaux.Le comparatif, c'est+ nom+ qui, il reste, encore, il y a, souvent.

**Unit-IV: Penser à son avenir - (15 heures)**

Parler de ses projets d'avenir, exprimer l'opposition.



**Grammaire :** Style direct/indirect, proposition introduite par que, mots d'enchaînement – donc, pourtant.

**Unit-V: L'astrologie (15 heures)**

Exprimer des conditions, dire quelque chose n'a pas d'importance, proposer quelque chose.

**Grammaire:** Le conditionnel – la condition.

**Manuel:**

1. K.Madanagobalane, **Synchronie-II**, Samhitâ Publication, 2011.

**Livre de référence :**

1. Annie Berthet /B_atrix Sampsonis/ Catherine Hugot /V_ronnique M Kizirian / Monique Waendendries, **Alter Ego A1**, Hachette, 2006.
2. Yves Loiseau/R_gineM_rieux, Connexions 1, Didier, 2011.

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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester III | Course Code 17UGF310003 | | | | | Title of the Paper French-III | | | | | | Hours 4 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | | |
| CO1 | 4 | 4 | 2 | 3 | 4 | 4 | 2 | 3 | 3 | 2 | 2 | | 3.0 |
| CO2 | 3 | 3 | 3 | 3 | 4 | 4 | 2 | 3 | 4 | 2 | 3 | | 3.1 |
| CO3 | 3 | 2 | 3 | 2 | 4 | 3 | 4 | 3 | 3 | 3 | 3 | | 3.0 |
| CO4 | 3 | 3 | 4 | 3 | 4 | 2 | 3 | 3 | 3 | 4 | 4 | | 3.3 |
| CO5 | 3 | 3 | 4 | 3 | 4 | 2 | 3 | 3 | 4 | 4 | 4 | | 3.4 |
| CO6 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | | 3.4 |
| | | | | | | | | | | | Mean Overall Score | | 3.2 |

**Result: The Score for this Course is 3.2 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semester: III** **Hours/Week: 4**
**17UGS310001** **Credits : 3**

## SANSKRIT-III

**Course Outcomes**

At the end of the course, a student should be able to demonstrate…

* Knowledge and understanding of essential Sanskrit vocabulary in a given topic
* Knowledge and understanding of the appropriateness of basic Sanskrit structures in Slokas
* Knowledge of the basic Sanskrit poetry.
* An idea on Epics and Puranas.
* The usage of – Upasargas.
* The familiarization the history of Sankrit literature Vedas – Puranas and Natakas.

**Unit-I** **8 hours**

Romodantam. Balakandam. 1-15

**Unit-II** **12 hours**

Romodantam. Balakandam. 15-30

**Unit-III** **12 hours**

Vedas – Vedangas. vivaranam.

**Unit-IV** **14 hours**

Puranas. Upanishads.

**Unit-V** **14 hours**

Upasargas. Bhavishyat Kaalah

**Books recommended:**


1. Parameshwara, Ramodantam, LIFCO, Chaennai, 2015.
2. R.S. Vadhyar & Sons, Book-Sellers and Publishers, Kalpathi, Palghat-678003, Kerala, South India, History of Sanskrit Literature, 2015.
3. Kulapathy, K.M., Saral Sanskrit Balabodh, Bharathiya Vidya Bhavan, Munshimarg, Mumbai-400 007, 2015.


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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester III | Course Code 17UGS310003 | | | | | Title of the Paper Sanskrit-III | | | | | | Hours 4 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | | |
| CO1 | 5 | 3 | 5 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 4 | | 3.1 |
| CO2 | 4 | 3 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 4 | 4 | | 3.1 |
| CO3 | 4 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 4 | | 3.1 |
| CO4 | 4 | 3 | 3 | 4 | 3 | 4 | 4 | 4 | 3 | 4 | 4 | | 3.1 |
| CO5 | 4 | 4 | 4 | 3 | 4 | 3 | 3 | 4 | 3 | 4 | 4 | | 3.1 |
| CO6 | 5 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 4 | 3 | | 3.1 |
| | | | | | | | | | | Mean Overall Score | | | 3.1 |

**Result: The Score for this Course is 3.1 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semester: III** **Hours/Week: 5**
**17UGE320103** **Credits: 3**

## GENERAL ENGLISH-III

**Course Outcome**

* Comprehend the local and global issues through the lessons
* Do the tasks centering on skill development and enhance their Grammar Using and Writing Skills
* Use interactive skills
* Train and develop the Listening and Reading Skills of the learners through teacher-led reading practice
* Enhance their Listening, Reading, Speaking, and Writing Skills
* Develop their Creative and Critical Thinking and Speaking Skills

**Unit-I: *Suggestions to Develop Your Reading Habit**

1.0 Introduction
1.1 Objectives
1.2 Listening and Reading Skills through Teacher-led Reading Practice
1.3 Glossary
1.3.1 Words
1.3.2 Phrases
1.4 Reading Comprehension
1.5 Critical Analysis
1.6 Creative Task
1.7 General Writing Skill: Letter Writing: Informal
1.8 Grammar: Simple Present Tense
1.9 **Non-Detailed Text:** Dickens, Charles. *Hard Times.*

**Unit-II: *The Secret of Success: An Anecdote**

2.0 Introduction
2.1 Objectives
2.2 Listening and Reading Skills through Teacher-led Reading Practice
2.3 Glossary
2.3.1 Words
2.3.2 Phrases
2.4 Reading Comprehension
2.5 Critical Analysis
2.6 Creative Task
2.7 General Writing Skills: Letter Writing: Formal

2.8 Grammar: Present Continuous Tense
2.9 **Non-Detailed Text:** Dickens, Charles. *Hard Times.*

**Unit-III**: ***The Impact of Liquor Consumption on the Society**
3.0 Introduction
3.1 Objectives
3.2 Listening and Reading Skills through Teacher-led Reading Practice
3.3 Glossary
3.3.1 Words
3.3.2 Phrases
3.4 Reading Comprehension
3.5 Critical Analysis
3.6 Creative Task
3.7 General Writing Skills: Letter to Newspaper
3.8 Grammar: Simple Past Tense
3.9 **Non-Detailed Text:** Dickens, Charles. *Hard Times*.

**Unit-IV: * Dr. A.P.J. Abdul Kalam: A Short Biography**
4.0 Introduction
4.1 Objectives
4.2 Listening and Reading Skills through Teacher-led Reading Practice
4.3 Glossary
4.3.1 Words
4.3.2 Phrases
4.4 Reading Comprehension
4.5 Critical Analysis
4.6 Creative Task
4.7 General Writing Skill: Write a letter applying for a job
4.8 Grammar: Past Continuous Tense
4.9 **Non-Detailed Text:** Dickens, Charles. *Hard Times.*

**Unit-V: *Golden Rule: A Poem**
5.0 Introduction
5.1 Objectives
5.2 Listening and Reading Skills through Teacher-led Reading Practice
5.3 Glossary



5.3.1 Words
5.3.2 Phrases
5.4 Reading Comprehension
5.5 Critical Analysis
5.6 Creative Task
5.7 Grammar: Simple Future Tense
5.8 General Writing Skill: Circular-Writing
5.9 **Non-Detailed Text: Dickens, Charles. *Hard Times.***

**Unit-VI: *Hygiene**
6.0 Introduction
6.1 Objectives
6.2 Listening and Reading Skills through Teacher-led Reading Practice
6.3 Glossary
6.3.1 Words
6.3.2 Phrases
6.4 Reading Comprehension
6.5 Critical Analysis
6.6 Creative Task
6.7 General Writing Skill: Writing an Agenda for a Meeting
6.8 Grammar: Future Continuous Tense
6.9 **Non-Detailed Text: Dickens, Charles. *Hard Times.***

**Textbook**

1. Jayraj, S. Joseph Arul et al. *Trend-Setter: An Interactive General English Textbook for Under Graduate Students*. New Delhi: Trinity, 2016. Print.

**Non-Detailed Text:**

1. Dickens, Charles. *Hard Times.* Wordsworth: Printing Press, 1854. Print.

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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester III | Course Code 17UGE320103 | | | | | Title of the Paper General English-III | | | | | | | | Hours 5 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | | 4.84 |
| CO2 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | | 4.92 |
| CO3 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | | 4.92 |
| CO4 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | | 4.84 |
| CO5 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | | 4.84 |
| CO6 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | | 4.84 |
| | | | | | | | | | | | | Mean Overall Score | | | 4.86 |

**Result: The Score for this Course is 4.86 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semester III** **L P C**
**17UEL330205** **6 - 4**

## DIGITAL ELECTRONICS

**Course Outcomes**

1. Ability to understand digital signals and number systems
2. Ability to understand the operations of basic and universal logic gates
3. Ability to acquire knowledge on sequential and combinational logic circuits
4. Acquire knowledge on different memory storage types
5. Understand the basics of digital integrated circuits
6. Ability to understand Boolean algebra for digital circuits simplification

**UNIT-I: Digital Concepts and Number systems (15hrs)**

Introduction to digital concepts - digital and analog quantities - Binary digits - logic levels and digital waveforms - basic logic operations - digital integrated circuits. Decimal numbers - binary numbers - decimal to binary conversion - binary arithmetic - 1's and 2's complement - signed numbers - arithmetic operations with signed numbers - hexadecimal numbers - octal numbers - BCD - digital codes -gray code - alphanumeric codes - ASCII - error detection and correction codes.

**UNIT-II: Logic gates and Boolean algebra and logic simplification (15 hrs)**

Logic Gates: Inverter - AND - OR - NAND - NOR - Exclusive-OR - Exclusive-NOR - IC gates. Boolean operations and Expressions - Laws and rules of Boolean Algebra -DeMorgan's Theorems - Boolean analysis and logic circuits - Simplification using Boolean Algebra - Standard forms of Boolean Expressions - Boolean Expressions and Truth Tables -Karnaugh map - SOP minimization - POS minimization - five variable k-map

**UNIT-III: Combinational logic circuits (15 hrs)**

Basic combinational logic circuits - AND-OR Logic - AND-OR-Invert logic - implementing combinational logic - NAND and NOR gates - logic circuit operation with pulse waveforms. Overview of logic functions - basic adders - half adder - full adder - parallel binary adders - comparators - decoders - 4 bit decoders - BCD to decimal decoder - BCD to 7 segment decoder - encoders - decimal to BCD encoder - code converters - BCD to binary conversion - binary to gray and gray to binary conversion - multiplexers - 4 input multiplexer - demultiplexers - 1 line to 4 line demultiplexer- parity generators/ checkers - glitches in decoder circuits.

**UNIT-IV: Sequential logic circuits (15 hrs)**

Introduction to sequential logic circuits - Latches - SR latch - gated SR latch - D latch - edge triggered Flip-flops -SR flip-flop - D flip-flop - JK flip-flop - Master-slave flip-flops - flip-flop operating characteristics - Counters - Asynchronous counter - 2-bit and 3-bit Asynchronous binary counter - Asynchronous decade counter - synchronous counter - 2 bit and 3 bit synchronous binary counter - up/down synchronous counter - design of synchronous counter - cascaded counter - counter decoding - decoding glitches - Shift registers - serial in/serial out - serial in/parallel out - parallel in/serial out - parallel in/parallel out - bidirectional shift registers - shift register counters - Johnson counter - Ring counter

**UNIT-V: Memory storage, digital integrated circuits and PLDs (12 Hrs)**

Basics of Semiconductor memory - RAM - ROM - PROMs and EPROMs - flash memories - memory expansion - special types of memories - magnetic and optical storage - Basics of digital integrated chips - operational characteristics -CMOS circuits - TTL circuits - practical considerations in the use of TTL - comparison of CMOS and TTL - PLDs - SPLDs - PAL.

**BOOK FOR STUDY:**

1. T. L. Floyd and R.P. Jain, "Digital Fundamentals", Pearson education, 8th Edition,2008.

**BOOKS FOR REFERENCE:**

1. M. Morris Mano and Michael D. Ciletti, "Digital design", Pearson education, 4th Edition.2008.
2. G.K. Kharate, "Digital Electronics", Oxford University Press, 1st Edition, 2010.
3. John F. Wakerly, "Digital Design: Principles and Practices", Prentice Hall, 4th Edition 2006

**SECTIONS:**

| UNIT | BOOK | SECTIONS |
|---|---|---|
| I | 1 | 1.1 - 1.4, 2.1 - 2.12 |
| II | 1 | 3.1 - 3.7, 4.1 - 4.11 |
| III | 1 | 5.1 - 5.5, 6.1 - 6.11 |
| IV | 1 | 7.1 - 7.4, 8.1 - 8.6, 9.1 - 9.7 |
| V | 1 | 10.1 - 10-8, 11.1 - 11.6, 12.1 - 12.3 |



**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester III | Course Code 17UEL330205 | | | | | Title of the Paper: DIGITAL ELECTRONICS | | | | | | | | Hours 6 | Credits 5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 5 | 5 | 2 | 4 | 5 | 4 | 5 | 4 | 2 | 4 | 1 | 2 | 4 | 3.6 | |
| CO2 | 5 | 5 | 2 | 4 | 5 | 4 | 5 | 4 | 2 | 4 | 1 | 2 | 4 | 3.6 | |
| CO3 | 5 | 5 | 2 | 4 | 5 | 4 | 5 | 4 | 2 | 4 | 1 | 2 | 4 | 3.6 | |
| CO4 | 5 | 5 | 2 | 4 | 5 | 4 | 5 | 4 | 2 | 4 | 1 | 2 | 4 | 3.6 | |
| CO5 | 5 | 5 | 2 | 5 | 4 | 4 | 5 | 4 | 2 | 4 | 1 | 2 | 4 | 3.6 | |
| CO6 | 5 | 5 | 2 | 4 | 5 | 4 | 5 | 4 | 2 | 4 | 1 | 2 | 4 | 3.6 | |
| | | | | | | | | | | | | Mean Overall Score | | 3.6 | |

**Result: The Score for this Course is 3.6 (High Relationship)**

*Note:*

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

*Values Scaling:*

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semester III** **Hours/Week: 4**
**17UEL330403A** **Credits: 4**

**Allied: APPLIED PHYSICS-I**

**Course Outcomes**

1. Acquire the knowledge of conducting materials
2. Know and understand different magnetic materials.
3. Learn the properties of dielectric materials and its applications.
4. Understand the principles of superconducting materials and its applications.
5. Know the various modern engineering materials
6. Understand the basics of nanomaterials and carbon nanotubes.

**UNIT-I:**

**CONDUCTINGMATERIALS** **(12 Hrs)**

Introduction – Classical free electron theory of metals - Quantum theory – Free electron gas – Fermi energy and carrier concentration. Introduction – Origin of magnetic moment –Bohr magnetron –Diamagnetism – Paramagnetism and Ferromagnetism – Hysteresis –Anti-Ferro magnetic materials – Ferrites –Applications.

**UNIT-II:**

**MAGNETIC MATERIALS** **(12 Hrs)**

Introduction - Origin of magnetic moment - Bohr magnetron - Diamagnetism, Paramagnetism and Ferromagnetism - Hysteresis - Anti-ferromagnetic materials - Ferrites - Applications.

**UNIT-III:**

**DIELECTRIC MATERIALS** **(12 Hrs)**

Introduction - Basic definitions - Various types of polarization in dielectric materials - Frequency and temperature dependence of polarization - Internal field or local field – Clausius-Mosotti equation - Dielectric losses - Dielectric breakdown - Applications of dielectric materials - Ferro electricity.

**UNIT-IV:**

**SUPERCONDUCTING MATERIALS** **(12 Hrs)**

Introduction – Meissner effect - Transition temperature - Isotope effect - Types of superconductors - BCS theory - High-TC superconductors - Applications of superconductors.



**UNIT-V:**

**MODERN ENGINEERINGMATERIALS** **(12 Hrs)**

Metallic glasses - Shape memory alloys - Nano materials - Carbon nanotubes.

**BOOK FOR STUDY**

1. Engineering Physics - D.K. Bhattacharya &A. Bhaskaran, Oxford University Press, 2010.

| Unit | Section |
|---|---|
| Unit – 1 | 6.1 – 6.5 |
| Unit – 2 | 8.1 – 8.8 |
| Unit – 3 | 10.1 – 10.10 |
| Unit – 4 | 9.1 – 9.8 |
| Unit – 5 | 11.1 – 11.4 |

**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester III | Course Code 17UEL330403A | | | | | Title of the Paper Allied: APPLIED PHYSICS-I | | | | | | | | Hours 4 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 5 | 4 | 1 | 3 | 3 | 5 | 3 | 3 | 2 | 3 | 1 | 2 | 2 | | 3.23 |
| CO2 | 5 | 4 | 2 | 4 | 4 | 4 | 4 | 2 | 3 | 2 | 1 | 2 | 2 | | 3.31 |
| CO3 | 5 | 4 | 2 | 4 | 3 | 4 | 4 | 3 | 3 | 3 | 1 | 2 | 2 | | 3.07 |
| CO4 | 5 | 4 | 1 | 3 | 4 | 4 | 4 | 2 | 2 | 3 | 1 | 2 | 3 | | 2.92 |
| CO5 | 5 | 4 | 1 | 3 | 4 | 4 | 4 | 3 | 2 | 2 | 1 | 2 | 3 | | 2.92 |
| CO6 | 5 | 5 | 2 | 3 | 3 | 4 | 5 | 4 | 2 | 3 | 2 | 2 | 2 | | 3.23 |
| | | | | | | | | | | | | | | Mean Overall Score | 3.11 |

**Result: The Score for this Course is 3.1 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semester III** **Hours/Week: 4**
**17UEL330403B** **Credits: 4**

## Allied: Computer Science-I

## INTERNET AND DATABASE CONCEPTS

**Course Outcomes**

1. Know the concept behind the web and working of internet
2. Acquire the basic knowledge of designing web pages
3. Design colourful web pages and is able to create a basic website
4. Create web forms and fetch data meaningfully on the web
5. Learn the essence of Databases
6. Infer the skills to fetch and manipulate data through queries

**UNIT-I** **(hr 12)**

Introduction to the Internet : Computers in Business - Networking - Internet- Email - Resource Sharing -Gopher - WWW - Usenet - Telnet – BulletinBoard Service - Wide Area Information Service.

**UNIT-II** **(12)**

Introduction to HTML: Designing a home page - HTML document – Anchortag - Hyperlinks - Head and Body sections: Header section - Title – Prologue- links - colourful pages - comments - Body Section: Heading – Horizontalruler - Paragraph - Tabs - Images and pictures - Lists and their types - Nested lists - Table handling.

**UNIT-III** **(12)**

Frames - Frameset definition - Frame definition - Nested framesets. Formsand form elements.

**UNIT-IV** **(12)**

Database System Applications - Database Systems versus File Systems - View of Data - Data Models - Database Languages - Database Users andAdministrators - Transaction Management - Database System Structure -Application Architectures - History of Database Systems.

