PERIYAR UNIVERSITY
SALEM – 11

SYLLABUS

M.Sc., ELECTRONICS

(PRIDE – NON-SEMESTER)

(EFFECTIVE FROM 2007-2008 ONWARDS)

PERIYAR UNIVERSITY Salem – 11

(PRIDE- SYLLABUS)-{Non –Semester}

M. Sc., ELECTRONICS

Regulations

1. CONDITION FOR ADMISSION

A candidate who has passed B.Sc., Electronics and Communication /B,Sc Tele –communication/B.Sc (Electronics) / B.Sc (Physics) / B.Sc (Instrumentation) / B.Sc (Industrial Electronics). / B.Sc (Biomedical Instrumentation) / B.Sc (Computer Science) / B.C.A. degree of this University or any of the above degree of any other university accepted by the syndicate as equivalent thereto, subject to such condition as may be prescribed therefore shall be permitted to appear and qualify for the M.Sc., Electronics degree examination of this university after a course of study of two academic years.

2. DURATION OF THE COURSE:

The course for the degree of **Master of Electronics** shall consist of two academic years .

3. COURSE OF STUDY

The course of study shall comprises instruction in the following subjects according to the syllabus and books prescribed from time to time.

4. EXAMINATIONS

The examination shall be three hours duration to each paper at the end of the year. The candidate failing in any subject(s) will be permitted to appear for each failed subject(s) in the subsequent examination.

Practical examinations for PG course should be conducted at the end of the year.

At the end of second year viva-voce will be conducted on the basis of the dissertation / project report submitted by the student. The Viva – voce will be conducted by one internal and one external examiners jointly.

5. SCHEME OF EXAMINATIONS

The scheme of examinations as follows.

I- year				
S. No.	Paper Code	Title of the paper	Duration	Marks
1	07PEL01	Electronic Devices and applications of IC'S	3	100
2	07PEL02	Advanced microprocessor	3	100
3	07PEL03	Digital and Optical Communication Engineering	3	100
4	07PEL04	Power Electronics &VLSI Design	3	100
5	07PELP01	Practical –I: Electronics Lab	3	100
II – year				
6	07PEL05	Wireless Communication	3	100
7	07PEL06	Advanced Networks	3	100
8	07PELP7	C++ and Java Programming	3	100
9	07PELP02	Practical -II : Microprocessor and Communication lab	3	100
10	07PELPR01	Dissertation / Project work & Viva-Voce (Project report (75) + Viva – Voce (25))	--	100
			Total	1000

6. QUESTION PAPER PATTERN : For theory:

Time: 3 Hours   **Max. Marks – 100**

PART – A: 5 x 5 = 25

(Answer all questions)

(Two questions from each unit with internal choice)

PART – B : 5 x 15 = 75

(Answer all questions)

(Two questions from each unit with internal choice)

For Practical:

Time : 3 Hours.   **Max. Marks – 100:**

(One question either or type)

7. DISSERTATION (100 Marks)

a. Topic

The topic of the dissertation shall be assigned to the candidate before the end of first year and a copy of the same should be submitted to the University for approval.

b. Advisory committee

Each guide shall have a maximum of five students in science and maximum of seven for all Arts subjects.

There will be an advisory committee consisting of the guide as chairman and one member from the same department or allied departments of the college and a third member should be from other college preferably from Aided / Government colleges in the case of self financing college and vice – versa.

c. No. of Copies/ Distribution of Dissertation

The students should prepare three copies of dissertation and submit the same for the evaluation by examiners. After evaluation one copy is to be retained in the college library and one copy is to be submitted to the University (Registrar) and one copy can be held by the student.

d. Format to be followed

The formats / certificate for dissertation to be submitted by the students are given below:

Format for the preparation of project work

      a. Title page

      b. Bonafide certificate

      c. Acknowledgement

      d. Table of content

CONTENTS

CHAPTER NO.	TITLE	PAGE NO
1.	Introduction	
2.	Review of literature	
3.	Materials and methods	
4.	Results	
5.	Discussion	
6.	Summary	
7.	Reference	

Format of the title page

TITLE OF THE DISSERTATION

Dissertation submitted in part fulfillment of the requirement for the degree of
Master of Science / Master of Arts in _____
to the Periyar University, Salem-636 011.

