# B Sc
# ELECTRONICS

## SYLLABUS (2007-2010)

under
## CHOICE BASED CREDIT SYSTEM
## (CBCS)

## ST. JOSEPH'S COLLEGE (AUTONOMOUS)

(Nationally Reaccredited with A+ Grade / College with Potential for Excellence)
## TIRUCHIRAPPALLI - 620 002

## Features of Choice Based Credit System (CBCS)

The Autonomous St. Joseph's College (1978) with A+ Grade from NAAC (2007) has introduced the choice based credit system (CBCS) for UG and PG courses from the academic year 2001-2002.

**OBJECTIVES** of Credit System:
* To provide mobility and flexibility for students within and outside the parent department
* To provide broad based education
* To help students learn at their own pace
* To provide students scope for acquiring extra credits
* To impart more job oriented skills to students
* To make any course multi-disciplinary in approach

**What is a 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. However, there could be some flexibility because of practicals, field visits and tutorials. The following Table shows the relation between credits and hours.

| Hours in a week | Hours (2-3) | Hours (4) | Hours (5-6) |
|---|---|---|---|
| Theory   Credits | 1 | 3 | 4 |
| Practicals  Credits | 1 | 2 | 3 |

For UG courses a student must earn a minimum of 140 credits to get a pass. The 140 credits are split as follows:

|  |  | BA | BSc | BCom |
|---|---|---|---|---|
| English | : | 16 | 16 | 8 |
| Languages | : | 12 | 12 | 12 |
| Allied: Compulsory - 2 courses | : | 10 | 10 | 10 |
| Allied: Optional - 2 courses | : | 10 | 8 | 10 |
| Computer Literacy | : | 2 | 2 | 2 |
| Foundation Courses | : | 3 | 3 | 3 |
| Environmental Studies | : | 3 | 3 | 3 |
| Electives | : | 9 | 9 | 9 |
| SHEPHERD | : | 3 | 3 | 3 |
| Core Courses | : | 72 | 74 | 80 |
| **Total** | : | 140 | 140 | 140 |

A student can acquire credits more than 140 by taking electives offered by departments in the free hours available to him in $5^{th}$ and $6^{th}$ semesters.

**Allied Courses**:
The allied courses are of two categories.
Allied Compulsory and Allied Optional: The student has choice in allied optional as two courses are offered simultaneously. The department must offer two courses.  The student has to choose one.

**Electives**
A student should take at least three electives.
A least one elective should be from Arts Department for a student of Science Department and vice versa for Arts students.
A student cannot take more than one elective from his parent department.

**Credit System Codes - Subject Code Fixation**

The various papers in the different courses are coded.  The following code system is adopted.

- The code number of the subject should be as **07UPH1XX** where
  - a)  07   refers to year of revision
  - b)  U    refers to Undergraduate
  - c)  PH   refers to Physics*
  - d)  1    refers to Semester 1
  - e)  0X   refers to Languages (Part 1)
  - f)  1X   refers to General English (Part 2)
  - g)  2X   refers to Core Major (Part 3)
  - h)  5X   refers to Core Allied Compulsory (Part 3) ⎫
  - i)  7X   refers to Core Allied Optional (Part 3)      ⎬  X - Paper number
  - j)  8X   refers to Elective (Part 3)                       ⎭
  - k)  9X   refers to Foundation Course (Part 4)

- The code number of the subject should be as **07PEC1XX** where
  - a)  07   refers to year of revision
  - b)  P    refers to Postgraduate
  - c)  EC   refers to Economics*
  - d)  1    refers to Semester 1
  - e)  2X   refers to Core
  - f)  4X   refers to Optional ⎫  X-Paper number
  - g)  6X   refers to EDC         ⎭

**Codes for Departments**:

| Sl. No. | Course | Subject Code |
|---------|--------|--------------|
| 1. | Biochemistry | BI |
| 2. | Biotechnology | BT |
| 3. | Business Administration | BU |
| 4. | Chemistry | CH |
| 5. | Commerce | CO |
| 6. | Computer Applications | CA |
| 7. | Computer Science | CS |
| 8. | Information Technology | IT |
| 9. | Economics | EC |
| 10. | English | EN |
| 11. | English - General | GE |
| 12. | Electronics | EL |
| 13. | Foundation Course | FC |
| 14. | French | FR |
| 15. | Hindi | HI |
| 16. | History | HS |
| 17. | Human Resource Management | HR |
| 18. | Mathematics | MA |
| 19. | Physics | PH |
| 20. | Plant Biology & Plant Biotechnology | PB |
| 21. | Personnel Management & Industrial Relations | PM |
| 22. | Sanskrit | SA |
| 23. | Statistics | ST |
| 24. | Tamil | TA |
| 25. | Tamil - General | GT |
| 26. | Transport Management | TM |

**Evaluation**

For each course there is formative Continuous Internal Assessment (CIA) and Semester Examinations (SE) in the weightage ratio 50:50. The following table illustrates how one evaluates the **Overall Percentage Marks** (OPM) for a student in Part I (English) in the four papers put together.

$$OPM = a_1b_1 + a_2b_2 + a_3b_3 + a_4b_4 / (b_1+b_2+b_3+b_4)$$

Where $a_1$, $a_2$, $a_3$ and $a_4$ indicate the marks obtained in the 4 semesters for English and $b_1$, $b_2$, $b_3$ and $b_4$ indicate the corresponding credits for the 4 courses. For example let us consider the following marks scored by a student in the 4 semesters in English.

Part II-General English

| S. No. | Sem. | Subject | CIA | SE | Total | Avg | Credit | Cr.pts |
|--------|------|---------|-----|-----|-------|------|--------|--------|
| 1. | I | GE-I | 50 | 48 | 98 | 49.0 | 4 | 196.0 |
| 2. | II | GE-II | 50 | 48 | 98 | 49.0 | 4 | 196.0 |
| 3. | III | GE-III | 50 | 50 | 100 | 50.0 | 4 | 200.0 |
| 4. | IV | GE-IV | 50 | 48 | 98 | 49.0 | 4 | 196.0 |
| | | *TOTAL* | | | | | | *788.0* |

OPM = 788 / total number of credits = 788.0 / 16 = 49.25
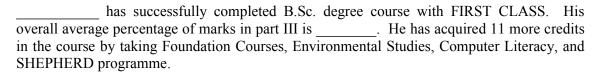
**This percentage corresponds to III class.**

If OPM is between 50 and 60 the student gets II class. If OPM is 60 and more then the student is placed in I class.

If scores OPM=75 and more he gets first class with distinction.

Similarly we can compute OPM for part II and Part III using the marks in various subjects and the corresponding credits.

Part IV consists of foundation courses, computer literacy, SHEPHERD programme, Service Organisation and only a pass is indicated for these and Part IV is not taken into account for computing OPM.

**Declaration of result:**

_____ has successfully completed B.Sc. degree course with FIRST CLASS. His overall average percentage of marks in part III is _____. He has acquired 11 more credits in the course by taking Foundation Courses, Environmental Studies, Computer Literacy, and SHEPHERD programme.

**B. Sc. ELECTRONICS - COURSE PATTERN**

| Sem. | Part | Code | Subject Title | Hr | Cr |
|---|---|---|---|---|---|
| I | I | * | Tamil – I / Hindi – I / French – I / Sanskrit - I | 4 | 3 |
| | II | 07UGE111 | General English - I | 5 | 4 |
| | III | 07UEL121 | Semiconductor Devices and Circuits- I | 5 | 4 |
| | III | @ | Electronics Practicals -I | 3 | |
| | III | @ | Workshop Practice | 3 | |
| | III | 07UMA155 | Allied Mathematics - I | 6 | 5 |
| | IV | 07UFC191 | Foundations of Humanity | 2 | 1 |
| | | | Library | 2 | |
| | | | Total for semester - I | **30** | **19** |
| II | I | * | Tamil – II / Hindi – II / French –II / Sanskrit - II | 4 | 3 |
| | II | 07UGE212 | General English - II | 5 | 4 |
| | III | 07UEL222 | Semiconductor Devices and Circuits - II | 5 | 4 |
| | III | 07UEL223 | Electronics Practical -I | 3 | 4 |
| | III | 07UEL224 | Workshop Practice | 3 | 2 |
| | III | 07UMA256 | Allied : Mathematics - II | 6 | 5 |
| | IV | 07UFC292 | Environmental Studies | 4 | 3 |
| | | | Total for semester - II | **30** | **28** |
| III | I | * | Tamil – III / Hindi – III / French –III / Sanskrit - III | 4 | 3 |
| | II | 07UGE313 | General English - III | 5 | 4 |
| | III | 07UEL325 | Electric Circuit Theory | 5 | 4 |
| | III | @ | Electronics Practical - II | 3 | |
| | III | 07UPH377 | Allied: Physics - I | 4 | 3 |
| | III | @ | Allied: Physics Practical - I | 2 | |
| | IV | 07UFC393 | Social Ethics / or | | |
| | IV | 07UFC394 | Religious Doctrine-I | 2 | 1 |
| | IV | 07UFC395 | Computer Literacy | 4 | 2 |
| | | | Total for semester - III | **30** | **19** |
| IV | I | * | Tamil – IV / Hindi – IV / French –IV / Sanskrit - IV | 4 | 3 |
| | II | 07UGE414 | General English – IV | 5 | 4 |
| | III | 07UEL426 | Digital Electronics | 5 | 4 |
| | III | 07UEL427 | Electronics Practical - II | 3 | 4 |
| | III | 07UPH478 | Allied: Physics - II | 4 | 3 |
| | III | 07UPH479 | Allied: Physics Practical - I | 2 | 4 |
| | IV | * | Elective - I | 4 | 3 |
| | IV | 07UFC496 | Building Men for Others / or | | |
| | IV | 07UFC497 | Religious Doctrine-II | 2 | 1 |
| | | | Total for semester - IV | **30** | **26** |

| | | | | | |
|---|---|---|---|---|---|
| | III | 07UEL528 | Communication System - I | 5 | 5 |
| | III | 07UEL529 | Linear Integrated Circuits | 5 | 5 |
| V | III | 07UEL530 | Microprocessor and its Applications | 5 | 5 |
| | III | 07UEL531 | Programming in C | 5 | 5 |
| | III | 07UEL532 | Electronics Practical - III | 6 | 4 |
| | IV | * | Elective - II | 4 | 3 |
| | | | **Total for Semester -V** | **30** | **18** |
| | III | 07UEL633 | Power Electronics | 5 | 5 |
| | III | 07UEL634 | Electronic Instrumentation | 5 | 5 |
| VI | III | 07UEL635 | Communication System - II | 5 | 5 |
| | III | 07UEL636 | Microcontroller and its Applications | 5 | 5 |
| | III | 07UEL637 | Electronics Practical - IV | 6 | 4 |
| | III | * | Elective –III | 4 | 3 |
| | | | **Total for Semester -VI** | **30** | **27** |
| I-V | IV | | Extension Service : SHEPHERD | | 3 |
| | | | **Total Credits for All Semesters** | **180** | **140** |

* Code numbers according to the subjects chosen
@ Practical Examination in the following semester

Sem:I                                      Hours : 5
07UGT101                               Credits: 4

## பொதுத்தமிழ் - 1

**நோக்கங்கள்:**

1. சமுக மாற்ற உணர்வை ஊட்டும் தலைசிறந்த தற்காலக் கவிஞர்கள், உரைநடை ஆசிரியர்களது படைப்புகளின் இலக்கியநயம் பாராட்டல்.