**UNIT-V** **(12)**

SQL Statements: Data Retrieval: SELECT, Data Definition Languages:CREATE, ALTER, DROP, RENAME, and TRUNCATE, Data ManipulationLanguage: INSERT - UPDATE, DELETE - MERGE. Transactional Control: COMMIT, ROLLBACK, SAVEPOINT, and Data Control Language: GRANT, REVOKE, SELECT ORDER BY - SELECT GROUP BY.

**BOOKS FOR STUDY**


1. C. Xavier, "World Wide Web Design with HTML", Tata McGraw Hill,2000.
2. Henry F. Korth Abraham Silberschatz , Database System Concepts,Fourth Edition McGraw Hill International Editions 2002.


**BOOKS FOR REFERENCE**


1. Wendy Willard, "Web Design - A beginners Guide", Tata McGraw Hill.
2. Thomas A. Powell, "The Complete Reference Web Design", Tata McGrawHill.
3. C.J. Date, An Introduction to Database System, seventh edition, PearsonEducation, New Delhi, 2002.




**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester III | Course Code 17UEL330403B | | | | | Title of the Paper: Computer Science-I | | | | | | | | Hours 4 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 4 | 4 | 3 | 4 | 4 | 3 | 3 | 3 | 4 | 4 | 4 | 3 | 4 | | 3.6 |
| CO2 | 5 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | | 4.0 |
| CO3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | | 3.9 |
| CO4 | 4 | 3 | 4 | 4 | 3 | 3 | 4 | 3 | 4 | 3 | 4 | 4 | 3 | | 3.5 |
| CO5 | 4 | 4 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | | 3.3 |
| CO6 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 4 | 4 | 3 | 4 | 4 | 4 | | 3.7 |
| | | | | | | | | | | | | | Mean Overall Score | | 3.7 |

**Result: The Score for this Course is 3.7 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semester III** **Hours/Week: 2**
**17UFC340901** **Credits: 2**

## ENVIRONMENTAL STUDIES

**Course Outcome**

1. To ensure understanding the significance of environment in which we live.
2. To ensure imparting knowledge on the recent issues associated with environment.
3. To ensure educating the youth the causes and consequences of various types of pollutions.
4. To ensure sensitizing the youth the increasing threats to nature and the misery mankind faces.
5. To ensure the limitations of the available natural resources and the need to sustain them.
6. To ensure imparting the knowledge on the concept of biodiversity and its advantages.

**Unit-I: Environmental Studies**

Environment - Scope and Importance - Environmental Movements in India - Eco-feminism - Public Awareness.

**Unit-II: Natural Resources**

Food Resources - L and Resources - Forest Resources - Mineral Resources - Water Resources - Energy Resources

**Unit-III: Ecosystems, Biodiversity and Conservation**

General structure - Functions of ecosystem - Energy flow and ecological pyramids - Biodiversity and conservation - Hot spots of Biodiversity - Endangered and Endemic Species - Value of Biodiversity - Threats to Biodiversity - Conservation of Biodiversity

**Unit-IV: Environmental Pollution**

Air pollution - Water pollution - Oil pollution - Soil pollution - Marine pollution - Noise pollution - Thermal pollution – Radiation pollution

**Unit-V: Environment, Human Population & Social Issues**

Human population growth - Urgent steps required for sustainable development - Conserving water - Current Environmental Issues

**Text Book:**

1. **Environmental studies,** Department of Foundation course, St.Joseph's College, Tiruchirappalli-2, 2015.



**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester III | Course Code 17UFC340901 | | | | | Title of the Paper ENVIRONMENTAL STUDIES | | | | | | | | Hours 2 | Credits 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 5 | 5 | 5 | 5 | 3 | 5 | 4 | 4 | 4 | 5 | 3 | 4 | 3 | 4.0 | |
| CO2 | 5 | 4 | 5 | 5 | 4 | 4 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4.5 | |
| CO3 | 5 | 4 | 5 | 5 | 3 | 5 | 4 | 4 | 5 | 3 | 3 | 4 | 2 | 4.0 | |
| CO4 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 5 | 4 | 4 | 3 | 4.2 | |
| CO5 | 5 | 5 | 4 | 5 | 4 | 3 | 5 | 5 | 4 | 4 | 5 | 3 | 4 | 4.3 | |
| CO6 | 5 | 5 | 4 | 4 | 3 | 4 | 4 | 3 | 3 | 4 | 3 | 2 | 4 | 3.7 | |
| | | | | | | | | | | | | | Mean Overall Score | | 4.1 |

**Result: The Score for this Course is 4.1 (Very High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semester IV** **Hours/Week: 2**
**17UFC441004A** **Credits: 2**

## FORMATION OF YOUTH-II

**Course Outcome**

1. To ensure preparing the students to live in harmony with nature.
2. To ensure the youth the significance of public health and the related issues.
3. To ensure sensitizing the youth about addictions and their consequences.
4. To ensure educating the youth on disaster management and First-Aid.
5. To ensure enlightening on the developmental issues and challenges of youth today.
6. To ensure the value of counselling for attaining positive mental health.

**Unit-I: Harmony with Nature**

What is environment, Why should we think of harmony, Longing for human well-being, Principles to conserve environmental resources, Causes of disharmony, The fruits of harmony with nature, Forest resources, Water resources, Mineral resources, Food resources, Fruits of dishormony, Economic values and growth, Environmental Ethics, Guidelines to live in harmony with nature, Towards life-centered system for better quality of life

**Unit-II: Public Health**

Health related issues, Health Care in India vs Developed Countries, Health and Heredity, Public Health - The Indian Scenario, Objectives of public health in India, Public Health System in India, Failure on the public health front, Role of the central government, Hospitals Services in India, Health and Abortion, Health and Drug Addiction, Drug abuse

**Unit-III: Disaster Management and First-Aid**

Disaster Management, Types of disaster, Plans of disaster management, Technology to manage natural disasters and catastrophes, Disaster Management, Rehabilitation and Reconstruction, Human-induced disaster, First Aid, The importance of First-aid, Disaster Declaration and Response

**Unit-IV: Issues Dealing with Science**

What is Science, Science and Religion, Social Relevance of Science and Technology, Science and technology for social justice, Difference caused by Science and Technology, Need for indigenous technology, Science,



Technology and Innovation Policy of India, Harnessing the forces of science and technology for the future

**Unit-V: Counselling for the Adolescents**

High Risk Behaviours, Developmental Changes in Adolescents, Key Issues of the Adolescents, Need for Counselling, Nature of Counselling, Counselling Goals, Does helping help? The Good and the Bad news.

**Text Book:**

1. **Formation of Youth,** Department of Foundation course, St.Joseph's College, Tiruchirappalli-2, 2016.

**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester IV | Course Code 17UFC441004A | | | | | Title of the Paper FORMATION OF YOUTH-II | | | | | | | | Hours 2 | Credits 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 4 | 4 | 5 | 4 | 5 | 5 | 3 | 4 | 5 | 5 | 4 | 5 | 4 | | 4.4 |
| CO2 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 3 | 4 | 4 | 4 | 5 | 5 | | 4.2 |
| CO3 | 5 | 3 | 5 | 4 | 5 | 4 | 4 | 3 | 4 | 4 | 4 | 5 | 5 | | 4.2 |
| CO4 | 3 | 4 | 5 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | | 4.0 |
| CO5 | 2 | 4 | 4 | 4 | 5 | 5 | 4 | 4 | 5 | 5 | 5 | 4 | 5 | | 4.3 |
| CO6 | 4 | 3 | 4 | 4 | 5 | 3 | 4 | 5 | 5 | 4 | 5 | 5 | 4 | | 4.2 |
| | | | | | | | | | | | | | Mean Overall Score | | 4.2 |

**Result: The Score for this Course is 4.2 (Very High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semester IV** **Hours/Week: 2**
**17UFC441004B** **Credits: 2**

## RELIGIOUS DOCTRINE-II

**Course Outcome**

1. To ensure appreciation of the harmony of religion.
2. To ensure training the youth in the power of prayer.
3. To ensure the understanding of Mary's role in salvation history and Marian Dogmas.
4. To ensure enlightening the graces and invisible effects of the sacraments.
5. To ensure the youth with the promise that God forgives failings on repentance.
6. To ensure understanding the concept of salvation and the promise of eternal life.

**Unit: I Harmony of Religions**

Introduction - Religions of India - Buddhism - Jainism - Sikhism - Judaism - Confucianism - Christianity - Zoroastrianism - Islam

**Unit: II The Christian Prayer**

Prayer Defined - Reasons to pray - The Way to Pray - Types of Prayer - Obstacles for Prayer - Prayer in Old -The Lord's Prayer

**Unit: III Mary, the Blessed Virgin, Mother of God**

Introduction - Marian Dogmas - Mary in need of Redemption - Mary in the New Testament - Apparitions of Mary - Devotion to Mary

**Unit: IV Sacraments of Initiation**

Introduction - An Overview - Baptism - Confirmation - Holy Eucharist

Unit: V Sacraments of Healing & at the Service of the Community

Reconciliation - Anointing of the Sick - Holy Orders – Matrimony

**Text Book:**

1. **Life in the Lord,** Department of Foundation course, St. Joseph's College, Tiruchirappalli-2, 2011.

**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester IV | Course Code 17UFC441004B | | | | Title of the Paper RELIGIOUS DOCTRINE-II | | | | | | | | Hours 2 | Credits 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | |
| CO1 | 4 | 1 | 4 | 3 | 3 | 4 | 4 | 4 | 5 | 4 | 5 | 5 | 5 | 3.9 |
| CO2 | 4 | 1 | 4 | 3 | 3 | 4 | 4 | 4 | 5 | 4 | 5 | 5 | 5 | 3.9 |
| CO3 | 4 | 3 | 4 | 4 | 3 | 4 | 4 | 5 | 4 | 4 | 5 | 5 | 5 | 4.2 |
| CO4 | 4 | 1 | 4 | 3 | 3 | 4 | 4 | 4 | 5 | 4 | 5 | 5 | 5 | 3.9 |
| CO5 | 4 | 1 | 4 | 3 | 3 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 5 | 3.8 |
| CO6 | 4 | 1 | 4 | 3 | 3 | 5 | 5 | 5 | 5 | 4 | 5 | 4 | 4 | 4.0 |
| | | | | | | | | | | | | | Mean Overall Score | 3.9 |

**Result: The Score for this Course is 3.9 (High Relationship)**

*Note:*

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

*Values Scaling:*

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**பருவம்: 4** **மணி நேரம்: 4**

**17UGT410004** **புள்ளிகள்: 3**

## பொதுத்தமிழ்-IV

**பாடத்தின் விளைவு**

- நாடகத்தின் போக்குகள், உத்திகள், பாத்திரப்படைப்பு, உரையாடல் முறை, கற்பனைத்திறம் போன்றவற்றை அறிந்துகொள்ளுதல்.
- புதிய நாடகங்களைப் படைக்கும் திறனைப் பெறுதல்.
- நாடகங்களை நடிக்கும் திறன் பெறுதல்
- கிரேக்க, ஆங்கில நாடகங்களை அடியொற்றி தமிழ்நாடகம் தோன்றிய வரலாறு அறியச் செய்தல்.
- சங்ககாலம் தொட்டு இக்காலம் வரை காதல் பற்றிய உணர்வுகளை எடுத்துரைத்தல்.
- தமிழ் வரலாற்றின் மன்னர்களின் ஆட்சியின் சிறப்புகளையும் வீழ்ச்சிகளையும் எடுத்துக்காட்டுதல்.

**அலகு-1** **(12 மணி நேரம்)**

மனோன்மணீயம், பாயிரம், அங்கம் - 1, களம் 1 - 5 வரை.

**அலகு-2** **(12 மணி நேரம்)**

மனோன்மணீயம், அங்கம் - 2, களம் 1 - 3 வரை.

இலக்கிய வரலாறு நான்காம் பாகம் - தமிழும் பிற துறைகளும் பக்கம் (365-387).

**அலகு-3** **(12 மணி நேரம்)**

மனோன்மணீயம், அங்கம் - 3, களம் 1 - 4 வரை.

உரைநடை நாடகம் ( கௌதம புத்தர்)

**அலகு-4** **(12 மணி நேரம்)**

மனோன்மணீயம், அங்கம் - 4, களம் 1 - 5 வரை.

இலக்கிய வரலாறு நான்காம் பாகம் - சமயத்தவரின் தமிழ்ப்பணி (பக்கம் 391-402)

**அலகு-5** **(12 மணி நேரம்)**

மனோன்மணீயம், அங்கம் - 5, களம் 1 - 3 வரை.

இலக்கிய வரலாறு நான்காம் பாகம் - வெளிநாடுகள் தந்த தமிழ் இலக்கியம் (பக்கம் 410-435)

**பாடநூல்கள் :**


1. சுந்தரனார், மனோன்மணீயம், தமிழாய்வுத்துறை (பதிப்பு), தூய வளனார் கல்லூரி, திருச்சிராப்பள்ளி-2. (அங்கம் : 3 களம் : 4 நீங்கலாக)
2. பாலசுப்பிரமணியம். கு.வெ, கௌதம புத்தர், அய்யா நிலையம், தஞ்சாவூர்
3. சமூகவியல் நோக்கில் தமிழிலக்கிய வரலாறு, தமிழாய்வுத்துறை வெளியீடு, 2014.


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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester IV | Course Code 17UGT410004 | | | | | Title of the Paper தொழுத்துமிழ்-IV | | | | | | | | Hours 4 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 4 | 3 | 4 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 5 | 5 | 5 | | 4.5 |
| CO2 | 5 | 4 | 3 | 5 | 4 | 5 | 5 | 4 | 4 | 3 | 4 | 5 | 5 | | 4.3 |
| CO3 | 4 | 3 | 3 | 5 | 4 | 3 | 3 | 4 | 3 | 3 | 4 | 5 | 5 | | 3.7 |
| CO4 | 5 | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | | 4.8 |
| CO5 | 3 | 4 | 4 | 5 | 5 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | | 4.1 |
| CO6 | 4 | 3 | 4 | 5 | 5 | 4 | 3 | 3 | 4 | 3 | 2 | 2 | 3 | | 3.4 |
| | | | | | | | | | | | | | Mean Overall Score | | 4.1 |

**Result: The Score for this Course is 4.1 (Very High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semestre: IV** **Hours/Week: 4**
**17UGH410004** **Credits: 3**

## HINDI-IV

**Course Outcomes**

At the end of the course, a student should be able to demonstrate…

* the ability to empower the students with globally employable soft skills
* the ability to translate Hindi passages to English
* the ideas on human values
* the ability to instruct the moral values given by the Bhakthi Saints
* the knowledge of Indian festivals .
* the knowledge of culture and tradition

**Unit-I** **8 hours**

Vidyarthi, Banking Shabda, Anuvad, Anuvad Lesson – 1, Adhikal, Premchand

**Unit-II** **12 hours**

Pusthakalaya, Nemikaryalaya Tippaniyan, Anuvadak, Anuvad lesson-2, Bakthikal-Gyan Marg, Mahadevivarma

**Unit-III** **12 hours**

Thyohar, Anuvad Ke Gun, Anuvad lesson – 3, Bakthi, Tippaniyaan, Prem Marg, Pant

**Unit-IV** **14 hours**

Yugpuresh Gandhi, Anuvadak Ke Gun, Anuvad Lesson – 4 Bakthikal, Bakthikal – Ram Bakthi Kal - Krishna Bakthi, Dinkar

**Unit-V** **14 hours**

Braman, Anuvad ek kala, Swarnayug Bakthikal, Anuvad Lesson - 5, Reetikal, Chayavad

**Books Recommended**


1. Kendriya Sachivalaya, Hindi Parishad New Delhi, Karyalaya Sahayika, 2016.
2. Dakshin Bharat Hindi Prachar Sabha Chennai-17, Niband Radhana, Hindi, 2016.
3. DBHP Sabha, Chennai-17, Anuvad Abyas-3, Hindi, 2016
4. Rajnath Sharma, Hindi Sahitya ka Itihas, Vinkod Pustak Mandir, Agra-2, 2016.

**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester IV | Course Code 17UGH410004 | | | | | Title of the Paper Hindi-IV | | | | | | Hours 4 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | | |
| CO1 | 4 | 4 | 4 | 3 | 4 | 3 | 3 | 4 | 5 | 4 | 4 | | 3.5 |
| CO2 | 3 | 3 | 2 | 3 | 3 | 3 | 5 | 3 | 4 | 3 | 3 | | 3.1 |
| CO3 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 4 | 3 | 3 | | 3.1 |
| CO4 | 3 | 2 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | | 2.7 |
| CO5 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 3 | 3 | 4 | 4 | | 3.3 |
| CO6 | 4 | 4 | 4 | 4 | 3 | 5 | 3 | 5 | 4 | 4 | 3 | | 3.9 |
| | | | | | | | | | | | Mean Overall Score | | 3.3 |

**Result: The Score for this Course is 3.3 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semestre: IV** **Heures /Semaine: 4**
**17UGF410004** **Credits : 3**

## FRANÇAIS-IV

**Course Outcomes**

* Comparer la culture de l'Inde et de la France
* Familiariser l'étudiant avec le vocabulaire, la grammaire et les conversations
* Connaître les auteurs français (20 auteurs) et leurs œuvres
* Dire qu'on aime quelqu'un/ quelque chose
* Demander des informations
* Exprimer une opinion personnelle et Justifier son opinion.

**Unit-I : Prières du Nouvel An** **(10 heures)**

Exprimer l'inquiétude, le regret, le souhait, l'obligation, la sympathie.

**Grammaire :** Le subjonctif, verbe craindre

**Unit-II : Retrouvailles** **(10 heures)**

Marquer la surprise

**Grammaire :** Le subjonctif, pronoms possessifs.

**Unit-III : C'est lui le meilleur ! (10 heures)**

Dire qu'on aime quelqu'un/ quelque chose, donner son opinion, insister.

**Grammaire :** Le superlatif, les pronoms démonstratif.

**Unit-IV Sauvons notre Terre !** **(15 heures)**

Enchaînement de cause et d'effet, demander à quelqu'un de tenir compté de quelque chose.

**Grammaire :** Le plus-que-parfait, il y a.

**Unit-V : Le jour des élections s'approche et les auteurs français (20 auteurs) et leurs œuvres** **(15 heures)**

Demander des informations, dire qu'une action n'est pas utile, exprimer une opinion personnelle, Justifier son opinion.

**Grammaire :** Le participe présent – le gérondif, la voix passive.

**Manuel**:

1. K.Madanagobalane, **Synchronie-II**, Samhitâ Publication, 2011.

**Livre de référence**:

1. Annie Berthet /B_atrix Sampsonis/ Catherine Hugot /V_ronnique M Kizirian / Monique Waendendries, **Alter Ego A1**, Hachette, 2006.
2. Yves Loiseau/R_gineM_rieux, Connexions 1, Didier, 2011.