By

Students name   :

Register Number   :

College / University Department

Year :

Format of the certificate

<div align="center">

CERTIFICATE

</div>

This to certify that the dissertation entitled…………………………………… …………………….. submitted in part fulfillment of the requirement of the degree of Master of Science / Master of Arts in …………………………. To the Periyar University, Salem is a record of bonafide research work carried out by …………………….. under my supervision and guidance and that no part of the dissertation has been submitted for the award of any degree, diploma, fellowship or other similar titles or prizes and that the work has not been published in part of full in any scientific or popular journals or magazines.

Date:

Place:

<div align="right">

Chairman, Advisory Committee,

</div>

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Approved by

Chairman:

Members:

1.

2.

</div>

External Examiner

Guidelines for approval of PG guides for guiding students in their research for submitting dissertation.

1. M.Sc. (Part fulfillment) Guide

i. The person seeking for recognition as guide should have.

ii. M.Sc degree with first class / second class

iii. Should have 3 years of active teaching / research experience.

2. They should have published atleast one research paper in a National journal authored solely or jointly. Procedure for submitting application for approval as guides

    a. The University will on request give prescribed application form.

    b. The filled in applications should be submitted before the close of said date by the University.

c. such applications should be routed through the Principal of their respective institutions with specific recommendations.

d. All relevant proofs should be submitted along with the applications.

3. Approval

The committee constituted for the purpose will scrutinize the applications and recommend for approval / rejection.

Orders will then be passed by the authority of the university and communicated to each member individually through the Principal.

8. Passing Minimum

The candidate shall be declared to have passed the examination if the candidate secure not less than 50 marks in the University examination in each paper.

For the practical paper, a minimum of 50marks out of 100 marks in the University examination and the record notebook taken together. There is no passing minimum for the record notebook. However submission of a record notebook is a must.

For the project work and viva voce a candidate should secure 50% of the marks for pass. The candidate should compulsory attend viva voce examination to secure pass in that paper.

Candidate who do not obtain the required minimum marks for a pass in a paper/ project report shall be required to appear and pass the same at a subsequent appearance.

9. Classification of successful candidates

Candidates who secure not less than 60% of the aggregate marks in the whole examination shall be declared to have passed the examination in **First Class.**

All other successful candidates' hall be declared to have passed in the **Second Class**.

Candidates who obtain 75% of the marks in the aggregate shall be deemed to have passed the examination in **First Class with Distinction** provided they pass all the examinations prescribed for the course at the first appearance.

Candidates who pass all the examinations prescribed for the course in the first instance and within a period two academic years from the years of admission to the course only are eligible for **University Ranking.**

10. Maximum duration for the completion of the PG Programme

The maximum duration for completion of the PG programme shall not exceed five years.

11. Commencement of this regulation

These regulations shall take effect from the academic year 2007-08, i.e., for students who are to be admitted to the first year of the course during the academic year 2007-08 and thereafter.

12. Transitory provision

Candidates who are admitted to the PG course of study before 2007-2008 shall be permitted to appear for the examinations under those regulations for a period of three years i.e, up to and inclusive of the examination of April / May 2011. Thereafter, they will be permitted to appear for the examination only under the regulations then in force

13. Regulations of project work

   a. Students should do their three months project work in company / institutions.
   b. The candidate to the department should submit the format which includes the topic of the dissertation, and the same should be submitted to the University for approval.
   c. Each internal guide shall have maximum of FIVE students.
   d. Periodically the project should be reviewed minimum three times by the advisory committee consisting of the guide and one member from the same department and the third member (min:5 years experience) should be from other institutions / organization.
   e. The students should use OHP/Power Point Presentation during their project Viva Voce examinations.

OBJECTIVES:

The syllabus of M.Sc., Electronics is enriched and necessary changes have been made in the course pattern and papers. This will enable the students to acquire through knowledge both in theory and practical.

1. An emphasis is given more to practicals in advanced experiments.

2. Since, the course is paraprofessional enough practical training is necessary when the student goes to industries. Hence at the end of every semester the practical papers are included in the syllabus to meet out this demand or challenges.

3. After successful completion of this course a student can pursue higher engineering courses like ME / M.Tech in Electronics & Communication with good GATE score.

4. The thrust is given in the curriculum by considering various recent developments in Electronics & Communication, Bio-medical Instruments and Networking. This exposure will make, the students to be eligible for service / Engineering in the field of Electronics industries / Communication Industries / Bio-medical Industries / Networking Companies and Software Industries.

SUGGESTIONS:

1. M,Sc., Electronics covers the basic topics of the field, however the regular updating of the syllabus is necessary according to the recent academic developments in this field.