2. சந்திப்பிழையின்றி எழுதப் பயிற்றுவித்தல்

**பயன்கள்**

1. சமூக உணர்வூட்டும் படைப்புகளை அழகியல் நுகர்ச்சி வாயிலாக மாணாக்கர் கற்றுக்கொள்வர்.

2. சந்திப்பிழை நீக்கி எழுதும் திறன் பெறுவர்.

**செய்யுள் திரட்டு**

1. மகாகவி பாரதியார் கவிதைகள்

2. பாரதிதாசன் கவிதைகள்

3. சுத்தானந்த பாரதியார், தமிழ்க்கனல் ஷஎன்னருமைத் தமிழர்களே'

4. கவிமணி கவிதைகள்

5. கவிஞர் கண்ணதாசன் - இயேசு காவியம்

6. பெருஞ்சித்திரனார் பாடல்கள்

7. அப்துல் ரகுமான் - ஆலாபனை

8. கவிஞர் அறிவுமதி கவிதைகள்

9. மொழிபெயர்ப்புக் கவிதைகள்

10. இலக்கணம்: வல்லினம் மிகும் - மிகா இடங்கள்

இலக்கிய வரலாறு - மூன்றாம் பாகம்
சிறுகதை
உரைநடை : முதல் ஆறு கட்டுரைகள்

**பாடநூல்**

1. செய்யுள் திரட்டு - தமிழ்த்துறை வெளியீடு, 2004-2007

2. இலக்கணம் - மேற்குறித்த நூலில் உள்ளது.

3. *சமூகவியல் நோக்கில் தமிழ் இலக்கிய வரலாறு*, தமிழ்த்துறை வெளியீடு

4. உரைநடை நூல் - *திறன் வளர்க்கும் கட்டுரைகள்*, தமிழ்த்துறை வெளியீடு, 2004-05 (அறக்கட்டளைச் சொற்பொழிவு நீங்கலாக 12 கட்டுரைகள்)

5. சிறுகதை: உறவு, நியுசெஞ்சுரி புத்தகநிலையம், சென்னை, 2007 முதற்பதிப்பு

Sem.: I                                                                    Hours  : 5
Code: 07UGE111              **GENERAL ENGLISH - I**                         Credits : 4

**Objectives**
1.  To enable students develop their communication skills.
2.  To inculcate in students the four basic skills: Reading, Writing, Listening and Speaking.

**Unit I**
1.  Prose                          : At the College
2.  Shakespeare                    : The Merchant of Venice
3.  Essential English Grammar      : Units 1 to 5
4.  Reading Comprehension

**Unit II**
5.  Poetry                         : The Passionate Shepherd to his Love
6.  Shakespeare                    : The Taming of the Shrew
7.  Essential English Grammar      : Units 6 to 10
8.  Letter Writing                 : Informal

**Unit III**
9.  Prose                          : Outside the Class
10. Shakespeare                    : The Tempest
11. Essential English Grammar      : Units 11 to 15
12. Letter Writing                 : Formal

**Unit IV**
13. Prose                          : For Business and Pleasure
14. Poetry                         : Daybreak
15. Shakespeare                    : Julius Caesar
16. Essential English Grammar      : Units 16 to 22

**Unit V**
17. Poetry                         : I love to see it lap the miles
18. Shakespeare                    : King Lear
19. Shakespeare                    : Macbeth
20. Essential English Grammar      : Units 23 to 29

**Required Reading**
1.  Krishnaswamy, N. & T. Sriraman: Creative English for Communication (Macmillan)
2.  Raju, A.K. (ed.)              : Pegasus (Macmillan)
3.  Murphy, R.                    : Essential English Grammar (CUP)
4.  Dodd, E.F.                    : Six Tales from Shakespeare (Macmillan)

Sem- I                                                                                     Hours:  5
07UEL121                                                                              Credits: 4

## SEMI CONDUCTOR DEVICES AND CIRCUITS-I

Objective: 1)  To learn the principles of working of all the semiconductor Devices
               2)  To learn the construction and working of rectifiers

### UNIT-I: SEMICONDUCTOR THEORY AND JUNCTION DIODE

Bonds in semiconductors-Energy band description of semiconductors-Effect of temperature-Hole Current-Intrinsic semiconductor-Extrinsic semiconductor- n-type semiconductor- p-type semiconductor-Majority and Minority carriers-pn junction- properties of pn junction-applying voltage across pn junction- current flow in forward biased pn junction-characteristics of pn junction- Resistances of diode-equivalent circuits- important terms.

### UNIT-II DIODE RECTIFIERS AND SPECIAL PURPOSE DIODES

Half wave rectifier- Efficiency of Half wave rectifier- Centre tap full wave rectifier- Full wave bridge rectifier-efficiency of full wave rectifier- ripple factor- Zener diode-equivalent circuits-Zener diode as voltage stabilizer-solving Zener diode equations-light emitting diode-voltage and current-advantages and applications-multicolour LEDs-photodiode- operation-characteristics-applications- optoisolator-tunnel diode- tunnel diode oscillator-varactor diode-application- Shockley diode.Types of filters

### UNIT-III TRANSISTOR BASICS AND BIASING TECHNIQUES

Transistor- naming the terminals and some facts- transistor action- symbols- transistor connections- Common base connection- characteristics- common emitter connection-characteristics- common collector connection- comparison of connections- load line analysis-operating point- cut-off and saturation-power rating-transistor as an amplifier- faithful amplification- stabilisation and essentials of a transistor biasing circuit- Base resistor method-biasing with feedback resistor- voltage divider bias- mid point biasing.

### UNIT-IV FIELD EFFECT TRANSISTORS

Junction field effect transistor- working principle- symbol- difference between JFET and BJT- characteristics of FET- important terms and expression for Drain current- parameters of JFET- JFET biasing- JFET connections- JFET as an amplifier- voltage gain of JFET amplifier- MOSFET-working principle- Types of JFET Biasing-enhanced mode and depletion mode MOSFET (Cyclosted material).

### UNIT-V THYRISTORS AND APPLICATIONS

Silicon controller rectifier (SCR) - working- equivalent circuit- characteristics of SCR-normal operation- SCR switching- SCR halfwave rectifier- SCR fullwave rectifier-applications- Triac- operations-characteristics- Diac- applications-  Unijunction transistor-equivalent circuit- characteristics- applications.

**BOOK FOR STUDY**:

1. PRINCIPLES OF ELECTRONICS, By V. K. METHA & ROHIT METHA
                    Sultan Chand publications: 2006 Reprint

| Units | Sections |
|-------|----------|
| I | 8.2, 8.5 - 8.11, 8.13-8.18, 9.3, 9.5, 8.19 |
| II | 9.8,9.9, 9.11 - 9.13, 9.15, 9.20, 9.21 - 9.23, 10.2 - 10.7, 10.9 - 10.16. |
| III | 11.1-11.11, 11.13, 11.16, 11.17, 11.21, 11.22, 11.15, 12.1, 12.4, 12.5, 12.8 - 12.10, 12.12 |
| IV | 22.2, 22.3, 22.6, 22.8- 22.10, 22.12, 22.15, 22.18, 22.19 |
| V | 23.1-23.3, 23.5, 23.6, 23.8- 23.11, 24.2, 24.4, 24.5, 24.7-24.11, 24.13 |

Sem I                                                        Hours/Week: 6
07UMA155                                                     Credit      : 5

## Allied: MATHEMATICS - I

**Objectives**
1. To train the student in mastering the techniques of various branches of Mathematics
2. To motivate the students to apply the techniques in their respective major subjects.

**Unit - I  Differential and Integral Calculus**
Successive diffentiation - Leibnitz's theorem (No proof) - Maxima and minima - Integration by parts - properties of definite integrals. (Chapter 1.11, 1.12, 2)

**Unit - II  Reduction formula**
Reduction formula for $\cos^n x$, $\sin^n x$, $e^{ax}\cos^n x$, $e^{ax}\sin^n x$ and $\tan^n x$.  Evaluation of double and triple integrals (simple problems only). (Chapter 1.13 & 5)

**Unit - III   Differential equations**
First order differential equations - Variable separable - Homogenous equation - Linear & Bernoulli's equation.   Second order differential equations (linear) with constant co-efficients - homogeneous linear equations with variable co-efficients

**Unit - IV  Algebra**
Eigen values and Eigen vectors of matrices: Problems- Cayley Hamilton theorem (No proof) and problems - Definition of Vector Space - Definition of linear independence of vectors - Examples in $R^3$.
(Chapter 8...6.4-8.6., Chapter6.1.1-6.1.3, 6.3.5-6.3.7)

**Unit - V  Convergence of Series**
Concept of limit of a sequence - limit of a function - Simple problems - Convergence, divergence and oscillation of a series - geometric series - tests of convergence and divergence, comparison, ratio and root tests(without proof). (Chapter 6(1-14))

**Books for study**
1. Narayanan and T.K. Manickavasagam pillai Ancillary Maths Book II & III Edn 1999  (Relevan Portion For Units I,II And III)
2. S. Arumugam and others Modern Algebra (For unit IV)
3. Dr. M.K. Venkataraman Higher Mathematics for Engineering and Science (For unit V)

Sem:II                                                              Hours  : 5
07UGT202                                                            Credits: 4

## பொதுத்தமிழ்-2

**நோக்கங்கள்**

1. சமயநல்லிணக்க உணர்வை வளர்த்தல்
2. தமிழ்க்காப்பியங்களில் அழகும் அறிவுணர்வும் ஊட்டும் பகுதிகளைப் படித்துப் புரிந்து கொள்வர். உரைநடைக்கட்டுரை எழுதும் திறன் பெறுவர்.

