B.S. ELECTRONICS

SYLLABUS: 2010

CHOICE BASED CREDIT SYSTEM (CBCS)

St. JOSEPH'S COLLEGE (Autonomous)

Re-accredited with A⁺ Grade by NAAC

College with Potential for Excellence by UGC

TIRUCHIRAPPALLI - 620 002

B.S. ELECTRONICS : COURSE PATTERN - 2010

SEM	PART	CODE	SUBJECT TITLE	Hours	Credits
I	I	08UGT110001	General Tamil –I/ Hindi – I/ French – I	4	3
	II	08UGE120101	General English – I	5	3
	III	10UEL130201	Electric Circuit Analysis	5	4
	III	@	Electronics Practical – I	3	
	III	@	Work shop Practice - I	3	
	III	10UEL130401	Allied Mathematics – I	6	5
	IV	08UFC140901	Value Education-I: Essentials of Ethics, Yoga and Stress Management	2	2
	IV	08UCC140602	Communicative English	-	5
			Total for Semester I	**30**	**22**
II	I	08UGT210002	General Tamil –II/ Hindi – II/ French – II	4	3
	II	08UGE220102	General English – II	5	3
	III	10UEL230202	Electronic Devices	5	4
	III	10UEL230203	Electronics Practical –I	3	4
	III	10UEL230204	Work shop Practice –I	3	4
	III	10UEL230402	Allied Mathematics – II	6	5
	IV	08UFC240603	Techniques of Social Analysis	2	1
	IV	08UCC240604	Computer Literacy	2	2
			Total for Semester II	**30**	**26**
III	I	08UGT310003	General Tamil–III/ Hindi–III/French–III	4	3
	II	08UGE320103	General English – III	5	3
	III	10UEL330205	Electronic Circuits	5	4
	III	@	Electronics Practical –II	3	
	III	10UEL330403	Allied Physics –I	4	4
	III	@	Allied Physics Practical – I @	2	
	IV	08UCC340805	Environmental Studies	4	2
	IV	08UFC340706A	Professional Ethics –I: Social Ethics (or)	2	2
	IV	08UFC340706B	Professional Ethics –I: Religious Doctrine	(2)	(2)
			Library	1	
			Total for Semester III	**30**	**18**
IV	I	08UGT410004	General Tamil–IV/ Hindi–IV/ French–IV	4	3
	II	08UGE420104	General English – IV	5	3
	III	10UEL430206	Digital Electronics	5	4
	III	10UEL230207	Electronics Practical –II	3	4
	III	10UEL430404	Allied Physics –II	4	4
	III	10UEL130405	Allied Physics Practical – I	2	2
	III	10UEL430301A	Core Elective-I : Data Structure with C (OR)	4	4
	III	10UEL430301B	Engineering Drawing and CAD	(4)	(4)
	IV	08UFC440707A	Professional Ethics –II: Social Ethics (OR)	2	2
	IV	08UFC440707B	Professional Ethics –II: Religious Doctrine	(2)	(2)
	IV	10UEL440608	Skill Based Elective: DVD Troubleshooting and Assembling	2	2
			Total for Semester IV	**30**	**28**

V	III	10UEL530208	Linear Integrated Circuits	5	4
	III	10UEL530209	Sensors, Transducers & Measurements	5	4
	III	10UEL530210	Microprocessors and its application	5	4
	III	10UEL530211	Electronics Practical – III	6	4
	III	10UEL530302A	Core Elective – II : Transmission line Characteristics and waveguide (OR)	4	4
	III	10UEL530302B	Core Elective – II : Virtual Instrumentation	(4)	(4)
	IV	10UEL540609	Skill Based Elective-II : PC Assembling	2	2
			Total for Semester V	**27**	**22**
VI	III	10UEL630212	Analog Communication	5	4
	III	10UEL630213	Microcontroller and its application	5	4
	III	10UEL630214	Signals and Systems	5	4
	III	10UEL630215	Electronics Practical -IV	6	4
	III	10UEL630303A	Core Elective – III : Antenna and wave propagation (OR)	4	4
	III	10UEL630303B	Control system	(4)	(4)
	III	10UEL630304A	Core Elective - IV : Microwave and optoelectronics (OR)	4	4
	III	10UEL630304B	Programmable logic controllers and programming	(4)	(4)
			Total for Semester VI	**29**	**24**
VII	III	10UEL730216	Digital Communication Techniques	5	4
	III	10UEL730217	Digital Signal Processing	5	4
	III	10UEL730218	VLSI and VHDL programming	5	4
	III	10UEL730305A	Core Elective - V : Embedded Systems (OR)	4	4
	III	10UEL730305B	Computer Networks	(4)	(4)
	III	10UEL730306	Mini Project and IPT	5	5
	III	10UEL730219	Electronics Practical - V	6	4
			Total for Semester VII	**30**	**25**
VIII	III	10UEL830220	Power Electronics	5	4
	III	10UEL830221	Satellite and Mobile communication	5	4
	III	10UEL830222	Management Information systems	5	4
	III	10UEL830307	Project Work	10	5
			Total for Semester VIII	**30**	**17**

@ Examination at the end of the year

Sem : 1 **Hours : 4**
08UGT110001 **Credit : 3**

பொதுத் தமிழ்-1

நோக்கங்கள் :

1. சமூக மாற்ற உணர்வை ஊட்டும் தலைசிறந்த தற்காலக் கவிஞர்கள், உரைநடை ஆசிரியர்களது படைப்புகளின் இலக்கியநயம் பாராட்டல்.
2. சந்திப்பிழையின்றி எழுதப் பயிற்றுவித்தல்.

பயன்கள் :

1. சமூக உணர்வூட்டும் படைப்புகளை அழகியல் நுகர்ச்சி வாயிலாக மாணாக்கர் கற்றுக் கொள்வர்.
2. சந்திப் பிழை நீக்கி எழுதும் திறன் பெறுவர்.

செய்யுள் திரட்டு

1. மகாகவி பாரதியார் கவிதைகள்
2. பாரதிதாசன் கவிதைகள்
3. கவிமணி கவிதைகள்
4. கவிஞர் கண்ணதாசன் - இயேசு காவியம்
5. சுத்தானந்த பாரதி பாடல்கள்
6. பெருஞ்சித்தரனார் பாடல்கள்
7. அப்துல் ரகுமான் கவிதைகள்
8. கவிஞர் அறிவுமதி கவிதைகள்
9. மொழிபெயர்ப்புக் கவிதைகள்
10. இலக்கணம் : வல்லினம் மிகும் - மிகா இடங்கள்

இலக்கிய வரலாறு - மூன்றாம் பாகம்

சிறுகதை - முழுமையும்

உரை நடை : முதல் ஆறு கட்டுரைகள்

பாடநூல்

1. செய்யுள் திரட்டு – தமிழ்த்துறை வெளியீடு, 2007 – 2010
2. இலக்கணம் - மேற்குறித்த நூலில் உள்ளது.
3. சமூகவியல் நோக்கில் தமிழ் இலக்கிய வரலாறு, தமிழ்த்துறை வெளீயீடு
4. உரைநடை நூல் - கட்டுரைக் களஞ்சியம், தமிழ்த்துறை வெளீயீடு, 2004-05
5. சிறுகதை : கதைஅரங்கம், மணிக்கதைகள் - 1, மீனாட்சி புத்தக நிலையம், மதுரை – 2.

Sem : 1 **Hours : 5**

08UGE120101 **Credit : 3**

GENERAL ENGLISH – I

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. Shakespeare	:	Daybreak
15. Shakespeare	:	Julius Ceasar
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)

Semester – I **Hours/Week : 5**
Sub Code - 10UEL130201 **Credits : 4**

ELECTRIC CIRCUIT ANALYSIS

Objective:

- To learn the methods to simplify any electrical networks and to analyze the performance of complex networks.

UNIT – I: DC CIRCUIT ANALYSIS

Charge, Current, Voltage and Power – Voltage and Current sources – Ohm's Law – Kirchhoff's Current Law – Kirchhoff's Voltage Law – The single node-pair circuits – Series and Parallel connected independent sources – Resistors in Series and Parallel – Source transformation – Voltage and Current Division – Nodal and Mesh Analysis.

UNIT – II: SINUSOIDAL STEADY STATE ANALYSIS

Sinusoidal Steady State Analysis: Average & RMS values of periodic waveform – Form factor & Peak factor – Characteristics of sinusoids – The complex forcing function – The Phasor – Phasor relationship for R, L and C – Impedance –Admittance – Phasor Diagrams – AC Circuit Power Analysis: Average Power – Reactive power- Apparent Power - Power factor – Power triangle involving R, L &C – Analysis of series and parallel RL, RC & RLC circuit.

Frequency Response: Parallel resonance – Series Resonance – Q factor, impedance and bandwidth of the resonant circuit.

UNIT – III: NETWORK THEOREMS

Delta-Wye conversion – Superposition theorem – Thevenin's and Norton's theorem – Reciprocity Theorem – Maximum Power Transfer Theorem – Compensation Theorem – Tellegen's theorem. (Both AC and DC sources)

UNIT – IV: TRANSIENTS

Steady state and Transient response – DC response of an RL circuit – RC circuit – RLC circuit – AC transient response of RL, RC and RLC series

UNIT –V: COUPLED CIRCUITS, DUALITY AND TOPOLOGY

Magnetically coupled circuits: Self Inductance – Mutual inductance – Coefficient of coupling – Dot convention rule – Series and parallel connections of coupled coils – Ideal transformer (Problems in all topics)

Network topology: Graph – Tree – Co-Tree – Incidence matrix – Tie set – Cut set – Duality of network.

BOOK FOR STUDY

1. William H. Hayt, Jr, Jack E. Kemmerly, Steven M. Durbin, "Engineering Circuit Analysis",6th Edition, Tata McGraw – Hill publishing company Ltd, 2008.
2. A. Sudhakar, Shyammohan S Palli, "Circuits & Networks Analysis and Synthesis", 3rd Edition, Tata McGraw – Hill publishing company Ltd, 2008.

BOOKS FOR REFERENCE

1. Umesh Sinha, "Circuit Theory", 4th Edition, Satya Prakasan Publications, New Delhi.
2. Paranjothi S.R, "Electric Circuit Analysis", New Age International.
3. David E. Johnson, Johny R. Johnson, John L. Hilburn, "Electric Circuit Analysis", 2nd Edition, PHI.

Unit	Book	Sections
I	1	2.3,2.4,2.5,3.3,3.4,3.6,3.7,3.8,3.9,4.2 – 4.5, 5.3
	2	1.4.1, 1.5 – 1.8, 2.15
II	1	10.2,10.4 – 10.8, 10.11, 11.2 11.3,11.5,11.6
	2	8.1, 8.2, 8.4, 8.5, 8.7 – 8.10, 5.3, 5.4, 6.1 – 6.5
III	1	5.6, 5.2, 5.4, 5.5
	2	3.5, 3.6, 3.9
IV	2	11.1 – 11.7
V	2	10.1, 10.3 – 10.6, 10.8, 10.9, 2.1, 2.2, 2.4, 2.7, 2.8.1, 3.8

SEMESTER – I **Hours/Week : 6**
Code 10UEL130401 **Credits : 5**

ALLIED MATHEMATICS-I

[For I B.Sc. Physics, Chemistry, Computer Science, Electronics, I BCA]

UNIT – I

Partial Fractions - Binomial Series - Summation of series - Finding terms - Coefficient of x^n (simple problems only).

Book 1: Chap 1 - sec 1.1 - 1.2, pp: 1-27.

UNIT – II

Exponential Series - Summation - Logarithmic Series - Summation.

Book 1: Chap 1 - sec 1.3, pp: 28-48.

UNIT – III

Matrices – Rank of a matrix - Solving simultaneous linear equation in three unknowns using Elementary operations method - Eigen values and Eigen vectors - Verification of Cayley Hamilton theorem.

Book 1: Chap 3 - sec 3.2 - 3.4, pp: 137 - 160.

UNIT – IV

Higher Derivatives - Formation of equations involving derivatives - Applications of Leibnitz's theorem.

Book 1: Chap 6 - sec 6.1, pp: 266-281.

UNIT – V

Expansions of cos nq and sin nq - Powers of sines and cosines off in terms of functions of multiples of q.

Book 1: Chap 5 - sec 5.1 - 5.4, pp: 220-242.

Text Book:

Ancillary Mathematics, Vol-I, 2009 Edition, S. Narayanan, R. Hanumantha Rao T.K. Manicavachagom Pillay, Kandaswamy.

Sem : 2 **Hours : 5**
08UGT210002 **Credit : 3**

பொதுத் தமிழ்-2

நோக்கங்கள் :

1. சமய நல்லிணக்க உணர்வை வளர்த்தல்
2. தமிழ்க்காப்பியங்களில் அழகும் அறிவுணர்வும் ஊட்டும் பகுதிகளைப் படித்துப் புரிந்து கொள்வர். உரைநடைக் கட்டுரை எழுதும் திறன் பெறுவர்.

பயன்கள் :

1. தமிழைத் திருத்தமாகப் படிக்கவும் பேசவும் பிழையின்றி எழுதவும் தேர்ச்சி பெறுதல்.
2. 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 (தமிழ்த் துறை வெளீயீடு, 2001)

உரைநடை நூல்-7 முதல் 13ஆம் கட்டுரை வரை, கட்டுரைக் களஞ்சியம் (7-13) (தமிழ் ஆய்வுத் துறை வெளியீடு, 2008).