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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester IV | Course Code 17UGF410004 | | | | | Title of the Paper French-IV | | | | | | Hours 4 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | | |
| CO1 | 4 | 4 | 2 | 3 | 4 | 4 | 2 | 3 | 2 | 2 | 3 | | 3.0 |
| CO2 | 3 | 3 | 3 | 3 | 4 | 4 | 2 | 4 | 3 | 2 | 3 | | 3.1 |
| CO3 | 3 | 2 | 3 | 2 | 4 | 3 | 4 | 3 | 3 | 3 | 4 | | 3.1 |
| CO4 | 3 | 3 | 4 | 3 | 4 | 1 | 2 | 2 | 4 | 3 | 3 | | 2.9 |
| CO5 | 3 | 3 | 4 | 3 | 4 | 3 | 2 | 2 | 4 | 4 | 5 | | 3.4 |
| CO6 | 3 | 4 | 3 | 3 | 3 | 4 | 4 | 2 | 4 | 3 | 4 | | 3.4 |
| | | | | | | | | | | Mean Overall Score | | | 3.2 |

**Result: The Score for this Course is 3.2 (High Relationship)**

*Note:*

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

*Values Scaling:*

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semester: IV** **Hours/Week: 4**
**17UGS410004** **Credits : 3**

## SANSKRIT-IV

**Course Outcomes**

At the end of the course, a student should be able to demonstrate…

* knowledge and understanding of the history of Sanskrit Drama.
* knowledge and understanding of the Nataka vivaranam.
* the introduction of Functional - Sanskrit conversation Letter writing.
* the ability to apply relevant theoretical perspectives to topics within the field of study
* the competence in academic writing and oral presentation skills.
* the ability to work both independently and in groups on presentations and/or development of Projects.

**Unit-I** **8 hours**

Paataah – Asta, Nava Dasha, Sankhya prayogah.

**Unit-II** **12 hours**

Lot lakaarah. Prqayaogah. Kartari Vaakyaani

**Unit-III** **12 hours**

Naatakasya Itihaasah.

**Unit-IV** **14 hours**

Karnabhaaram. Naatakam.

**Unit-V** **14 hours**

Kathaapaatra Vailaksharnyam.

**Books recommended:**


1. R.S.Vadhyar & Sons, Book-Sellers and Publishers, Kalpathi, Palghat 678003, Kerala, South India, History of Sanskrit Literature, 2014.
2. Samskritha Bharathi, Aksharam 8th Cross, 2nd Phase, Giri Nagar, Bangalore. Vadatu Sanskritam – Samskara Binduhu, 2014.
3. R.S. Vadhyar & Sons, Book-Sellers and Publishers, Kalpathi, Palghat 678003, Kerala, Soth India. Karnabharam, 2014.
4. Kulapathy, K.M., Saral Sanskrit Balabodh, Bharathiya vidya Bhavan, Munshimarg, Mumbai 400007, 2014.


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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester IV | Course Code 17UGS410004 | Title of the Paper Sanskrit-IV | | | | | | | | | Hours 4 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | Mean Score of COs |
| CO1 | 5 | 3 | 5 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 4 | 3.1 |
| CO2 | 4 | 3 | 4 | 4 | 4 | 3 | 3 | 4 | 3 | 4 | 3 | 3.1 |
| CO3 | 4 | 3 | 3 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 3.2 |
| CO4 | 4 | 3 | 3 | 4 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 3.1 |
| CO5 | 4 | 4 | 4 | 3 | 4 | 3 | 4 | 3 | 4 | 4 | 4 | 3.0 |
| CO6 | 5 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 4 | 3.2 |
| | | | | | | | | | | Mean Overall Score | | 3.1 |

**Result: The Score for this Course is 3.1 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling*:**

| | |
|---|---|
| **Mean Score of COs** = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$ | **Mean Overall Score for COs** = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$ |



**Semester: IV** **Hours/Week: 5**
**17UGE420104** **Credits: 3**

**GENERAL ENGLISH-IV**

**Course Outcome**

* Comprehend the local and global issues through the lessons
* Do the tasks centering on skill development and enhance their Grammar Using and Writing Skills
* Use interactive skills
* Train and develop the Listening and Reading Skills of the learners through teacher-led reading practice
* Improve their General Writing Skills such as Note-Taking, Note-Making, Précis Writing, Paragraph Writing, and Writing Short Essays on Current Issues/General Topics
* Understanding the social background and human character of the period

**Unit-VII:**

***Women through the Eyes of Media**

7.0 Introduction
7.1 Objectives
7.2 Listening and Reading Skills through Teacher-led Reading Practice
7.3 Glossary
7.3.1 Words
7.3.2 Phrases
7.4 Reading Comprehension
7.5 Critical Analysis
7.6 Creative Task
7.7 General Writing Skill: Writing Minutes of a Meeting
7.8 Grammar: Present Perfect Tense
7.9 **Non -Detailed Poem:** Thomas Hood (1799–1845): "Silence"

**Unit-VIII:**

***Effects of Tobacco Smoking**

8.0 Introduction
8.1 Objectives
8.2 Listening and Reading Skills through Teacher-led Reading Practice
8.3 Glossary
8.3.1 Words
8.3.2 Phrases

8.4 Reading Comprehension
8.5 Critical Analysis
8.6 Creative Task
8.7 General Writing Skill: Note-Taking
8.8 Grammar: Present Perfect Continuous Tense
8.9 **Non -Detailed Poem:** Coventry Patmore (1823-1896): "The Toys"

**Unit-IX:**

*** Short Message Service (SMS)**

9.0 Introduction
9.1 Objectives
9.2 Listening and Reading Skills through Teacher-led Reading Practice
9.3 Glossary
9.3.1 Words
9.3.2 Phrases
9.4 Reading Comprehension
9.5 Critical Analysis
9.6 Creative Task
9.7 General Writing Skill: Note-Making
9.8 Grammar: Past Perfect Tense
9.9 **Non -Detailed Poem:** Stephen Spender (1909-1995): "Daybreak"

**Unit-X:**

***An Engineer Kills Self as Crow Sat on his Head: A News Paper Report**

10.0 Introduction
10.1 Objectives
10.2 Listening and Reading Skills through Teacher-led Reading Practice
10.3 Glossary
10.3.1 Words
10.3.2 Phrases
10.4 Reading Comprehension
10.5. Critical Analysis
10.6. Creative Task
10.7 General Writing Skill: Précis Writing
10.8 Grammar: Past Perfect Continuous Tense
10.9 **Non -Detailed Poem:** Gabriel Imomotimi Okara (1921): "Once Upon a Time"



**Unit-XI:**

***Traffic Rules**

11.0 Introduction
11.1 Objectives
11.2 Listening and Reading Skills through Teacher-led Reading Practice
11.3 Glossary
11.3.1 Words
11.3.2 Phrases
11.4 Reading Comprehension
11.5 Critical Analysis
11.6 Creative Task
11.7 General Writing Skill: Paragraph Writing
11.8 Grammar: Future Perfect Tense
11.9 **Non -Detailed Poem:** Robert Winner (1930-1986): "Opportunity"

**Unit-XII:**

***A Handful of Answers: A Zen Tale**

12.0 Introduction
12.1 Objectives
12.2 Listening and Reading Skills through Teacher-led Reading Practice
12.3 Glossary
12.3.1 Words
12.3.2 Phrases
12.4 Reading Comprehension
12.5 Critical Analysis
12.6 Creative Task
12.7 General Writing Skill: Writing Short Essays on Current Issues/General Topics
12.8 Grammar: Future Perfect Continuous Tense
12.9 **Non -Detailed Poem:** Ted Hughes (1930–1998): "The Harvest Moon"

**Textbook**

1. Jayraj, S. Joseph Arul et al. *Trend-Setter: An Interactive General English Textbook for Under Graduate Students*. New Delhi: Trinity, 2016. Print.

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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester IV | Course Code 17UGE420104 | | | | | Title of the Paper General English-IV | | | | | | | | Hours 5 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 5 | 4 | 5 | 5 | 4 | 4 | 4 | 5 | 5 | 5 | 4 | 5 | 5 | | 4.61 |
| CO2 | 5 | 4 | 5 | 5 | 3 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | 4.69 |
| CO3 | 4 | 4 | 5 | 4 | 4 | 3 | 4 | 4 | 5 | 5 | 4 | 4 | 5 | | 4.23 |
| CO4 | 4 | 4 | 5 | 4 | 4 | 3 | 4 | 5 | 5 | 5 | 4 | 4 | 5 | | 4.30 |
| CO5 | 5 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 4 | 4 | 5 | | 4.38 |
| CO6 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 5 | 5 | 5 | 4 | 4 | 5 | | 4.61 |
| | | | | | | | | | | | | | Mean Overall Score | | **4.47** |

**Result: The Score for this Course is 4.47 (Very High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

| Mean Score of COs = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$ | Mean Overall Score for COs = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$ |
|---|---|



**Semester IV** **L P C**
**17UEL430206** **6 - 4**

## ELECTRONIC DEVICES AND CIRCUITS

**Course Outcomes**

1. Ability to acquire the knowledge on basic electronic devices.
2. Ability to understand the various applications of electronic devices.
3. Ability to differentiate various transistors
4. Will be able to classify and analyze various power devices
5. Ability to understand various types of Oscillators
6. Will be able to acquire knowledge on feedback amplifiers & Power Amplifiers

**UNIT-I: Special Function Diodes (15 Hrs)**

Introduction-Diode resistance -Transition or space charge capacitance-Diffusion capacitance-Effect of temperature on PN junction diode-Junction diode switching characteristics-Break down in PN junction diode-Diode as circuit element -Zener diode, varactor diode, step recovery diode, Schottky diodes, Tunnel diode, Gunn diode- Diode applications.

**UNIT-II: Transistor amplifier (15 Hrs)**

Introduction - Characteristics- Relation between alpha beta-Transistor configuration-Biasing of transistor-Biasing methods of transistor-Transistor switch-Transistor inverter - current mirror Using BJT-Transistor amplifier-Transistor: voltage and current amplifier-Single stage CE, CC and CB Amplifier. UJT characteristics and operating principle.

**UNIT-III: FET, MOSFET& Power Devices (15 Hrs)**

Introduction - construction of FET -operation of FET - Configurations ofFET - Pinch-off voltage - VI characteristics - Low Frequency Modelof FET - Construction of MOSFET - Enhancement type - Depletion type - VI characteristics - Construction of SCR - Equivalent transistor model -operation - VI characteristics - Construction of TRIAC, DIAC & IGBT.

**UNIT-IV: Feedback Amplifiers (15 Hrs)**

Concepts of feedback - effects and Types of negative feedback - Feedback topology - Nyquist criterion for stability of feedback amplifiers - Barkhausen's Criterion - Mechanism for start of oscillation - oscillators -Analysis of LC oscillators: Colpitt's - Hartley - Clapp oscillator circuits -RC phase shift oscillator - Wien's bridge oscillator - crystal oscillator circuits.

**UNIT-V: Tuned & Power Amplifiers** **(12 Hrs)**

Tuned Amplifier: Single Tuned - Double Tuned - Stagger tuned - PowerAmplifiers: Working principle of Class A - Class AB - Class B - Class C - ClassD - Class S amplifiers - Efficiency of class A, Band C amplifiers.

**BOOKS FOR STUDY:**


1. Salivahanan. S, Suresh Kumar .N, Vallavaraj. A, "Electronic Devices and Circuits", 2nd Edition, TMH, 2008
2. R.Y.Borse, "Basic electronic Devices and circuits" First edition 2012, Adhyayan Publishers & Distributors, New Delhi.


**BOOKS FOR REFERENCE:**


1. Thareja B.L."Basic electronics" S. Chand and Co. 3rd edition -2012.
2. David bell. "electronic devices and circuits", 5th edition, 2008, PHI
3. Mehta V.K & Mehta R, "Principles of Electronics", 3rd edition, S. Chand& Co, 2005.
4. Albert Malvino and David Bates, "Electronics Principles", 8th Edition, 2015, Mc Graw Hill.


**SECTIONS:**

| UNIT | BOOK | SECTIONS |
|---|---|---|
| I | 1 | 4.15-4.23,5.1-5.5,5.7.5-5.9, 17.1 – 17.2 |
| II | 2 | 4.1.8-4.1.11, 5.1 – 5.1.1.3, 5.1.2 – 5.1.3, 5.1.5 – 5.1.7, 6.1, 6.2, 6.4, 6.6 -6.7 |
| III | 1 | 7.1-7.6, 7.9-7.11, 17.2, 8.3, 8.4, 8.7, 8.8. Lecture notes- IGBT |
| IV | 1 | 14.2 - 14.6, 15.3- 15.7, 15.11(i) - 15.12, 15.14 |
| V | 1 | 13.3.1, 13.3.2, 13.6, 12.1 - 12.14 |



**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester IV | Course Code 17UEL430206 | Title of the Paper: ELECTRONIC DEVICES AND CIRCUITS | | | | | | | | | | | Hours 6 | Credits 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | |
| CO1 | 5 | 4 | 2 | 4 | 4 | 3 | 4 | 4 | 2 | 4 | 2 | 3 | 3 | 3.4 |
| CO2 | 5 | 4 | 2 | 4 | 4 | 3 | 4 | 4 | 2 | 4 | 2 | 3 | 3 | 3.4 |
| CO3 | 5 | 4 | 2 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 2 | 3 | 3 | 3.4 |
| CO4 | 5 | 4 | 2 | 4 | 4 | 3 | 4 | 4 | 2 | 4 | 2 | 3 | 3 | 3.4 |
| CO5 | 5 | 4 | 2 | 4 | 4 | 3 | 4 | 4 | 2 | 4 | 2 | 3 | 3 | 3.4 |
| CO6 | 5 | 4 | 2 | 4 | 4 | 3 | 4 | 4 | 2 | 4 | 2 | 3 | 3 | 3.4 |
| | | | | | | | | | | | | Mean Overall Score | | 3.4 |

**Result: The Score for this Course is 3.4 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

| Semester IV | L | P | C |
|---|---|---|---|
| 17UEL430207 | - | 3 | 4 |

**Electronics Practical-II**

**DIGITAL ELECTRONICS AND ELECTRONICS DEVICES AND CIRCUITS**

**Course Outcomes**

1. Ability to understand the concepts of semiconductor circuits and digital circuits by practical experiments
2. To learn the basic IDE's for circuit simulation.

**List of Experiments: Any Sixteen - Digital electronics (8) and Analog (8)**

**Digital Experiments:**

1. Construction and study of basic gates (NOT, AND and OR) using transistor and diodes
2. Simplification of Boolean laws
3. Simplification and verification of K-map
4. Construction and study of 4:1 Multiplexer and 1:4 Demultiplexer and study of IC 74151 and IC74154
5. Construction and study of encoder and decoder
6. Construction and study of synchronous counters
7. Construction and study of Flip-Flops
8. Construction and study of Asynchronous counters
9. Construction and study of Shift registers
10. Construction and study of adder and subtractors
11. Construction and study of 3bit parity generator and checker
12. Construction and study of binary to gray, gray to binary code, decimal to ASCII and ASCII to decimal code converters
13. Construction and Study of basic gates (AND, OR and NOT) using Universal gates (NAND and NOR) and study of voltage levels (TTL & CMOS).

**Analog experiments (Electronics devices and Circuits)**

14. Study of Zener diode characteristics.
15. UJT relaxation oscillator
16. Study of clipper and clamper circuits using diodes
17. Study of transistor biasing ,calculation of Q-point and DC load line analysis



18. Study of FET biasing.
19. Study of MOSFET characteristics.
20. Study of SCR characteristics
21. Lamp dimmer using TRIAC& DIAC
22. Study of Transistor characteristics -CE mode
23. Study of Transistor characteristics -CB mode
24. Study of Transistor characteristics -CC mode
25. Construction and Study of RC coupled Transistor amplifier
26. Transistor voltage and current amplifier
27. Hartley oscillator -construction and verification of start of oscillation equation
28. Colpitt's oscillator - construction and verification of start of oscillation equation
29. Construction and study of RC phase shift oscillator
30. Construction and study of Wien's bridge oscillator
31. Construction and study of Class A Power Amplifier
32. Construction and study of Class B Power Amplifier
33. Construction and study of Class E Power Amplifier

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**Semester IV** **L P C**

**17UEL430301A** **4 - 3**

**Core Elective: HOME APPLIANCES SERVICING AND REPAIR**

**Course Outcomes**

1. Ability to understand the classification of active components
2. Ability to understand the classification of passive components
3. Will be able to integrate trouble shooting skills in equipment servicing
4. Will be able acquire knowledge on operations of home appliances
5. Ability to acquire knowledge on maintenance and safety measures of home appliances
6. Ability to understand test and troubleshooting chart of home appliances

**UNIT-I: Electronic components** **(10 Hrs)**

Introduction–Passive components–Transformer–Working principle–application–Active devices: Diode–Transistor– Analog IC–amplifier–oscillators and Digital ICs–logic gates–encoder–decoder.

**UNIT-II: Equipments for servicing** **(8 Hrs)**

Soldering Iron–Flux–lead–Zero defect soldering–Desoldering pump–soldering station–Basics of Multimeter–Measurement of current, voltage and resistance using multimeter–Checking transistors and diodes–In circuit measurements.

**UNIT-III: Heating appliances** **(10 Hrs)**

Heater types–working principle– Heating Rod–Iron Box–Iron box with steamer–Toasters– Geysers– MicroWave Ovens– Oven –Disassembling and assembling procedure– Fault indicator–Testing and Troubleshooting methods.

**UNIT-IV: Motorised appliances** **(10 Hrs)**

Types of Motors–DC and AC motor– Fans– mixers– blenders–wet grinders–circuit connection- testing methods. Washing machine – Electrical connections–assembly – Dish washer –Electrical connection–Testing and troubleshooting methods.

**UNIT-V: Refrigeration appliances** **(10 Hrs)**

Fridge– Electrical connection– Compressor–coolants–Automatic defrost circuits –Testing and troubleshooting of refrigerators–Air coolers and Air conditioners–Mounting and fixing of Air Conditioners–testing and troubleshooting methods.

**Book for Study:** Material prepared by the department

**Book for Reference:**

1. Trevor Linsely, "Electronic Servicing and Repairs", 3rd Edition, 2011, Rouledge



**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester IV | Course Code 17UEL430301A | | | | | Title of the Paper: HOME APPLIANCES SERVICING AND REPAIR | | | | | | | | Hours 4 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 4 | 3 | 2 | 4 | 5 | 4 | 3 | 2 | 3 | 4 | 4 | 4 | 4 | | 3.5 |
| CO2 | 4 | 3 | 2 | 4 | 5 | 4 | 3 | 2 | 3 | 4 | 4 | 4 | 4 | | 3.5 |
| CO3 | 4 | 3 | 2 | 3 | 5 | 4 | 3 | 2 | 3 | 4 | 4 | 4 | 4 | | 3.5 |
| CO4 | 4 | 3 | 2 | 3 | 5 | 4 | 3 | 2 | 3 | 4 | 4 | 4 | 4 | | 3.5 |
| CO5 | 4 | 3 | 2 | 5 | 5 | 4 | 3 | 2 | 3 | 4 | 4 | 4 | 4 | | 3.6 |
| CO6 | 4 | 3 | 2 | 4 | 5 | 4 | 3 | 2 | 3 | 4 | 4 | 4 | 4 | | 3.5 |
| | | | | | | | | | | | | | Mean Overall Score | | 3.5 |

**Result: The Score for this Course is 3.5 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semester IV** **L P C**
**17UEL430301B** **4 - 3**

**Core Elective:**

**LAB EQUIPMENTS MAINTENANCE AND SERVICING**

**Course Outcomes:**

1. Ability to understand the classification of active components
2. Will be able to understand the classification of passive components
3. Will be able to integrate trouble shooting skills in lab equipment servicing
4. Ability to acquire knowledge on operations of lab equipment.
5. Ability to acquire knowledge on maintenance and safety measures of lab equipment
6. Will be able to understand test and troubleshooting chart of lab equipment.