**பயன்கள்**

தமிழைத் திருத்தமாகப் படிக்கவும் பேசவும் பிழையின்றி எழுதவும் தேர்ச்சி பெறுதல்.

தம் படைப்புக்களில் படித்தவற்றை முறையாகப் பயன்படுத்தல்

**1. செய்யுள் திரட்டு**

    1. சிலப்பதிகாரம்
    2. மணிமேகலை
    3. சீவகசிந்தாமணி
    4. கம்பராமாயணம்
    5. தேம்பாவணி
    6. சீறாப்புராணம்
    7. இரட்சணிய சரிதம்
    8. இலக்கணம்: எழுத்து, சொல்

**2. இலக்கணம் - எழுத்து, சொல் (தமிழ்த் துறை வெளியீடு)**

    இலக்கிய வரலாறு - இரண்டாம் பாகம் (தமிழ்த்துறை வெளியீடு,2001)
    உரைநடை நூல்-7 முதல் இறுதிக்கட்டுரைகள் வரை, திறன்வளர்க்கும் கட்டுரைகள்
    (7-12) (தமிழ் ஆய்வுத்துறை வெளியீடு, 2001)

**பாடநூல்:**

    செய்யுள் திரட்டு - தமிழ்த்துறை வெளியீடு, 2004-07

Sem.  : II                                                                                  Hours  : 5
Code  : 07UGE212                                                                  Credits : 4

# GENERAL ENGLISH - II

Objectives
1. To enable students develop their communication skills.
2. To inculcate in students the four basic skills: Reading, Writing, Listening and Speaking.

**Unit I**
1. Prose                              : Are you Smart?
2. Jules Verne                      : Around the World in 80 Days (Chap. 1 to 5)
3. Essential English Grammar   : Units 30 to 35
4. Reading Comprehension

Unit II
5. Poetry                           : Gitanjali (Song 36)
6. Jules Verne                      : Around the World in 80 Days (Chap. 6 to 10)
7. Essential English Grammar   : Units 36 to 40
8. Note-making

Unit III
9. Prose                            : Are you Creative?
10. Jules Verne                     : Around the World in 80 Days (Chap. 11 to 15)
11. Essential English Grammar  : Units 41 to 45
12. Note-taking

Unit IV
13. Prose                           : How to Win?
14. Poetry                          : The Pond
15. Jules Verne                     : Around the World in 80 Days (Chap. 16 to 20)
16. Essential English Grammar  : Units 46 to 50

Unit V
17. Poetry                          : The Tree
18. Jules Verne                     : Around the World in 80 Days (Chap. 21 to 26)
19. Essential English Grammar  : Units 51to 57
20. Dialogue Writing

Required Reading
1. Krishnaswamy, N. & T. Sriraman : Creative English for Communication (Macmillan)
2. Raju, A.K. (ed.)              : Pegasus (Macmillan)
3. Murphy, R.                    : Essential English Grammar (CUP)
4. Verne, J. (Retold by M. Green) : Around the World in Eighty Days (Macmillan)

Sem- II                                                                Hours:  5
07UEL222                                                             Credits: 4

## SEMI CONDUCTOR DEVICES AND CIRCUITS-II

Objective: 1)  To learn the principles of working of semiconductor Devices
               2)  To learn the circuits of amplifier, oscillator and feedback networks.

### UNIT-I SINGLE STAGE TRANSISTOR AMPLIFIERS

How transistor amplifies- graphical demonstration of transistor amplifier- practical circuit of transistor amplifier- phase reversal- DC and AC equivalent circuits- load line analysis- voltage gain- AC emitter resistance- formula for AC emitter resistance- voltage gain in terms of AC emitter resistance-input impedance of an amplifier- amplifier equivalent circuit.h-parameter analysis of CE,CB,CC amplifier

### UNIT-II MULTISTAGE TRANSISTOR AMPLIFIERS AND POWER AMPLIFIERS

Multistage transistor amplifier- important terms- RC coupled amplifier- transformer couple amplifier- difference between voltage and power amplifiers- performance quantities of power amplifiers- classification- expression for collector efficiency- maximum collector efficiency of series fed class A amplifier- maximum collector efficiency of transformer coupled class A amplifier- thermal runaway- heat sink- mathematical analysis- pushpull amplifier- complementary symmetry amplifier

### UNIT-III FEEDBACK AMPLIFIERS AND TUNED AMPLIFIERS

Feedback- principles of negative feedback in amplifiers- gain of voltage feedback amplifier- advantages of negative feedback- feedback circuit- principles of negative current feedback- current gain with negative feedback- effects of negative feedback-tuned amplifiers-analysis of parallel tuned circuit- frequency response of tuned amplifier- relation between Q and Bandwidth-single tuned amplifier- class C amplifiers- operation- DC and AC loads-maximum AC output power- emitter follower- Darlington amplifier.

### UNIT-IV SINUSOIDAL OSCILLATORS

Sinusoidal oscillator- types of sinusoidal oscillations- oscillatory circuit- undamped oscillations from tank circuit- positive feedback amplifier- essentials of transistor oscillator- Barkhausen criterion- tuned collector oscillator- Colpitt's oscillator- Hartley oscillator- phase shift oscillator- piezoelectric crystals

### UNIT-V SOLID STATE SWITCHING CIRCUITS

Switching circuit- mechanical switch- electromechanical switches- electronic switches- advantage of electronic switch- switching action of a transistor- multivibrators-transistor Astable multivibrator- transistor monostable multivibrator- transistor bistable multivibrator- integrating and differentiating circuits- diode clippers and clampers.

BOOK FOR STUDY:
1. PRINCIPLES OF ELECTRONICS, By V. K. METHA & ROHIT METHA Sultan Chand publications: 2006 Reprint.

| Units | Sections |
|-------|----------|
| I | 13.2-13.14 |
| II | 14.1-14.4, 15.2-15.7, 15.9-15.11, 15.15, 15.16 |
| III | 16.1-16.8, 18.1, 18.3, 18.7-18.9, 18.14, 18.17, 16.9, 16.15 |
| IV | 17.1-17.7, 17.9-17.11, 17.13, 17.16 |
| V | 21.1, 21.3-21.6, 21.9, 21.10, 21.12- 21.18,21.20 |

Sem - II                                                        Hours:  3
07UEL223                                                     Credits: 4

## ELECTRONICS PRACTICALS -I

SEMICONDUCTOR DEVICES AND CIRCUITS

1. Study of Diode characteristics.

2. Study of Zener diode characteristics.

3. Study of Transistor characteristics - CB mode.

4. Study of Transistor characteristics - CE.

5. Study of Transistor characteristics - CC.

6. Photo electronic devices (LDR, photo diode and transistor).

7. Study of FET characteristics.

8. Study of SCR characteristics.

9. Study of TRIAC and DIAC characteristics.

10. Study of UJT characteristics.

11. Half wave rectifier with and without filter.

12. Regulated power supply (Transistor & Zener diode).

13. Regulated power supply (Transistor & Zener diode).

14. Filter circuits - low, high and band pass.

15. Voltage Multiplier Circuits.

16. Regulated power supply (Transistor & Zener diode).

17. RC coupled transistor amplifier.

18. FET amplifier

19. Power amplifier - Transistor Emitter follower.

20. Hartley oscillator - Transistor.

21. Phase shift oscillator - Transistor.

22. Colpitt's oscillator - Transistor.

Sem - II                                                                                      Hours/Week: 3
07UEL224                                                                                   Credits: 2

## WORKSHOP PRACTICE

**Objective: To impart workshop skills to the students.**

1. Component identification

2. Transformer winding

3. Cabinet marking

4. Cabinet making

5. Component placing (Heat sinks)

6. PCB layout

7. PCB etching

8. Soldering & desoldering the components in PCB layout

9. Construction of power supplies (Variable power supplies, Dual power supplies)

10. Functions of Multimeters, Component checking, voltage and Current measuring.

11. Study of CRO (single trace and dual trace).

12. Study of Function Generators.

13. House wiring (single phase and three phase)

14. Assembling and troubleshooting of Stereo Cassette player

15. Assembling and troubleshooting of DVD player and Surround Sound System.

Sem - II                                                                                      Hours/week: 6
07UMA256                                                                                Credits     : 5

## Allied:  MATHEMATICS - II

**Objectives**
1. To train the students in master in the techniques of various branches of Mathematics
2. To motivate the students to apply the techniques in their respective major subjects.

**Unit - I   Numerical methods**
Solution of simultaneous linear equations - Gauss Elimination - Gauss Seidal Methods - Numerical Solutions to O.D.E - Solution by Taylor's Methods - Euler's Method - Runge Kutta Method ($4^{th}$ Order)(Chapter 4 Section 4.2, Chapter 6 Section 6.2 and Chapter 11 Section 11.6,11.10,11.14 and 11.16)

**Unit - II Partial differential equations**
Formation of p.d.e by eliminating constants and function - General -Particular and complete integral - Lagrange's form of the linear first order equations (Chapter 6 Section 6.1-6.6).