2. To provide further improvement in the teaching, quality of, the teachers in this university areas should be given short term training programmes in the specialized fields.

M.Sc., DEGREE EXAMINATIONS., MAR/APR 2007
ELECTRONICS
ADVANCED MICROPROCESSORS

Time: 3 hrs   Max. Marks: 100

PART – A (5x5 = 25)

Answer all the questions:

1a) Discuss About evolution of Microprocessor(or)

  b) Write note on I/O Devices of Microprocessor.

2.a)Explain register set of Microprocessor.(or)

  b)Discuss about the pin out of 8085.

3 a) What is address decoding , Explain.(or)

   b)Define the term RAM refreshing.

4a)Discuss about 8086 flag register.(or)

  b)Explain about Motorola 68000 registers.

5a)Write note on Segmentation.   (or)

  b)discuss Pentium processor pipelining.

PART- B(5X15=75)

  Answer all the questions

6 a).Explain the block diagram of 8085 Processor.(or)

  b)Explain about microcontroller architecture.

7.a)Discuss the various instructions of 8085 in detail.(or)

  b)Explain the various addressing modes of Microprocessor.

8 a)Explain 8259 Architecture.(or)

  b)Discuss about 8257.

9 a)Explain 8086 Architecture .(or)

  b)Explain the addressing modes of 8086 with examples.

10 a) Explain the architecture of Pentium Processor(or)

   b) Explain addressing modes of Pentium processor.

PAPER :1 ELECTRONIC DEVICES AND APPLICATIONS OF IC'S

Unit – I

Working and Characteristics of Junction diode ,Zener diode and tunnel diode. Working of IMPATT diode, PIN diode . Construction and V-I characteristics of thermistors, Gunn effect diode, Varactor diode, Photoconductive devices - Photoconductive cells, photo diodes, LED, Solar Cells - MEMS and Nano Technology

Unit -II

Construction – operation and Characteristics of a Bipolar transistor-biasing of a transistor – base bias, collector to base bias and self bias-. Causes of shift of Quiescent operating point. Stability factor- Hybrid parameters- Construction , operation and Characteristics of SCR, UJT, JFET and MOSFET - Biasing of JFET- Multivibrators.

Unit III

IC Fabrication: classification –fundamentals of monolithic IC technology – basic planer processes: Silicon wafer preparation – Epitaxial growth – Oxidation – photolithography – Diffusion – Isolation – Metallization – monolithic transistors – monolithic diodes – integrated resistors – integrated capacitors – thin and thick film technology

Unit IV

Digital IC's: Basic terms related to digital IC's – RTL and DTL circuits – Integrated Injection logic - TTL – Open collector output – Totem pole output – Schottky TTL gate – ECL – MOS – CMOS.

Unit V

Designing of OPAMP circuits: OPAMP as Comparator – OPAMP as zero crossing detector – Constant current source – current to voltage converter – thermocouple – temperature monitor – strain gages –force measurement

Reference Books

1.Electronic Devices and Circuits by G.K.Mithal

2.Electronic devices : Applications and Integrated circuits by Mathur, Kulshreshtha and Chandha

3.D. Roy Choudhury and Shail Jain "Linear Integrated Circuits" New age   International Ltd, New Delhi 1997

4.Ramakant A Gayakwad "Op Amps and Linear Integrated Circuits" PHI 1988.

PAPER :2 ADVANCED MICROPROCESSORS

UNIT-I

Evolution of Microprocessor – Typical Micro Computer Architecture – Memory –memory addressing - Timing diagram -Input/Output .

UNIT – II

Intel 8085: Introduction – Register Structure- block diagram – 8085 Addressing modes – Timing Methods- 8085 CPU pins and Associated Signals – instruction set- – Interrupt System – SID and SOD Lines – 8085 Based System Design.

UNIT – III

Interfacing Devices: Introduction – Types of Interfacing Devices – Addressing Decoding for I/O – Input/Output Ports – Programmable Interrupt Controller 8259 – Programmable DMA Controller: 8257 Programmable DMA Controller – Analog Input Devices – Analog Output Devices.

UNIT – IV

16-bit Microprocessor: Intel 8086:Introduction – Architecture – Addressing Modes – 8086 Input/Output. Motorola MC 68000:Introduction – Registers – Memory Addressing – Instruction Format – Addressing modes – Motorola 68000 I/O

UNIT - V

Introduction- register set- internal architecture- addressing modes of 80286- .