**UNIT-I: Passive and Active components** **(10 Hrs)**

Resistors–types–Colorcode–wattage–tolerence–capacitors–types–inductors–transformer–stepup and step down–-uses–Diode–ratings–operation–transistor–NPN and PNP–switching–amplifier–Diode and Transistor testing–MOSFET–Types–Testing MOSFET.

**UNIT-II: Power supply** **(10 Hrs)**

AC power supply-parameters–DC power supply design–Regulated power supplies–single–Dual– variable voltage–Switched mode power supply–Transformerless power supply design– Design of fuses–Testing and troubleshooting.

**UNIT-III: Analog Equipments** **(10 Hrs)**

Variable Resistance Box–variable Capacitance Box– variable inductance box–Cathode Ray oscilloscope –Block diagram–Frequency measurement – Function generator– Range of frequencies–Amplitude–types of waves-Meters- Ammeter-Voltmeter-Testing and trouble shooting.

**UNIT-IV: Digital Equipments** **(8 Hrs)**

LED–current limiting concept–switches–types-Logic module–circuit diagram–Concept of common ground–Pulse generator–Circuit diagram – Active low and Active high pulses – Logic modules interfacing boards–Kits–Testing and troubleshooting methods.



**UNIT-V:Common chemistry lab equipments** **(10 Hrs)**

Digital balance–block diagram–Load cell sensors–pH meter–electrode specifications–Stirrer–Centrifuge–Rotation Per Minute measurement–magnetic stirrer with paddle–block diagram–Ovan–heating elements

**BOOK FOR STUDY:**

Material prepared by the department

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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester IV | Course Code 17UEL430301B | | | Title of the Paper: LAB EQUIPMENT MAINTENANCE AND SERVICING | | | | | | | | Hours 4 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | |
| CO1 | 4 | 2 | 2 | 4 | 4 | 4 | 3 | 3 | 4 | 3 | 4 | 3 | 4 | 3.4 |
| CO2 | 4 | 2 | 2 | 4 | 4 | 4 | 3 | 3 | 4 | 3 | 4 | 3 | 4 | 3.4 |
| CO3 | 4 | 2 | 2 | 4 | 5 | 4 | 3 | 4 | 4 | 3 | 4 | 3 | 4 | 3.5 |
| CO4 | 4 | 2 | 2 | 4 | 5 | 4 | 3 | 4 | 4 | 3 | 4 | 2 | 4 | 3.5 |
| CO5 | 4 | 2 | 2 | 4 | 5 | 4 | 3 | 3 | 4 | 3 | 4 | 2 | 4 | 3.4 |
| CO6 | 4 | 3 | 2 | 4 | 5 | 4 | 3 | 2 | 4 | 4 | 4 | 4 | 4 | 3.6 |
| | | | | | | | | | | | | | Mean Overall Score | 3.5 |

**Result: The Score for this Course is 3.5 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semester IV** **L P C**
**17UEL430404A** **4 - 4**

**Allied: APPLIED PHYSICS - II**

**Course Outcomes**

1. Understand the laws of quantum physics.
2. Understand the working of laser.
3. Know the types of lasers and the application of laser
4. Learn the basics of ultrasonic, its production and applications.
5. Understand principles, functions and applications of fiber optics
6. Understand physics of semiconducting materials.

**UNIT - I:**

**QUANTUM PHYSICS** **(12 Hrs)**

Introduction - Black body radiation - Compton effect - Matter waves - Hesienberg's Uncertainty principle - Schordinger 's wave equation - The electron microscope

**UNIT - II:**

**LASERS** **(12 Hrs)**

Introduction - Principle of spontaneous emission and stimulated emission - Population inversion – Types of lasers – He-Ne lasers – $CO_2$ laser – semiconductor laser - Industrial applications - Medical application – Holography – applications of holography

**UNIT - III:**

**ULTRASONICS** **(12 Hrs)**

Introduction - Production of ultrasonic waves - Detection of ultrasonic waves - Properties of ultrasonic waves - Cavitation - Acoustic grating - Industrial applications - SONAR - Non-destructive testing - Medical application

**UNIT – IV:**

**FIBRE OPTICS AND APPLICATIONS** **(12 Hrs)**

Introduction - Propagation of light in optical fibres - Numerical aperture and acceptance angle - Types of optical fibres - Double crucible technique of fiber drawing - Splicing - Power losses in optical fibres - Fibre optic communication systems - Light sources - Detectors - Fibre optic sensors - Endoscope.

**UNIT- V:**

**SEMICONDUCTING MATERIALS** **(12 Hrs)**

Introduction - Intrinsic semiconductors – Carrier concentration – Fermi level – variation of Fermi level with temperature – Electrical conductivity – Band

gap determination – Extrinsic semiconductors (carrier concentration in n-type and p-type semiconductors) –Variation of Fermi level with temperature and impurity concentration – compound semiconductors – Hall Effect and its Applications.

**BOOK FOR STUDY**

1. Engineering Physics - D.K. Bhattacharya &A. Bhaskaran, Oxford University Press, 2010.
   Unit-1: Sec.4.1-4.7; Unit-2: Sec.2.1-2.7; Unit-3: Sec.1.1-1.10; Unit-4: Sec.3.1-3.12; Unit-5: Sec.7.1-7.11



**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester IV | Course Code 17UEL430404A | | | | | Title of the Paper Allied: APPLIED PHYSICS-II | | | | | | | | Hours 4 | Credits 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 5 | 4 | 1 | 3 | 3 | 5 | 3 | 3 | 2 | 3 | 1 | 2 | 2 | | 3.23 |
| CO2 | 5 | 4 | 2 | 4 | 4 | 4 | 4 | 2 | 3 | 2 | 1 | 2 | 2 | | 3.31 |
| CO3 | 5 | 4 | 2 | 4 | 3 | 4 | 4 | 3 | 3 | 3 | 1 | 2 | 2 | | 3.07 |
| CO4 | 5 | 4 | 1 | 3 | 4 | 4 | 4 | 2 | 2 | 3 | 1 | 2 | 3 | | 2.92 |
| CO5 | 5 | 4 | 1 | 3 | 4 | 4 | 4 | 3 | 2 | 2 | 1 | 2 | 3 | | 2.92 |
| CO6 | 5 | 5 | 2 | 3 | 3 | 4 | 5 | 4 | 2 | 3 | 2 | 2 | 2 | | 3.23 |
| | | | | | | | | | | | | | Mean Overall Score | | 3.11 |

**Result: The Score for this Course is 3.1 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semester IV** **L P C**
**17UEL430405A** **- 2 2**

**Practical:**
**APPLIED PHYSICS**

**Course Outcomes**

1. Learn the basics of ultrasonic, its production and applications.
2. Understand principles, functions and applications of fiber optics.
3. Understand physics of semiconducting materials.

**Any 16 experiments**

1. Spectrometer – Refractive index of a prism
2. Spectrometer – Grating – Minimum Deviation – Wavelength
3. Field along the axis of a coil – Field
4. Field along the axis of the coil – Moment of a magnet – TAN A
5. Convex lens
6. Concave lens
7. P.O Box – Temperature coefficient – Thermister
8. Carey Foster's Bridge – R and n
9. Potentiometer – Ammeter Calibration
10. Potentiometer – Resistance of a coil of wire R and n
11. BG – Figure of merit & Resistance of the Galvanometer
12. BG – Determination of C
13. Conversion of a Galvanometer into voltmeter
14. Conversion of a Galvanometer into Ammeter
15. Newton's law of cooling
16. K- Forbe's method
17. Resonaters
18. Air Wedge – Thickness of a wire
19. Newton's Rings – Determination of R
20. Sonometer – Frequency

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**Semester IV** **Hours/Week: 4**
**17UEL430404B** **Credits: 4**

**Allied: Computer Science-II**
**DATA AND COMMUNICATION NETWORKS**

**Course Outcomes**

1. Familiarize the students to understand the basic concepts of Data Communication
2. Understand the Classification of computer networks
3. Acquire the knowledge of Topology
4. Gets to know about the various types of networks
5. Learns the different transmission media
6. Infers the concept used in Mobile Communication technology

**Unit-I** **(12 )**

Data Communication Fundamentals: Analog Signal Transmission – Digital Signal Transmission. Data Transmission: Serial and Parallel Transmission – Communication Modes – Transmission Modes – Transmission Media : Two – wire open lines – Twisted Pair – Coaxial Cable – Optical Fibers – Unguided Transmission Media.

**Unit-II** **(12 )**

Classification of Computer Networks: Classification by Geographical Spread – Topological Classification – Classification by Ownership – Circuit Switching – Message Switching – Packet Switching – Routing – Multiplexing and Concentration: Frequency Division Multiplexing – Time Division Multiplexing – Concentrator – Terminal Handling – Components of Computer Network

**Unit-III** **(12 )**

Local Area Network – The Evolution of LAN – LAN Architecture – The OSI Model and LAN Access – LAN advantages and Services – Characteristics of LAN: The Server – Workstations – The Transmission Media for LAN – Communication Equipments – LAN Topologies: Bus and Tree – Ring Topology – Star Topology – LAN Access Protocols : Round Robin – Contention – Reservation.

**Unit-IV** **(12 )**

Wireless LANs: Need for Wireless LANs – Advantages of Wireless LANs – Components of Wireless LAN: Mobile Clients – Special Units – Working of Wireless LANs – Transmission Media: Radio Wave Technologies –

Narrowband Technology –DSSS - FHSS – Infrared Technology: Characteristics of Infrared Transmission – Direct Modulation – Operating Modes – Benefits and Drawbacks – Wireless LAN Types : Ad hoc Wireless LAN – Infrastructure Wireless LAN

**Unit-V** **(12 )**

Digital Cellular Radio : Global Systems for Mobile Communications – Cellular Digital Packet Data – Code Division Multiple Access – Bluetooth technology : The Evolution – Goals and Features – Bluetooth products – Network Architecture – Hardware and Software Architecture – Applications – Features of ISDN – ISDN Channels – ISDN Services – ISDN User Interface

**Books for Study**


1. Rajesh, Eswarakumar, Balasubramanian, "Computer Networks, Fundamentals and Applications", Vikas Publishing House Pvt. Ltd, 2002.


**Books for Reference**


1. William Stallings, " Data and Computer Communications", Prentice Hall of India, Seventh Edition, 2004.




**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester IV | Course Code 17UEL430404B | | | | | Title of the Paper: Computer Science-II | | | | | | | | Hours 4 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 4 | 3 | 4 | 4 | 2 | 2 | 2 | 2 | 3 | 4 | 5 | 3 | 3 | 3.1 | |
| CO2 | 5 | 2 | 4 | 5 | 4 | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 2 | 3.3 | |
| CO3 | 5 | 4 | 5 | 4 | 4 | 2 | 4 | 2 | 4 | 3 | 4 | 5 | 2 | 3.6 | |
| CO4 | 4 | 2 | 5 | 4 | 2 | 2 | 2 | 2 | 5 | 3 | 4 | 4 | 2 | 3.1 | |
| CO5 | 4 | 4 | 4 | 4 | 2 | 2 | 3 | 2 | 4 | 3 | 3 | 4 | 2 | 3.1 | |
| CO6 | 4 | 4 | 4 | 4 | 4 | 2 | 3 | 2 | 4 | 3 | 3 | 5 | 3 | 3.4 | |
| | | | | | | | | | | | | Mean Overall Score | | 3.3 | |

**Result: The Score for this Course is 3.3 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semester III & IV** **Hours/Week: 2**
**17UEL430405B** **Credits: 2**

**Allied:**

**COMPUTER SCIENCE PRACTICALS**

**(SOFTWARE LAB - WEB DESIGN USING HTML)**

**Course Outcomes**

1. Able to understand the Web desiging concepts using HTML by practically

**Detailed Study**

1. Simple web page with all the text formatting tags
2. Adding images to Web pages
3. Creating Lists (Ordered and unordered list )
4. Adding links to Web Pages
5. Creating Tables using various attributes
6. Creating Frames
7. Designing forms using simple form elements
8. Implementation of Data Definition language commands
9. Implementation of DML, TCL and DCL commands

**Simple Projects using HTML**

1. Creating Web blocks consists of personal details
2. Creating Website for the Department/college



**Semester IV** **Hours/Week: 2**
**17UFC441004A** **Credits: 2**

**FORMATION OF YOUTH-II**

**Course Outcome**

1. To ensure preparing the students to live in harmony with nature.
2. To ensure the youth the significance of public health and the related issues.
3. To ensure sensitizing the youth about addictions and their consequences.
4. To ensure educating the youth on disaster management and First-Aid.
5. To ensure enlightening on the developmental issues and challenges of youth today.
6. To ensure the value of counselling for attaining positive mental health.

**Unit-I: Harmony with Nature**

What is environment, Why should we think of harmony, Longing for human well-being, Principles to conserve environmental resources, Causes of disharmony, The fruits of harmony with nature, Forest resources, Water resources, Mineral resources, Food resources, Fruits of dishormony, Economic values and growth, Environmental Ethics, Guidelines to live in harmony with nature, Towards life-centered system for better quality of life

**Unit-II: Public Health**

Health related issues, Health Care in India vs Developed Countries, Health and Heredity, Public Health - The Indian Scenario, Objectives of public health in India, Public Health System in India, Failure on the public health front, Role of the central government, Hospitals Services in India, Health and Abortion, Health and Drug Addiction, Drug abuse

**Unit-III: Disaster Management and First-Aid**

Disaster Management, Types of disaster, Plans of disaster management, Technology to manage natural disasters and catastrophes, Disaster Management, Rehabilitation and Reconstruction, Human-induced disaster, First Aid, The importance of First-aid, Disaster Declaration and Response

**Unit-IV: Issues Dealing with Science**

What is Science, Science and Religion, Social Relevance of Science and Technology, Science and technology for social justice, Difference caused by Science and Technology, Need for indigenous technology, Science,

Technology and Innovation Policy of India, Harnessing the forces of science and technology for the future

**Unit-V: Counselling for the Adolescents**

High Risk Behaviours, Developmental Changes in Adolescents, Key Issues of the Adolescents, Need for Counselling, Nature of Counselling, Counselling Goals, Does helping help? The Good and the Bad news.

**Text Book:**


1. **Formation of Youth,** Department of Foundation course, St.Joseph's College, Tiruchirappalli-2, 2016.


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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester IV | Course Code 17UFC441004A | | | | | Title of the Paper FORMATION OF YOUTH-II | | | | | | | | Hours 2 | Credits 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 4 | 4 | 5 | 4 | 5 | 5 | 3 | 4 | 5 | 5 | 4 | 5 | 4 | | 4.4 |
| CO2 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 3 | 4 | 4 | 4 | 5 | 5 | | 4.2 |
| CO3 | 5 | 3 | 5 | 4 | 5 | 4 | 4 | 3 | 4 | 4 | 4 | 5 | 5 | | 4.2 |
| CO4 | 3 | 4 | 5 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | | 4.0 |
| CO5 | 2 | 4 | 4 | 4 | 5 | 5 | 4 | 4 | 5 | 5 | 5 | 4 | 5 | | 4.3 |
| CO6 | 4 | 3 | 4 | 4 | 5 | 3 | 4 | 5 | 5 | 4 | 5 | 5 | 4 | | 4.2 |
| | | | | | | | | | | | | | Mean Overall Score | | 4.2 |

**Result: The Score for this Course is 4.2 (Very High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semester IV** **Hours/Week: 2**
**17UFC441004B** **Credits: 2**

## RELIGIOUS DOCTRINE-II

**Course Outcome**

1. To ensure appreciation of the harmony of religion.
2. To ensure training the youth in the power of prayer.
3. To ensure the understanding of Mary's role in salvation history and Marian Dogmas.
4. To ensure enlightening the graces and invisible effects of the sacraments.
5. To ensure the youth with the promise that God forgives failings on repentance.
6. To ensure understanding the concept of salvation and the promise of eternal life.

**Unit: I Harmony of Religions**

Introduction - Religions of India - Buddhism - Jainism - Sikhism - Judaism - Confucianism - Christianity - Zoroastrianism - Islam

**Unit: II The Christian Prayer**

Prayer Defined - Reasons to pray - The Way to Pray - Types of Prayer - Obstacles for Prayer - Prayer in Old -The Lord's Prayer

**Unit: III Mary, the Blessed Virgin, Mother of God**

Introduction - Marian Dogmas - Mary in need of Redemption - Mary in the New Testament - Apparitions of Mary - Devotion to Mary

**Unit: IV Sacraments of Initiation**

Introduction - An Overview - Baptism - Confirmation - Holy Eucharist

Unit: V Sacraments of Healing & at the Service of the Community

Reconciliation - Anointing of the Sick - Holy Orders – Matrimony

**Text Book:**

1. **Life in the Lord,** Department of Foundation course, St. Joseph's College, Tiruchirappalli-2, 2011.

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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester IV | Course Code 17UFC441004B | | | | | Title of the Paper RELIGIOUS DOCTRINE-II | | | | | | | | Hours 2 | Credits 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 4 | 1 | 4 | 3 | 3 | 4 | 4 | 4 | 5 | 4 | 5 | 5 | 5 | 3.9 | |
| CO2 | 4 | 1 | 4 | 3 | 3 | 4 | 4 | 4 | 5 | 4 | 5 | 5 | 5 | 3.9 | |
| CO3 | 4 | 3 | 4 | 4 | 3 | 4 | 4 | 5 | 4 | 4 | 5 | 5 | 5 | 4.2 | |
| CO4 | 4 | 1 | 4 | 3 | 3 | 4 | 4 | 4 | 5 | 4 | 5 | 5 | 5 | 3.9 | |
| CO5 | 4 | 1 | 4 | 3 | 3 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 5 | 3.8 | |
| CO6 | 4 | 1 | 4 | 3 | 3 | 5 | 5 | 5 | 5 | 4 | 5 | 4 | 4 | 4.0 | |
| | | | | | | | | | | | | | Mean Overall Score | 3.9 | |

**Result: The Score for this Course is 3.9 (High Relationship)**

*Note:*

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semester V** **L P C**
**17UEL530208** **5 - 4**

## MICROPROCESSORS AND ITS APPLICATION

**Course Outcomes:**

1. Ability to acquire knowledge on architecture of 8085 microprocessor.
2. Ability to understand the 8085 instruction set and memory mapping concepts.
3. Ability to understand and interpret 8085 assembly language program.
4. Will be able to acquire knowledge on interfacing different peripheral devices with 8085.
5. Ability to understand architecture of 8086 microprocessor
6. Will be able to understand the instruction set of 8086 to develop assembly language programs.