**Unit - III Vectors**
Gradient, divergence and curl operations (No proofs of theorem, only simple applications)- Theorems of Gauss,Green and Stokes without proof - simple applications only. (Chapter 1-4)

**Unit - IV Trigonometry**
Expansion of functions Sinnx, Cosnx, $Sin^nx$,$Cos^nx$, $Sin^mxCos^nx$. Infinite series of $\sin\theta$ ,$\cos\theta$ , $\tan\theta$ , Inverse trigonometric functions - Hyperbolic functions - Inverse hyperbolic functions (Chapter 3 & 4)

**Unit - V Complex analysis**
Cauchy Riemann Conditions (No derivation) - Analytic function - (Concept of Complex integration) - Singularities contour integration (Integral over the unit circule only) (Chapter 1, Sections1.11 and Chaprter 5 Sections 1-3).

**Books for study**
1. Venkataraman, M.K.:Numerical methods and Science and Engineering (For unit I)
2. Manickavasagam pillai, T.K. & Others: Ancillary Maths Book II & Others - Viswanathan Printers & Publish (for Unit II)
3. Manickavasagam pillai, T.K. & Others: Ancillary Maths Book III & Others - Viswanathan Printers & Publish (for Unit III & IV)
4. Narayanan and Manickavasagam Pillai, Complex Analysis
   (For Unit V).

Sem:III                                                                                          Hours : 5
07UGT303                                                                                    Credits: 4

## பொதுத்தமிழ்-3

### நோக்கங்கள்

1. தமிழ்ச்செய்யுள்களைப் படித்துப் பொருள் புரிந்து கொள்ளுதல்

2. செய்யுள்களில் அமைந்துள்ள சமூகக்கருத்துக்களை உணர்தல்

3. படைப்புத்திறனை வளர்த்தெடுத்தல்

### பயன்கள்

1. புரிந்து கொண்ட கருத்துக்களில் பயனுள்ளவற்றைத் தெளிவாக, இனிமையாக எடுத்துச்சொல்லும் திறனைப் பெறுதல்.

2. தமிழ் மொழியின் சிறப்பை அறிதல்.

### செய்யுள் திரட்டு

1. குறுந்தொகை

2. பதிற்றுப்பத்து

3. கலித்தொகை

4. புறநானூறு

5. சிறுபாணாற்றுப்படை

6. பதினெண் கீழ்க்கணக்கு - திருக்குறள்

7. இலக்கணப் பகுதி: யாப்பு, அணி

### இலக்கணம் : யாப்பு, அணி

புதினம் - சூரியகாந்தன், *அம்மன் பூவோடு*, பாவைபதிப்பகம், சென்னை, 2003

இலக்கிய வரலாறு - முதல் பாகம்.

### பாடநூல்

செய்யுள் திரட்டு - தமிழ்த்துறை வெளியீடு 2004-07

சமூகவியல் நோக்கில் இலக்கிய வரலாறு - தமிழ்த்துறை வெளியீடு

Sem.   : III                                                  Hours  : 5
Code   : 07UGE 313                                 Credits : 4

# GENERAL ENGLISH - III

## Objectives

1. To enable students to acquire reading habit and thus develop their reading skills.
2. To make them activate their passive vocabulary and sentence structures through prescribed texts.
3. To enhance their taste for reading that will naturally develop their vocabulary power and sentence structures.
4. To develop the listening, speaking and writing skills of students through the prescribed texts.

## Unit – I

1. Guy de Maupassant      : The Diamond Necklace
2. Emile Gaboriou           : The Accursed House
3. Sheila Kaye-Smith      : Mrs. Adis
4. Anton Tchekov           : The Bet
5. Reading Comprehension

## Unit – II

6. O. Henry                : After Twenty years
7. Leonard Merrick        : The Judgement of Paris
8. Stephen Leacock        : The Conjuror's Revenge
9. A.E. Coppard            : The Halfyard Ham
10. Expansion of a Maxim

## Unit – III

11. Far From the Madding Crowd : Chapters 1 to 4
12. Far From the Madding Crowd : Chapters 5 to 8
13. Far From the Madding Crowd : Chapters 9 to 11
14. Far From the Madding Crowd : Chapters 12 and 13
15. Essential English Grammar    : Units 58 to 72

## Unit – IV

16. P.G. Wodehouse         : The Prize Poem
17. Mulk Raj Anand         : The Barber's Trade Union
18. R.K. Narayan           : Wife's Holiday
19. Kushwant Singh          : The Mark of Vishnu
20. Essential English Grammar    : Units 73 to 91

## Unit - V

21. Far From the Madding Crowd : Chapters 14 to 15
22. Far From the Madding Crowd : Chapters 16 to 18
23. Far From the Madding Crowd : Chapters 19 to 21
24. Far From the Madding Crowd : Chapters 22 to 24
25. Précis Writing

## Required Reading

1. Ramesh, K.P. (Ed.)        : The Diamond Necklace and Other Stories (Macmillan)
2. Hardy,T. (Retold by EF Dodd) : Far From the Madding Crowd (Macmillan)
3. Murphy, Raymond       : Essential English Grammar (CUP)

Sem- III                                                    Hours:  5
07UEL325                                                 Credits: 4

**ELECTRIC CIRCUIT THEORY**

Objective: 1)  To learn the methods to simplify any electrical network
            2)  To analyze the performance of complex Networks.

**UNIT -I:ANALYSIS OF SINUSOIDAL WAVES**
Voltage and Current values of sine wave- Phase relation in pure R, L&C circuits Impedance diagram-Phasor diagram- Series circuits -Parallel Circuits-Instantaneous power-Average power - Power factor- Reactive power- Power triangle.

**UNIT - II: RESONANCE AND COUPLED CIRCUITS**
Series resonance - Impedance - Phase angle -Voltage - Current - Bandwidth- Q-factor Magnification. Parallel resonance - Tank circuit - Q-factor - Reactance curve. Mutual inductance - Coefficient of coupling  - Ideal transformer. Series connection of coupled inductor - tuned circuits - Single and double.

**UNIT - III: NETWORK ANALYSIS FOR DC AND AC**
Current-Voltage- Capacitance-Resistance-Inductance-Energy sources - Kirchoff's voltage law - Voltage division - Kirchoff's current law - Current division - Power - graph theory - Tree - TIESET - CUT-SET - Mesh analysis and Node analysis, Source transformation technique.

**UNIT -IV : NETWORK THEOREMS FOR DC AND AC**
Star-delta transformation - Superposition theorem - Thevenin's theorem - Norton's theorem - Reciprocity theorem - Compensation theorem- Maximum power transformation theorem-Tellegen's Theorem.

**UNIT -V: TRANSIENT ANALYSIS AND TWO-PORT NETWORK**
Steady state and transient response - DC response of RC, RL and RLC circuits - Sinusoidal response of RL, RC and RLC circuits - application of differential equations in electrical circuits - Application of Laplace transform in transient circuits. Open circuit impedance parameters - Short circuit admittance parameter - Transmission parameter - Hybrid parameters - Inter relationship of different parameters.

**BOOK FOR STUDY**:
1.  Sudhakar, A & ShyamMohan, S.P: Circuits and Networks - Analysis and Synthesis.(7$^{th}$ reprint) New Delhi: Tata McGraw - Hill publishing company Ltd 1994)

**BOOKS FOR REFERENCE**
1. Umesh Sinha: Circuit Theory (4th edn) (New Delhi: Satya Prakasan Publications,  1995).
2. Paranjothi, S.R: Electric Circuit analysis.(New Age International,1995).

| UNIT | BOOK | SECTION |
|------|------|---------|
| I | 1 | 4.4-4.7, 5.1-5.4, 6.1-6.5 |
| II | 1 | 8.1-8.12, 10.1-10.3, 10.5-10.7 |
| III | 1 | 1.9-1.15, 2.1-2.11, 7.1-7.4 |
| IV | 1 | 3.1-3.7, 7.5-7.8 |
| V | 1 | 11.4, 12.1-12.7, 13.9, 15.1-15.4, 15.6, 15.8 |

Sem III                                                                          Hours / Week : 4
07UPH 377                                                                     Credits : 3

## Allied: PHYSICS – I

**Objectives:**
➢ To know about the information regarding Lasers and Fibre optics in communication system.
➢ To have knowledge on the atomic model and idea on Thermal physics.
➢ To know the importance of Acoustics and to get an idea about Ultrasonics.
➢ To know about X-Rays, Photoelectric effect and Superconductors.
➢ To have an idea on materials like conducting, dielectric and magnetic materials.

**Unit I: LASERS AND FIBRE OPTICS**
Lasers: Introduction – Principle – Einstein's theory – Methods of achieving population inversion – Ruby Laser – He-Ne Laser – Applications.
Fibre Optics: Introduction – Structure of optical fibres – Materials – Classifications – Preparation of fibres – Applications.

**UNIT II : ATOMIC PHYSICS AND THERMAL PHYSICS**
Atomic Physics: Thomson's atom model – Rutherford Atom model – Bohr Atom model – Sommerfeld and Vector atom model.
Thermal Physics: Definitions – Specific heat determination – Newtons law of cooling – Cooling method – Thermal conductivity – Rectilinear flow of heat through a rod – Forbe's method – Lee's disc method.

**UNIT III: ACOUSTICS AND ULTRASONICS**
Acoustics: Classifications – Characteristics of musical sound – Transmission loss – Acoustics of buildings – sound absorbing materials – Acoustic design of an auditorium – sound insulation.
Ultrasonics: Introduction – Classification – generation of ultrasonic waves – Ultrasonic velocity measurements – Applications.

**UNIT IV: X RAYS, PHOTOELECTRIC EFFECT AND SUPERCONDUCTIVITY**
X rays – Generation – properties – origin – Mosley's law – Diffraction of X rays – Bragg's law – Applications – Photo electric effect: Experimental study – Salient features – Einstein's photo electric equations- Super conductors: Introduction – General properties – Types of super conductors – Applications – Solar Cells.

**UNIT V: ELELCTRONIC MATERIALS**
Introduction – Classification – Electrical conduction in materials – Expression for electrical conductivity – Dielectric materials: Definition – types of polarization – Internal field – types of dielectric materials – Clausius –Mossotti relation –dielectric loss – dielectric breakdown – dielectric properties – Magnetic materials: Definition – types of magnetic materials – Hard and soft magnetic materials.