பாடநூல் :

செய்யுள் திரட்டு – தமிழ்த் துறை வெளீயீடு, 2004 – 07

Sem : 2 **Hours : 5**

08UGE220102 **Credit : 3**

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 to5)
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 to10)
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. 11to15)
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 to20)
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 51 to 57
20. Dialogue Writing		

REQUIRED READING :

1. Krishnaswamy, N. & T. Sriraman	:	Creative English for Communciation (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)

Semester – II **Hours/Week : 5**
Sub Code – 10UEL230202 **Credits : 4**

ELECTRONIC DEVICES

Objective:

To learn the principles of working of the semiconductor & display devices.

UNIT – I: DIODES

Introduction to semiconductor diode – Construction – Working – Energy band diagram of PN junction – Current equations – Volt Ampere characteristics – Diode resistance – Transition capacitance – Diffusion capacitance – Temperature characteristics.

Special Diodes: Zener diode – Varactor diode – Tunnel diode – Schottky diode – PIN diode. (Energy band diagram & VI characteristics)

UNIT - II: TRANSISTORS

Introduction to construction of transistor - Current components - Configurations of transistors - Characteristics - Analytical expressions for the characteristics - α, β & γ relationships - Eber's Moll model.

UNIT – III: FET& MOSFET

Introduction to construction of FET – Working of FET – Configurations of FET – Pinch-off voltage – Volt-ampere characteristics – Low Frequency Model of FET

Construction of MOSFET – Enhancement type – depletion type – Volt-ampere characteristics

UNIT – IV: POWER DEVICES

Construction of UJT – Intrinsic stand-off ratio – Equivalent circuit – Volt-ampere characteristics.

Construction of SCR – Equivalent transistor model – Working – Volt-ampere characteristics – Characteristics of TRIAC, DIAC & IGBT.

UNIT – V: SPECIAL DEVICES

Construction & working of LED – LCD – Photo diode – Photo transistor – CRT Deflection plates – Electrostatic & electromagnetic focusing

BOOK FOR STUDY

1. Salivahanan. S, Suresh Kumar .N, Vallavaraj. A, “Electronic Devices and Circuits”, 2nd Edition, TMH, 2008.

BOOKS FOR REFERENCE

1. Jacob Milliman, Christos C. Halkins, Satyebranta Jit, “Electronic Devices & Circuits”, 2nd Edition, TMH, 2008.
2. David A. Bell, “Electronic devices and circuits”, Prentice Hall of India, 2004.
3. Floyd, “Electron devices”, Pearson Asia, 5th Edition, 2001.

Unit	Book	Sections
I	1	4.11 – 4.18, 5.2, 5.4, 5.7.5, 5.8, 5.12
II	1	6.1, 6.2, 6.4, 6.5, 6.6, 6.10
III	1	7.1 – 7.6, 7.9 – 7.11
IV	1	17.2, 8.3, 8.4, 8.7, 8.8
V	1	22.3.2, 22.6, 22.7, 3.9, 3.10

Semester – II **Hours/Week : 3**
Sub Code – 10UEL230203 **Credits : 4**

ELECTRONICS PRACTICALS –I
(Network and Characteristics Experiment)

1. Study of voltage division, current division and source transformation
2. Verification of Kirchhoff's voltage law.
3. Verification of Kirchhoff's Current law.
4. Verification of Thevenin's Theorem.
5. Verification of Norton's theorem.
6. Verification of Superposition theorem.
7. Verification of Compensation theorem.
8. Verification of Reciprocity theorem.
9. Verification of Maximum power transformation theorem.
10. Study of Series resonance circuit.
11. Study of Parallel resonance circuit.
12. Study of Wheatstone bridge.
13. Study of Steady state analysis of series RC, LC, and RLC Circuit.
14. Study of transient state analysis of series RC, LC and RLC Circuit.
15. Calculation of RMS voltage, current, reactive power, apparent power, power factor and phase relation for RL and RC circuits
16. Study of Diode characteristics.
17. Study of Zener diode characteristics.
18. Study of Transistor characteristics – CB mode.
19. Study of Transistor characteristics – CE mode.

20. Study of Transistor characteristics – CC mode.
21. Study of FET characteristics.
22. Study of MOSFET characteristics.
23. Photo electronic devices (LDR, photo diode, phototransistor and p-i-n diode).
24. Study of SCR characteristics.
25. Study of TRIAC and DIAC characteristics.
26. Study of UJT characteristics.
27. Study of IGBT characteristics.
28. Study of Tunnel diode characteristics.
29. Study of Back diode characteristics.
30. Study of Varactor diode characteristics.

Semester - III **Hours/Week : 3**
Sub Code - 10UEL330204 **Credits : 4**

WORKSHOP PRACTICE

1. Component Identification
2. Functions of Multimeters, Component Checking, voltage and current measurements
3. Study of CRO (single trace and dual trace)
4. Study of AFO
5. Study of LCR Meter
6. PCB layout and etching
7. Soldering and de-soldering the components in PCB layout
8. Soldering simple circuits and checking continuity
9. Construction of Power supplies (single power supply)
10. Construction of Power supplies (dual power supply)
11. Cabinet making
12. House wiring – I(Fitting Switches, AC Pin Sockets and Indicator Lamp in Switch Box)
13. House wring – II (tube light)
14. Hobby circuits – I
15. Hobby circuits – II
16. Hobby circuits – III
17. Engineering Drawing - I
18. Engineering Drawing – II
19. Engineering Drawing – III
20. PCB layout preparation by software (Xpress PCB)

SEMESTER – II **Hours/Week : 6**
10UEL230402 **Credits : 5**

ALLIED MATHEMATICS II

[For I B.Sc. Physics, Chemistry, Computer Science, Electronics, I BCA]

UNIT - I

Integration - Integrals of functions containing linear functions of x - Integrals of functions involving $a^2 + x^2$ - integrals of Rational algebraic functions - Integration of irrational functions.

Book 1: Chap. I sec 6.1, 6.2, 7 (Omit 7.4), 8 case (i) to (iv) only
Page no: 7-13, 23-31, 39-47.

UNIT – II

Properties of definite integrals - Simple applications - Integration by parts - Bernoulli's formula.

Book 1: Chap. I Sec. 11, 12, 15
Page no: 61-72, 93, 94.

UNIT – III

Differential equations of first order - Variable separable - Homogeneous equations - Nonhomogeneous equations - Linear equation - Bernoulli's equation.

Book 1: Chap 4: Sec 1-5
Page no: 205-218.

UNIT – IV

Second order Linear equations with constant co-efficients - Particular integrals for $e^{(kx)}$, sin kx, cos kx, x^n and $e^{(kx)}$ X.

Book 2: Chap 3: Sec 1-4, Page no: 42-60.

UNIT – V

Laplace transform - Definition - Some general theorems - Inverse Transform.

Book 1: Chap 7: 7.1, 7.2, 7.3, 7.4, 7.5
Page no: 289-308.

Text Book:

1. Ancillary Mathematics, Vol-II (2009), S. Narayanan, R. Hanumantha Rao, T.K. Manicavachagom Pillay, Kandaswamy.
2. Ancillary Mathematics Book II: Narayanan, Manicavachagom PIllay.

Sem : 3 **Hours : 5**
08UGT310003 **Credit : 3**

பொதுத் தமிழ்-3

நோக்கங்கள்

1. தமிழ்ச் செய்யுள்களைப் படித்துப் பொருள் புரிந்து கொள்ளுதல்
2. செய்யுள்களில் அமைந்துள்ள சமூகக் கருத்துக்களை உணர்தல்
3. படைப்புத் திறனை வளர்த்தெடுத்தல்

பயன்கள்

1. புரிந்து கொண்ட கருத்துக்களில் பயனுள்ளவற்றைத் தெளிவாக, இனிமையாக எடுத்துச் சொல்லும் 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 - டாக்டர்.ரா.பாலசுப்பிரமணியன், சுவடுகள், பாவை பப்ளிகேஷன்ஸ், சென்னை – 600 014.

பாடநூல் :

செய்யுள் திரட்டு – தமிழ்த் துறை வெளியீடு 2004 – 07
சமூகவியல் நோக்கில் இலக்கிய வரலாறு - முதற்பாகம் தமிழ்த் துறை வெளியீடு

Sem : 3 **Hours : 5**

08UGE320103 **Credit : 3**

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. Reading Comprehension

UNIT – II

6. O. Henry : After Twenty years
7. Leonary 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. Narayanan : 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. Precis Writing :

REQUIRED READING :

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

Semester - III **Hours/Week : 5**
Sub Code - 10UEL330205 **Credits : 4**

ELECTRONIC CIRCUITS

Objective:

- To learn the working principles of amplifier, oscillator and feedback networks.

UNIT – I: RECTIFIERS AND POWER SUPPLIES

Linear mode power supply: Half-wave – Full-wave – Bridge Rectifiers – Analysis for Vdc and ripple voltage with C, CL, L-C and C-L-C filters – Zener Voltage regulator – Switched mode power supplies.

UNIT – II: TRANSISTOR BIASING

Bias Stability – Need for Biasing – Load Line – Thermal runaway – Stability Factors –Methods of biasing circuits for BJT –Biasing the FET – Source bias – Self bias – Voltage divider bias for FET – Use of FET as voltage variable resistor.

UNIT – III: FREQUENCY RESPONSE OF AMPLIFIERS

Single stage amplifier: CE, CB and CC amplifiers – Small Signal analysis of amplifiers *(h & re' parameters)* to obtain gain, input impedance and output impedance – FET amplifier: CS, and CD amplifiers – Frequency of amplifier – Bode plot analysis – Transient response – RC Coupled Amplifier Analysis – An introduction to differential amplifiers.

UNIT – IV: FEEDBACK AMPLIFIERS

Concepts of feedback – Types of negative feedback – Method of identifying feedback topology – Nyquist criterion for stability of feedback amplifiers Barkhausen's Criterion – Mechanism for start of oscillation and stabilization of amplitude – RC phase shift oscillator – Wien's bridge oscillator – Twin-T oscillators –Analysis of LC oscillators: Colpitt's – Hartley – Clapp – Crystal Oscillator circuits.

UNIT – V: TUNED & POWER AMPLIFIERS

Tuned Amplifier: Single Tuned – Double Tuned – Stagger tuned – Power amplifiers: Working principle of Class A, Class AB, Class B, Class C, Class D, and Class S amplifiers –efficiency of class A, Band C amplifiers.

BOOK FOR STUDY

1. Salivahanan. S, Suresh Kumar .N, Vallavaraj. A, "Electronic Devices and Circuits", 2nd Edition, TMH, 2008.

2. Albert Paul Malvino, "Electronic Principles", 7th Edition, TMH

BOOKS FOR REFERENCE

1. Jacob Milliman, Christos C. Halkins, Satyebranta Jit, "Electronic Devices & Circuits", 2nd Edition, TMH, 2008.
2. David A. Bell, "Electronic devices and circuits", Prentice Hall of India, 2004.
3. Floyd, "Electron devices", Pearson Asia 5th Edition, 2001.

Unit	Book	Sections
I	1	18.1, 18.2, 18.2.2, 18.2.3, 18.2.4, 18.3
II	1	6.11, 6.11.1, 6.11.2, 6.12, 7.16, 7.17
III	1 2	9.5 – 9.8, 9.10, 9.11, 9.11.1 – 9.11.5, 9.12, 9.12.1 – 9.12.3, 9.14, 10.5
IV	1	14.2 – 14.6, 15.3, 15.5, 15.6, 15.7, 15.11(i), 15.12 – 15.14
V	1	13.3.1, 13.3.2, 13.6, 12.1 – 12.10, 12.13, 12.14

Semester – III **Hours/Week : 4**
10UPH330403 **Credits : 3**

ALLIED: APPLIED PHYSICS – I

UNIT – I: Conducting Materials

Introduction – Classical free electron theory of metals – Quantum theory – Free electron gas – Fermi energy and carrier concentration.

UNIT – II: Magnetic Materials

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

UNIT – III: Dielectric Materials

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

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

UNIT – V: Modern Engineering Materials

Metallic glasses – Shape memory alloys – Nanomaterials – Carbon nano tubes

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

Sem : 4 **Hours : 5**
08UGT410004 **Credit : 3**

பொதுத் தமிழ்-4

நோக்கங்கள்

1. நாடகத்தின் நோக்கம், அதன் போக்கு, உத்திகள், பாத்திரப் பாங்கு, 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 :

தெரிவு - முனைவர் கா. வாசுதேவன் (தொ.ஆ)

பாடநூல்

1. பேராசிரியர் சுந்தரனார், மனோன்மணீயம் - (பதி) தமிழ்த் துறை, தூய வளனார் கல்லூரி, திருச்சிராப்பள்ளி
2. முனைவர் கா.வாசுதேவன், ஏனையோர், (தொ.ஆ.), தெரிவு, பாவை பப்ளிகேஷன்ஸ், சென்னை – 14

மதிப்பெண் பகிர்வு

மனோன்மணீயம் - 80
உரைநடை நாடகம் - 20

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

Sem : 4 **Hours : 5**

08UGE420104 **Credit : 3**

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 prescribe 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 Niggle	:	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)

Semester - IV **Hours/Week : 5**
Sub Code - 10UEL430206 **Credits : 4**

DIGITAL ELECTRONICS

Objective:

- To learn basic functioning of digital components
- To learn the design procedure and methods of analysis of any digital circuits

UNIT - I: NUMBER SYSTEMS, LOGIC GATES AND BOOLEAN ALGEBR

Number System: Binary, Decimal, Octal, Hexadecimal – Conversion – Complements – BCD codes – Gray codes – Alphanumeric codes – ASCII – Error detection and correction codes

Logic Gates : Basic gates – AND, OR, NOT gates – Universal Gates – NAND, NOR gates – Exclusive-OR – Exclusive-NOR – Boolean operation and expression – Laws and rules of Boolean algebra – Demorgan's theorem

UNIT – II: MINIMIZTION TECHNIQUE AND DIGITAL INTEGRATED CIRCUITS

Boolean Expressions – K- map – SOP – POS – Minimization Technique: Quine Mcluskey method only – Implementation using universal gates.