Pentium processor

Introduction- register set- block diagram -addressing modes- pipelining- integer pipelining- floating pipelining.

REFERENCE BOOKS:

1 M.Rafiquzzaman, "Microprocessors Theory and Applications : Intel and Motorola", Prentice Hall India, Revised Edition, 2004.

2. Aditya P. Mathur, "Introduction to Microprocessors", Tata McGraw Hill, Third Edition, 1990.

3 R.S.Gaonkar, "Microprocessor Architecture,programming and Applications with the 8085", 1995.

4. M.Rafiquzzaman, "Microprocessor and MicroComputerBased System

Design",UBS, 1995.

5.Advanced microprocessor – Mc graw Hill-Daniel Tabak

PAPER 3: DIGITAL AND OPTICAL COMMUNICATION ENGINEERING

UINT I: Pulse modulation System:

Introduction to pulse Modulation – Types – Sampling theorem-Pulse-Width modulation-Generation and demodulation of (PEM)-Pulse position modulation (PPM). Pulse code modulation-Principles-Effects of noise-Companding-Advantages and applications of PCM-Differential PCM-Delta modulation.

UINT II: Digital modulation techniques:

Digital carrier systems-Amplitude shift keying-Frequency shift keying-Phase shift keying (PSK)-Binary phase shift keying (BPSK)-Carrier recovery circuits- Differential phase shift keying (DPSK)-Hard and soft decision decoders.

UINT III: Fiber optic cables:

Optical fiber cables-Fiber strength and durability-Stability of the fiber transmission characteristics:-Micro bending-Hydrogen absorption-Nuclear radiation exposure-Cable design; fiber buffering-Cable structured and strength members-Cable sheath and water barrier-Example of fiber cables.

UINT IV: Light sources and light detectors:

Light sources: LED structure-Planar LED, dome LED, Surface emitter LEDs-Edge emitter LEDs-Super luminescent LEDs-LEDs reliability.
Light detectors: mid-Infrared photodiodes-Phototransistors-Photoconductive detectors.

UNIT V: Fiber optical communication components and systems:

Components: coupling components for optical fibers-Modulation methods and modulators-Switches-Transmitters-Receivers-Optical amplifiers (Semiconductor Laser Amplifiers). Systems: transmitter and receiver design-Link design-Link codes for optical fiber links.

Text and reference books:
1. Electronic communications systems by George Kennedy III edition Tata Mc Graw hill publishing company Ltd., New Delhi 1998.
2. Electronic communications by Dennis Roddy and john Coolen IV Edition prentice-Hall of India, New Delhi 2004.
3. Optical fiber communications by john M. Senior II Edition prentice-Hall of India, New Delhi 2005.
4. Fiber optic communications by D.C Agarwal II Edition S. Chand & Company Ltd., 2004.
5. Principles of communication systems by Taub and schilling II edition Tata Mc Graw hill Ltd., New Delhi, 1998.
6. Electronic communication by Taub and Schilling Bell & Howell Company, 1992.

PAPER 4: POWER ELECTRONICS &VLSI DESIGN

Unit I

Thyristor : Introduction – natural commutation – forced commutation – self commutation – impulse commutation – resonant pulse commutation – complementary commutation - external pulse commutation.

Unit II

Controlled rectifiers:- Introduction – principles of phase controlled converters – single-phase semi converters – single-phase full converters – single-phase dual converters – single-phase series converters.

Unit III

Static switches:- Introduction – single phase AC switches – three phase AC switches – three phase reversing switches - AC switches for Bus transfer – solid state relays.

AC voltage controller:- Introduction – Principles of ON - OFF control – principle of phase control – single phase bidirectional controllers with resistive loads and inductive loads– single phase cyclo converters-UPS.

Unit IV:

VLSI FABRICATION TEHNIQUES

An overview of wafer fabrication – Wafer processing – Oxidation – Patterning – Diffusion – Ion implantation – Deposition – Si gate n MOS process – C MOS process – n well – p well Twin tub – Si on insulator – C MOS process Enhancement – Interconnection circuit elements.

UNIT V   INTRODUCTION TO VHDL

Overview of VHDL – Capabilities – Hardware device – Basic terminology – Entity declaration.

ARCHITECTURE BODY : Structure style of modeling – Data flow – Style of modeling – Behavioral style of modeling – Mixed style of modeling – Configuration declaration – Package declaration.