**BOOK FOR STUDY:**
Rajendran V and Manickam A  – Applied Physics for Engineers – Tata Mc Graw Hill, New Delhi 2$^{nd}$ edition 1999.

| UNIT | BOOK | SECTIONS |
|------|------|----------|
| I | 1 | 5.1.1 – 5.1.5, 5.1.8, 5.1.9, 5.1.12, 5.3.1 – 5.3.6 |
| II | 1 | 9.1.1 – 9.1.4, 9.2.1 – 9.2.3, 17.1-17.3, 17.7.4, 17.8.1 |
| III | 1 | 7.2, 7.3, 7.5, 7.6, 7.9, 7.10, 7.12, 8.1-8.4, 8.6 |
| IV | 1 | 11.1 – 11.7, 11.9, 12.2, 14.4, 14.6 |
| V | 1 | 14.1.1 – 14.1.4, 14.2.1-14.2.4, 14.2.8, 14.2.10, 14.2.11, 14.3.1 – 14.3.3, 14.3.5 |

Sem: IV                                                                                         Hours : 5
07UGT404                                                                                      Credits: 4

## பொதுத்தமிழ்-4

### நோக்கம்

1. நாடகத்தின் நோக்கம், அதன் போக்கு, உத்திகள், பாத்திரப்பாங்கு, உரையாடல் முறை, கற்பனைத்திறம்  போன்றவற்றை வெளிப்படுத்தல்

2. புதிய நாடகங்களைப் படைக்கும் திறனை மாணவர்களிடையே உருவாக்குதல்.

### பயன்கள்

1. நாடகவழி அழகியல் உணர்வுகளை வளர்த்தல்.

2. நாடகங்களைச் சமூகப் பயன்பாட்டிற்கு ஏற்ப உருவாக்குதல்

### செய்யுள் நாடகம் :

**மனோன்மணீயம்**, பேராசிரியர் சுந்தரனார்

    அலகு 1: மனோன்மணீயம், பாயிரம், அங்கம் 1, களம் 1-5 வரை

    அலகு 2: மனோன்மணீயம், பாயிரம், அங்கம் 2, களம் 1-3 வரை

    அலகு 3: மனோன்மணீயம், பாயிரம், அங்கம் 3, களம் 1-4 வரை

    அலகு 4: மனோன்மணீயம், பாயிரம், அங்கம் 4, களம் 1-5 வரை

    அலகு 5: மனோன்மணீயம், பாயிரம், அங்கம் 5, களம் 1-3 வரை

### உரைநடை நாடகம் :

முனைவர் ஆ. சிவக்கண்ணன், *பேராசிரியர் பிரம்மச்சாரி*, நியூசெஞ்சுரி புத்தகநிலையம், 2005. (உரைநடை நாடகம் முழுமையும்)

### பாடநூல்

1. பேராசிரியர் சுந்தரனார் , மனோன்மணீயம் - (பதி) தமிழ்த்துறை, தூய வளனார் கல்லூரி, திருச்சிராப்பள்ளி

2. முனைவர் சிவக்கண்ணன், *பேராசிரியர் பிரம்மச்சாரி*, பாவைப்பதிப்பகம்.

### மதிப்பெண் பகிர்வு

        மனோன்மணீயம        - 80

        உரைநடை நாடகம்        - 20

உரைநடை பாகம் 3-இல் நாடகம் கட்டுரை வினாவில் மட்டும் இடம் பெற வேண்டும்.

Sem.   : IV                                             Hours  : 5
Code   : 07UGE414                            Credits : 4

# GENERAL ENGLISH - IV

## Objectives

1. To enhance reading skills towards developing vocabulary power and composition skills.
2. To create in students a taste for enjoying English One-Act Plays thus making them imbibe dramatic skills.
3. To develop the listening, speaking and writing skills of students through the prescribed texts.

## Unit – I

1. A. Ball                              : The Seven Slaves
2. R.H. Wood                       : Post Early for Christmas
3. Reading Comprehension
4. Essential English Grammar   : Units 92 to 98

## Unit – II

5. Monica Thorne                  : The King Who Limped
6. A.E.M. Bayliss                  : One Good Turn
7. A Tale of Two Cities          : Part I
8. Essential English Grammar   : Units 99 to 106

## Unit – III

9. A Tale of Two Cities          : PART II: Chapters 1 to 3
10. A Tale of Two Cities         : PART II: Chapters 4 to 7
11. A Tale of Two Cities         : PART II: Chapters 8 to 10
12. General Essay

## Unit – IV

13. Allan Monkhouse             : Night Watches
14. Ella Adkins                      : The Unexpected
15. A Tale of Two Cities         : PART II: Chapters 11 to 13
16. Essential English Grammar  : Units 107 to 114

## Unit – V

17. Josephina Niggli              : Sunday Costs Five Pesos
18. A Tale of Two Cities         : PART III: Chapters 1 to 5
19. A Tale of Two Cities         : PART III: Chapters 6 to 9
20. Report Writing

## Required Reading

1. K.S. Ramamurthy (Ed.)          : Seven One-Act Plays (OUP)
2. Dickens, C. (Retold by P. Atkinson): A Tale of Two Cities (Macmillam)
3. Murphy, Raymond               : Essential English Grammar (CUP)

Sem - IV                                                                             Hours:  5

07UEL426                                                                            Credits: 4

## DIGITAL ELECTRONICS

**Objective**:
1) To learn the principles of functioning of digital components
2) To learn the design procedure for digital circuits and methods of analysis of any digital circuits.

### UNIT - I: NUMBER SYSTEM AND BOOLEAN ALGEBRA

Number system - Number Base Conversion - Signed Number - binary codes - Complements - Logic gates - Boolean operations & expressions - Laws and rules of Boolean Algebra  - Demorgan's Theorem - Boolean Analysis of logic circuits - Simplification - Standard form of Boolean expressions:  SOP and POS simplification - Truth table - Karnaugh Map - two - three - four variable.

### UNIT - II : DIGITAL LOGIC FAMILIES

Digital Logic families -Special Characteristics - Bipolar logic families - Resistance Transistor Logic -Diode Transistor Logic - Transistor Transistor Logic : Totem pole - Emitter Coupled Logic - Metal Oxide Semiconductor logic - Complementary MOS logic .

### UNIT - III : COMBINATIONAL LOGIC DESIGN

Half adder - Full adder - Half subtractor - Full subtractor -Comparator - Encoders: Decimal to BCD encoder - Octal to binary encoder - Decoders: BCD to decimal decoder / driver - BCD to 7 segment decoder / driver - Mulitiplexer - Demultiplexer.

### UNIT - IV : SEQUENTIAL LOGIC DESIGN

S-R Flip-flops - Edge triggered Flip-flops - Master Slave Flip-Flop - Operating Characteristics - Shift Registers: SISO, SIPO, PISO and PIPO -Bi-directional registers - Asynchronous Counter - Synchronous counter - UP/DOWN Synchronous counter- Design of Synchronous Counter.

### UNIT -V: MEMORY AND PROGRAMMABLE LOGIC DEVICES

RAM - Memory Decoding -ROM - Types of ROM - PLD - Programmable Logic Array- Programmable Array Logic - Sequential Programmable device - SPLD - CPLD -FPGA.

**Books for study**
1. Morris Mano, M:
   Digital Design (3$^{rd}$ Edition) Prentice Hall of India,2000
2. Thomas L.Floyd and R.P.JAIN :
   Digital Fundamentals, Eighth Edition, Published By Pearson Education

**Book for Reference**
   Salivahanan .S and S. Arivazhagan: Digital circuits and Design
   (Vikas Publishing House Pvt Ltd. 2000)

Section:

| Unit | Book | Sections |
|---|---|---|
| I | 1 | 1.2-1.7 |
|  | 2 | 2.1 -2.12,3.1-3.6,4.1-4.10 |
| II | 1 | 10.1 -10.8 |
| III | 2 | 6.2,6.5 -6.6,6.8-6.9 |
| IV | 2 | 7.1 - 7.4,9.1 -9.6, 8.1 -8.4 |
| V | 1 | 7.1-7.3,7.5-7.8 |

Sem - IV                                                                  Hours:  3
07UEL427                                                                 Credits: 4

## ELECTRONICS PRCTICALS -II
## NETWORK AND DIGITAL EXPERIMENTS

1.  Verification of Kirchoff's voltage law.
2.  Verification of Kirchoff's Current law.
3.  Verification of Thevenin's Theorem.
4.  Verification of Norton's theorem.
5.  Verification of Superposition theorem.
6.  Verification of Compensation theorem.
7.  Verification of Reciprocity theorem.
8.  Verification of Maximum power transformation theorem.
9.  Study of Series resonance circuit.
10. Study of Parallel resonance circuit.
11. Study of wheatstone Bridge.
12. Study of Series RC, LC, RLC Circuit.
13. Encoders and Decoders.
14. Multiplexers and Demultiplexers.
15. Shift registers.
16. Asynchronous counters.
17. Synchronous counters.
18. Basic gates and Verification of Boolean laws.
19. Adders and Subtractors.
20. Flip-flops using gates.
21. Parallel Binary adders and Subtractors.
22. BCD adders and BCD Subtractors.
23. K Map simplification.

Sem IV                                          Hours / Week : 4
07 UPH 478                                      Credits : 3

## Allied:  PHYSICS II

**Objectives:**
- To acquire knowledge about the principle and types of condenser and to understand the magnetic effects of electric currents.
- To study various types of galvanometers and their uses.
- To understand the working principle of current, voltage and resistance measuring instruments.
- To acquire knowledge of self and mutual inductance and their determination.
- To study the working principle of electrical machines.

### UNIT I: FUNDAMENTALS OF MAGNETIC PHENOMENA
Coulomb's law – Magnetic field and magnetic Intensity – Magnet in a uniform field and magnetic moment – Magnetic potential – Potential and Intensity at any point due to a bar magnet (Dipole)– Oersted's experiment – Ampere's law – Magnetic field at a point on the axis of a circular coil carrying current and solenoid – Force experienced by a conductor carrying current – Force between two conductors carrying current.