Digital ICs: SSI, MSI, LSI and VLSI devices- TTL, ECL, MOSFET circuits

UNIT – III: COMBINATIONAL LOGIC

Design Procedure – Adders – Subtractors – Decimal Adder – Multiplexer – Demultiplexer – Decoder – 4-bit decoder – BCD-to-seven segment Decoder/driver – Encoder – Parity Generators and Checkers- Code Converters: Binary-to- Gray converters – Gray -to-Binary converters

UNIT - IV: SEQUENTIAL CIRCUIT

Flip-flops: S-R, J-K, T, D – triggering of flip-flops – Master-slave flip-flop – Counters: Asynchronous counter – 4-bit binary Up/down counter –

Synchronous counter – Up/down counter – Design of synchronous counters – Shift registers.

UNIT -V: MEMORY DEVICES AND PROGRAMMABLE LOGIC

Introduction – RAM organization – Memory decoding – ROM organization – PROM – EPROM – EEPROM – EAPROM – Programmable logic devices: Programmable Logic Array (PLA) – Programmable Array Logic (PAL) – Sequential Programmable devices.

BOOKS FOR STUDY:

1. Morris Mano. M, Michael D. Ciletti "Digital Design", 4th Edition, Prentice Hall of India Pvt. Ltd., New Delhi, Pearson Education (Singapore) Pvt. Ltd., New Delhi, 2008.
2. Thomas L. Floyd, "Digital Fundamentals, 8th Edition, Pearson Education, Inc, New Delhi.

BOOKS FOR REFERENCE:

1. Donald P Leach, Albert Paul Malvino, Goutam Saha, "Digital Principles And Applications", 6th Edition, Tata McGraw- Hill publishing company limited, New Delhi, ninth reprint 2008
2. Salivahanan. S, Arivahagan. S, "Digital Circuits and Design", 3rd Edition, Vikas publishing house Pvt. Ltd., 2009.

Unit	Book	Sections
I	2	2.2, 2.3 – 2.5, 2.83 – 2.12, 3.1 – 3.6, 4.1, 4.2, 4.3
II	1	3.2, 3.3, 3.5, 3.6, 3.7, 3.10, 10.2, 10.5, 10.6, 10.7
	2	11.1
III	1	4.5, 4.6, 4.9 – 4.11
	2	6.5, 6.7, 6.9, 6.10
IV	2	7.1, 7.2, 7.3, 8.1, 8.2, 8.3, 8.4, 9.1– 9.5
V	1	7.1, 7.2, 7.3, 7.5, 7.6, 7.7, 7.8

Semester - IV **Hours/Week : 3**
Sub Code - 10UEL430207 **Credits : 4**

ELECTRONICS PRACTICALS – II
(Semiconductor circuits and Digital Experiment)

1. Study of transistor biasing, calculation of Q point and DC load line analysis (Fixed Bias and Voltage Divider for both npn and pnp)
2. Study of FET biasing, calculation of Q point and DC load line analysis (Switching and Self Bias)
3. Study of MOSFET biasing, calculation of Q point and DC load line analysis
4. Half wave rectifier with and without filter.
5. Regulated power supply (Transistor & Zener diode).
6. Passive Filter circuits – low, high and band pass.
7. Voltage Multiplier Circuits.
8. RC coupled transistor amplifier.
9. FET amplifier
10. Construction and study of differential amplifier based on transistor.
11. Construction and study of power amplifier circuits.
12. Hartley oscillator – Transistor.
13. Phase shift oscillator – Transistor.
14. Colpitt's oscillator – Transistor.
15. Construction and study of DC amplifier and Sample & Hold circuits based on MOSFET
16. Construction of AND & NOT gates based on diode, transistor, FET (ON/OFF state voltage, current calculation)

17. Construction of all the gates based on MOSFET (ON/OFF state voltage, current calculation)
18. Encoders and Decoders.
19. Multiplexers and Demultiplexers.
20. Shift registers.
21. Asynchronous counters.
22. Synchronous counters.
23. Basic gates and Verification of Boolean laws.
24. Adders and Subtractors.
25. Flip-flops using gates.
26. Parallel Binary adders and Subtractors.
27. BCD adders and BCD Subtractors.
28. K Map simplification.
29. Quine Mcluskey method of simplification
30. Construction and Study of Code Converters

SEMESTER – IV **Hours/Week : 4**
10UPH330404 **Credits : 3**

ALLIED: APPLIED PHYSICS – II

UNIT – I Quantum Physics

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

UNIT – II Lasers

Introduction – Principle of spontaneous emission and stimulated emission – Population inversion – Types of lasers – Industrial applications – Medical application – Holography

UNIT – III Ultrasonics

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

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: Electrochemical Power Sources

Basic principles, chemical and electrical energies - inter conversion - charging and discharging - requirements for a good power source - Types of power sources. Primary Batteries: Description of primary cells - alkaline, manganese cells - silver oxide - zinc cells - lithium primary cells - applications.

Secondary Batteries: Importance applications - charge discharge efficiency - cycle life - energy density - lead acid batteries for electric vehicles. Fuel Cells: Basic principles - Hydrogen, oxygen fuel cells - gas diffusion electrodes for fuel cells - alkaline fuel cells.

BOOK FOR STUDY

1. Engineering Physics – D.K. Bhattacharya & A. Bhaskaran, Oxford University Press, 2010
2. Hamann C.H. Hamnett A., and Vielstich W., Electrochemistry.
3. Hibbert D.B., Introduction to electrochemistry.

UNIT	SECTION
Unit – 1	4.1 – 4.7
Unit – 2	2.1 – 2.7
Unit – 3	1.1 – 1.10
Unit – 4	3.1 – 3.12
Unit – 5	Course Material

Semester – 3 & 4 **Hours/Week : 2**
10UPH430405 **Credits : 2**

APPLIED – PHYSICS PRACTICAL

Any 16 of the following

1. Spectrometer – Refractive index of a prism
2. P.O Box – Temperature coefficient – Thermistor
3. Carey Foster's Bridge - R and ρ.
4. Potentiometer – Ammeter Calibration
5. Potentiometer – Calibration of Voltmeter
6. Potentiometer - Resistance of a coil of wire R and ρ.
7. BG – Figure of merit & Resistance of the Galvanometer
8. BG – Determination of C
9. Conversion of a Galvanometer into voltmeter
10. Conversion of a Galvanometer into Ammeter
11. Study of RTD
12. Study of Optical Transducers: Thermal Sensors
13. Study of Optical Transducers : Light Sensors
14. Study of fundamental physical Properties of LASER beams
15. Resistance of a Thermistor- Multimeter
16. EMF of a Thermocouple – Multimeter

Semester -IV **Hours/Week : 4**
Sub Code - 10UEL430301A **Credits : 4**

CORE ELECTIVE – I: DATA STRUCTURES WITH C

Objective

- To learn the different techniques of handling data

UNIT - I: INTRODUCTION

Sparks – How to create programs – How to analyze programs – Arrays: Axiomatization –ordered list – Sparse matrices representation of arrays.

UNIT– II: STACKS AND QUEUES

Fundamentals – Making problem – Expression Evaluation – Multiple stacks and queues –Linked List: singly linked list – Linked stacks and queues – Polynomial addition – Equivalence relations – Doubly linked list – Garbage collection and compaction.

UNIT – III: TREES

Basic terminology – Binary trees – Binary tree representation – More on binary trees –Binary tree traversal – Threaded binary tree – Application of trees

UNIT – IV: GRAPHS

Terminology and representation – Traversals, connected components, spanning trees –Shortest path and transitive closure – Activity networks, topological sort, critical path – Numerating all paths

UNIT– V: SORTING

Searching – Insertion sort – Quick sort-two way merge sort – Heap sort – Files: files, queues and sequential organization – File organization.

BOOK FOR STUDY

1. Ellis Horowitz, Sartaj Sahni, “Fundamentals of data structures”, Galgotia, New Delhi, 2005.

BOOK FOR REFERENCES

1. Tanaenbaum, A.S., Langram, Y. and Augestein, M.J, “Data Structures using C”, Pearson Education, 2004.
2. Weiss, M.A., “Data Structures and Algorithm Analysis in C”, 2nd Edition, Pearson Education, 2005.

UNIT	BOOK NUMBER	CHAPTERS	SECTIONS
1	1	1,2	1.1-2.4
2	1	3,4	3.1-3.4, 4.1,4.2,4.4,4.6,4.8,4.10
3	1	5	5.1-5.4,5.6,5.8
4	1	6	6.1-6.6
5	1	7,10	7.1-7.3,7.5,7.6, 10.1-10.3

Semester –IV **Hours/Week : 4**
Sub Code - 10UEL430301B **Credits : 4**

CORE ELECTIVE – I: ENGINEERING DRAWING AND CAD

Objective:

- To draw and interpret various projections of 1D, 2D, 3D objects.
- To prepare and interpret the drawings of buildings using AutoCAD

UNIT- I: INTRODUCTION TO ENGINEERING DRAWING

Introduction to engineering drawing – drawing instruments and their uses- importance-codes-drawing instruments-boards-mini drafter –drawing sheets-Lettering, numbering and dimensioning

UNIT- II: PROJECTION OF LINES AND SOLIDS

Orthographic projections: projection of simple objects in three views-projection of simple solids Cylinder, cone, prism, square and hexagonal pyramid

UNIT III BASICS OF AutoCAD

Draw geometrical figures using line, circle arc, polygon, ellipse, rectangle- erase – Basic Edit commands

UNIT – IV: CREATING OBJECTS

An overview - creating objects- creating text and drawing precision-editing and modifying objects - Controlling the drawing display and inquiry

UNIT- V: DIMENSION AND 3D

Hatching-Basic dimensioning- isometric drawing-File commands-3D Fundamentals.

BOOK FOR STUDY

1. S. Mathiyazhagan, I. Jayachandran, “Technical drawing”, Anitha publications “Machine drawing &AutoCAD”, MAHESH KARTHIK PUBLICATIONS PALANI-1.

2. Michael E. Beall and Howard M. Fulmer, “AUTOCAD 14 Fundamentals”, Techmedia, New Delhi, 1997

BOOK FOR REFERENCES

1. Venugopal, “Engineering drawing and graphics”, New age

UNIT	BOOK	SECTION
I	1	Chapter 1.0 page 1-44
II	1	Chapter 2.0,3.0 page 45-52, 77-130
III	1	Chapter 6.0 page 185-208
IV	2	Part B , page 1-34
V	2	Part B, 39-59

Semester - IV **Hours/Week : 2**
Sub Code - 10UEL440608 **Credits : 2**

SKILL BASED ELECTIVE – I: DVD TROUBLESHOOTING AND ASSEMBLING

Objective:

- To learn the fundamental concepts of assembling and troubleshooting DVD player.

UNIT – I: CDROM & DVD

Introduction to optical technology – Principles of CD & DVD – Structure of CD & DVD – Read operation – Writing operation – Comparison of CD & DVD.

UNIT- II: ASSEMBLING MATERIALS

Block diagram of DVD player – Mother board – Power board – Display board – mechanism – Lens drivers – Game card – RF card – BT board – Power amplifier.

UNIT- III: TROUBLESHOOTING TECHNIQUES

Importance of Earth – Earth testing – Usage of multimeter – Case studies – Symptoms and solutions – DC Single and Dual Power Supply.

BOOK FOR STUDY

Material prepared by the department.

Semester - V **Hours/Week : 5**
Sub Code - 10UEL530208 **Credits : 4**

LINEAR INTEGRATED CIRCUITS

Objective:

- To learn the principles of operations and applications of Operational amplifier.

UNIT- I: INTEGRATED CIRCUIT FABRICATION AND DIFFERENTIAL AMPLIFIER

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 – Differential amplifier – Types of configuration – DC and AC analysis.

UNIT- II: OP-AMP THEORY & APPLICATIONS

Op-Amp – Block diagram – Symbol – Ideal Characteristics of an Op-Amp – DC analysis: Bias & offset currents – Offset voltages – CMRR – AC analysis: Slew rate – Frequency response – Basic application: Inverting amplifier – Non-inverting amplifier – Summing amplifier – Subtractor – Integrator – Differentiator - V-I converter – I-V converter – Instrumentation amplifier.

UNIT- III: COMPARATORS AND ITS APPLICATIONS

Comparator – Op-amp as comparator – Zero crossing detector – High-speed comparator – Comparator characteristics – Comparator applications: Schmitt trigger –Window detector – V/F and F/V converters – Peak detector – Clippers and Clampers – Positive and Negative clippers – Small-signal Half wave rectifiers – Positive and Negative clampers – Sample and Hold circuits.

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.