**UNIT-I: Architecture of Intel 8085 (12 Hrs)**

Overview of microprocessors - Architecture of 8085 microprocessor, ALU-Timing and control unit – registers - Address bus and data bus – Pin configuration – Intel 8085 instructions – opcode and operands – instruction word size - Instruction cycle – Fetch operation – Execute operation - machine cycle and T-state instruction and date flow- timing diagram for opcode fetch cycle – memory read – I/O read – memory write – I/O write

**UNIT-II: Instruction Set & Programming Basics of 8085 (12 Hrs)**

Instruction and data format -Addressing modes -direct addressing -register addressing -register indirect addressing -immediate addressing -implicit addressing -status flags -symbols and abbreviations -Intel 8085 -data transfer -arithmetic -logic - branching -stack I/O and machine control group. Assembly language -high level language.

Programming exercises -multiplication, division, array manipulation (average in array, ascending, descending, mean, median), BCD to seven segment display.

**UNIT-III: Advanced Programming of 8085 (12 Hrs)**

Stack and stack related operations – Subroutines - interrupt based programming: hardware and software interrupts – interrupts call location – RST7.5,6.5 and 5.5 -Asynchronous and synchronous data transfer-Delay subroutine : Time delays using single register and register pair-8085 simulator software.



**UNIT-IV: Peripheral Interfaces (14 Hrs)**

Address space partitioning -Memory and I/O interfacing -PPI 8255 -UART 8251 –8253 Timer -8259 interrupt controller -8237 programmable DMA -8275 programmable CRT controller-8279 keyboard and display interface controller - Applications Stepper motor and traffic controller using 8085 microprocessor.

**UNIT-V: Intel 8086 Architecture (10 Hrs)**

Intel 8086 architecture - Pin description and function overview - Minimal &maximum mode -Bus activities during read/write operation-Interrupts structure and its operation - Comparative study of 286,386,486 & Pentium processors.

**BOOKS FOR STUDY:**


1. B. Ram: Fundamentals of microprocessors and microcomputers-DhanpatRai Publications, New Delhi, 5th edition, reprint 2003.
2. Barry B. Brey, "THE INTEL MICROPROCESSORS", 8th Edition, Imprint of PEARSON.2009.


**BOOKS FOR REFERENCE:**


1. Ramesh S. Gaonkar: Microprocessor Architecture, Programming and Application with the 8085-Penram International Publishing, Mumbai,6th edition,2013
2. V. Vijayendran: Fundamentals of microprocessor-8085- S. Viswanathan publishers, Chennai, 2009.


**SECTIONS:**

| UNIT | BOOK | SECTION |
|---|---|---|
| I | 1 | Chapter – 3 |
| II | 1 | Chapter – 4,5.1-5.3, Programming exercises- lecture notes |
| III | 1 | 5.5-5.6, 7.5.1-7.5.3,7.4.1,7.4.2,9.1-9.2 |
| IV | 1 | 7.1-7.3.2, 7.7,7.10,7.11.1,7.9,7.8,7.12,7.12.5,9.7-9.8 |
| V | 2 | 2.1,9.1,9.3-9.6,12.1,16.1,17.1,18.1,19.1 |

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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester V | Course Code 17UEL530208 | | | | Title of the Paper: MICROPROCESSOR AND ITS APPLICATION | | | | | | | | Hours 5 | Credits 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | |
| CO1 | 5 | 5 | 2 | 4 | 4 | 4 | 2 | 3 | 1 | 4 | 4 | 2 | 4 | 3.4 |
| CO2 | 5 | 5 | 2 | 4 | 4 | 4 | 4 | 1 | 4 | 1 | 3 | 2 | 4 | 3.3 |
| CO3 | 5 | 5 | 2 | 4 | 4 | 3 | 3 | 1 | 4 | 1 | 3 | 2 | 4 | 3.1 |
| CO4 | 5 | 5 | 2 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 3 | 2 | 4 | 3.7 |
| CO5 | 5 | 5 | 2 | 4 | 4 | 3 | 2 | 3 | 1 | 4 | 4 | 2 | 4 | 3.3 |
| CO6 | 5 | 5 | 2 | 4 | 4 | 3 | 3 | 2 | 4 | 1 | 3 | 2 | 4 | 3.2 |
| | | | | | | | | | | | | | Mean Overall Score | 3.3 |

**Result: The Score for this Course is 3.3 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semester V** **L P C**
**17UEL530209** **5 - 4**

## LINEAR INTEGRATED CIRCUITS

**Course Outcomes:**

1. Ability to understand different IC fabrication techniques
2. Will be able to acquire knowledge on Op-amp and its characteristics.
3. Ability to understand various applications of Op-amps.
4. Ability to understand functional blocks of IC555
5. Ability to design circuits usingIC555
6. Ability to understand the knowledge on analog to digital converter and digital to analog converter.

**UNIT-I: Integrated Circuit Fabrication (10 Hrs)**

Introduction - Classification - IC chip size and circuit complexity - Fundamentals of Monolithic IC technology - Development of IC - Package types - Basic planar process - Fabrication of a typical circuit - Active and Passive components for ICs - fabrication of FETs - thin and thick film technology.

**UNIT-II: Op-Amp and Its Characteristics (12 Hrs)**

Introduction to op-amp - basics of op-amp -circuit symbol - op-amp terminals - linear IC's - ideal op-amp - open loop operation - feedback in ideal op-amp - inverting amplifier - non-inverting amplifier - voltage follower - differential amplifier - CMRR - op-amp internal circuit - difference amplifier - constant current source - input resistance - active load - level translator - output stage. DC characteristics - Input bias current - input offset current - input offset voltage - total offset voltage - thermal drift. Slew rate - analysis of data sheets of an op-amp.

**UNIT-III: Op-Amp Applications (12 Hrs)**

Basic op-amp applications - scale changer inverter - summing amplifier - inverting summing amplifier - non-inverting summing amplifier -subtractor-adder-subtractor- instrumentation amplifier - AC amplifier - V to I and I to V converter - op-amp circuits using diodes - half-wave rectifier - full-wave rectifier - peak detector - clipper - clamper - sample and hold circuit - Differentiator - integrator. Comparator - zero crossing detector - window detector - phase detector - Schmitt trigger.

**UNIT-IV: Waveform Generators and Filters (12 Hrs)**

Square Wave generator –monostable multivibrator- triangular wave generator - sine wave generator - phase shift oscillator - Wien's bridge oscillator - Square wave generator -RC filters - first order low pass filter - second order low pass filter - high pass active filter - band pass filter - Band reject filter.

**UNIT-V: Timer and D/A, A/D Converters (14 Hrs)**

555 Timer: Functional block diagram -Monostable operation - applications in monostable mode - missing pulse detector - linear ramp generator - frequency divider - pulse width modulation -Astable operation - applications in astable mode - FSK generator - pulse-position modulator - 555 timer as Schmitt trigger - PLL - phase detector - voltage controlled oscillator - introduction to digital to analog converters - basic DAC techniques - weighted resistor DAC - R-2R Ladder DAC - inverted R-2R Ladder - Analog to digital converters - flash - counter type - servo tracking A/D converter - Successive approximation converter - Dual slope ADC - DAC and ADC specifications.

**BOOK FOR STUDY:**

1. Roy D. Choudhury, Shail Jain, "Linear Integrated Circuits", 2002 Reprint, New Age International (P) Limited.

**BOOKS FOR REFERENCES:**

1. Ramakant A. Gayakwad, "Op-amps and Linear Integrated Circuits", 4th Edition, Prentice Hall India,2003.
2. N. Mathivanan, "PC based instrumentation: concepts and practice", 1st Edition, PHI learning Pvt. Ltd.2007

**SECTIONS:**

| UNIT | BOOK | SECTIONS |
|---|---|---|
| I | 1 | 1.1 - 1.9 lecture notes – development of IC and package types |
| II | 1 | 2.1 - 2.4.6, 3.1 - 3.2.5, 3.3.4 - 3.4 |
| III | 1 | 4.1 - 4.7, 4.10 - 4.11, 5.1 - 5.3 |
| IV | 1 | 5.4 - 5.7, 7.1. - 7.2.2, 7.2.4 - 7.2.6. |
| V | 1 | 8.1 - 8.5, 9.1 - 9.4, 10.1 - 10.2.3, 10.3 - 10.3.4, 10.3.6, 10.4 |



**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester V | Course Code 17UEL530209 | | | | | Title of the Paper: LINEAR INTEGRATED CIRCUITS | | | | | | | Hours 5 | Credits 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | |
| CO1 | 5 | 4 | 3 | 2 | 4 | 4 | 2 | 3 | 4 | 2 | 4 | 2 | 4 | 3.3 |
| CO2 | 5 | 4 | 3 | 4 | 4 | 4 | 4 | 3 | 4 | 3 | 3 | 2 | 4 | 3.6 |
| CO3 | 5 | 4 | 3 | 3 | 4 | 4 | 4 | 3 | 4 | 3 | 3 | 2 | 4 | 3.5 |
| CO4 | 5 | 4 | 3 | 4 | 4 | 4 | 3 | 3 | 4 | 3 | 3 | 2 | 4 | 3.5 |
| CO5 | 5 | 4 | 3 | 2 | 4 | 4 | 3 | 3 | 4 | 2 | 3 | 2 | 4 | 3.3 |
| CO6 | 5 | 4 | 3 | 4 | 4 | 4 | 4 | 3 | 4 | 2 | 3 | 2 | 4 | 3.5 |
| | | | | | | | | | | | | Mean Overall Score | | 3.5 |

**Result: The Score for this Course is 3.5 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semester V** **L P C**
**17UEL530210** **6 - 4**

## COMMUNICATION SYSTEM

**Course Outcomes:**

1. Ability to understand the basics of analog communication systems
2. Acquire knowledge on various modulation techniques
3. Acquire knowledge on AM transmitter and receiver functions
4. Ability to understand FM transmitter and receiver functions
5. Ability to understand various types of noise in communication systems
6. Acquire knowledge on PAM and PCM techniques

**UNIT-I: Amplitude Modulation (12 Hrs)**

Modulation - Types of modulation (AM, FM and PM) - Mathematical expression for AM wave - Side frequencies - Modulation index - power relationship - component phasor of AM signal - spectrum of AM wave. Generation of AM waves - Linear modulation - collector, base and emitter modulation - Square law modulator - Balanced modulator –DSS- SC-SSB - SC generation - VSB. Demodulation of AM waves

**UNIT-II: Frequency and Phase Modulation (12 Hrs)**

Angle modulation - Phase and frequency modulation - Mathematical representation of FM and PM - Frequency spectrum of FM - Bandwidth of FM: Bessel's identity - Carson's rule - spectrum of Narrow Band and Wide Band FM. Generation of FM - Direct and indirect method - Relationship between FM and PM - Pre-emphasis and de-emphasis in FM. Demodulation of FM waves - Slope detector - Balanced slope detector - Foster - Seeley discriminator - Ratio detector - Amplitude limiter.

**UNIT-III: Transmitter and Receivers (12 Hrs)**

Communication transceiver- Block schematic study of transmitters - AM transmitter - High level and low level AM transmitters - SSB-SC transmitter - FM transmitter - Direct and indirect FM transmitters. Block schematic study of receivers - Types - TRF receiver- Super heterodyne receiver -Double conversion receiver - Choice of IF frequencies - Tracking -Alignment - AGC - AFC - Characteristics of receivers -

**UNIT-IV: Noise (12 Hrs)**

Introduction-Classification of noise-Atmospheric noise-Extraterrestrial noise-Man made noise-Thermal noise-Shot noise-Addition of noise due to several sources- Addition of noise due to several amplifiers in cascade- Noise in



reactive circuits-Signal to Noise ratio-Noise figure-Calculation of noise figure-Expression for noise figure in terms of equivalent noise resistance-Noise temperature

**UNIT-V: Pulse Modulation (12 Hrs)**

Sampling process - PAM - other forms of pulse modulation - Bandwidth - Noise trade off - Quantization - PCM - Noise considerations in PCM systems - TDM - Digital multiplexers - Virtues, limitation and modification of PCM modulation - Linear prediction - Differential pulse code modulation - delta modulation - Adaptive Delta Modulation.

**BOOKS FOR STUDY:**


1. Kennedy and George Davis, "Electronic Communication Systems", 4th Edition, 1999.
2. Dennis Roddy and John Coolen, "Electronic Communications", 4th Edition, PHI, 1997
3. Simon Hawkins, John Wiley, "Communication systems", 4th Edition, 2001.
4. G.K. Mithal 'Radio engineering, 20th edition kanna publication, 2002.


**BOOKS FOR REFERENCE:**


1. R.P. Singh and S.D. Sapre, "Communication Systems Analog and Digital", Tata McGraw Hill, 1995.
2. Anokh Singh, "Principles of communication Engineering", S. Chand and Co. Ltd., 1994.
3. Taub and Schilling, "Principles of communication", 2nd Edition, McGraw Hill, 1989.
4. N.D Deshpande, D.A. Deshpande, & P.K. Rangola, "Communication electronics",7th reprint. Tata Mc Graw Hill New Delhi, 1996


**SECTIONS:**

| UNIT | BOOK | SECTIONS |
|---|---|---|
| I | 2 | Chapter 2,4 |
| II | 1 | Chapter 4 |
| III | 1<br>2 | Chapter 5,<br>Chapter 11 |
| IV | 4 | Chapter 2 |
| V | 3 | 4.1-4.7, 4.10, 4.11 |

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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester V | Course Code 17UEL530210 | | | | | Title of the Paper: COMMUNICATION SYSTEM | | | | | | | | Hours 6 | Credits 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 4 | 4 | 2 | 3 | 4 | 4 | 4 | 5 | 2 | 2 | 2 | 4 | 4 | 3.4 | |
| CO2 | 4 | 4 | 2 | 3 | 4 | 4 | 4 | 5 | 2 | 2 | 2 | 4 | 4 | 3.4 | |
| CO3 | 4 | 4 | 2 | 3 | 4 | 4 | 4 | 5 | 2 | 2 | 2 | 4 | 4 | 3.4 | |
| CO4 | 4 | 4 | 2 | 3 | 4 | 4 | 4 | 5 | 2 | 2 | 2 | 4 | 4 | 3.4 | |
| CO5 | 4 | 4 | 2 | 3 | 4 | 4 | 4 | 5 | 2 | 2 | 2 | 4 | 4 | 3.4 | |
| CO6 | 4 | 4 | 2 | 3 | 4 | 4 | 4 | 5 | 2 | 2 | 2 | 4 | 4 | 3.4 | |
| | | | | | | | | | | | | | Mean Overall Score | | 3.4 |

**Result: The Score for this Course is 3.4 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semester V** **L P C**
**17UEL530211** **- 6 4**

## Electronics Practical-III
## OPERATIONAL AMPLIFIER, COMMUNICATION, MICROPROCESSOR & 'C' PROGRAMMING

**Course Outcomes**

1. To learn the principles of operations and applications of Operational amplifier.
2. Ability to learn the concepts of instrumentation
3. Able to learn the programming in microprocessor

**List of experiments:**

**Any sixteen: Op-amp (6), Microprocessor (5), Communication and 'C' programming (5)**

1. Microprocessor 8085- Programming I { Data transfer and rotate operations }
2. Microprocessor 8085- Programming II {addition, subtraction, multiplication and division }
3. Microprocessor 8085- Programming III { Code conversion - Gray to Binary, Binary to BCD Binary to Gray, BCD to Binary }
4. Microprocessor 8085 - Programming IV { largest, smallest, sorting in ascending order and descending order }
5. Microprocessor 8085 - Programming V {Usinguser routines in Monitor program}
6. Microprocessor Interfacing - Input and Output using8255 PPI
7. Microprocessor Interfacing - 8253
8. Microprocessor Interfacing - Traffic Controller.
9. Microprocessor Interfacing - Stepper Motor Controller.
10. Study of AM
11. Study of FM
12. Study of PAM, PWM, PPM and PCM
13. Study of Transmission Line Characteristics
14. Study of BM
15. Fiber optic communication {NA, Losses, receiver sensitivity}
16. Study of op-amp characteristics using LM741
17. Construction and study of inverting, non-inverting, voltage follower, summing amplifier using op-amp LM741

18. Construction and study of comparator, integrator and differentiator using op-amp TL064
19. Construction and study of instrumentation amplifier using op-amp LM358
20. Construction and study of phase shift and wiens bridge oscillator using op-amp LM358
21. Construction and study of filters using op-amp LM358 (Low pass filter, High pass filter and Band pass filter)
22. Construction and study of I to V converter, V to I converter using op-amp LM358.
23. Construction and study of astable and monostablemultivibrator using IC555.
24. Construction and study of 4-bit DAC using R-2R ladder method
25. Construction and study of 4 bit flash type ADC
26. Solving simultaneous equations using op-amp.
27. Study of 555 applications using PSpice {Square wave, saw tooth & VCO}
28. C programming-I (input, output, string and file manipulation)
29. C programming-II (implementation of statistical functions)
30. C programming-III (functions and header file creation)
31. C programming-IV (pointers and structures)

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**Semester V** **L P C**
**17UEL530212A** **- - 2**

## Self-Paced Learning:
## PROGRAMMABLE LOGIC CONTROLLER

**Course Outcomes**:

1. Ability to understand the concepts of PLC
2. Ability to understand PLC wiring
3. Acquire knowledge on PLC ladder logic programming
4. Ability to write Ladder Logic programming for interfacing sensors
5. Acquire knowledge on simulation environments of PLC
6. Ability to understand the various applications of PLC systems

**UNIT-I: Overview of PLC**

Introduction to PLC - PLC Vs Microcontroller - Basic Componentsand their Symbols - Control Transformers - Fuses - Switches - Relays -Time Delay Relays

**UNIT-II: Programmable Logic Controller & Fundamental Programming**

PLC Configurations - System Block Diagram - Physical Components Vs Program components -Internal Relays -Basics of PLC Programming-Developing Fundamental PLC Wiring Diagramsand Ladder Programs

**UNIT-III: Advanced Programming Techniques**

Ladder Program execution Sequence - Counters -industrialexamples- Timers - Master control Relays and control Zones - AND LadderRung- Entering Normally Closed Contacts - OR Ladder Rung

**UNIT-IV: Analog I/O & Sensors**

Analog (A/D) inputs - Analog (D/A) output - Sensor Output classification-Connecting Discrete sensors to PLC inputs –Proximitysensors- Optical Proximity Sensors.

**UNIT-V: Working In Omron & Keyence Ide with Ladder Logic**

Introduction to OMRON & KEYENCE - Creating a project – LadderProgramming- Compiling and Executing - Ladder Programs - Logic Gatefunctions (AND, OR, NOT, NAND, NOR, XOR ) - Using Timers ( ON delaytimer, OFF delay timer, one shot pulse, flashing pulse).