### UNIT II :  MEASURING INSTRUMENTS
Tangent Galvanometer – Moving coil galvanometer – Moving coil Ballistic Galvanometer – Correction for damping in BG – Characteristics of Galvanometer – Figure of merit and resistance of the galvanometer – Ammeter and Voltmeter – Determination of absolute capacity of a condenser.

### UNIT III:  ELECTRICAL MEASUREMENTS
Kirchoff's law – Wheatstone bridge – Meter bridge – Post office Box – Carey Foster's bridge – Potentiometer – Determination of internal resistance of a cell – calibration of ammeter and voltmeter – Determination of  resistance.

### UNIT IV:  ELECTROMAGNETIC INDUCTION
Faraday's law – Lens law – Fleming's right hand rule – Self induction – Definition – units – Self inductance of a long solenoid – energy stored in an inductance – L by Rayleigh's method – Mutual induction – Mutual inductance of two solenoids – Determination of mutual inductance.

### UNIT V:  PRACTICAL APPLICATIONS OF ELECTROMAGNETIC INDUCTION
Measurement of a strong magnetic field(Search Coil) – Eddy currents – ac generators – Poly phase circuits – single and three phase generators – distribution of three phase ac – dc generator – energy losses – dc motors – transformers.

### BOOK FOR STUDY:
1. A text book of Electricity and Magnetism -  Brijlal and N. Subramaniam, Ratan Prakashan Mandir, Twentieth Revised and enlarged edition 2000.

| UNIT | BOOK | SECTIONS |
|------|------|----------|
| I | 1 | 1.3-1.5, 1.10,1.11 |
|   |   | 11.1, 11.2, 11.5, 11.8-11.10 |
| II | 1 | 12.1, 12.4, 12.7, 12.9, 12.18 |
|   |   | 13.9, 13.10, 13.47 |
| III | 1 | 13.21, 13.22, 13.28, 13,31, 13.32, 13.35, 13.36, 13.41, 13.42 |
| IV | 1 | 18.1-18.3, 18.6, 18.7, 18.9-18.11, 18.13-18.15, |
| V | 1 | 19.2, 19.4, 19.6-19.12, 19.17 |

Sem IV                                          Hours / Weeks : 2
07UPH 479                                       Credits : 4

## ALLIED: PHYSICS PRACTICAL

Any 16 of the following:

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 ρ
9.  Potentiometer – Ammeter Calibration
10. Potentiometer – Resistance of a coil of wire R and ρ
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

Sem - V                                                                    Hours/Week: 5
07UEL528                                                                    Credits: 5

# COMMUNICATION SYSTEM - I

Objective:      To learn the fundamental concepts of Communication principles and systems.

## UNIT - I :  SIGNAL AND SYSTEMS

Sinusoidal waveforms - periodic waveforms - trigonometric Fourier series for a periodic waveform - Fourier coefficient - spectrum for trigonometric Fourier series - general properties of periodic waveform - exponential Fourier series - formula for Fourier coefficients - energy signal and Fourier transform - FFT - IFFT - thermal noise and other noises - signal to noise ratio

## UNIT - II: AMPLITUDE MODULATION

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 - SSB-SC generation - VSB. Demodulation   of AM waves - Envelope and synchronous detector.

## UNIT - III : FREQUENCY AND PHASE MODULATION

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 - IV : TRANSMITTERS AND RECEIVERS

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 - Superheterodyne receiver - Double conversion receiver - Choice of IF frequencies - Tracking - Alignment - AGC - AFC - Characteristics of receivers - Communication receivers.

## UNIT - V  : DIGITAL COMMUNICATION

Sampling theory - pulse amplitude modulation - pulse code modulation - pulse frequency modulation - pulse time modulation - pulse position modulation - pulse width modulation - amplitude shift keying - frequency shift keying - phase shift keying - concepts of TDMA and FDMA.

**Books for Study**
1.  Kennedy and George Davis - "Electronic Communication Systems" - 4th ed., 1999.
2.  Dennis Roddy and John Coolen - "Electronic Communications" - 4th ed., PHI, 1997.

**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 ed., McGraw Hill, 1989.

4.  B.P. Lathi - "Modern Digital and Analog Communication Systems" - 3rd ed.,  Oxford Series, 1998.

| Unit | Book | Section |
|------|------|---------|
| 1 | 2 | CHAPTER 2,4 |
| 2 | 1 | CHAPTER 4.1 |
| 3 | 1 | CHAPTER 5.1 |
|   | 2 | CHAPTER 11 |
| 4 | 1 | CHAPTER 4.2,5.3,7 |
| 5 | 2 | CHAPTER 12 |

Sem - V                                                                                          Hours:  5
07UEL529                                                                                     Credits: 5

## LINEAR INTEGRATED CIRCUITS

**Objective**:
       To learn the principles of operation and applications of OP-AMP, 555 timer and PLL.

**UNIT-I       INTEGRATED CIRCUIT FABRICATION**
Classification - IC chip size and circuit complexity - Fundamentals of Monolithic IC technology - Basic planar process-Fabrication of a typical circuit - Active and Passive components for ICs - Fabrication of FETs - Thick and Thin film technology - Technology trends.

**UNIT-II   OP-AMP THEORY & APPLICATIONS**
Ideal Characteristics of an Op - Amp - Internal Architecture of op - Amp (741) - Differential amplifier - DC analysis - Bias & offset currents - Offset voltages - CMRR- AC analysis- Slew rate - Frequency response - Basic application- Inverting amplifier - Non-inverting amplifier - Summing amplifier - Subtractors - Integrator - Differentiator - V-I converter- I-V converter-Instrumentation amplifier.

**UNIT-III  COMPARATORS AND ITS APPLICATIONS**
Comparator- Op-amp as comparator- High-speed comparators- Comparator characteristics  - Comparator applications -Schmitt trigger- Window detector- Peak detector- Clippers and Clampers-Positive and Negative clippers- Small-signal Half wave rectifiers- Positive and Negative clampers- Sample and Hold circuits. Analog computation for solving simultaneous equations.

**UNIT-IV  WAVEFORM GENERATORS AND FILTERS**
Oscillator- Phase shift oscillator- Wien's bridge oscillator- Square wave generator-Triangular wave- Saw tooth waveform generator - Active filter- first order Low- pass Butter worth filter-first order High-Pass Butter worth filter- Band pass filters- Band reject filter- IC voltage regulators (78XX series only).

**UNIT-V    TIMER AND D/A, A/D CONVERTERS**
555 Timer- Functional block diagram- monostable multivbrators,astable multivibrator-VCO-PLL- applications- D/A converters- binary weighted resistors method- R-2R ladder network method- A/D converters- Successive approximation A/D converter- Flash converter.

**BOOKS FOR STUDY**
1) Ramakant A.Gayakwad -Op-amps & Linear Integrated Circuits (III edition)- Prentice Hall India.
2) D.Roy Choudhury & Shail Jain, Linear Integrated Circuits  (2000 Reprint)-, New Age International (P) Limited.

| Unit | Book | Section |
|------|------|---------|
| I | 2 | 1.1 - 1.10 |
| II | 2 | 2.3,2.3.6,2.3.7,2.5.2,3.2.1,3.2.33.3,3.3.1,3.3.4,4.2,4.3,4.5,4.10,4.11, |
| III | 1 | 9.1,9.2,9.4-9.5,9.8,9.9,9.12,9.14,9.15 |
| IV | 1 | 8.2,9.3,8.5,8.8,8.9,8.11-8.13,8.15-8.17 |
|  | 2 | 6.3 |
| V | 2 | 8.1-8.4,9.2-9.4,9.7,10.2.1,10.2.2,10.3.1,10.3.4 |

Sem - V                                                          Hours/Week: 5
07UEL530                                                         Credits: 5

## MICROPROCESSOR AND ITS APPLICATIONS

**Objective**:  To learn  the architecture of 8085 and the technique to develop ASM program.

### UNIT-I:  MICROPROCESSOR ARCHITECTURE
Intel 8085-ALU-Timing and control unit-Registers-Data and Address Bus-Pin configuration-Op-code and operation-Instruction Cycle-Fetch operation Execute operation-Machine cycle and State-Instruction and Data flow-Timing Diagram-Timing diagram for opcode Fetch cycle Memory read-I/O Read-Memory write-I/O write

### UNIT-II  INSTRUCTION SET FOR INTEL 8085
Instruction and Data formats-Addressing modes-Direct-Registers-Register indirect-Immediate and Implicit addressing-Status flags-Intel 8085 instructions-Data Transfer group-Arithmetic group-Logical group-Branch group-Stack, I/O and Machine control groups.

### UNIT-III ASSEMBLY LANGUAGE PROGRAMMING
Machine language-Assembly language-One pass and two pass assembler-Applications-stacks-subroutines-MACRO-micro programming-Data transfer and data manipulation programs-single byte and multibyte arithmetic-complement-shift-mask-Lookup table-larger-smaller-sorting-Array-manipulation-sum of series.

### UNIT-IV  PERIPHERAL DEVICES AND THEIR INTERFACING
Address space partitioning-Memory and I/O interfacing-Data transfer schemes-I/O ports-Programmable peripheral interface 8255-DMA controller 8257-Interrupts of Intel 8085-Interrupt controller 8259-Programmable Interval timer/counter 8253-Interfacing of A/D converter.

### UNIT-V MICROPROCESSOR APPLICATIONS
Delay subroutine-& segment LED display-Measurement of Frequency-Measurement of Voltage and current-Temperature measurement and control-Water level indicator-Interfacing of stepper motor-Microprocessor based Traffic controller-To generate a square wave or pulse using I/O port.