UNIT- V: TIMER AND D/A, A/D CONVERTERS

555 Timer – Functional block diagram – Monostable Multivibrator – Astable Multivibrator – VCO – PLL –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", 3rd Edition, Prentice Hall India.
2. Roy D. Choudhury, Shail Jain, "Linear Integrated Circuits", 2002 Reprint, New Age International (P) Limited.

BOOK FOR REFERENCE

1. William D. Stanley, "Operational Amplifier with Linear Integrated Circuits", Pearson Education, 2004.
2. Robert F Coughlin, Fredrick, F. Drisold, "Op-amp and linear ICs", 4th Edition, Pearson education, 2002.
3. Albert Paul Malvino, "Electronic Principles", 7th Edition, TMH

Unit	Book	Sections
I	1	1.1 –1.7,2.9, 2.10
	2	1.1 - 1.7
II	1	2.2,2.3,2.5,3.3,5.2 – 5.4, 5.11, 6.10, 6.2, 7.5,7.6 – 7.10, 7.12
III	1	9.1 – 9.5, 9.8, 9.9, 9.10, 9.12, 9.14, 9.15
IV	1	8.11 – 8.13, 8.15 – 8.17, 8.2,8.3, 8.5, 8.8, 8.9
V	1	10.4, 10.5, 10.5.1, 8.18, 9.11
	2	10.3.1

Semester - V **Hours/Week : 5**
Sub Code - 10UEL530209 **Credits : 4**

SENSORS, TRANSDUCERS & MEASUREMENTS

Objective:

- To expose the fundamentals of instrumentation and the working principle of sensors and transducers.

UNIT - I: INTRODUCTION TO MEASUREMENTS AND SENSING FUNDAMENTALS

Measurements – Significance – Concept of Direct and Indirect Measuring Methods –Static and Dynamic Characteristics of Sensors – Mechanical, Thermal and Electrical Dynamic Models of Sensor Elements – Positions of Sensors in a Data Acquisition System - Advantages of Sensors – Classifications of Transducers – Primary and Secondary Transducers – Characteristics of Transducers

UNIT – II: TRANSDUCERS AND PRIMARY SENSING ELEMENTS

Transducers – electric transducers – classification of transducers – characteristics and choice of transducers – factors influencing the choice of transducers – Resistive transducers - strain gauges – resistance thermometers – Thermistors – Thermocouples – Principle of LVDT – capacitive transducers – Principle of peizo electric transducers – Principle of hall effect transducers – Magneto resistors

UNIT – III: MEASUREMENT OF NON-ELECTRICAL QUANTITIES

Measurement of pressure: using electrical transducers as secondary transducers – Low pressure: Pirani gauges – Measurement of linear velocity (moving magnet type) – Measurement of angular velocity (D.C. Tachometer generators and Digital methods) – Measurement of vibrations – Seismic transducers – Measurement of liquid level – Measurement of thickness – Measurement of Humidity – Gas analyzer

UNIT IV: ELECTRONIC INSTRUMENTATION

DC Ammeter – Multirange ammeter – Aryton Shunt – Basic Meter as DC voltmeter – DC Voltmeter – Multirange Voltmeter – Loading – Transistor Voltmeter – Micro Voltmeter – AC Voltmeter using rectifiers – Series Ohmmeter – Shunt Type Ohmmeter – Multimeter – Oscilloscopes – Basic principles – Block diagram of oscilloscopes – Vertical Amplifier – Horizontal deflecting system – delay line triggered sweep.

UNIT V: BIOMEDICAL INSTRUMENTATION

Resting Potential – Action Potential – Human Physiological Systems – Electrocardiogram (ECG) – ECG Measurement Techniques – Defibrillators – Pacemakers - Electroencephalography (EEG) – Medical Imaging Techniques - Computer Tomography (CT) – Magnetic Resonance Imaging (MRI) – Endoscopy – Applications of Lasers in Medical Instrumentation.

BOOKS FOR STUDY

1. A. K. Sawhney, “Electrical and Electronics Measurements and Instrumentation”, Dhanpat Rai and company, 2001.
2. H.S. Kalsi, “Electronics Instrumentation”, 2nd Edition,TMH,2004
3. Dr. M. Arumugam, “Biomedical Instrumentation”, 2nd Edition, Anuradha Publications.

BOOK FOR REFERENCE

1. Jacob Fraden, “Handbook of Modern sensors – Physics, Designs and applications”, 3rd Edition, Springer, 2004.
2. Donald P. Eckman, “Industrial Instrumentation” - CBS Publishers, 2004.
3. D.Patrabnabis, “Principles of Industrial Instrumentation”, 2nd Edition, Tata McGraw-Hill, 2000.
4. V.N.Bindal, “Transducers for Ultrasonic Flaw detection”, Narosa Publishing House, 1999.
5. Leslie Cromwell, Fred J. Werbell and Eruch A. Pfeiffer – “Biomedical Instrumentation and Measurements”, 2nd Edition, PHI, 2005.

UNIT	BOOK	SECTIONS
1	1	1.1– 1.3, 2.3,2.6, 2.7, 2.10, 2.11, 2.13, 2.15, 2.17, 2.18, 2.19, 4.1,4.4 - 4.6, 25.8,25.9
2	1	25.6 – 25.11, 25.16, 25.19, 25.20, (25.20.1, 25.20.2, 25.20.3), 25.21, 25.24, 25.28 – 25.31
3	1	29.17, 29.16.2, 29.21.1, 29.22.1, 29.22, 29.24, 29.25, 29.41, 29.43, 29.44, 29.47
4	2	3.1 – 3.5, 4.2 – 4.8, 4.12, 4.21 – 4.25, 7.2 – 7.4, 7.6, 7.7, 7.10
5	3	4.31, 5.5, 5.2, 10.7, 10.4

Semester - V **Hours/Week : 5**
Sub Code - 10UEL530210 **Credits : 4**

MICROPROCESSOR AND ITS APPLICATIONS

Objective:

- To learn the architecture, programming and interfacing of 8085 and 8086 microprocessors in detail and learn briefly about advance processor.

UNIT – I: ARCHITECTURE OF INTEL 8085

Architecture of 8085 – Pin description and functions – Instruction and Data flow – Machine cycle – Timing diagram for op-code fetch cycle, memory, I/O Read and write cycles –Interrupt structure and its operation.

UNIT - II: ASSEMBLY PROGRAMMING WITH 8085

8085 addressing modes – Instruction set classification and format – Stack and subroutine – Assembly language programming.

UNIT - III: INTEL 8086 ARCHITECTURE

Intel 8086 architecture – Pin description and function overview – Minimal & maximum mode – Bus activities during read/write operation – Interrupts structure and its operation

UNIT - IV: INTEL 8086 PROGRAMMING AND ADVANCED PORCESSORS

Instruction set – Addressing modes – Assembly level language programming (ALP) – Comparative study of 286, 386,486 & Pentium processors – Memory Protection and Virtual Memory Concepts.

UNIT - V: PERIPHERAL INTERFACE

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

BOOK FOR STUDY

1. Ram .B, “Fundamentals of microprocessor and microcomputers”, 4th Edition, Dhanpat Rai & Sons.
2. Douglas V. HALL, “Microprocessor and Interfacing”, 2nd Edition.
3. Barry B. Brey, “ THE INTEL MICROPROCESSORS”, 8th Edition, Imprint of PEARSON

BOOK FOR REFERENCE

1. Ramesh Goankar, “Microprocessors and its Application”, 3rd Edition.

UNIT	BOOK	SECTION
I	1	3.1 – 3.3.5
II	1	4.1 – 4.6.5
III	3	9.1, 9.6, 9.3 – 9.4
III	2	2.12, 8.1 – 8.39
IV	3	3, 4, 5, 6 (instruction set & addressing modes), 3.1 – 3.19, 15.2 – 15.41, 16.2
V	1	7.2, 7.3, 7.6, 7.7, 7.10, 7.11, 7.9, 7.8, 7.12.5,

Semester – V **Hours/Week : 6**
Sub Code - 10UEL530211 **Credits : 4**

ELECTRONICS PRACTICALS – III
(Operational Amplifier, Communication, Power and Instrumentation)

1. Measurement of OP AMP parameters (Gain, input offset voltage, input offset current, bias current, CMRR, output voltage & slew rate)
2. OP AMP basic operation (Inverting, Non Inverting, Differential, Unity gain and Summing amplifiers)
3. OP AMP based Integrator, Differentiator and Peak Detector
4. Voltage to Current and Current to Voltage converters
5. Comparators-Inverting, Non Inverting, Zero Cross and Window Detector
6. Clippers and Clampers
7. Solving simultaneous equation
8. Design of instrumentation amplifier
9. Construction & study of precision rectifier and sample & hold circuits
10. Full Wave Control rectifier using SCR, TRIAC & UJT
11. Construction and study of single phase half wave power control rectifier with RL load
12. Construction and study of step up and step down choppers
13. PWM based motor speed control using IGBT
14. Construction and study of voltage fed inverters using IGBT/SCR
15. Construction and study of static circuit breakers
16. Construction and study of SMPS
17. Construction and study of AC voltage controllers for resistive load

18. Study of AM & FM
19. Study of PAM, PWM, PPM and PCM
20. Study of TV Receivers
21. Study of Radio Receivers – Super Hetro Dyne
22. Study of Transmission Line Characteristics
23. Study of Klystron Oscillator – Microwave
24. Construction and study of Balanced Modulator
25. Generation of SSB and its reception
26. Study of ASK & FSK
27. Fiber optic communication (NA, Losses, receiver sensitivity)
28. Study of Sensors – I (Thermal & Optical)
29. Study of Sensors – I (LVDT, Hall Effect, Strain Gauge, Flow and Level)
30. Construction and Study of function generators and ammeters.

Semester – V **Hours/Week : 4**
Sub Code - 10UEL530302A **Credits : 4**

CORE ELECTIVE – II: TRANSMISSION LINE CHARACTERISTICS AND WAVEGUIDE

Objective

To learn the fundamentals of transmission line and wave guides

UNIT– I: TRANSMISSION LINE THEORY

General solution of Transmission line – The two standard forms for voltage and current of a line terminated by an impedance – Physical significance of the equation and the infinite line – Reflection coefficient – Wavelength and velocity of propagation – Waveform distortion – Distortion less transmission line – The telephone cable – Induction loading of telephone cables – Input impedance of lossless lines – reflection on a line not terminated by Z_0 - Transfer impedance - Reflection factor and reflection loss - T and p section equivalent to lines.

UNIT– II: THE LINE AT RADIO FREQUENCIES

Standing waves and standing wave ratio on a line – One eighth wave line – The quarter wave line and impedance matching – the half wave line – The circle diagram for the dissipation less line – The Smith Chart – Application of the Smith Chart – Input impedance of a lossless line terminated by impedance – Single stub matching and double stub matching.

UNIT – III: GUIDED WAVES

Types of propagation – TM,TE, and TEM waves, Transmission of TM Waves between parallel planes –Transmission of TE Waves between parallel planes – Transmission of TEM Waves between parallel planes – Manners of wave travel – Velocities of the waves – Characteristics impedance of the planes – Attenuation with planes of finite conductivity TEM case – Attenuation with planes of finite conductivity TM case – Attenuation with planes of finite conductivity TE case.

UNIT – IV: RECTANGULAR WAVEGUIDES

Transverse Magnetic Waves in Rectangular Wave guides – Transverse Electric Waves in Rectangular Waveguides – characteristic of TE and TM Waves – Impossibility of TEM in rectangular waveguides – Cylindrical wave guide – The TEM wave in the coaxial line-Attenuation of TE and TM modes in rectangular waveguides – Wave impedances – characteristic impedance – Dominant mode in rectangular waveguide – Excitation of modes.

UNIT- V: CIRCULAR WAVE GUIDES AND RESONATORS

Circular waveguide – TE and TM waves in circular waveguides – Other waveguides- methods of exciting wave guide- waveguide coupling – Basic accessories – Multiple junctions – Impedance matching and tuning – Cavity resonators – Rectangular cavity resonator and circular cavity resonator – Auxiliary components – Resonant cavities.

BOOK FOR STUDY

1. J.D.Ryder, “Networks, Lines and Fields”, 2nd Edition, PHI, New Delhi, 2003.
2. Kennedy, Davis, “Electronic communication systems”, 4th Edition, Tata Mcgraw -Hill publishing company ltd. New Delhi.

BOOK FOR REFERENCES

1. Ramo, Whineery and Van Duzer, “Fields and Waves in Communication Electronics” John Wiley, 2003.
2. David M. Pozar, “Microwave Engineering”, 2nd Edition, John Wiley.
3. David K. Cheng, “Field and Waves in Electromagnetism”, Pearson Education, 1989.

UNIT	BOOK	SECTIONS
1	1	Chapter 6
2	1	7.11 – 7.24
3	1	Chapter 11
4	1	Chapter 12
5	2	Chapter 10.2-10.6

Semester - V **Hours/Week : 4**
Sub Code - 10UEL530302B **Credits : 4**

CORE ELECTIVE – II: VIRTUAL INSTRUMENTATION

Objective

- To learn Labview programming for developing virtual instruments

UNIT – I: VIRTUAL INSTRUMENTATION

Historical perspective – Advantages – Block diagram and architecture of a virtual instrument – Data-flow techniques – Graphical programming in data flow – Comparison with conventional programming – Development of Virtual Instrument using GUI – Real-time systems – Embedded Controller.