**BOOKS FOR REFERENCE**


1. John R. Hackworth, Frederick D. Hackworth, Jr., "Programmable Logic Controllers, Programming Methods and Applications", NewDelhi: Pearson Education, 3rd edition, 2008.
2. John. W .Webb, Renaldo A. Rein, "Programmable Logic Controller Principles and Application", Prentice Hall India, 5th Edition, 2003.
3. Frankpetruzella, "Programmable Logic Controllers", Tata McGraw Hill, 2nd edition, 1997.


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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester V | Course Code 17UEL530212A | Title of the Paper: Self-Paced Learning: PROGRAMMABLE LOGIC CONTROLLER | | | | | | | | | | | | Hours - | Credits 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 4 | 5 | 2 | 3 | 4 | 4 | 3 | 4 | 4 | 3 | 4 | 3 | 4 | | 3.7 |
| CO2 | 4 | 5 | 2 | 3 | 4 | 4 | 3 | 4 | 4 | 3 | 4 | 3 | 4 | | 3.7 |
| CO3 | 4 | 5 | 2 | 3 | 4 | 4 | 3 | 4 | 4 | 3 | 4 | 3 | 4 | | 3.7 |
| CO4 | 4 | 5 | 2 | 3 | 4 | 4 | 3 | 4 | 4 | 3 | 4 | 3 | 4 | | 3.7 |
| CO5 | 4 | 5 | 2 | 3 | 4 | 4 | 3 | 4 | 4 | 3 | 4 | 3 | 4 | | 3.7 |
| CO6 | 4 | 5 | 2 | 3 | 4 | 4 | 3 | 4 | 4 | 3 | 4 | 3 | 4 | | 3.7 |
| | | | | | | | | | | | Mean Overall Score | | | | 3.7 |

**Result: The Score for this Course is 3.7 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semester V** **L P C**
**17UEL530212B** **- - 2**

**Self-Paced Learning:**
**AUDIO ELECTRONICS**

**Course Outcomes:**

1. Ability to understand the principles of sound
2. Will be able to acquire the knowledge on principles of acoustics
3. Ability to integrate audio equipment handling and maintenance skills
4. Ability to understand various service techniques in audioequipment repair
5. Ability to acquire the knowledge on PA audio system maintenance
6. Will be able to integrate testing and troubleshooting skills on audio systems

**UNIT-I: Principles of Sound**

Components of sound: pitch, intensity, tones and harmonics- propagation of sound- speed of sound in air -perception of sound- human hearing capability -Voice Frequency - measurement techniques of sound

**UNIT-II: Acoustics and Auditorium**

Fundamental of Acoustics- acoustic sub disciplines: speech, music, architecturalplan of room- specification- analyzing acoustic level of room- hydrography(echo sounding)- echo Cancellation techniques- selection: microphones, amplifiers, speakers -positioning the speakers- Sound System Installation -Electrification : power stabilization, earthing , Cooling - Multi Amplifier System Arrangement. Safety and precautions.

**UNIT-III: Microphone**

Basic Principle of Sound transducer -Internal and External Structure of microphone - Types of microphone–microphone polar patterns- impedance matching -Microphone Specification: frequency response, gain, noise and distortion- application specific design.

**UNIT-IV: Speaker**

Internal Structure of speaker- Specification of Speaker: impedance, power, frequency response, gain, noise and distortion - types of speaker -Speaker box design and types -line matching transformer- losses and noises in speaker systems- Handling of Speakers.



**UNIT-V: Amplifiers**

Pre amplifier, pre amplifier cum mixer -power amplifier –Specification of Amplifier- Impedance matching -power rating -output load management- simple Public Addressing system (PA) - PA system connecting Methodology - Home Theatre amplifiers

**BOOKS FOR REFERENCES**

1. John Linsleyhood, “Audio Electronics”, Newnes Publishers, 2nd ed., 1995.
2. Bob Cordell, “Designing Audio Power Amplifiers” McGraw Hill Professional, 2010.
3. Sontheimer, R., “Designing audio circuits”, Elektor International Media, 1998.

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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester V | Course Code 17UEL530212B | | | | | Title of the Paper: Self-Paced Learning: AUDIO ELECTRONICS | | | | | | | | Hours - | Credits 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 4 | 3 | 3 | 3 | 4 | 5 | 3 | 3 | 4 | 3 | 3 | 4 | 4 | | 3.7 |
| CO2 | 4 | 3 | 3 | 3 | 4 | 5 | 3 | 3 | 4 | 3 | 3 | 4 | 4 | | 3.7 |
| CO3 | 4 | 3 | 3 | 3 | 4 | 5 | 3 | 3 | 4 | 3 | 3 | 4 | 4 | | 3.7 |
| CO4 | 4 | 3 | 3 | 3 | 4 | 5 | 3 | 3 | 4 | 3 | 3 | 4 | 4 | | 3.7 |
| CO5 | 4 | 3 | 3 | 3 | 4 | 5 | 3 | 3 | 4 | 3 | 3 | 4 | 4 | | 3.7 |
| CO6 | 4 | 3 | 3 | 3 | 4 | 5 | 3 | 3 | 4 | 3 | 3 | 4 | 4 | | 3.7 |
| | | | | | | | | | | | | | Mean Overall Score | | 3.7 |

**Result: The Score for this Course is 3.7 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semester V** **L P C**
**17UEL530302A** **4 - 4**

## Core Elective-A: PROGRAMMING IN 'C' LANGUAGE

**Course Outcomes**:

1. Acquire knowledge on variables and data types in C programming
2. Acquire knowledge on control statements for efficient programming
3. Ability to Create user defined functions for various applications
4. Ability to implement strings and pointers
5. Ability to write embedded c programs for novel applications
6. Ability to differentiate c and embedded c

### UNIT-I: Overview of C (10 Hrs)

Introduction to C - Basic Structure of C Language - Elements of C Language: C Character Set - Constants - keyword and Identifiers - Variables - Data types - Declaration of variable - operators and Expressions: arithmetic operators - relational operators - logical operators - assignment and conditional operators - data type conversion and mixed mode operations.

### UNIT-II: Control Statements (8 Hrs)

Managing Input and Output operations: GETC, PUTC, SCANF, PRINTF-assignment statements - Illustrations. Control statements: IF, IF ELSE, ELSE.IF, SWITCH, GOTO Statement - FOR, WHILE, DO WHILE Statements - programs.

### UNIT-III: Functions and Arrays (10 Hrs)

C Functions: Library functions - user defined functions - advantage of the functions - arguments - function declaration - recursive functions - storage class specifies - scope of the variables. ARRAYS: Introduction - one-dimensional arrays - two-dimensional arrays - Initialization -Multi-dimensional arrays

### UNIT-IV: Strings and Pointers (10 Hrs)

Strings: Introduction - Declaring, Initializing - Functions: strcat(), strcmp(), strcpy(), strlen() - Table of Strings. POINTERS: Introduction - declaring a pointer variable - address operator - pointer arithmetic - pointers as function parameters - passing parameters by reference - pointers and arrays - dynamic storage allocation.Structures -declaration -example program.

**UNIT-V: Embedded C Programming** **(10 Hrs)**

Introduction to C Programming for Embedded Systems -Template for Embedded C Program -C Directives -Example -Programming Time Delays - Indefinite Loops -Variables in Embedded C-Example - C Functions-Example - Other Loops in C - Example -Making Decisions in the Program - Operator - Example -Logical and Bit-wise Operations Arrays

**BOOKS FOR STUDY:**


1. Balagurusamy. E "Programming in ANSI C", Tata McGraw-Hill Publishing Company ltd, 2008.
2. Material prepared by the department


**BOOKS FOR REFERENCE:**


1. Yashvant kanetkar, "Let us C", Third edition,1999, BPB publication.
2. Denies Ritche Ansi, 1990, C programming language, 1990.
3. Brian Kernighan and Denies Ritche, "C programming language, 1990.


**SECTIONS**

| UNIT | BOOK | SECTIONS |
|---|---|---|
| I | 1 | 1.1-1.10, 2.2-2.8,3.1-3.7,3.14 |
| II | 1 | 4.2-4.5, 5.1-5.5,5.7,5.9,chapter 6 |
| III | 1 | 9.1-9.5,9.16,9.19,7.1-7.7 |
| IV | 1 | Chapter – 8, 11.1-11.6,10.1-11.16 |
| V | 2 | Lecture notes |

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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester V | Course Code 17UEL530302A | Title of the Paper: Core Elective: PROGRAMMING IN 'C' LANGUAGE | | | | | | | | | | | Hours 4 | Credits 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | |
| CO1 | 5 | 4 | 3 | 3 | 5 | 4 | 4 | 4 | 2 | 1 | 3 | 4 | 5 | 3.6 |
| CO2 | 5 | 4 | 3 | 3 | 5 | 4 | 4 | 4 | 3 | 1 | 3 | 4 | 5 | 3.7 |
| CO3 | 5 | 4 | 3 | 3 | 5 | 4 | 3 | 4 | 4 | 1 | 3 | 4 | 5 | 3.7 |
| CO4 | 5 | 4 | 3 | 3 | 5 | 4 | 3 | 4 | 4 | 1 | 3 | 4 | 5 | 3.7 |
| CO5 | 5 | 4 | 3 | 3 | 5 | 4 | 4 | 4 | 4 | 1 | 3 | 4 | 5 | 3.8 |
| CO6 | 5 | 4 | 3 | 3 | 5 | 4 | 4 | 4 | 4 | 1 | 3 | 4 | 5 | 3.8 |
| | | | | | | | | | | | | | Mean Overall Score | 3.7 |

**Result: The Score for this Course is 3.7 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

| Semester V | L | P | C |
|---|---|---|---|
| 17UEL530302B | 4 | - | 4 |

**Core Elective-B:**
**COMPUTER HARDWARE AND NETWORKS**

**Course Outcomes**:

1. Ability to understand fundamentals of computer hardware
2. Acquire knowledge on installation of Operating System
3. Ability to understand the interfacing of various hardware components
4. Ability to understand Networking and its Connections
5. Ability to understand troubleshooting techniques used in computer service
6. Acquire knowledge on add-on card and its driver installation

**UNIT-I: Basic Computer Hardware (8 Hrs)**

Introduction - Basic Input/output System -CPUs - motherboards - BIOS - Memory systems- Bus structures- Expansion cards- Ports -connectors and cables- Data storage devices- Video and multimedia input/output devices- Printers and scanners - Display devices

**UNIT-II: Assembling and installation (10 Hrs)**

Portable computers and devices - Operating systems –software - Electricity and power systems - Monitoring and management –Security and Safety - Assembling and disassembling - Troubleshooting and maintaining a PC

**UNIT-III: Computer Networks (10 Hrs)**

Basic networking concepts - Physical and logical topologies, Bus, Star, Ring and Mesh topologies Network topologies: - types of network: LAN, WAN, MAN, PAN, CAN. - Networking Model - The OSI model - TCP/ IP Model - Network adapters. - Protocols. - Network Switching Technologies.

**UNIT-IV: Internet communication (10 Hrs)**

Internet –Intranet- Types of Internet connections: - Dialup, Broadband, Leased Line- Wi-Fi- Wi-Max- 2G, 3G, 4G, WWW, E-mails, Search Engines, Social Networking. - Cloud application. - Audio-video Conferencing. - Voice over Internet Protocol (VOIP) -Recovery and backup -. Essential security measures

**UNIT-V: Network Hardware and Components (10 Hrs)**

Concept of Server- client, node, segment, backbone, host etc. Analog and Digital transmission, Network Interface Card, Crimping tools and Color



standards for Straight crimping and Cross crimping Functions of NIC, Repeaters, Hub, Switches, Routers, Bridges- Transmission Media and Topologies - Media types: STP cable, UTP cable, Coaxial cable, Fiber cable, Base band and Broadband transmission, Cables and Connectors-Cabling and troubleshooting.

**BOOKS FOR STUDY:**


1. Upgrading and Repairing PCs: 19th Edition By Mueller Scott, 2009.
2. Computer networks, Andrew S. Tanenbaum, David J. Wetherall, 5th edition, 2011.
3. "A+ Guide to Hardware, Managing, Maintaining and Troubleshooting", Jean Andrews 6th Edition, 2002.


**BOOKS FOR REFERENCE:**


1. Troubleshooting of Electronic Devices By Nipun Sharma, Firewall Media Publications, New Delhi, 2009.
2. Computer Monitor CRT/LCD & TFT Service Manual By S. K. Gupta, GT Publication, Jaipur, 2009.
3. Troubleshooting of Electronic Devices By Nipun Sharma, Firewall Media Publications, New Delhi, 2009.


**SECTIONS:**

| UNIT | BOOK | SECTIONS |
|---|---|---|
| I | 1 | 1- 15 |
| II | 1 | Chapter 4.1 |
| III | 2 | 1.2 - 1.5 |
| IV | 2 | 3.1 - 3.15 |
| V | 3 | CHAPTER 1 |

———

**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester V | Course Code 17UEL530302B | | | Core Elective: COMPUTER HARDWARE AND NETWORKS | | | | | | | | Hours 4 | Credits 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | |
| CO1 | 5 | 3 | 2 | 3 | 4 | 4 | 3 | 4 | 4 | 2 | 5 | 4 | 4 | 3.6 |
| CO2 | 5 | 3 | 2 | 3 | 4 | 3 | 4 | 4 | 4 | 2 | 5 | 4 | 4 | 3.6 |
| CO3 | 5 | 3 | 2 | 3 | 4 | 3 | 4 | 4 | 4 | 2 | 5 | 4 | 4 | 3.6 |
| CO4 | 5 | 3 | 2 | 3 | 4 | 4 | 4 | 4 | 4 | 2 | 5 | 4 | 4 | 3.6 |
| CO5 | 5 | 3 | 2 | 3 | 4 | 5 | 3 | 4 | 4 | 2 | 5 | 4 | 4 | 3.6 |
| CO6 | 5 | 3 | 2 | 3 | 4 | 4 | 3 | 4 | 4 | 2 | 5 | 4 | 4 | 3.6 |
| | | | | | | | | | | | | Mean Overall Score | | 3.6 |

**Result: The Score for this Course is 3.6 (High Relationship)**

*Note:*

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

*Values Scaling:*

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semester V** **L P C**
**17UEL540601** **2 - 2**

## Skill-Based Elective-I:

## ENTREPRENEURIAL ELECTRONICS

**Course Outcomes**:

1. Will be able to acquire the knowledge on basic electrical technology
2. Will be able to acquire the knowledge on working principle of measuring instruments
3. Will be able to acquire the knowledge on active components and their classification
4. Ability to understand testing procedures of active components
5. Will be able to acquire the knowledge on Soldering techniques for troubleshooting
6. Will be able to acquire the knowledge hobby circuit and de-soldering techniques for troubleshooting

**UNIT-I:**

**Introduction to Electrical Technology** **(5 Hrs)**

Introduction to Electricity–Alternating Current Based System -Single Phase -3 Phases -Dc Signal -Dc Source -Fundamentals-Voltage, Current and Power-Power Factor–Passive Components.

**UNIT-II:**

**Measuring Instruments** **(5 Hrs)**

Introduction to Multimeter – Analog Multimeter –Digital Multimeter - Voltage Measurement – Current Measurement – Resistance Measurement - Cathode Ray Oscilloscope –Frequency Calculation - Function Generator – Calibration.

**UNIT-III:**

**Active Components** **(5 Hrs)**

Diode - Half Wave Rectifier - Switching Circuits - Transistor - NPN testing – PNP testing - Transistor Amplifier – Oscillator – Metal Oxide Semiconductor Field Effect Transistor – Introduction - MOSFET Types – Testing MOSFET - Switching Circuits Based On MOSFET.

**UNIT-IV:**

**Servicing and Trouble Shooting** **(5 Hrs)**

Soldering And De-Soldering Techniques – Pretreatment - Precaution During

Soldering And Desoldering - DC Power Supply Design -Single – Dual-Variable Voltage - Printed Circuit Board - Layout Drawing.

**UNIT-V:**

**Hobby Circuits** **(4 Hrs)**

Circuit Design Basics – Amplifier Circuits – Applications - Oscillator Circuits -Automated Switching Circuits – Relay Based Circuits – Opto-Coupler Based Circuits -Timer/Counter Based Circuits.

**BOOKS FOR STUDY:**

Material prepared by the department.



**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester V | Course Code 17UEL540601 | | | | | Title of the Paper: ENTREPRENEURIAL ELECTRONICS | | | | | | | | Hours 2 | Credits 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 5 | 3 | 2 | 3 | 4 | 3 | 4 | 4 | 3 | 3 | 4 | 5 | 4 | | 3.6 |
| CO2 | 5 | 3 | 2 | 3 | 4 | 3 | 4 | 4 | 3 | 3 | 4 | 5 | 4 | | 3.6 |
| CO3 | 5 | 3 | 2 | 3 | 4 | 3 | 4 | 4 | 3 | 3 | 4 | 5 | 4 | | 3.6 |
| CO4 | 5 | 3 | 2 | 3 | 4 | 3 | 4 | 4 | 3 | 3 | 4 | 5 | 4 | | 3.6 |
| CO5 | 5 | 3 | 2 | 3 | 4 | 3 | 4 | 4 | 3 | 3 | 4 | 5 | 4 | | 3.6 |
| CO6 | 5 | 3 | 2 | 3 | 4 | 3 | 4 | 4 | 3 | 3 | 4 | 5 | 4 | | 3.6 |
| CO7 | 5 | 3 | 2 | 3 | 4 | 3 | 4 | 4 | 3 | 3 | 4 | 5 | 4 | | 3.6 |
| | | | | | | | | | | | Mean Overall Score | | | | 3.6 |

**Result: The Score for this Course is 3.6 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semester V** **L P C**
**17USS540701A** **2 - 2**

**Inter Departmental Courses (IDC):**
**SOFT SKILLS**

***Course Outcomes***

1. To augment the level of confidence in articulation oif the students in their communication.
2. To ensure that the students learn to speak and interact with one another as social beings
3. To equip them and train to present the best of themselves as job seekers.
4. To equip with conversation techniques, presentation skills and grooming
5. To prepare them write their own resume and enhance their interview skills required by employers
6. To ensure that the students learn the parameters of group dynamics a key component of conversation

***Module I***

**Basics of Communication: D**efinition of communication, Barriers of Communication, Grooming, Presentations & Practicum.

***Module II***

**Resume Writing & Interview Skills:** Resume Writing: What is resume? Types of Resume - Chronological, Functional and Mixed Resume**,** Steps in preparation of Resume. **Interview Skills:** Preparation

***Module III***

**Group Discussion: Basics of G**roup Discussion, Parameters of GD, Essential Points for GD preparation, and GD Topics and Practicum.

***Module IV***

**Personal Effectiveness:** Self Discovery; and Goal Setting; Questioneers & Presentations for interview, Common interview questions, Attitude, Body Language, The mock interviews and Practicum

***Module V***

**Numerical Ability:** Calendar, Average, Percentage; Profit and Loss**,** Simple Interest, Compound Interest; Time and Work, Pipes and Cisterns; Time and Distance**,** Problems on Trains**,** Boats and Streams; Ratios and Proportions.