**Books for Study**
1)  Ram B, Fundamentals Of Microprocessor And Microcomputers(4<sup>th</sup> edn)
      (Delhi: Dhanpat Rai & Sons, 2003).
      Unit   Book   Sections
      I      1        3.1- 3.3.5
      II     1        4.1 - 4.6.5
      III    1        5.1, 5.2, 5.5, 5.6. 6.1-6.30.
      IV     1        7.1, 7.2, 7.4, 7.5, 7.7, 7.7.1- 7.7.4, 7.8, 7.8.1, 7.8.2, 7.9, 7.9.1, 7.11.1-7.11.4
      V      1        9.1-9.3.3, 9.5.1, 9.6.1, 9.6.4, 9.7, 9.8
**Book for Reference**:
1. Microprocessors and it's Application : Ramesh Goankar,3<sup>rd</sup> Edition ,

Sem -V                                                                                    Hours:  5
07UEL531                                                                              Credits: 5

## PROGRAMMING IN 'C' LANGUAGE

**Objective**:
To learn the C language syntax and writing programs for problems related to electronics.

### UNIT - I DATA TYPES, OPERATORS AND CONTROL STATEMENTS

Introduction to C -character set - constants- variables-keywords-operators- operator precedence-evaluating expressions - first C programs - console I/O functions.
If statement-if else statement-for statement-while statement-do while statement- switch case statement- go to, break and continue statements-programs.

### UNIT - II   ARRAYS, STRUCTURE AND STRINGS

Arrays - manipulating arrays - multidimensional arrays - strings - standard library string functions - structures - manipulating structures - array of structures - features of structures - Problems

### UNIT - III   POINTERS AND FILES

Pointers - declaration - pointers in array - array of pointers to strings - limitation of array of pointers to strings - pointers in structure - file manipulation - Problems.

### UNIT - IV   FUNTIONS

Function  - use of function - passing values between functions  - scope rule of functions - function call by value - function call by reference - passing array elements to a function - passing an entire array to function - recursion - storage classes- Problems.

### UNIT - V   INTERFACING THROUGH PARALLEL PORT

Parallel port - interfacing LED and generating pattern - interfacing high power devices - interfacing stepper motor - dc motor speed control - interfacing matrix keyboard - interfacing ADC - interfacing DAC.

**Books for Study**
1.  Yashavant Kanetkar - Let us C(No sections)
2.  Cyclosted material - unit V

**Books for Reference**
1.  Byron S. Gottfried: Theory and Problems of Programming With C, Schaum's Outline Series, TMH, 1996.
2.  Balagurusamy .E: Programming in ANSI C, ( TMH, New Delhi).

Sem - V                                                                                    Hours:  6
07UEL532                                                                              Credits: 4

# ELECTRONICS PRACTICAL -III
## (Instrumentation, Power and Communication)

1.  OP-Amp. Basic Operations

2.  OP-Amp. Filters

3.  OP-Amp. Wave Form Generators

4.  OP-Amp. Solving simultaneous Equations

5.  OP-Amp. V-I and I-V Characteristics

6.  OP-Amp. Instrumentation Amplifier

7.  555 - Astable & Monostable Multivibrator

8.  555 - Timer - Applications

9.  IC Regulated Power Supply

10. Half Wave Power control using SCR & UJT.

11. Full Wave Control using SCR & UJT

12. TV Receivers

13. Radio Receivers

14. PAM, PPM, PWM Study

15. AM and FM Study

16. Transmission Line Characteristics

17. Study of Klystron Oscillator - Microwave

18. Hartley oscillator- Op-Amp

19. Phase shift oscillator - Op-Amp

20. Study of PLL

21. Study of Transducers.

Sem : VI                                                          Hours/Week:5
07UEL633                                                          Credits:5

## POWER ELECTRONICS

**Objective**:
✧ To learn the principles of operation of power electronic devices and their use in application circuits.

## UNIT-I  INTRODUCTION TO POWER ELECTRONICS
Concept of Power electronics-Applications of Power electronics- Advantages and Disadvantages of Power electronic converters- Power electronics systems- Power semiconductor devices- Types of power electronics converters- Power electronics modules.

## UNIT-II  POWER TRANSISTORS AND THYRISTORS
Power MOSFETs-Insulated Gate Bipolar Transistor (IGBT), MOS controlled Thyristor (MCT), Terminal characteristics of thyristors-thyristor turn ON methods-Switching characteristics of thyristors- thyristor gate characteristics- Thyristor ratings- thyristor protection- series and parallel operation of thyristors- Gate turnoff thyristor-firing circuits for thyristors.

## UNIT -III  PHASE CONTROLLED RECTIFIERS
Principle of phase control-Single phase half wave circuit with RL load -Single phase half wave circuit with RL load and flywheel diode-Single Phase half wave circuit with RLE load-Single phase Full wave converters-Three Phase converter circuits.

## UNIT-IV CHOPPER, INVERTERS AND CYCLOCONVERTERS
Principle of chopper operation-control strategies-thyristor Chopper circuits-Single phase voltage Inverters-Operating principle-Voltage control in single-phase inverters-Principle of cycloconverter operation-Single phase to single phase circuit step- up cycloconverter-Single phase to single phase step-down converter.

## UNIT-V:  AC VOLTAGE CONTROLLERS AND SOME APPLICATIONS
Types of AC voltage controllers-Integral cycle control-Single phase voltage controllers-Switched mode power supply (SMPS)-Static switches-Static circuit breakers.

## BOOK FOR STUDY
1. Bimbhra P.S:  Power Electronics: Khanna Publishers, sixth reprint 2002.

|       UNIT | SECTIONS |
|------------|----------|
| I          | 1.1-1.7  |
| II         | 2.6, 2.7, 2.9, 4.1-4.4, 4.6, 4.7, 4.10, 4.12, 4.14 |
| III        | 6.11, 6.2, 6.71 |
| IV         | 7.1, 7.2, 9.6, 8.1, 8.5, 10.1 |
| V          | 9.2, 9.3, 11.1, 11.4 |

Sem - VI                                                                                                    Hours:  5
07UEL634                                                                                               Credits: 5

## ELECTRONIC INSTRUMENTATION

**Objectives:**
To learn the various Measuring Equipments, measuring Techniques and signal conditioning.

### UNIT-I MEASUREMENTS
Performance Characteristics- Static Characteristics- Error in measurement- types of error-sources of error- dynamic characteristics- statistical analysis- electrical standards - IEEE 488 Electrical Standard.

### UNIT-II: MEASUREMENTS OF ELECTRICAL QUANTITIES
DC ammeter- Multirange ammeters- Aryton shunt- basic meter as a DC voltmeter- DC voltmeter- multirange voltmeter- loading- Transistor voltmeter-micro voltmeter-AC voltmeter using rectifiers - series type ohmmeter- shunt type ohmmeter-mutlimeter- Oscilloscopes-basic principle- block diagram of oscilloscope- vertical amplifier- horizontal deflecting system- delay line in triggered sweep.

### UNIT-III: TRANSDUCERS
Selecting a transducer- resistive transducer- strain gauges - thermistor- inductive transducer-differential transducer- LVDT- capacitive transducer- load cell- piezo transducer-photo electric transducers- photo voltaic cell- semiconductor photo diode- photo transducer- thermo electric transducers.  Pirani and Penning gauges.

### UNIT-IV: MEASUREMENT OF NON- ELECTRICAL QUANTITY
Measurement of Torque - Tachometers -stroboscope- Measurement of Vibrations - Measurement of flow - Measurement of Liquid Level - Measurement of Thickness - Measurement of pH value - Gas Analyser.

### UNIT-V: SIGNAL CONDITIONING CIRCUITS AND RECORDERS
Signal conditioning - operational amplifier circuits used in Instrumentation - common mode signals - advantages of differential amplifier -charge amplifier - Instrumentation amplifier - AM and demodulation circuits for measurement system- AC Bridge - types of ADC. Log and Anti Log Amplifier -Strip chart recorders - XY recorders - UV recorders - magnetic tape recorders.

**Books for Study**
 1. Kalsi,H.S.: Electronic instrumentation(NewDelhi:Tata McGraw Hill publishing Ltd,1995).
 2. A. K. Sawhney, A Course in Electrical and Electronic Measurements and Instrumentation, 2001, Dhanpat Rai & Co.

| Unit | Book | Section |
|------|------|---------|
| I | 1 | 1.2-1.8, 1.11 |
| II | 1 | 3.1-3.5, 4.2-4.8, 4.12, 4.21-4.25, 7.2-7.4, 7.6-7.7, 7.10 |
| III | 1 | 13.3-13.20 |
| IV | 2 | 29.20, 29.22.1, 29.23-29.25, 29.40-29.43, 29.46, 29.47 |
| V | 2 | 26.1, 26.5-26.7, 26.11, 26.22, 26.23, 26.28, 26.40, 28.47-28.50 |

**Books for Reference**
  Albert D.Helbrick and William D.Cooper:  Modern Electronic Instrumentation and Measurement techniques, (New Delhi: Prentice Hall of India,1995).

Sem - VI                                                                          Hours/Week: 5
07UEL635                                                                          Credits: 5

# COMMUNICATION SYSTEM - II

**Objective**:
To learn the principles of various Modes of Electronics based Communication methods.

## UNIT - I:  TRANSMISSION LINES CABLES AND TELEPHONE SYSTEMS

Introduction - primary line constants - phase velocity and line wavelength - characteristic impedance - the propagation coefficient - phase and group velocities - standing waves - loss less lines at radio frequencies - voltage standing wave ratio - wire telephony - Telephone circuits - transmission bridges  - the four wire terminating set - two wire repeaters - four wire transmission - public telephone network - electronic switching - trunk circuits - private telephone networks - cellular communication

## UNIT - II: ANTENNAS & TV SYSTEMS

Antenna terminologies - antenna coupling at medium frequencies - directional high frequency antennas - wide and special purpose antenna - TV Transmission fundamentals - scanning - blanking and synchronizing pulses - TV Reception fundamentals - common, video and sound circuits - synchronizing circuits - deflection circuits - color transmission and reception.

## UNIT - III: MICROWAVE DEVICES AND CIRCUITS

Concepts of wave guides - reflex klystron - magnetron - TWT - Passive microwave circuits - microwave transistor and integrated circuits - varactor and step recovery diodes - tunnel diodes and negative resistance amplifier - gunn effect and diodes - gunn diode applications - avalanche effect and diodes - other microwave diodes.