UNIT – II: VI PROGRAMMING TECHNIQUES

VIS and sub-VIS – Loops and charts – arrays – clusters and graphs – Case and sequence structures – Formula nodes – Local and global variables – string and file I/O – Instrument Drivers.

UNIT – III: DATA ACQUISITION BASICS

Introduction to data acquisition on PC – Sampling fundamentals – Input/output techniques and buses – ADC – DAC – Digital I/O – Counters and timers – DMA – Software and hardware installation – Calibration – Resolution – Data acquisition interface requirements.

UNIT - IV COMMON INSTRUMENT INTERFACES

Current loop – RS 232C/ RS485, GPIB – Bus Interfaces: USB, PCMCIA, VXI, SCSI, PCI, PXI, Fire wire – PXI system controllers – Ethernet control of PXI – Networking basics for office & Industrial applications – VISA and IVI – Industrial Communication – Image acquisition and processing – Motion control.

UNIT –V: LAB VIEW AND AUTOMATION TECHNOLOGY

Mathematics and simulation in Lab VIEW – Commercial communication applications –Fourier transform analysis – Time frequency

analysis of signals – Designing digital filters – Quality – Reliability and maintenance of Lab VIEW programs

BOOK FOR STUDY

1. S. Sumathi, P. Surekha, “LABVIEW based advanced Instrumentation System”, Springer, 2007.3
2. Kevin James, “PC Interfacing and Data Acquisition: Techniques for Measurement”, Instrumentation and Control, Newnes, 2000.

E-BOOK

1. Rahman, and Herbert Pichlik, “LABVIEW – Applications and Solutions”, National Instruments Release, ISBN 0130964239.

BOOK FOR REFERENCES

1. Gary Johnson, “LABVIEW Graphical Programming”, 2nd Edition, McGraw Hill, Newyork, 1997.
2. Lisa K. wells & Jeffrey Travis, “LABVIEW for everyone”, Prentice Hall, New Jersey, 1997.

UNIT	BOOK NUMBER	CHAPTERS	SECTIONS
1	1	1	1.2,1.3,1.5-1.5.3,1.6,1.8,1.9,1.10
2	1	2,3	2.5.3-2.5.5,3.2-3.2.2,3.3.2,3.4,3.5,3.6,3.7,3.8,3.10,3.13-3.13.2
3	2	1,3,5,6	1.1-2.4,3.1-3.7,5.1-5.7,6.1
4	1	5,6,7	5.3-5.5,5.6-5.6.6,5.7-5.7.2,6.2-6.2.6,6.3-6.3.5,6.6-6.6.6,6.7.1-6.7.5,6.8-6.8.7,7.5,7.6
5	E-Book		

Semester - V **Hours/Week : 2**
Sub Code - 10UEL540609 **Credits : 2**

SKILL BASED ELECTIVE – II: PC ASSEMBLING

Objective

- To develop the skill of assembling and maintaing the personal computer

UNIT- I: MOTHERBOARD

Motherboard design- motherboard connectors-onboard connectors-back panel connector-front panel connectors-processors

UNIT- II: PORTS AND CONNECTORS

Mother board ports-serial ports- parallel ports - USB-IEEE-wireless ports-video connectors VGA -SCSI connectors

UNIT- III: BIOS

BIOS function- BIOS activities- BIOS startup screen- system configuration summary-standard setting-advance features-security and passwords- formatting PC (material)

BOOK FOR STUDY

1. Ron Glister, “PC upgrades and repair”, Dream tech press Edition, 2003, New Delhi.

UNIT	CHAPTER	PAGES
I	1, 12	4-6,310-315,42-47
II	12	316 - 333
III	4	88,93-99,102-106
III	15	408-420,422-423,433-434

Semester - VI **Hours/Week : 5**
Sub Code - 10UEL630212 **Credits : 4**

ANALOG COMMUNICATION

Objective

- To learn the various analog modulation techniques

UNIT - I: 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- II: 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 III: TRANSMITTER 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 - IV: NOISE

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: APPLICATIONS

RADAR: Introduction-Constituents of Pulsed radar system-Free space Radar range equation

Satellite communication: Introduction-General structure of a satellite communication system-merits and drawbacks of satellite communication-Active and passive satellites

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. G.K.Mithal,"Radio Engineering", 20thEdition, Khanna publishers, 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. B.P. Lathi, "Modern Digital and Analog Communication Systems", 3rd Edition, Oxford Series, 1998.

UNIT	BOOK	SECTIONS
I	2	CHAPTER 2,4
II	1	CHAPTER 4.1
III	1 2	CHAPTER 5.1 CHAPTER 11
IV	3	CHAPTER 2
V	3	CHAPTER 14,20,21

Semester - VI **Hours/Week : 5**
Sub Code - 10UEL630213 **Credits : 4**

MICROCONTROLLERS AND ITS APPLICATIONS

Objective:

- To acquire the knowledge about microcontrollers and programming for various applications

UNIT- I: INTRODUCTION TO 8051 MICROCONTROLLER

Introduction to Microcontroller – Comparison of Microcontrollers and Microprocessor – overview of 8051– Pin description of 8051 – Registers – Program counters – ROM & RAM space – Stack and PSW – SFR.

UNIT - II: ON-CHIP PERIPHERALS OF 8051

Counters/Timers – Counter programming – Basics of serial communication – RS232 and MAX 232 IC connection – Serial communication registers – Serial communication – Interrupts – Interrupts registers – Internal and external interrupts programming.

UNIT- III: 8051 ASSEMBLY LANGUAGE 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 – Data types and directives.

UNIT – IV: EMBEDDED C PROGRAMMING WITH C51 COMPILER OF KEIL IDE

Introduction to embedded C – C51 Compiler basics – Compiler related differences from ANSI C – 8051 memory configurations – Local memory model specification – Variables and constants – Simple embedded C programs.

UNIT – V: APPLICATIONS OF MICROCONTROLLER

Matrix keyboard – LCD – ADC – DAC – Temperature monitoring system – Traffic light control system – Stepper motor

BOOKS FOR STUDY:

1. Mazidi and Mazidi, “The 8051 Microcontroller and Embedded Systems”, PHI, 2000.
2. Hitex (UK) Ltd. University of Warwick Science Park Coventry “C51 Primer - An Introduction to the Use of the Keil C51 Compiler on the 8051 Family”.

BOOKS FOR REFERENCE:

1. A.V. Deshmuk, “Microcontrollers (Theory & Applications)”, TMH, 2005.
2. John B. Peatman, “Design with PIC Microcontrollers”, Pearson Education, 2005.

UNIT	BOOK NUMBER	CHAPTERS	SECTIONS
I	1	1,2	1.1,1.2,2.1-2.7, 5.2,
II	1	9, 10, 11	9.1,9.2,10.1-10.3,11.1-11.5
III	1	2, 3, 5, 6,	3.1-3.3, 5.1-5.3, 6.1-6.4, 2.2-2.5
IV	E-Book		
V	1	12,13	12.1,12.2, 13.1, 13.2, 13.3,

Semester - VI **Hours/Week : 5**
Sub Code - 10UEL630214 **Credits : 4**

SIGNALS AND SYSTEMS

Objective:

- To acquire the basics of Signals, Systems and Transformations.

UNIT – I: INTRODUCTION TO SIGNAL AND SYSTEM

Signals: Definition – Classification of signals – Basic operations on signals – Types of signals. Systems: Definition – Classification of systems – Properties of systems.

UNIT – II: REPRESENTATION OF PERIODIC SIGNALS BY FOURIER SERIES AND BY SAMPLES

The Response of LTI Systems to Complex Exponentials – Continuous Time Periodic Signals – Convergence of Fourier series – Properties of CTFS. Discrete Time Periodic Signals – Properties of DTFS – Representation of continuous time signals by its samples – Sampling Theorem, Impulse – Train Sampling, Sampling with a zero order hold – Reconstruction of a signal from it samples using inter polation – The effect of under sampling: Aliasing – Sampling of discrete time signals – Discrete time decimation & Interpolation

UNIT – III: FOURIER TRANSFORM

Continuous Time Fourier Transform (CTFT) for A periodic and Periodic Signals – Properties – Discrete Time Fourier Transform (DTFT) for A periodic and Periodic Signals – Properties – Parseval's Relations for CTFT and DTFT.

UNIT – IV: LINEAR TIME INVARIANT SYSTEM

Introduction – Discrete Time Linear Time Invariant Systems – Representation of Discrete Time Signals in Terms of Impulses – The Convolution Sum – Continuous-Time Linear Time Invariant Systems – Representation of Continuous Signals in Terms of Impulses – The Convolution Integral – Properties of Linear Time Invariant Systems – The

Unit Step Response of Linear Time Invariant System – System Characterization by Linear Constant Coefficient Differential Equations and Difference Equations.

UNIT V: LAPLACE AND Z TRANSFORMS

Laplace Transform – Region of Convergence – Inverse Laplace Transform – Properties: Linearity, Time Shifting, Time Scaling, Conjugation, Convolution Property – Z Transform – Region of Convergence – Inverse Z-Transform – Properties: Linearity, Time Shifting, Time Scaling, Conjugation, Convolution Property.

BOOK FOR STUDY

1. Alan V. Opphenehim, Alan S. willsky and Hamid nawab S., "Signals and Systems", 2nd Edition, PHI, 2008.
2. Poornachandra S., "Signals and System", Vijay Nicole imprints Pvt. Ltd., 2004.

BOOK FOR REFERENCE

1. Haykin, Simon and Barry van veen, "Signals and System", 2nd Edition, Wiley, 2003.
2. Ramesh Babu P, Ananda Natarajan R., "Signals and System", 3rd Edition, Scitech Publication Private Limited, 2007.
3. B. P. Lathi, "Linear Systems & Signals", Oxford University press, 2007.
4. Ziemer and Tranter – "Signals and linear systems", 2nd Edition, Maxwell McMillan, 2001.

Unit	Book	Sections
I	2	1.1 – 1.4, 2.1 – 2.9, 3.4, 4.3
II	1 2	3.2 – 3.7, 7.1 –7.3, 7.5 (Relevant problems only – Chapter 5 & 6)
III	1 2	4.0 – 4.3, 5.0 – 5.3 (Relevant problems only – Chapter 7 & 8)
IV	1 2	2.0 – 2.4 (Relevant problems only – Chapter 3 & 4)
V	1 2	9.1 – 9.3, 9.5, 10.1 – 10.3, 10.5 (Relevant problems only – Chapter 10 & 11)

Semester - VI **Hours/Week : 6**
Sub Code - 10UEL630215 **Credits : 4**

ELECTRONICS PRACTICALS – IV
(Simulation, Microprocessor and Microcontrollers)

1. Study of active filters using p-Spice
2. Calculation of node voltages and currents for passive and active component circuits using p-spice
3. 555 applications (Square wave, saw tooth & VCO)
4. Study of sequence detector using MODEL SIM
5. Study of gray code counters using MODEL SIM
6. Study of parity generator using MODEL SIM
7. Study of LABVIEW program to store a set of data in a table
8. LABVIEW program for array manipulation
9. LABVIEW program for representing a data in graph
10. LABVIEW program for interfacing parallel port
11. Microprocessor 8085-Programming I (Data transfer and rotate operations)
12. Microprocessor 8085-Programming II (addition, subtraction, multiplication and division)
13. Microprocessor 8085-Programming III (Code conversion - Gray to Binary, Binary to BCD Binary to Gray, BCD to Binary etc)
14. Microprocessor 8085-Programming IV (largest, smallest, sorting in ascending order and descending order)
15. Microprocessor 8085- Programming V (Using user routines in Monitor program)
16. Microprocessor Interfacing – Input and Output using 8255 PPI

17. Microprocessor Interfacing – 8253
18. Microprocessor Interfacing – Traffic Controller.
19. Microprocessor Interfacing – Stepper Motor Controller.
20. Microprocessor Interrupt Programming
21. Microprocessor 8086 Programming I (Data transfer, Block data transfer)
22. Microprocessor 8086 Programming II (Arithmetic and Array arithmetic)
23. Microprocessor 8086 Programming III (Sorting numbers)
24. Writing Keil C program and to study its equivalent disassembly codes in ASM
25. Microcontroller program I (Data transfer)
26. Microcontroller program II (Arithmetic and Logical)
27. Microcontroller program III (Code convertion)
28. Interfacing LED for pattern generation
29. Study of utilizing Keil C library function
30. Interfacing matrix keypad with a microcontroller.

Semester - VI **Hours/Week : 4**
Sub Code - 10UEL630303A **Credits : 4**

CORE ELECTIVE – III: ANTENNAS AND WAVE PROPAGATION

Objective:

- To enable the student to study the various types of antennas and wave propagation.

UNIT – I: BASIC ANTENNA THEORY

Introduction – Potential Functions and Electromagnetic fields – Hertzian Dipole – Antenna Fundamentals – Antenna Parameters –FRIIS transmission equation – Radiation from Half-wave dipole or quarter-wave monopole – Loop antenna – Antenna Towers – Assumed current distribution for wire antennas – Use of capacity hat and loading coil for short antennas.