***Module VI***

**Test of Reasoning - Verbal Reasoning:** Series Completion, Analogy; Data Sufficiency, Assertion and Reasoning; and Logical Deduction. **Non-Verbal Reasoning:** Series; and Classification

**Textbook**

1. JASS, 2016. *Straight from the traits: Securing the soft skills*. St.Joseph's College, Trichy

**References**

1. Aggarwal, R.S. 2010. *A Modern Approach to Verbal and Non Verbal Reasoning*. S.Chand, New Delhi.
2. Aggarwal, R.S. 2001. Quantitative Aptitude. S.Chand. New Delhi
3. Covey, Stephen. 2004. *7 Habits of Highly effective people,* Free Press. Egan, Gerard. (1994). *The Skilled Helper* (5th Ed). Pacific Grove, Brooks/ Cole.
4. Khera ,Shiv 2003. *You Can Win.* Macmillan Books , Revised Edition.
5. Murphy, Raymond. 1998. *Essential English Grammar*. 2nd ed., Cambridge University Press. Sankaran, K., & Kumar, M. *Group Discussion and Public Speaking*. M.I. Pub, Agra, 5th ed., Adams, Media.
6. Trishna's 2006. *How to do well in GDs & Interviews*, Trishna Knowledge Systems.
7. Yate, Martin. 2005. H*iring the Best: A Manager's Guide to Effective Interviewing and Recruiting*.

**Evaluation Pattern**

| Modules | Topic | Examination Pattern | |
|---|---|---|---|
| | | CIA | Online |
| I | Basics of Communication | 15 | 5 |
| II | Resume Writing & Interview Skills | 15 | 5 |
| III | Group Discussion | 10 | 10 |
| IV | Personal Effectiveness | 10 | 10 |
| V | Numerical Ability (Common Session) | - | 10 |
| VI | Test of Reasoning (Common Session) | - | 10 |
| | Total | **50** | **50** |

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**Semester V** **Hours/Week: 2**
**17USS540701B** **Credits: 2**

**Inter Departmental Courses (IDC):**
**NATIONAL CADET CORPS**

**Course Outcomes**

1. NCC 'C' and 'B" certificates are very much useful and increase credit marks in UPSC and SSB examinations..
2. They learnt discipline punctual and leadership quality.
3. They got physical fitness for Army and Police selection.
4. They learnt general knowledge find political issue.
5. They got trained for social service and volunteers for disaster.
6. They will be the best citizens of India.

**Unit-I: About NCC - Personality Developmet - Self Awareness** (6 hours)

NCC Aims and objectives of NCC - Organization and training and NCC song Incentives for cadets in NCC - NCC ranks Religion, culture , traditions and customs of India.- National integration – importance and necessity - Freedom struggle and nationalist movement in India - Personality development - Introduction to personality development - Factors influencing / shaping personality – Physical , social, psychological and philosophical Self awareness – know yourself / insight . - Change your mindset.

**Unit-II: Interpersonal Relationship and Communication - NDMA** (6 hours)

Interpersonal relationship and communication - Communication skills Leadership traits - Types of leadership Attitude – assertiveness and negotiation - Time management - Effects of leadership with historical examples - Stress management skills - Interview skills - Conflict motives.- Importance of group – team work - Disaster Management - Civil defence organization and its duties – NDMA Types of emergencies / natural disasters- Assistance during natural / other calamities / floods / cyclone / earth quake / accident - Setting up of relief camp during disaster Management - Collection and distribution of aid material .

**Unit-III: Social Awareness and Community Development - Hygiene and Sanitation** (6 hours)

Social awareness and community development - Basics of social service-weaker sections of our society and their needs - Health and Hygiene Structure and functioning of the human body - Hygiene and sanitation- Physical and mental health - Infectious and contagious diseases and its prevention -



Basic of home nursing and first aid in common medical emergencies - Wounds and fractures - Introduction to yoga and exercises

**Unit-IV: AIR-WING** (6 hours)

Principles of flight – Elementary Mechanics – Atmosphere - Venturi effect and Bernauli's theorem - Glossary of terms; Aero engines – Aero-engine components; Aircraft components – Airframe structure; Metereology – Importance of Metereology in Aviation; Air Navigation – Why a pilot should study Navigation; Airmanship – Airmanship; Aeromodelling – History of Aeromodelling – Materials used in Aeromodelling – Types of Aeromodels.

**Unit-V: NAVAL** (6 hours)

Naval orientation - history of Indian Navy – Navy head quarters commands fleets- ships shore establishment war ships and their role - induction to Anti submarine warfare.- Types of war ships - types anchor parts of anchor - GPS RACON RADAR - types of firewater making in the ships- NBCD organization and structure - Damage flooding.

**Text Book**

1. Cadet's hand book published by the Directorate General, National Cadet Corps, Ministry of Defence, R. K. Puram, New Delhi 110022, 2008.

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**Semester VI** **L P C**
**17UEL630213** **5 - 4**

## MICROCONTROLLER AND ITS APPLICATIONS

**Course Outcomes**:

1. Will be able to acquire the knowledge on architecture of 8051 microcontroller
2. Ability to understand the instruction set and addressing modes 8051 microcontroller
3. Ability to write assembly and C language programs for 8051 microcontroller
4. Will be able to acquire knowledge on on-chip peripherals of 8051
5. Ability to interface external sensors and devices with 8051 for various applications
6. Will be able to acquire knowledge on RTX51 and its application

**UNIT-I: Introduction to 8051 Microcontroller (10 Hrs)**

Introduction to Microcontroller - Comparison of Microcontrollers and Microprocessor - overview of 8051- Pin description of 8051 - Registers - Program counters - ROM & RAM space - Data types and directive - Stack and PSW - SFR.

**UNIT-II: 8051 Assembly Language (10 Hrs)**

Programming 8051 addressing modes: Immediate - Register - Direct - Indirect - Instruction set: Arithmetic and logical operations - Call and jump instructions - Bit manipulation instructions -Simple assembly language programs..

**UNIT-III: On-Chip Peripherals of 8051 (15 Hrs)**

Counters/Timers - Counter programming - Basics of serial communication - RS232 and MAX 232 IC connection - Serial communication registers - Serial communication programming - Interrupts - Interrupts registers - Internal and external interrupts programming.(only ASM programming for all the topics)

**UNIT-IV: Applications of Microcontroller (15 Hrs)**

Interfacing: Matrix keyboard - LCD - ADC - DAC - Temperature monitoring system -DC motor interfacing and PWM - Stepper motor. (Only embedded C programming).



**UNIT-V: Introduction to RTOS (10 Hrs)**

Introduction to OS and RTOS - RTX-51 Real-Time Operating System, Single Task Program, Round-Robin Task Switching, os_wait Function, Wait for Timeout, Wait for Signal, Pre-emptive Task Switching, TRAFFIC: RTX-51 Tiny Example Program, Traffic Light Controller Commands, Software, TRAFFIC Project.

**BOOKS FOR STUDY:**


1. Muhammad Ali Mazidi, J.G. Mazidi and R.D. McKinlay, "The 8051 Microcontroller and Embedded Systems: Using Assembly and C", 2nd edition, Pearson education, 2006.
2. Material prepared by the department (Keil RTX51 user guide)


**BOOKS FOR REFERENCE:**


1. J. S. Parab, V.G. Shelake, R.K. Kamat and G.M. Naik ,"Exploring C for Microcontrollers A hands on approach",1st edition, Springer, 2007.
2. Kai Qian, David Den Haring, Li Cao, "Embedded Software Development with C", 1st edition, Springer, 2009


**SECTIONS:**

| UNIT | BOOK | SECTIONS |
|---|---|---|
| 1 | 1 | 1.1 – 1.2, 8.1, 2.1 – 2.7 |
| 2 | 1 | 5.1 – 5.4, 3.1 – 3.2, 4.1 – 4.2 |
| 3 | 1 | 9.1 – 9.2, 10.1 – 10.3, 11.1 – 11.5, |
| 4 | 1 | 12.1 – 12.2, 13.1 – 13.3, 17.2 – 17.3 |
| 5 | 2 | Material prepared by the department (Keil RTX51 user guide) |

**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester VI | Course Code 17UEL630213 | | | | | Title of the Paper: MICROCONTROLLER AND ITS APPLICATION | | | | | | | | Hours 5 | Credits 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 5 | 4 | 2 | 2 | 5 | 5 | 3 | 4 | 3 | 3 | 4 | 5 | 4 | 3.8 | |
| CO2 | 5 | 4 | 2 | 3 | 5 | 5 | 3 | 4 | 3 | 5 | 4 | 5 | 4 | 4.0 | |
| CO3 | 5 | 4 | 2 | 2 | 5 | 5 | 3 | 4 | 3 | 5 | 4 | 5 | 4 | 3.9 | |
| CO4 | 5 | 4 | 2 | 2 | 5 | 4 | 3 | 4 | 4 | 4 | 4 | 5 | 4 | 3.8 | |
| CO5 | 5 | 4 | 2 | 2 | 5 | 4 | 4 | 4 | 4 | 3 | 4 | 5 | 4 | 3.8 | |
| CO6 | 5 | 4 | 2 | 3 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 4.0 | |
| | | | | | | | | | | | | Mean Overall Score | | 3.8 | |

**Result: The Score for this Course is 3.8 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semester VI** **L P C**
**17UEL630214** **5 - 4**

## POWER ELECTRONICS

**Course Outcomes**:

1. Ability to understand the basics of power electronics
2. Will be able to acquire knowledge on line commutated rectifiers and converters
3. Will be able to acquire knowledge on AC and DC regulators
4. Ability to understand chopper circuits
5. Ability to understand inverter circuits
6. Will be able to acquire knowledge on applications of power electronic devices

**UNIT-I:**

**Basics Concepts of Power Electronics and Semiconductor Power Switches and Characteristics** **(10 hrs)**

Conversion of electrical energy: Classification of converters- Output parameters and characteristics of converters-Influence of converters on the grid-Basic converter parameters-AC and DC filters- Dynamic processes in filters. Power diode-Power bipolar transistors.

Thyristor: Controllable Semiconductor switches with p-n-p-n structures. Gate commutated thyristors (GCTs, ETOs, MTOs)

**UNIT-II:**

**Line Commutated Rectifiers and Converters** **(15 hrs)**

The rectification principle -Circuit with active load-Circuit with resistive-inductive load-Counter-EMF load-Single-phase bridge circuit -Three phase bridge circuit. Characteristics of Rectifiers: Output voltage ripple-Distortion of the input current-The commutation of the thyristors-External rectifier characteristic-Energy characteristics of rectifiers Grid-tie inverters. Direct frequency converters -Thyristor-based ac-ac converters- Reducing of the output-voltage distortion.

**UNIT-III:**

**AC and DC Regulators** **(10 hrs)**

Ac voltage regulators based on thyristors-Single-phase ac voltage regulators-Operation with active load-Operation with resistive-inductive load-Operation with inductive load-Three-phase ac voltage regulators. Dc voltage regulators-

Step-down dc/dc converter-Step-up dc/dc converter-Inverting regulator-The Cuk converter

**UNIT-IV:**

**Choppers and Inverters (15 hrs)**

Choppers: Principle of chopper operations - Control strategies-step up and step down choppers - quadrant operation. Voltage Inverters - Single-phase voltage inverters - Pulse-width control in single-phase voltage inverters - Three-phase voltage inverters. Current inverters - Transistor current inverters - Pulse-width control in current inverters - Current inverters based on single -throw thyristors. PWM techniques in inverters-Single-phase full-bridge voltage source inverter -Three-phase voltage source inverter. Current Source inverters.

**UNIT-V:**

**Applications of Power Electronics (10 hrs)**

Improving of the efficiency of power supply-Control of power transmission and power quality- Control of AC power flows - Reactive-Power compensation - Phase shifters - Power transmission and dc links - Power quality control - Electric drives Control of dc machines - Control of induction motors - Scalar control- Vector control - Control of synchronous machines - Control of synchronous motors with adjustable excitation - Control of switched motors, SMPS,UPS-Static switches-Static circuit breakers - Solid state relays.

**BOOKS FOR STUDY:**


1. Yuriy Rozanov, Sergey Ryvkin Evgeny Chaplygin, Pavel Voronin, "Power electronics basics-operating principles, design, formulas and applications". CRC Press, 1st Edition, 2016.
2. Dr.P.S.Bimbhra "Power Electronics", Khanna publishers, 4th edition, 2006.


**BOOKS FOR REFERENCE:**


1. Rashid, MH "Power Electronics Handbook" Butterworth-Heinemann Publications 2011.
2. MD Singh "Power Electronics" Tata McGraw Hill, New Delhi, 2004.
3. Power Electronics by PC Sen, Tata McGraw-Hill Publication company Ltd., New Delhi 30th reprint 2008.




**SECTIONS:**

| UNIT | BOOK | SECTIONS |
|---|---|---|
| I | 1 | 1.1-1.5,2.2-2.2.3,2.7,2.7.1,2.4,2.4.1,2.5.2. |
| II | 1 | 4.2-4.2.1.3,4.2.2.2,4.2.2.4,4.2.3-4.2.3.2,4.3.1,4.4-4.4.2. |
| III | 1 | 4.5-4.5.2,5.2-5.2.4 |
| IV | 2 | 7.1-7.4.5 |
| | 1 | 6.1-6.1.3,6.2-6.2.3,7.2.1-7.2.2 |
| V | 1 | 10.1-10.1.1.5,10.2-10.2.3.2 |
| | 2 | 11.1,11.2,11.4,11.6 |

**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester VI | Course Code 17UEL630214 | | | | | Title of the Paper: POWER ELECTRONICS | | | | | | | | Hours 5 | Credits 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 5 | 4 | 2 | 3 | 4 | 2 | 2 | 2 | 4 | 3 | 4 | 4 | 4 | 3.3 | |
| CO2 | 5 | 4 | 3 | 3 | 4 | 3 | 3 | 3 | 4 | 4 | 4 | 5 | 4 | 3.8 | |
| CO3 | 5 | 4 | 3 | 3 | 4 | 4 | 3 | 3 | 4 | 3 | 4 | 5 | 4 | 3.8 | |
| CO4 | 5 | 4 | 2 | 3 | 4 | 3 | 3 | 3 | 4 | 4 | 4 | 5 | 4 | 3.8 | |
| CO5 | 5 | 4 | 2 | 3 | 4 | 3 | 3 | 3 | 4 | 4 | 4 | 5 | 4 | 3.8 | |
| CO6 | 5 | 4 | 3 | 2 | 4 | 3 | 2 | 2 | 4 | 4 | 4 | 4 | 4 | 3.5 | |
| | | | | | | | | | | | | | Mean Overall Score | | 3.6 |

**Result: The Score for this Course is 3.6 (High Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$



**Semester VI** **L P C**
**17UEL630215** **5 - 3**

## SENSOR TECHNOLOGY

**Course Outcomes**:

1. Will be able to acquire knowledge on basics and fundamentals of sensors classification
2. Will be able to acquire knowledge on principles of resistive, capacitive and inductive type sensors
3. Ability to understand sensors role in flow, level and pressure measurement systems
4. Will be able to acquire knowledge on principles of optical sensors
5. Will be able to acquire knowledge on bio-receptors and biosensors design
6. Ability to understand various sensors used in different applications

**UNIT-I: Sensor Fundamentals** **(12 hrs)**

Basic Sensor Technology, Sensor Systems, Sensor Characteristics, System Characteristics, Instrument Selection, Data Acquisition and Readout, Installation, Sensor Signal Conditioning: Conditioning Bridge Circuits, Amplifiers for Signal Conditioning, Analog to Digital Converters for Signal Conditioning, Signal Conditioning High Impedance Sensors.

**UNIT-II: Force, Weight Sensors and Temperature Sensors** **(12 hrs)**

Introduction, Quartz Sensors, Strain Gauge Sensors: Strain-Gauge Based Measurements, Strain Gauge Sensor Installations, Sensor Types and Technologies, Introduction to temperature sensor, types and technologies, applications of temperature Sensors.

**UNIT-III: Capacitive and Inductive Displacement Sensors** **(12 hrs)**

Introduction, Capacitive Sensors, Inductive Sensors, Capacitive and Inductive Sensor Types, Selecting and Specifying Capacitive and Inductive Sensors, Comparing Capacitive and Inductive Sensors, Applications, Latest Developments.

**UNIT-IV: Flow, Level and Pressure Sensors** **(12 hrs)**

Introduction to Flow sensors, Selecting Flow Sensors, Installation and Maintenance, Recent Advances in Flow Sensors, Level Sensors, Piezoresistive Pressure Sensing, Piezoelectric Pressure Sensors, applications.

**UNIT-V: Optical, Position and Biosensors** **(12 hrs)**

Photosensors, Contact and Non-contact Position Sensors, Linear and Rotary Position and Motion Sensors, Biosensors: Overview of Biosensor,

Applications of Biosensors, Origin of Biosensors, Bioreceptor Molecules, Transduction Mechanisms in Biosensors, Application Range of Biosensors.

**BOOKS FOR STUDY:**


1. Jon S. Wilson, "Sensor Technology Handbook", Newnes is an imprint of Elsevier, Elsevier Inc, 2005.


**BOOKS FOR REFERENCE:**


1. Jacob Fraden, "Handbook of Modern sensors - Physics, Designs and applications", 3rd Edition, Springer, 2004.
2. A. K. Sawhney, "Electrical and Electronics Measurements and Instrumentation", DhanpatRai and company, 2001.
3. H.S. Kalsi, "Electronics Instrumentation", 2nd Edition,TMH, 2004.
4. Dr. M. Arumugam, "Biomedical Instrumentation", 2nd Edition, Anuradha Publications, 1994.
5. D.Patrabnabis, "Principles of Industrial Instrumentation", 2nd Edition, Tata McGraw-Hill, 2000.