## UNIT - IV:  FIBER OPTIC COMMUNICATIONS

Introduction - principles of light transmission in a fiber - propagation within a fiber - effect of index profile on propagation - modes of propagation  - number of modes a fiber will support - single mode propagation  - losses in fibers - dispersion - light sources for fiber optics - introduction - light emitting diodes - semiconductor laser diodes - photo diodes - the p_m photo diode - the p_i_n photo diode - avalanche photo diode - optical receiver circuit - fiber optic communication systems

## UNIT - V  SATELLITE AND RADAR COMMUNICATION

Introduction - Kepler's laws - orbits - geostationary orbit - power systems - attitude control - station keeping - antenna loop angle - limits of visibility - frequency plans and polarization - transponders - uplink - downlink - overall link - digital carrier transmission - multiple access method - radar fundamentals - performance factor - pulsed systems - other radar systems.

**Books for Study**
 1. Kennedy: Electronic Communication system (3$^{rd}$ edn)( McGraw Hill, New Delhi.)
 2. Roddy Coolen: Electronic Communication (4$^{th}$ edition) Prentice Hall of India, New Delhi.

**Books for Reference**
Anokh Singh:  Principle of Communication Engineering (5$^{th}$ edn) New Delhi: S. Chand and Co. Ltd, 1999)

| Unit | Book | Section |
|------|------|---------|
| 1 | 2 | Chapter 8 |
| 2 | 1 | Chapter 10,17 |
| 3 | 1 | Chapter 12 |
| 4 |   | Cyclosted Notes |
| 5 | 1 | Chapter 16 |
|   | 2 | Chapter 19 |

Sem - VI                                                                            Hours:  5
07UEL636                                                                          Credits: 5

# MICROCONTROLLER AND ITS APPLICATION

**Objective**:
To learn the  basic ideas on micro controller architecture and programming techniques

## UNIT -I: MICROCONTROLLERS ARCHITECTURE AND PIN FUNCTIONS
Pin description of 8051, Architecture of 8051, I/O- Pin designations and Programming, Bit manipulations, Program counter and RAM, FLAGS & PSW register, Register Bank and Stack, Assembly programming, Assembling and Running a program, Data types and Directives.

## UNIT -II: ADDERESSING MODES AND INSTRUCTION SET
Addressing modes- Immediate, Register, Accessing memory using addressing modes, Unsigned, Signed Arithmetic instructions, Logical and compare instructions, rotate and Swap, Loop and Jump instructions, CALL instructions, Time delay and generation and calculation.

## UNIT -III: BIT MANIPULATION &  TIMER
        Single bit instructions and programming- Timer - Modes of timer - time delay using timer- 8051 Timer programming-application of timer-counter programming-counter applications

## UNIT -IV:  INTERRUPTS AND SERIAL COMMUNICATION
Interrupts in 8051- priorities- programming external interrupts- 8051 Serial communications-RS232 Interface- Modes of serial communication-serial programming.

## UNIT -V: MICROCONTROLLER REAL WORLD APPLICATION
Concepts of emulator and simulator- Interfacing an LCD, Interfacing to ADC ,-Interfacing to Keyboard,-Interfacing to DAC -Interfacing Stepper motor-Temperature monitor system .

**Books for Study**
1. Muhammad Ali Mazidi,Janice Gillspie Mazidi: The 8051 Microcontroller and Embedded systems (7th Indian reprint,2002) (Pearson Education).

   | Unit | Book | Section |
   |------|------|---------|
   | I | 1 | Chapter1, 4 |
   | II | 1 | Chapter2, 3,5,6,7 |
   | III | 1 | Chapter8, 9 |
   | IV | 1 | Chapter10, 11 |
   | V | 1 | Chapter12, 13 |

**Books for Reference**
1. Kenneth J ayala: The 8051 Micro controller Architecture, Programming & Applications ( 2nd edition)

Sem - VI                                                        Hours:  6
07UEL637                                                        Credits: 4

## ELECTRONICS PRACTICAL - IV

1.  Study of ALU

2.  Construction and study of RAM

3.  Construction and study of DAC & DAC08

4.  Construction and study of ADC (flash converter) & ADC IC 0809

5.  Latch, Transceiver, Buffer - study.

6.  Microprocessor 8085     - Programming I

7.  Microprocessor 8085     - Programming II

8.  Microprocessor 8085     - Programming III

9.  Microprocessor Interfacing - Input and Output using8255 PPI

10.  Microprocessor Interfacing - Display.

11.  Microprocessor Interfacing - 8253

12.  Microprocessor 8085     - Programming IV

13.  Microprocessor 8085     - Programming V

14.  Microprocessor Interfacing - Traffic Controller.

15.  Microprocessor Interfacing - Temperature Controller.

16.  Microprocessor Interfacing - Stepper Motor Controller.

17.  Microprocessor Interfacing - Keyboard.

18.  Microprocessor Interrupt Programming

19.  Microcontroller Programming I

20.  Microcontroller Programming II

Programming I:
    Data transfer and rotate operations.

Programming II:
    Arithmetic Operation (addition, subtraction, multiplication and        division).

Programming III:
    Code conversion (Gray to Binary, Binary to BCD Binary to Gray, BCD to Binary etc).

Programming IV:
    Array manipulation (largest, smallest, sorting in ascending order and descending order).

Programming V:
    Using user routines in Monitor program (clear display, display the data in the address field
    & data field, delay subroutine, read keyboard etc).

## ELECTIVES OFFERED BY VARIOUS DEPARTMENTS FOR
## UG COURSES

| Sem | Code No. | Title of the Paper | Hours | Credits |
|-----|----------|--------------------|-------|---------|
| **Department of Business Administration** | | | | |
| IV | 07UBU481 | Soft Skills Development | 4 | 3 |
| V | 07UBU582 | Advertisement and Sales Promotion | 4 | 3 |
| VI | 07UBU683 | Personal Growth Programme | 4 | 3 |
| **Department of Chemistry** | | | | |
| IV | 07UCH481 | Food and Nutrition | 4 | 3 |
| V | 07UCH582 | Everyday Chemistry | 4 | 3 |
| VI | 07UCH683 | Soil Testing | 4 | 3 |
| **Department of Commerce** | | | | |
| IV | 07UCO481 | Elements of Business Process Outsourcing (BPO) | 4 | 3 |
| | 07UCO482 | Accounts for Executives | 4 | 3 |
| V | 07UCO583 | Soft Skills Development | 4 | 3 |
| | 07UCO584 | Fundamentals of Investment Management | 4 | 3 |
| VI | 07UCO685 | Small Scale Business Development | 4 | 3 |
| | 07UCO686 | Hotel Management | 4 | 3 |
| **Department of Computer Science** | | | | |
| IV | 07UCS481 | Office Automation | 4 | 3 |
| | 07UCS482 | Internet Concepts | 4 | 3 |
| V | 07UCS583 | Fundamentals of Computer Networks | 4 | 3 |
| | 07UCS584 | Information Technology | 4 | 3 |
| VI | 07UCS685 | E-Commerce | 4 | 3 |
| | 07UCS686 | Foundations of Computer Science | 4 | 3 |
| **Department of Computer Application (BCA) (SFS)** | | | | |
| IV | 07UCA481 | Personal Soft Skills | 4 | 3 |
| **Department of Economics** | | | | |
| IV | 07UEC481 | Indian Economy | 4 | 3 |
| V | 07UEC582 | Tamil Nadu Economy | 4 | 3 |
| VI | 07UEC683 | Economics of Social Issues | 4 | 3 |
| **Department of Electronics** | | | | |
| IV | 07UEL481 | Computer Electronics | 4 | 3 |
| V | 07UEL582 | Radio and Television | 4 | 3 |
| VI | 07UEL683 | DVD Player Assembling and Troubleshooting | 4 | 3 |

**Department of English**

| IV | 07UEN481 | English for Competitive Exams | 4 | 3 |
|----|----------|-------------------------------|---|---|
|    | 07UEN482 | Film Studies | 4 | 3 |
| V  | 07UEN583 | English for Communication | 4 | 3 |
|    | 07UEN584 | Public Speaking in English | 4 | 3 |
| VI | 07UEN685 | English of Literature | 4 | 3 |
|    | 07UEN686 | English for Empowerment | 4 | 3 |

**Department of History**

| IV | 07UHS481 | Tourism and Travel Agency | 4 | 3 |
|----|----------|---------------------------|---|---|
| V  | 07UHS582 | Tourism and Automation | 4 | 3 |
| VI | 07UHS683 | Indian History for Competitive Examinations | 4 | 3 |

**Department of Mathematics**

| IV | 07UMA481 | Mathematics for Competitive Examinations | 4 | 3 |
|----|----------|------------------------------------------|---|---|
| V  | 07UMA582 | Graph Theory | 4 | 3 |
| VI | 07UMA683 | Operations Research | 4 | 3 |

**Department of Physics**

| IV | 07UPH481 | Everyday Physics | 4 | 3 |
|----|----------|------------------|---|---|
| V  | 07UPH582 | Photography | 4 | 3 |
| VI | 07UPH683 | Cell Phone Servicing | 4 | 3 |
|    | 07UPH684 | Electrical Wiring | 4 | 3 |

**Department of Plant Biology & Plant Biotechnology**

| IV | 07UBO481 | Mushroom Culture | 4 | 3 |
|----|----------|------------------|---|---|
| V  | 07UBO582 | Everyday Biology | 4 | 3 |
| VI | 07UBO683 | Remote Sensing | 4 | 3 |

**Department of Statistics**

| IV | 07UST481 | Statistics for Management | 4 | 3 |
|----|----------|---------------------------|---|---|
| V  | 07UST582 | Data Analysis for Competitive Examination | 4 | 3 |
| VI | 07UST683 | Actuarial Statistics | 4 | 3 |

**Department of Tamil**

| IV | 07UTA481 | மைய அரசுப்பணித்தேர்வுத் தமிழ் | 4 | 3 |
|----|----------|------------------------------|---|---|
| V  | 07UTA582 | தமிழ் இலக்கியத்தில் மனித உரிமைகள் | 4 | 3 |
| VI | 07UTA683 | சித்த மருத்துவம் | 4 | 3 |
| VI | 07UTA684 | மக்கள் தகவல் தொடர்பியல் | 4 | 3 |