UNIT – II: ANTENNA ARRAYS

Introduction – Two elements Array with equal currents in phase – Two elements Array supplied with equal currents – Two elements Array with equal currents but not in phase – Linear Array – Pattern Multiplication method – planar array and circular array –Yagi-uda antenna – Turnstile antenna – Horn antenna

UNIT – III: REFLECTOR, MICROSTRIP AND BROADBAND ANTENNA

Slot Antenna – Reflector Antenna – Plane reflector – Corner reflector – Parabolic reflector – Parabolic – Feed system for parabolic reflector – Micro strip Antenna – Characteristics – Type of patch – Feeding methods – Broadband Antenna – Log Periodic Antenna -Helical Antenna

UNIT – IV: GROUND AND SKY WAVE PROPAGATION

Introduction – Concept of propagation of radio waves – Electromagnetic wave spectrum and frequency ranges – Modes of propagation – Ground wave propagation – Plane Earth reflection – Sky wave propagation – Structure of Atmosphere – Propagation of radio waves through ionosphere – Mechanism of reflection and refraction – Critical frequency –

Skip distance – Mechanism by which the ionosphere affects sky wave propagation

UNIT – V: SPACE WAVE PROPAGATION

Introduction – Space wave propagation – Radio Horizon - Atmospheric effects in space wave propagation – Refraction of rays and the radio horizon – Troposphere waves – Normal refraction – Relation between radius of curvature and the change in refractive index with height – Abnormal reflection and refraction – Modified index curves and duct propagation – Duct propagation.

BOOK FOR STUDY

1. U. A Bakshi, A.V Bakshi, K.A Bakshi, “Electromagnetic waves and Radiating systems”, 1st Edition, Technicial Publication Pune, 2008, India.

BOOKS FOR REFERENCE

1. E.C. Jordan and Balmain, “Electro Magnetic Waves and Radiating Systems”, PHI, 1968, Reprint 2003.
2. R.E. Collins, “Antennas and Radio Propagation”, McGraw-Hill, 1987
3. Ballany, “Antenna Theory”, John Wiley & Sons, 2nd Edition, 2003.

UNIT	BOOK	SECTIONS
1	1	11.1-11.2, 11.4-11.9
2	1	12.1-12.8
3	1	12.9-12.12
4	2	8.1-8.18
5	2	9.1-9.6

Semester - VI **Hours/Week : 4**
Sub Code - 10UEL630303B **Credits : 4**

CORE ELECTIVE – III: CONTROL SYSTEM

Objective

To design a control system module and to analyze

UNIT – I: MATHAMETICL AMODELS OF CONTROL SYSTEMS AND COMPONENTS

Control system – Examples of control system – Block diagram reduction techniques – Signal flow graph using Mason's gain formula – M mathematical models : Mechanical system – electrical system – Electrical analogous of mechanical translational systems (two notes) – Electrical analogous of mechanical rotational systems (Force voltage &current). Components of Automatic control system – Potentiometer – Synchros – Controllers – Tacho generators – Modulator and Demodulator.

UNIT – II: TIME RESPONSE ANALYSIS

Time response – Test signals – Transfer function of a system – Laplace transform review Response of first order system for unit step input – Second order system response: Under damped – over damped – over damped – critically damped. Time domain specifications: Rise time – Time constant – MPO – Settling time.

UNIT – III: CONTROLLERS &ERRORS

Response of 2nd order systems with P, PI & PID controllers – Comparison of the responses – Steady state 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

Review of Fourier transform – Frequency domain specifications – Estimation of frequency domain specifications for II order system – Correlation between time and frequency response – Frequency response plots: Bode plot – Nichols plot – M &N circles Nichols chart

UNIT – V: CONCEPTS OF STABILITY AND ROOT LOCUS

Definitions of stability – Location of roots on the S-plane for stability – Routh Hurwitz criterion – Mathematical preliminaries for Nyquist stability criterion – Relative stability – Estimation of range of system gain – Root locus construction – Root locus for systems with dead time or transportation lag. Steps for designing a lead – lag compensator.

BOOK FOR STUDY

1. Nagoor Gani, "Control system", 1st Edition, RBA publications, 2006.

BOOKS FOR REFERENCE

1. R. Anandanatarajan & P. Ramesh Babu, "Control Systems Engineering", 2nd Edition, Scitech Publications, 2010
2. M. Gopal, "Control system principles and design", TMH, 1998.
3. B. C. Kuo, "Automatic Control Systems", 7th Edition, PHI, 1995.

UNIT	BOOK NUMBER	CHAPTERS	SECTIONS
1	1	1	1.1-1.6,1.9-1.12
2	1	3	3.1-3.7
3	1	3	3.8,3.10-3.15,3.17
4	1	4	4.1-4.10
5	1	5	5.1-5.4,5.6-5.8,

Semester - VI **Hours/Week : 4**
Sub Code - 10UEL630304A **Credits : 4**

CORE ELECTIVE – IV: MICROWAVE AND OPTOELECTRONICS

Objective:

- To learn the concepts of microwave and the principles of optical fiber systems.

UNIT I: INTRODUCTION TO MICROWAVE AND PASSIVE MICROWAVE DEVICES

Introduction – Characteristics of microwave – Passive microwave devices - Terminations – Variable short circuits – Attenuators - Electronically controlled attenuators – Phase shifter - Electronically controlled phase shifter – Hybrid Junctions – Magic T – Hybrid ring – Power Dividers – Faraday Rotation – Microwave devices employing faraday rotation – Gyrator – Isolator – Resonance isolator – Circulators – Three –port circulator – Field analysis of Three-Port Circulator.

UNIT – II MICROWAVE SOLID STATE DEVICES

Introduction – Bipolar transistor – Microwave transistor – cut-off frequency – Microwave characterization – Biasing of microwave transistor – DC biasing for microwave silicon transistor – Microwave semiconductor diodes – PIN diodes – Parameter – Switches – Phase shifter – IMPATT and related avalanche transit time devices – Physics of IMPATT diodes – Avalanche multiplication – Output power and quality factor – Oscillators and amplifiers – Gunn diode – principle – Electron dynamics in negative differential mobility medium – Domain formation – Gunn oscillation mode – LSA diodes

UNIT – III OPTICAL TRANSMITTER

Basic Concepts – Emission and absorption rates – p-n junctions – Semiconductor materials – Light emitting diodes – Power-current characteristics – LED spectrum – Modulation response – LED structures – Semiconductor Lasers – open gain – Feedback and Laser Threshold – Laser structures – Laser Characteristics – CS characteristics – Small-signal modulation – Large single modulation – Relative intensity noise – spectral line width.

UNIT - IV OPTICAL FIBERS

Introduction- Geometrical-optics description – Step-index – graded-index – Wave propagation – Maxwell's equations – Fiber modes – Single-mode fibers – Dispersion in single-mode fibers – Group-velocity dispersion – material dispersion – waveguide dispersion – waveguide dispersion – higher-order – polarization-mode – dispersion-induced limitations-basic propagation equation – fiber bandwidth – fiber losses- attenuation coefficient - material absorption – Rayleigh scattering – waveguide imperfections.

UNIT –V OPTICAL AMPLIFIERS

Basic concepts – Gain spectrum and bandwidth – gain saturation – amplifier noise – applications – semiconductor optical amplifiers – amplifier design – characteristics – pulse amplification – system applications – raman amplifiers – raman gain and bandwidth – characteristics – performance – Eribium-doped fiber amplifiers – pumping requirements – gain spectrum – simple theory – noise – multichannel amplification – distributed-gain amplifiers.

BOOK FOR STUDY

1. Robert E. Collin, "Foundations for microwave engineering", 2nd Edition, Print India press, Delhi
2. Ganesh Prasad srivastava, Vijay Laxmi Gupta, "Microwave devices and circuit design", Prentice-Hall of India private limited, New Delhi- 110 001.
3. Govindu P. Agarwal, "Fiber-optics communication system", unique color carton, Delhi, 2008.

BOOK FOR REFERENCE

1. Samuel Y. Liao, Microwave devices and circuits, PHI 3rd edition, 1994.
2. John M. Senior, Optical fiber communication, PHI, 2nd edition, 2002.
3. M.L Sisodia and G.S. Raghuvanshi, Microwave circuits and passive deivces, Wiley Eastern Ltd, New age international publishers Ltd. 1995.

Unit	Book	Sections
1	1	6.1 – 6.3, 6.4 – 6.10
2	2	7.1, 7.3, 7.4, 7.7 – 7.9
3	3	3.1-3.4 3.5
4	3	2.1-2.5
5	3	6.1-6.4

Semester - VI **Hours/Week : 4**
Sub Code - 10UEL630304B **Credits : 4**

CORE ELECTIVE – IV: PROGRAMMABLE LOGIC CONTROLLERS AND PROGRAMMING

Objective:

- To learn the concepts of PLC
- To Deal with Ladder Logic programming and Simulation in IDE using OMRON and KEYENCE
- To focuses on how PLCs work and gives students practical information about programming, and understanding the various hardware details of PLC systems

UNIT- I: INTRODUCTION TO PLC, LADDER DIAGRAM FUNDAMENTALS

Introduction to PLC – PLC Vs Microcontroller – Basic Components and their Symbols – Control Transformers – Fuses – Switches – Relays – Time Delay Relays – Fundamentals of Ladder Diagram – Basic diagram framework – Wiring Reference Designators – Boolean Logic & Relay Logic – AND-OR & OR-AND – Ground Test – The Latch – Two handed Anti-Tie Down, Anti-Repeat – Combined Circuit – Machine Control Terminology.PLC Vs Relay comparison

UNIT- II: PROGRAMMABLE LOGIC CONTROLLER & FUNDAMENTAL PROGRAMMING

PLC Configurations – System Block Diagram – Update – Solve the Ladder – Physical Components Vs Program components –Internal Relays - Basics of PLC Programming-Developing Fundamental PLC Wiring Diagrams and Ladder Programs-Simple Programs.

UNIT - III: ADVANCED PROGRAMMING TECHNIQUES AND OVERVIEW OF MNEMONIC PROGRAMMING CODE

Ladder Program execution Sequence –– Counters – industrial examples – Timers – Master control Relays and control Zones – AND Ladder Rung – Entering Normally Closed Contacts – OR Ladder Rung – Simple

Branches – Complex Branches-Complex Branches-Case studies-Industrial problems and Ladder logic solutions

UNIT- IV: WIRING TECHNIQUES, ANALOG I/O & SENSORS

PLC Power Connection – input wiring – Inputs having a single common – Isolated inputs – Output wiring – Relay outputs – Solid state outputs – Analog (A/D) inputs – Analog (D/A) output – Sensor Output classification – Connecting Discrete sensors to PLC inputs – Proximity sensors – Optical Proximity Sensors.

UNIT- V: WORKING IN OMRON & KEYENCE IDE WITH LADDER LOGIC

Introduction to OMRON & KEYENCE – Creating a project – Ladder Programming – Compiling and Executing – Ladder Programs – Logic Gate functions (AND, OR, NOT, NAND, NOR, XOR) – Using Timers (ON delay timer, OFF delay timer, one shot pulse, flashing pulse), Counters – Using Calendar functions

BOOK FOR STUDY

1. John R. Hackworth, Frederick D. Hackworth, Jr., “Programmable Logic Controllers, Programming Methods and Applications”, New Delhi: Pearson Education, 3rd edition.

BOOK FOR REFERENCE

1. John. W .Webb, Renaldo A. Rein, “Programmable Logic Controller Principles and Application”, Prentice Hall India, 5th Edition.
2. Frankpetruzella, “Programmable Logic Controllers”, Tata McGraw Hill, 2nd edition.

UNIT	BOOK	SECTIONS
1	1	Material prepared by the department (for 1st two topics), 1.1 – 1.3
2	1	2.1 - 2.5, 3.1,3.3
3	1	4.1, 4.8, 4.10, 4.11, 5.1, 5.2, 5.3, 5.4, 5.5
4	1	6.1 – 6.7, 7.1, 7.2, 8.1 – 8.3, 8.7
5	-	Material prepared by the department

Semester - VII **Hours/Week : 5**
Sub Code - 10UEL730216 **Credits : 4**

DIGITAL COMMUNICATION TECHNIQUES

Objective:

- To get expertise on digital communication system based on digital modulation and error coding techniques

UNIT – I: PULSE MODULATION

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

UNIT - II: BASEBAND PULSE TRANSMISSION

Matched filter – Error Rate due to noise – Inter-symbol Interference – Nyquists's criterion for distortion less base band binary transmission – Correlative level coding – Base band M array PAM transmission – Adaptive equalization – Eye patterns

UNIT – III: PASSBAND DATA TRANSMISSION

Introduction – Pass band transmission model – Coherent phase shift keying – Hybrid amplitude/phase modulation schemes – Detection of signals with unknown phase – Non-coherent orthogonal modulation – Non-coherent binary frequency shift keying – Differential phase shift keying – Comparison of digital modulation systems using a single carrier – Carrier and symbol synchronization

UNIT – IV: CHANNEL CODING

Types of error control – Coding methods – Channel models – Code rate and redundancy – Linear block codes – Cyclic codes – Convolution codes encoding – Maximum likelihood decoding – Viterbi decoding – TCM encoding and decoding.

UNIT –V: SPREAD SPECTRUM MODULATION

Spread spectrum overview – Pseudo-Noise sequences – DS Spread spectrum systems –Frequency Hopping systems – Synchronization – Acquisition and tracking – CDMA – DSCDMA.

BOOK FOR STUDY

1. Simon Hawkins, John Wiley, "Communication systems", 4th Edition, 2001
2. Bernard Sklar, Pearson education, "Digital communications Fundamentals and applications", 2nd Edition, 2001.