**SECTIONS**

| UNIT | BOOK | SECTIONS |
|---|---|---|
| 1 | 1 | 1.1, 2.1, 4.1, 4.2,4.3,4.4 |
| 2 | 1 | 11.1-11.3,19.1-19.3, 20.1,20.2 |
| 3 | 1 | 8.1-8.9 |
| 4 | 1 | 10.1- 10.6, 16.1, 16.2 |
| 5 | 1 | 14.1, 15.1-15.3,6.1-6.6 |

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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester VI | Course Code 17UEL630215 | | | | | Title of the Paper: SENSOR TECHNOLOGY | | | | | | | Hours 5 | Credits 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | |
| CO1 | 5 | 4 | 2 | 3 | 4 | 3 | 3 | 4 | 3 | 2 | 5 | 3 | 4 | 3.5 |
| CO2 | 5 | 4 | 2 | 3 | 4 | 3 | 3 | 4 | 3 | 2 | 5 | 3 | 4 | 3.5 |
| CO3 | 5 | 4 | 2 | 3 | 4 | 3 | 3 | 4 | 3 | 2 | 5 | 3 | 4 | 3.5 |
| CO4 | 5 | 4 | 2 | 3 | 4 | 3 | 3 | 4 | 3 | 2 | 5 | 3 | 4 | 3.5 |
| CO5 | 5 | 4 | 2 | 3 | 4 | 3 | 3 | 4 | 3 | 2 | 5 | 3 | 4 | 3.5 |
| CO6 | 5 | 4 | 2 | 3 | 4 | 3 | 3 | 4 | 3 | 2 | 5 | 3 | 4 | 3.5 |
| | | | | | | | | | | | | Mean Overall Score | | 3.5 |

**Result: The Score for this Course is 3.5 (Moderate Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

| Semester VI | L | P | C |
|---|---|---|---|
| 17UEL630216 | - | 6 | 4 |

**Electronics Practical - IV**

**MICROCONTROLLERS, POWER ELECTRONICS AND SENSOR TECHNOLOGY**

**Course Outcomes:**

1. Will be able to acquire knowledge on principles of optical sensors
2. Will be able to acquire knowledge on bio-receptors and biosensors design
3. Ability to understand various sensors used in different applications

**List of experiments**

**Any sixteen - Microcontroller (8), Power electronics (4), Sensors( 4)**

1. Writing C program for 8051 and to study its equivalent disassembly codes in ASM using Keil software.
2. Microcontroller program I {Data transfer}
3. Microcontroller program II {Arithmetic and Logical}
4. Microcontroller program III {Code conversion}
5. Interfacing microcontroller with LED {blinking LED, Bi-colour & RGB}
6. Interfacing matrix keypad with a microcontroller.
7. Study of Timers in 8051 microcontroller.
8. Study of Counters in 8051 microcontroller.
9. Study of interrupts in 8051 microcontroller.
10. Study of serial communication in 8051 microcontroller.
11. Interfacing ADC with 8051 microcontroller.
12. Interfacing LCD with 8051 microcontroller.
13. Interfacing GSM with 8051 microcontroller
14. Interfacing printer with 8051 microcontroller.
15. Frequency measurement using 8051.
16. Full Wave Control of rectifier output using SCR, TRIAC and UJT
17. Construction and study of step up and step down choppers
18. PWM based motor speed control using IGBT.
19. Construction and study of voltage fed inverters using IGBT/SCR.
20. Construction and study of static circuit breakers.
21. Study of Sensors - I {Temperature – LM35, RTD, Thermocouple)



22. Study of Sensors - II {LVDT, Hall Effect, Strain Gauge, Flow and Level}.
23. Study of Sensors – III { opto triac, opto SCR, opto coupler}
24. Study of DC motor control using PWM with 8051 microcontroller (L293 motor driver)
25. Interfacing stepper motor with 8051 microcontroller
26. Interfacing LED dot matrix display with 8051 microcontroller
27. Interfacing seven segment display with 8051 microcontroller
28. Study of charge controller for solar panel
29. DHT11 sensor interfacing with 8051 microcontroller (temperature and humidity sensor)
30. Ultrasonic sensor interfacing with 8051 microcontroller
31. RTC interfacing with 8051 microcontroller
32. Interfacing Relay with 8051 microcontroller

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| Semester VI | L | P | C |
|---|---|---|---|
| 17UEL630217 | - | - | 2 |

## COMPREHENSIVE EXAMINATION

**Course Outcomes:**

1. Ability to understand and recollect the knowledge on Electric circuit, digital electronics, control system and communication systems concepts.

**UNIT-I: Electric circuit theory**

DC circuit analysis- KCL- KVL - Series and parallel circuits - Network theorem - Thevenin – Norton – Superposition - Reciprocity - Sinusoidal analysis – Terminologies - RLC series and parallel circuits-Different kinds of power - Transient analysis - RL-RC and RLC-Network topology - Tie set and cut set.

**UNIT-II: Electronic Devices**

Diodes-PN junction - Zener diode - Varactor diode-Tunnel - Schottky diode-PIN diode-Transistor configurations - a- b- g relationship-FET characteristics and amplifier- MOSFET-types-MOSFET Switches- UJT- characteristics - standoff ratio- SCR- TRIAC – DIAC - IGBT-LED - LCD.

**UNIT-III: Digital electronics**

Number system-Decimal – Octal – hexadecimal-Conversion-Logic gates-minimization technique-K-Map- Combinational circuits-Adder-Subtractor-Encoder-Decoder-Sequential circuits-Latch-Flipflop-up/down counter-synchronous counter-Asynchronous counter-Shift register.Memory devices-RAM-ROM-PROM-EEPROM

**UNIT-IV: Microprocessors and Microcontroller**

Microprocessor 8085-Architecture-Instruction set-AsSem-bly level programming-Interfacing Peripheral IC's-8251-8253-8259-8237-8279-Microcontroller 8051-Architecture-Instruction set-Assembly level programming-ADC and DAC interfacing.

**UNIT-V: Communication system and C language**

Modulation:AM,FM and PM techniques-Demodulation:AM and FM-Pulse modulation technique-Fibre optic communication-Single mode and multimode operation-Modulation techniques. Introduction to C - Basic Structure of C Language - Elements of C Language: C Character Set - Constants - keyword and Identifiers - Variables - Data types - Declaration of variable - operators and Expressions: arithmetic operators - relational operators - logical operators - assignment and conditional operators - data type conversion and mixed mode operations -control statements -strings and arrays -pointers and functions - structures.



| Semester VI | L | P | C |
|---|---|---|---|
| 17UEL630303A | 4 | - | 4 |

## Core Elective: CONTROL SYSTEM

**Course Outcomes:**

1. Will be able to acquire the knowledge on mathematical models of control system
2. Ability to understand the components of control system
3. Will be able to acquire knowledge on time response analysis of various systems
4. Ability to understand the process of frequency response analysis
5. Will be able to acquire the knowledge on concepts of stability
6. Will be able acquire the knowledge on Routh Hurwitz criterion and Nyquist stability analysis

**UNIT-I: Mathematical Models of Control System (8 Hrs)**

Control system - Examples of control systems - Mathematical models of control systems - Electrical systems - Electrical analogous of mechanical translational systems (two nodes) - Electrical analogous of mechanical rotational systems - Block diagram - Signal flow graph.

**UNIT-II: Components of Control System (8 Hrs)**

Components of Automatic control system - Potentiometer -Synchros-Controllers -Tachogenerators- Modulator and Demodulator - Example.

**UNIT-III: Time Response Analysis (12 Hrs)**

Time response - Test signals - Order of a system - Response of first order system for unit step input - Second order system - Time domain specifications - Response with P, PI & PID controllers - Type number of control systems - Steady state error - Static error constants - Steady state error when input is unit step, unit ramp and unit parabolic signal - Generalized error coefficients - Correlation between static and dynamic error coefficients.

**UNIT-IV: Frequency Response Analysis (10 Hrs)**

Frequency response - Frequency domain specifications - Estimation of frequency domain specifications for II order system - Correlation between time and frequency response - Frequency response plots - Bode plot - Polar plot - Nichols plot - M & N circles - Nichols chart.

**UNIT-V: Concepts of Stability and Root Locus (10 Hrs)**

Definitions of stability - Location of roots on the S-plane for stability -Routh Hurwitz criterion - Mathematical preliminaries for Nyquist stability criterion - Relative stability - Gain margin root locus.

**BOOK FOR STUDY:**


1. NagoorGani. A, "Control system", 1st Edition, RBA publications, 2006.


**BOOKS FOR REFERENCES:**


1. M. Gopal, "Control system Principles and design", TMH, 1998
2. B.C. Kuo, "Automatic Control Systems", 7th Edition, PHI,1995.


**SECTIONS**

| UNIT | BOOK | SECTION |
|---|---|---|
| I | 1 | 1 1.1 – 1.3, 1.6,1.9 – 1.12 |
| II | 1 | 2.1 – 2.4, 2.9 – 2.10, EXAMPLE 2.4 |
| III | 1 | 3.1 – 3.3, 3.5 – 3.15, 3.17 |
| IV | 1 | 4.1 – 4.8, 4.10, 4.11 |
| V | 1 | 5.1 – 5.4, 5.6 - 5.8 |



**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester VI | Course Code 17UEL630303A | Title of the Paper: Core Elective: CONTROL SYSTEM | | | | | | | | | | | Hours 4 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | |
| CO1 | 5 | 4 | 2 | 3 | 5 | 5 | 4 | 4 | 1 | 2 | 1 | 2 | 4 | 3.2 |
| CO2 | 4 | 4 | 2 | 3 | 5 | 5 | 4 | 4 | 1 | 2 | 1 | 2 | 4 | 3.1 |
| CO3 | 4 | 4 | 2 | 3 | 5 | 4 | 4 | 4 | 1 | 2 | 1 | 2 | 4 | 3.0 |
| CO4 | 5 | 4 | 2 | 3 | 5 | 4 | 4 | 4 | 1 | 2 | 1 | 2 | 4 | 3.1 |
| CO5 | 5 | 4 | 2 | 3 | 5 | 4 | 4 | 4 | 1 | 2 | 1 | 2 | 4 | 3.1 |
| CO6 | 4 | 4 | 2 | 3 | 5 | 4 | 4 | 4 | 1 | 2 | 1 | 2 | 4 | 3.0 |
| | | | | | | | | | | | Mean Overall Score | | | 3.1 |

**Result: The Score for this Course is 3.1 (High Relationship)**

*Note:*

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

*Values Scaling:*

$$\text{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \text{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

**Semester VI** **L P C**
**17UEL630303B** **4 - 3**

**Core Elective:**
**ELECTRONIC MEASUREMENT SYSTEM**

**Course Outcomes**:

1. Ability to understand errors in measurement
2. Will be able to acquire the knowledge on different types of measuring instruments
3. Ability to understand electrical indicating and test instruments
4. Ability to understand variable conversion elements and transmission techniques
5. Will be able to acquire the knowledge on instruments design using different digital integrated circuits
6. Will be able to acquire the knowledge on principles on various biomedical instruments

**UNIT-I: Instrument types and performance characteristic (10 Hrs)**

Introduction - review of instrument types - active and passive instruments - null type and deflection type instruments - analog and digital instruments - indication instruments - smart and Non-smart instruments. Static characteristics of instruments - accuracy and inaccuracy - precision - tolerance - range of span - linearity - sensitivity of measurement - threshold - resolution - sensitivity to disturbance - hysteresis effects - dead space - Dynamic characteristics of instruments - necessity for calibration. ESD – EMC.

**UNIT-II: Measurement uncertainty and calibration (10 Hrs)**

Sources of Systematic Error - Reduction of systematic errors - quantification of Systematic Errors - sources and treatment of systematic errors - statistical analysis of measurements subject to random errors - mean and median values - standard deviation and variance - graphical data analysis - standard error of the mean - estimation of random error in a single measurement. Aggregation of measurement system errors - combined effect of systematic and random errors. Calibration - principles of calibration - control of calibration environment - calibration chain and traceability - calibration records

**UNIT-III: Electrical indicating and test instruments (10 Hrs)**

Introduction -digital meters - voltage to time conversion digital voltmeter - potentiometric - dual slope integration - voltage to frequency conversion - digital multimeter- analogue meter - moving coil meter - moving iron - clamp



on meters - analogue multimeter- oscilloscopes - analog oscilloscopes - Digital storage oscilloscopes - computer based oscilloscope. Display of measurement signals - recording of measurement data - presentation of data.

**UNIT-IV: Variable conversion elements and Measurement signal transmission (10 Hrs)**

Bridge circuits - null-type dc bridge - deflection type DC bridge - error analysis - ac bridges - commercial bridges - Resistance measurement - dc bridge circuit - voltmeter-ammeter method - resistance substitution method - use of digital voltmeter to measure resistance - Ohmmeter - inductance measurement - capacitance measurement - current measurement - frequency measurement - digital counter/timer - PLL - oscilloscope - Wien bridge - phase measurement - X-Y plotter - phase sensitive detector. Electrical transmission - pneumatic transmission -fibre optic transmission - optical and radio telemetry - digital transmission protocols

**UNIT-V: Biomedical instruments (8 Hrs)**

ECG - origin of cardiac action potential - ECG lead configurations - ECG recording set up - practical considerations of ECG recording - Analysis of recorded ECG signal -vector cardiography- phonocardiography - Echocardiography, blood cell counter - electron microscope - principle of magnetic focusing - scanning electron microscope (SEM-) - spectrophotometer - flame photometer.

**BOOK FOR STUDY:**

1. Alan S. Morris and R. Langari, Measurement and instrumentation theory and application, 1st edition, publisher : Academic Press, 2012
2. M. Arumugam , Biomedical Instrumentation, , 3rd edition, Publisher: Anuradha,2016
3. ESD BOOK is based on CEI/IEC 61340-5-1: 1998 and CEI/IEC 61340-5-2/ TS:1999 published by the International Electrotechnical Commission, 3, rue de Varambe, Geneva, Switzerland

**BOOKS FOR REFERENCE:**

1. Albert .D. Helfrick and William D. Hooper, “Modern Electronic Instrumentation and Measurement Techniques”, PHI, 1st edition, 1990
2. H.S. Kalsi, “Electronics Instrumentation”, 2nd edition, TMH, 2004
3. Leslie Cromwell, Fred J. Werbell and Eruch A. Pfeiffer, “biomedical instrumentation and measurements”, 2nd edition, PHI, 2005

4. A. K. Sawhney, “Electrical and Electronics Measurements and Instrumentation”, DhanpatRai and company, 2001.

**SECTION:**

| UNIT | BOOK | SECTIONS |
|---|---|---|
| I | 1 | 1.1 - 1.4, 2.1 - 2.4. ESD & EMC Lecture notes |
| II | 1 | 3.1 - 3.6.7, 3.7, 4.1 - 4.5 |
| III | 1 | 7.1 - 7.4, 8.1 - 8.5 |
| IV | 1 | 9.1 - 9.8, 10.1 - 10.7, 11.1 - 11.4 |
| V | 2 | 4.3 - 4.3.8, 7.1 - 7.3, 7.5.2 - 7.5.3 |

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**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester VI | Course Code 17UEL630303B | Core Elective: ELECTRONIC MEASUREMENT SYSTEM | | | | | | | | | | | | Hours 4 | Credits 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | | Mean Score of COs | |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | | |
| CO1 | 5 | 4 | 2 | 3 | 4 | 4 | 4 | 3 | 2 | 4 | 4 | 3 | 3 | 3.5 | |
| CO2 | 5 | 4 | 2 | 3 | 4 | 4 | 3 | 3 | 2 | 4 | 4 | 3 | 3 | 3.4 | |
| CO3 | 5 | 4 | 2 | 3 | 4 | 4 | 3 | 3 | 2 | 4 | 4 | 3 | 3 | 3.4 | |
| CO4 | 5 | 4 | 2 | 3 | 4 | 4 | 4 | 3 | 2 | 4 | 4 | 3 | 3 | 3.5 | |
| CO5 | 5 | 4 | 2 | 3 | 4 | 4 | 4 | 3 | 2 | 4 | 4 | 3 | 3 | 3.5 | |
| CO6 | 5 | 4 | 2 | 3 | 4 | 4 | 4 | 3 | 2 | 4 | 4 | 3 | 3 | 3.5 | |
| | | | | | | | | | | | | | Mean Overall Score | | 3.5 |

**Result: The Score for this Course is 3.5 (Moderate Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling:***

$$\textbf{Mean Score of COs} = \frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}} \qquad \textbf{Mean Overall Score for COs} = \frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$$

| Semester VI | L | P | C |
|---|---|---|---|
| 17UEL640602 | 2 | - | 2 |

**Skill-Based Elective-II:**
**TROUBLESHOOTING COMPUTER HARDWARE**

**Course Outcomes**:

1. Will be able to integrate the computer hardware trouble-shooting skills
2. Will be able to acquire knowledge on various power supplies and terminal connectors
3. Ability to understand various computer components and peripherals
4. Ability to classify computer memory standards
5. Will be able to acquire the knowledge on assembling and installation of PC
6. Will be able to acquire knowledge on safety and maintenance of PC

**UNIT-I:**

**PC organization** **(5 Hrs)**

Introduction to computer hardware -components of mother boards–connectors types: onboard -front panel –back panel –ports-slots -Basics of add on cards–BIOS.

**UNIT-II:**

**Power supply** **(5 Hrs)**

Power supply unit-SMPS outputs -Voltage measurements-CPU connector-Motherboard connector and device connectors-cabinet types–AT,ATX,BTX,SFF,ITX and its form factor-Types of cases–Tower case–desktop case-portable case.

**UNIT-III:**

**Memories** **(4 Hrs)**

Semiconductor memory – ROM–PROM–EPROM – RAM–Virtual memory-Cache memory-Linear and Physical memory-video memory-Secondary memories: Floppy–HDD–CD Rom-CD-RW-DVD.

**UNIT-IV:**

**Input and Output devices** **(5 Hrs)**

Input devices–keyboard-mouse-types of mouse-DIN/PS2 port-Serial port–parallel ports–USB ports-Output devices- monitor- printer -Organization and connectors.



**UNIT-V:**

**Assembling and installation** **(5 Hrs)**

PC Assembling –Bios setting -Booting sequence setting-Installation Menu-Selection-Partitioning-Formatting–Copying and installation-Account creation-Device driver installation.

**Book for Study:**

1. Material prepared by the Department.

**Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes**

| Semester VI | Course Code 17UEL640602 | Title of the Paper: Skill-based Elective: TROUBLESHOOTING COMPUTER HARDWARE | | | | | | | | | | Hours 2 | Credits 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Course Outcomes (COs) | Programme Outcomes (POs) | | | | | Programme Specific Outcomes (PSOs) | | | | | | | Mean Score of COs |
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 | |
| CO1 | 5 | 4 | 2 | 3 | 4 | 4 | 5 | 4 | 4 | 4 | 5 | 3 | 4 | 3.9 |
| CO2 | 5 | 4 | 2 | 3 | 4 | 4 | 5 | 5 | 5 | 4 | 5 | 3 | 4 | 4.1 |
| CO3 | 5 | 4 | 2 | 3 | 4 | 4 | 4 | 3 | 3 | 5 | 4 | 3 | 4 | 3.7 |
| CO4 | 5 | 4 | 2 | 3 | 4 | 4 | 5 | 5 | 5 | 5 | 4 | 3 | 4 | 4.1 |
| CO5 | 5 | 4 | 2 | 3 | 4 | 4 | 4 | 5 | 5 | 5 | 3 | 3 | 4 | 3.9 |
| CO6 | 5 | 4 | 2 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 4 | 3.7 |
| | | | | | | | | | | | Mean Overall Score | | | 3.9 |

**Result: The Score for this Course is 3.9 (Moderate Relationship)**

***Note:***

| Mapping | 1-20% | 21-40% | 41-60% | 61-80% | 81-100% |
|---|---|---|---|---|---|
| Scale | 1 | 2 | 3 | 4 | 5 |
| Relation | 0.0-1.0 | 1.1-2.0 | 2.1-3.0 | 3.1-4.0 | 4.1-5.0 |
| Quality | Very poor | Poor | Moderate | High | Very High |

***Values Scaling*:**

| **Mean Score of COs** = $\frac{\text{Total of Values}}{\text{Total No. of POs \& PSOs}}$ | **Mean Overall Score for COs** = $\frac{\text{Total of Mean Scores}}{\text{Total No. of COs}}$ |
|---|---|





*Notes*

***Notes***