BOOK FOR REFRENCE

1. Taub and Schilling, "Principles of Digital Communication", Tata McGraw-Hill, 28th reprint, 2003.
2. Wayne Tomasi, Pearson education ,"Electronic Communications Systems Fundamentals through Advanced, 4th Edition, 2003
3. Sam K. Shanmugam, John Wiley, "Analog and Digital Communication".
4. John G. Proakis, "Digital Communication", McGraw Hill, 3rd Edition, 1995

UNIT	BOOK	SECTIONS
1	1	3.1 – 3.15
2	1	4.1– 4.7, 4.10, 4.11
3	1	6.2 – 6.10, 6.14
4	2	6.2, 6.3, 6.4, 6.7, 7.1, 7.3.1, 7.3.3, 9.10
5	2	12.1 –12.5, 12.7, 12.8

Semester - VII **Hours/Week : 5**
Sub Code - 10UEL730217 **Credits : 4**

DIGITAL SIGNAL PROCESSING

Objective:

- To impart the algorithms of Signal Processing.

UNIT I: DISCRETE TRANSFORMS

Introduction to Digital Signal Processing – Discrete Transforms – Discrete-Time Fourier Transform (DTFT), Discrete Convolutions – Linear, Circular and Sectioned Convolution – Discrete Fourier Transform – Properties – Frequency Analysis of Signals using DFT – Decimation-in-Time – FFT algorithms – Inverse FFT

UNIT – II: FINITE IMPULSE RESPONSE (FIR) FILTERS

Symmetric and anti-symmetric FIR filters – Design of linear-phase FIR filters using windows: Rectangular – Blackman – Hamming – Hanning – Design of linear-phase FIR filters by frequency-sampling method – Optimum equi-ripple linear-phase FIR filter – Comparison of design methods for linear-phase FIR filter.

UNIT – III: INFINITE IMPULSE RESPONSE (IIR) FILTERS

IIR filter design by approximation of derivatives – Impulse invariance method – Bilinear transformation – Characteristics of analog filters: Butterworth – Chebyshev – Elliptic – Frequency transformation in the analog and digital domain.

UNIT – IV: ARCHITECTURE OF FIXED POINT PDSP

Multiplier and multiplier accumulator (MAC) – Modified bus structure and memory access schemes – Multiple access memory – Multi ported memory – VLIW architecture – Pipelining – Special addressing modes in PDSP's – On-chip peripheral – Architecture of TMS 320 C5X.

UNIT – V: ASSEMBLY LANGUAGE INSTRUCTION AND PROGRAMMING

Syntax – Addressing modes – Load / Store instruction – Addition/ Subtraction instruction – Move Instruction – Multiplication instruction – NORM instruction – Program control instruction – Peripheral control – Program for familiarization of the addressing modes – Program for familiarization of the arithmetic instruction – Real time signal processing program.

BOOKS FOR STUDY

1. Ramesh Babu P., "Digital Signal Processing", 4th Edition, Scitech Publication Pvt. Ltd, 2007.
2. Venkataramani B, Bhaskar M., "Digital signal processors - Architecture, Programming and Applications", 1st Reprint, TATA McGraw Hill, 2003.

BOOK FOR REFERENCE

1. John G. Proakis, Dimitris G. Manolakis, "Digital Signal Processing Principles, Algorithm and Applications", 4th Edition, PHI, 2007.
2. Alan V. Opphenehim, Ronald W. Schafer, "Digital Signal Processing", 2nd Edition, PHI, 2004.
3. Salivahanan S, Vallavaraj A, Gnanapriya C, "Digital Signal Processing", Tata McGraw Hill Publishing, 2003.
4. Poornachandra S., "Signals and System", Vijay Nicole imprints Pvt. Ltd., 2004.

Unit	Book	Sections
I	1	3.4,3.6 – 3.9, 4.1 - 4.4
II	1	6.1, 6.2, 6.6, 6.9, 6.10
III	1	5.1 – 5.13
IV	2	2.1-2.8,3.1-3.14
V	2	4.1- 4.9,6.2- 6.4

Semester - VII **Hours/Week : 5**
Sub Code - 10UEL730218 **Credits : 4**

VLSI design and VHDL programming

Objective:

- To learn the basics of VLSI technology and VHDL programming

UNIT – I: SEMICONDUCTOR DEVICES FOR VLSI TECHNOLOGY

Basic MOS transistor – Enhancement and depletion mode transistor action – NMOS fabrication – CMOS fabrication – BICMOS technology – pass transistor – nMOS inverter, CMOS and BICMOS inverter – Latch-up in CMOS & BICMOS circuits - MOS layer – Stick diagram – Design rules and layout diagram – Lambda based design rules – contact cuts – Double metal MOS process rules – CMOS lambda based design rules - Symbolic diagram.

UNIT – II: SCALING AND TESTING FOR VLSI SYSTEM

Basic circuit concepts – Sheet resistance – Capacitance – Delays – Driving large capacitive loads – Propagation delays – Wiring capacitance - Scaling factor for device parameter factors – limitation of scaling - Switch logic — Pass transistors and transmission gates - gate logic – The inverter -CMOS logic – Pseudo nMOS logic – Dynamic CMOS logic – Clocked CMOS – CMOS domino logic – n-p CMOS logic - real world VLSI design – Design styles and philosophy – The interface with the fabrication house – CAD tools for design and simulation – Aspects of design tools – Graphical entry layout – Design verification prior to fabrication - DRC – circuit extractors - Test and test ability – System partitioning.

UNIT III: DESIGN STYLES IN VHDL

Behavioral Modeling: Entity declaration – architecture body – process statement – variable assignment statement – signal assignment statement – wait, if, case, null, loop, exit, next, assertion statement – more on signal assignment - other sequential statements – multiple process – postponed processes – Dataflow Modeling: concurrent signal assignment – concurrent Vs sequential signal assignment - delta delay revisited – multiple drivers –

conditional signal assignment – selected signal assignment – Structural Modeling: Component declaration – component instantiation

UNIT IV: GENERICS, SUBPROGRAM AND PACKAGES

Identifiers – data objects – data types – operators- generics – sub programs – package declaration – package body – design file – design libraries – implicit visibility – explicit visibility – attributes – writing a test bench – state machine modeling – interfacing state machines

UNIT – V: CIRCUIT DESIGN AND SIMULATION USING QUARTUS-II IDE

Architecture of CPLD and FPGA – Survey of CPLD and FPGA - Introduction to Quartus II IDE- creating project – loading programs – compiling – functional and timing simulation –Using DE1 kit- Features of DE1kit - implementing the design in DE1 – interfacing an LCD with DE1 – interfacing seven segments – interfacing ADC0808 with DE1 kit – interfacing DE1 with switches.

BOOKS FOR STUDY:

1. Douglas A. Pucknell & Kamran Eshraghian, “Basic VLSI Design”, 3rd edition, Prentice hall of India pvt Ltd, New Delhi
2. A VHDL Primer by J.Bhasker, third edition, PHI learning private limited, 2009, New Delhi

BOOK FOR REFERENCE:

1. Clive “Max” Maxfield,”Design Warriors Guide to FPGAs”, Elsevier, 2004.
2. Eugene D.Fabricius “Introduction to VLSI Design” McGraw Hill, 2002.
3. Randall L.Geiger,Phillip E.Allen and Noel R.Strader “ VLSI Design Techniques for Analog and Digital Circuits” McGraw Hill, 2002
4. Neil H.E.Weste and Kamran Eshraghian-“Principles of CMOS VLSI Design”-(2nd ed), 2004.
5. Douglas L. Perry, “VHDL programming by example”, 4th edition, Tata McGraw hill. New Delhi.

6. Z.Nawabi, “VHDL Analysis and Modeling of Digital Systems” – McGraw Hill, 1998.
7. M.J.S.Smith, “Application Specific Integrated Circuits”, Addison Wesley, 1997

UNIT	BOOK	SECTIONS
1	1	1.1 – 1.11, 2.5-2.10, 2.12.3- 2.14, 3.1-3.3.4, 3.8
2	1	4.1-4.11, 5.1-5.6, 6.1-6.3.4.5, 10.8-10.13.4.2
3	2	Chapter 4, 5.1 – 5.6, 6.2, 6.3
4	2	Chapter 3, 7.1, 8.1, Chapter 9, 10.7, 11.2, 12.8, 12.9
5		Material Prepared by the Department of Electronics

Semester - VII **Hours/Week : 4**
Sub Code - 10UEL730305A **Credits : 4**

CORE ELECTIVE – IV: EMBEDDED SYSTEM

Objective

- To learn about different processors, devices and RTOS

UNIT – I EMBEDDED SYSTEMS INTRODUCTION: PROCESSOR, ARCHITECTURE AND MEMORY ORGANIZATION

Embedded system – Processor embedded into a system – Embedded hardware units and devices in a system – Embedded software in a system – Design process in embedded system – Formalization of system design – Classification of embedded system – Introduction to advanced architectures – Processor and memory organization – Instruction level and parallelism – Performance metrics – Memory types – Memory maps and address – Processor selection – Memory selection

UNIT – II: DEVICES AND COMMUNICATION BUS

I/O types and examples – Serial communication device – Parallel device ports – Sophisticated interfacing features in device ports – Wireless devices – Timer counting devices – Watch dog timers – Real time clock – Networked embedded system – Serial bus communication protocol – Internet enabled system – Network protocol – Wireless and mobile system protocol – Programmed IO busy – Wait approach without interrupt service mechanism – ISR concept – Interrupt source – Interrupt servicing mechanism – DMA – Device driver programming

UNIT – III: MODELING AND INTERPROCESS COMMUNICATION

Program models – DFG models – State machine programming models for event controlled program flow – Modeling of multiprocessor systems – UML modeling – Multiple process in application – Multi thread in application – Task – Task state – Task and data – Concept of semaphores – Shared data – Inter process communication – Signal function – Semaphores function – Message queue function – Mailbox function – Pipe function – Socket function

UNIT – IV: FUNDAMENTALS OF REAL TIME OPERATING SYSTEMS (QING LI)

Characteristics of RTOS & its types: key characteristics of RTOS – Concurrency Vs parallelism – Scheduling algorithm (round-robin – Pre-emptive priority) – Inter Process Communication(IPC): Tasks – Tasks states – Operation – Task structure – Semaphores (binary counting & mutex) – Message queues – Pipes – Event – Signal – Conditional variables – Pseudo codes for IPC objects – Critical session – Deadlocks and its avoidance – Timing management : Real time clock – PIT – Timer ISR – Software Timer.

UNIT- V: SPECIFIC REAL TIME OPERATING SYSTEMS

Basic types and function of RTOSES – Study of Micro COS-II – Window CE – Linux 2.6x and RT Linux – Case study of digital camera hardware and software architecture – Case study for sending application layer bytes streams on a TCP/'IP networks using RTOS VX works – Embedded system in automobile – Case study of embedded system for an adaptive cruise control (ACC) system in car.

BOOKS FOR STUDY

1. Qing Li, "Real time Concepts for Embedded Systems", CMP Books, 2003.
2. Rajkamal, "Embedded Systems Architecture, Programming and Design", TATA McGraw-Hill, First reprint Oct. 2003.

BOOK FOR REFERENCE

1. Steve Heath, "Embedded Systems Design", 2nd Edition, 2003, Newnes,
2. David E.Simon, "An Embedded Software Primer", Pearson Education Asia, First Indian Reprint, 2000.
3. Frank Vahid and Tony Givargis, "Embedded Systems Design – A unified Hardware / Software Introduction", John Wiley, 2002.

UNIT	BOOK	SECTIONS
I	2	1.1-1.4, 1.8 -1.9, 1.11, 2.3-2.9
II	2	3.1- 3.10, 3.12, 3.13, 4.1-4.4, 4.6, 4.8, 4.9
III	2	6.1- 6.5, 7.1-7.15
IV	1	4.1-4.8,5.1-5.7,7.1-7.8,8.1-.3,11.2,11.3,11.5,11.7
V	2	9.1,9.2,10.1,10.3,11.2,11.3,12.2, 12.3

Semester - VII **Hours/Week : 4**
Sub Code - 10UEL730305B **Credits : 4**

CORE ELECTIVE – IV: COMPUTER NETWORKS

Objective:

- To learn the basics of network connections and its protocols

UNIT- I: INTRODUCTION TO DATA COMMUNICATIONS

Components – Direction of Data flow – Distributed Processing – Networks – Components and Categories – Types of Connections – Topologies – Protocols and Standards – ISO / OSI model – Physical layer Line Coding – Transmission modes – Multiplexing – TDM – FDM – Transmission Media – Coaxial Cable – Fiber Optics – Circuit switching – Space Division Switch and Time Division Switch

UNIT – II: DATA LINK LAYER

Error – detection and correction – Parity – LRC – CRC – Checksum – Hamming code – Flow Control and Error control – Stop and wait – go back – NARQ – Selective repeat ARQ – sliding window – HDLC – LAN – Ethernet IEEE 802.3 – IEEE 802.4 – IEEE 802.5 –IEEE 802.11 – Virtual Circuit Switching – Frame Relay – ATM

UNIT- III: NETWORK LAYER

Internetworks – Packet Switching and Datagram approach – IP addressing methods –IPV6 – Routing – Distance Vector Routing – Link State Routing – Routers.

UNIT – IV: TRANSPORT LAYER

Duties of transport layer – Multiplexing – Demultiplexing – Sockets – User Datagram Protocol (UDP) – Transmission Control Protocol (TCP) – Congestion Control – Quality of services (QOS) – Integrated Services.

UNIT –V: APPLICATION LAYER AND DATA SECURITY

Domain Name Space (DNS) – SMTP – FTP – Introduction to Network Security – Cryptography symmetric key – Public key cryptography – Message Security-Digital Signature – User Authentication – Key management.

BOOK FOR STUDY

1. Behrouz A. Forouzan, “Data communication and Networking”, Tata McGraw-Hill, 2004.

BOOK FOR REFERENCE

1. James F. Kurose and Keith W. Ross, “Computer Networking: A Top-Down Approach Featuring the Internet”, Pearson Education, 2003.
2. Larry L. Peterson and Peter S. Davie, “Computer Networks”, Harcourt Asia Pvt. Ltd., 2nd Edition.
3. Andrew S. Tanenbaum, “Computer Networks”, PHI, 4th Edition, 2003.
4. William Stallings, “Data and Computer Communication”, 6th Edition, Pearson Education, 2000

UNIT	BOOK	SECTIONS
1	1	1.1, 1.2, 1.4, 2.2, 2.3, 4.3, 6.1, 7.1, 8.1
2	1	10.1 – 10.5, 11.2, 11.4, 11.5, 11.6, 13.2, 14.4, 18.1, 18.2
3	1	20.1, 20.2, 20.3, 22.3
4	1	23.1, 23.2, 23.3, 24.3, 24.5, 24.7
5	1	25.2, 26.2, 26.3, 31.1, 31.7

Semester - VII **Hours/Week : 6**
Sub Code - 10UEL530219 **Credits : 4**

ELECTRONICS PRACTICALS –V
{Embedded, VLSI and DSP experiments}

1. Study of I/O ports in 8051 microcontroller
2. Study of Timers in 8051 microcontroller
3. Study of Counters in 8051 microcontroller
4. Study of interrupts in 8051 microcontroller
5. Study of serial communication in 8051 microcontroller
6. Interfacing relay using ULN2003 & MCT2E with 8051 microcontroller
7. Interfacing ADC with 8051 microcontroller
8. Interfacing DAC with 8051 microcontroller
9. Interfacing LCD with 8051 microcontroller
10. Interfacing keypad with 8051 microcontroller
11. Interfacing RTC DS1307 with 8051 microcontroller
12. DC motor speed control using PWM technique
13. Data acquisition system
14. Interfacing printer with 8051 microcontroller
15. Study of SPI protocol
16. Frequency measurement using 8051
17. Developing test bench for MUX and DMUX and verifying the same in ModelSIM
18. Implementing Full adder, Full subtractor, Multiplier, divider and ALU in FPGA
19. Implementing D flip-flop with synchronous and asynchronous inputs, 4-bit up/down counter with control input in FPGA (clock source to be switch)

20. Implementing clock divider, pulse counter (for delay program) shift register and barrel shifter
21. Interfacing LCD with FPGA
22. Implementing soft-core processor in FPGA (NIOS-II, Microblaze, Picoblaze, Mico8)
23. Designing standalone CPLD system for interfacing stepper module using XC9572XC CPLD
24. Waveform / signal generation (sine wave, square wave, saw tooth wave, AM wave, unit impulse, unit step, Ramp signal and exponential) - MATLAB
25. Linear convolution, circular convolution, autocorrelation and cross correlation - MATLAB
26. Discrete Fourier and inverse discrete Fourier, fast Fourier and inverse fast Fourier transform - MATLAB
27. DSP programming I

Semester - VIII **Hours/Week : 5**
Sub Code - 10UEL830220 **Credits : 4**

POWER ELECTRONICS

Objectives:

- To learn the operative principles of power electronic devices and their applications.

UNIT - I: POWER SEMICONDUCTOR DEVICES AND CHARACTERISTICS

Power semiconductor devices – Basic structure – Power diode – Power transistors – Power MOSFET – IGBT – Physics of device operation and steady state characteristics.

Thyristor: Principle of operation – Two transistor analogy – Protection against high di/dt and high dv/dt – Turn on and turn off methods – gate triggering circuits – Series and parallel operation of thyristors – Methods to ensure proper current and voltage sharing – String efficiency.

UNIT - II: PHASE CONTROLLED RECTIFIERS

Principles of phase control – Single phase half wave circuit with R, RL and RLE load – freewheeling- Single-phase full wave controlled converters - Single phase semi converters - Estimation of load voltage, load current under continuous current conduction.

Three phase half controlled and fully controlled converter circuits - Waveform and average load voltage for continuous current operation.

UNIT- III: CHOPPERS, AC VOLTAGE CONTROLLERS AND DUAL CONVERTERS

Chopper: Principle of chopper operations – Control strategies – step up and step down choppers - Quadrant operation - Estimation of load voltage and load current for continuous current operation.

AC voltage controllers: Principle of phase control & Integral cycle control - Single phase AC voltage controller with R,RL load –Two stage sequence control of Voltage controllers for R Load.

Dual-converters: Principles of operations – Ideal Dual converter – Practical dual converter

UNIT – IV: INVERTERS AND DUAL CONVERTERS

Inverters: Classification of inverters – Voltage source inverters – single phase half bridge and full bridge inverters – Three phase voltage source inverters for 1200 and 1800 conduction mode - current source inverters – Single phase CSI with ideal switches –Single phase capacitor commutated CSI with R load – Series Inverter – Parallel inverter.

Cyclo-converters: Principles of operations – Single phase to single phase circuit step-up cyclo-converters – Single phase to single phase step-down converters.

UNIT – V: VOLTAGE CONTROL OF INVERTERS AND SOME APPLICATIONS

Voltage control – External control of ac output voltage – External control of dc input voltage – Internal control of Inverters – Pulse width modulated inverters Applications – Switched mode power supply – UPS – Static switches – Static circuit breakers – Solid state relays.

BOOK FOR STUDY

1. Dr. Bimbhra, “Power Electronics”, Khanna publishers, 4th edition, 2006.

BOOK FOR REFERENCES

1. Rashid , M H “Power Electronics” Pearson education
2. MD singh “Power Electronics” Tata McGraw Hill, New Delhi.

UNIT	Book	CONTENTS
I	1	2.2,2.3,2.5,2.6,2.7, 4.1,4.2,4.4,4.10
II	1	6.1,6.1.1-6.1.3,6.7.1.1-6.7.1.2,
III	1	7.1,7.2,7.3,7.4 9.1,9.2,9.3.1,9.3.2,9.4.1,6.10,6.10.1-6.10.2
IV	1	8.1,8.2,8.4,8.8,8.8.1,8.8.2,8.9,8.10, 10.1,10.1.1,10.1.2
V	1	8.5.1,8.5.2,8.5.3,8.6,11.1,11.2,11.4,11.6

Semester - VIII **Hours/Week : 5**
Sub Code - 10UEL830221 **Credits : 4**

SATELLITE AND MOBILE COMMUNICATION

Objective

- To learn about satellites and its orbit with fundamentals of communication

UNIT – I: SATELLITE ORBITS AND LAUNCHING

Introduction – Active and passive satellites – Frequency allocation – Types of orbits – Kepler's laws – Orbital elements – Orbit period and velocity – Look angles and slant range – Orbital perturbations – Station keeping- Launch vehicles –Launch sequence

UNIT – II: SPACE SEGMENT AND EARTH SEGMENT

Communication satellite– Subsystems – Power supply – Attitude control – TT and C-Transponder –Common antenna types – Earth station- Block diagram-TVRO-Transmit and Receive Types -Antenna types-VSAT

UNIT – III: ACCESS TECHNIQUES

Multiple access techniques – FDMA, TDMA, SS-TDMA, DAMA, SPADE systems – Spread spectrum techniques – CDMA –ALOHA schemes – Introduction to Multi carrier system

UNIT – IV: MOBILE COMMUNICATION FUNDAMENTALS

Introduction to cellular concept – Frequency reuse – Channel assignment strategies – Handoff strategies – Interference – System capacity

Co-channel interference – Adjacent channel interference – Interference reduction – Trunking efficiency and grade of service – Improving capacity in cellular systems – Sectoring – Channel sharing and borrowing – Micro cell system.

UNIT-V: WIRELESS STANDARDS

Advanced Mobile Phone System (AMPS), United States Digital Cellular(USDC), Global System for mobile (GSM), IS-95, Cordless Telephone

-2(CT2) Standard for cordless telephone, Digital European Cordless Telephone (DECT)- Personal Access Communication System (PACS) – Wireless in Local Loop (WLL) – Blue tooth - Zigbee.

BOOKS FOR STUDY

1. Dennis Roddy, "Satellite Communications", 2nd Edition, Prentice Hall, Tata McGraw Hill, 2001.
2. T. S. Rappaport, "Wireless Communications: Principles and Practice", 2nd Edition, Pearson Education/ Prentice Hall of India, Third Indian Reprint 2004.

BOOKS FOR REFERENCES

1. T. Pratt and G.W. Bostion, "Satellite Communications", John Wiley and Sons, 2001.
2. M. Richharia, "Mobile Satellite Communication", Pearson Education, 2003.
3. K. Feher, "Wireless Digital Communications - Modulation and Spread Spectrum Applications", Prentice-Hall India, 2005.
4. W.C.Y.Lee, "Mobile Communications Engineering: Theory and applications", 2nd Edition, McGraw-Hill International, 1998.

Unit	Book	Sections
I	1	19.1 – 19.7
II	1	19.8 – 19.13
III	2	9.1.1- 9.2, 9.3- 9.6.1, 9.6.2
IV	2	23.1- 3.7.4
V	2	11.1 – 11.7

Semester - VIII **Hours/Week : 5**
Sub Code - 10UEL830222 **Credits : 4**

MANAGEMENT INFORMATION SYSTEMS

Objective:

- The objective of this course is to sensitize and expose students to critical tasks, functions and issues of management information systems and to gain insight into the dynamics of employee management relations on the different job situations.

UNIT- I: CORE CONCEPTS IN INFORMATION SYSTEMS

Introduction – Understanding Information systems – Changing face of business environment – Types – IS vs IT – Emerging trends in Information technology – Hardware, Software, Network Resources – Data-impact of internet Revolution Business – Managing E-Transformation – Evolution of business processes – Organizational Structure and IT Architecture.

UNIT- II: TELECOMMUNICATION AND COMPUTER NETWORKS FOR BUSINESS

Competitive Edge of computer networks – Evolution of computer networks – Networking for People – Technological foundation – Types of network-architecture – Media – protocols – Quality of service – Internet telephony – Network planning – Design – Management.

UNIT- III: DATABASE MANAGEMENT

Application – Concepts – What is a database – Steps in designing a database – Objects –Normalization – Management system – Data model – Object-oriented data Model – Types – Composite Information system – Data Integration and data Planning – Data Warehousing.

UNIT- IV: INFORMATION SYSTEM PLANNING AND DEVELOPMENT

Business system Planning – Organizing Work – Business and IT Mapping – Am Enterprise-Wide Architecture – Requirement Analysis – Life Cycle – Prototyping – Rapid Application Development – Data Flow Diagrams – Entity Relationship Diagram.

UNIT- V: IS LEADERSHIP AND SECURITY MANAGEMENT

The Profile of a Chief Information Officer – Role of CIO – CIOs Role in Innovation – Challenges – Information Security Threats – IS Policy and Enforcement – IS Management Standards and Global Practices – IS Practices – IS Access Control System and Technologies – IS Risk Management Framework.

BOOK FOR STUDY

1. Mahadeo jaiwal and Monika mital, “Management Information systems”, OXFORD University Press, New Delhi.

BOOK FOR REFERENCES

1. Buffs and Miller, “Production-inventory system: planning and control”.

UNIT	BOOK	SECTION
I	1	Chapter 1, 2
II	1	Chapter 3
III	1	Chapter 4
IV	1	Chapter 9
V	1	Chapter 10, 11

SKILL BASED ELECTIVE COURSES OFFERED

BUSINESS ADMINISTRATION

08UBU440608	Personal Growth Programme
08UBU540609	Personality Development

CHEMISTRY

08UCH440608	Food and Nutrition
08UCH540609	Everyday Chemistry

COMMERCE

08UCO440608	Accounting for Executives
08UCO540609	Fundamentals of Accounting Packages

COMMERCE - COMPUTER APPLICATIONS

08UCC440608	Accounts for Managers
08UCC540609	Soft Skills

COMPUTER APPLICATIONS

08UCA440608	Internet Concepts
08UCA440609	Web Design

COMPUTER SCIENCE

08UCS440608A	Office Automation
08UCS440608B	Internet Concepts
08UCS540609A	Fundamentals of Computer Networks
08UCS540609B	E-Commerce

ECONOMICS

08UEC440608	Security Analysis
08UEC530609	General Economic Review

ELECTRONICS

10UEL440608	DVD Assembling and Trouble Shooting
10UEL540609	PC Assembling

ENGLISH

08UEN440608	Business English Writing
08UEN440609	Introduction to Print Media

HISTORY

08UHS440608	Air Fares and Ticketing (SBEC – I)
08UHS540609	Arts and Crafts (SBEC – II)

MATHS

08UMA 4 4 06 08	MATLAB Applications
08UMA 5 4 06 09	Maths for Competitive Examinations

PB & PBT

08UPB540608	Mushroom Culture
08UPB640609	Biological Techniques

PHYSICS

08UPH 440608	Electrical Wiring
08UPH 540609	Cell Phone Servicing

STATISTICS

08UST440608	Data Analysis
08UST540609	Statistics for Management

TAMIL

08UTA440608	இணையத் தமிழ் இலக்கியங்கள்
08UTA540609	கணினித் தமிழ்