Reference Books:

1. Rashid M.H " Power Electronics: Circuits Devices and Application " II-nd Edition PHI New Delhi 1996.

2. Timothy J. Maloni: Industrial solid state electronic devices and circuits" II-nd Ed., 1986.

3. Neil H.E. Weste kamaran eshraghian, "**PRINCIPLES OF CMOS VLSI DESIGN".**

4. J. Bhasker, "VHDL Primer", Low Price Edition, 2001

5.Charles H. Roth, Jr. "**DIGITAL SYSTEM DESIGN USING VHDL",** Brooks/Cole Thomson Learning PWS Publishing, ISBN-981-240-052-4.

PAPER 5:
PRACTICAL –I:ELECTRONICS LAB
(any 15)

1. Full wave and bridge rectifiers.
2. Clipping and clamping circuits.
3. CE amplifier design.
4. CS FET amplifiers design.
5. UJT Relaxation oscillator.
6. Colpitts oscillators.
7. Hartley oscillator.
8. Wien bridge oscillator.
9. Phase shift oscillator.
10. Multivibrators using transistors.
11. Verification of Demorgan's theorem
12. Half and Full Adder,
13. Half and Full subtractor
14. Multiplexer
15. De-multiplexer
16. Encoder and Decoder
17. Shift Register
18. Decade and UP/DOWN counter
19. Analog to Digital Counter
20. Single phase inverter

PAPER 6: WIRELESS COMMUNICATION

Unit-I

Telecommunication system:

GSM-mobile services – system architecture – radio interfaces – protocols – localization and calling – hand over and security-new date services.

DECT- system architecture – protocol architecture –TETRA-UMTS and IMT2000- UMTS releases and standardization- UMTS architecture –UMTS radio interface – Hand over.

Unit –II

GEO- LEO-MEO –routing localization- hand over.

Wireless LAN: Infrared and radio transmission-infrastructure and ad-hoc network-IEEE802.11- HIPERLAN – blue tooth.

Unit –III

Mobile and ad- hoc networks – routing –destination sequence distance vector- dynamic source routing – alternative matrices.

Unit – IV

Mobile transport layer ;

Traditional: congestion control – slow start- fast retransmit/ fast recovery-implication of mobility. Classification of TCP improvements : indirect-snooping- mobile TCP-fast transmission /receiving- transmission/time out frequency-selective retransmission

Unit-V

File system: consistency –coda-little work-ficus – Mio-NFS-recover.

WAP: Architecture-Wireless datagram protocol-transmission layer security-transaction protocol- session protocol- application environment.

Reference books

1.Mobile communication – 2 nd edition –schiller – pearson.

2. Wireless communication networks William stellys – Low price edition Pearson Edu.

3.wireless and mobile circuits – JACKM HOLTZMAN, DAVIDJ.GOODMAN – Allied publication.

PAPER 7:ADVANCED NETWORKS

Unit-I

Internet working: principles of internet working – concatenated virtual circuits – connection less internetworking – tunneling- internetwork routing- fragmentations- firewall.

Unit II

The www: the client side – the server side – writing a web page in HTML – locating information on the web.

The internet transport protocol(TCP and UDP): the TCP service model-TCP protocol-TCP segment header-TCP connection management – TCP transmission policy –TCP congestion control – TCP time management – UDP-wireless TCP and UDP.

Unit III

ISDN: the integrated digital network- overview of ISDN-transmission structure-user access-ISDN protocols.

BROAD BAND ISDN: NTI,-NTI plus and voice communication basis: terminating ISDN connections via NTI- Basis OF NTI and NTI plus- theISDN voice communication primer.

Unit IV

B-ISDN: Introduction- the current situation- the idea of the ISDN-B-ISDN- ATM based service and applications- B-ISDN- service and applications initial ATM network services

Unit V

Desktop video conference: The down sizing of video conference-desk top video conferencing systems- video conferencing requirements- leading desktop video conferencing systems- elements of video conferencing style.

Reference books:

1. Andrew S.Tananbaumn-computer networks-PHI III Ed-1999.
2. David angel- ISDN for dummies- pub II Ed-1996.

PAPER 8: C++ & JAVA PROGRAMMING

UNIT I

Basic Concepts of OOP – Structure of C++ - Data types - Variables – Control Structures – Functions – Classes and Objects – Constructors and Destructors.

UNIT II

Overloading: Function, Operator – Inheritance – Pointers – Virtual Function – Polymorphism.

UNIT III

Streams in C++ - Stream Classes – Formatted and Unformatted data – Manipulators – User Defined Manipulators – File Streams – Opening and Closing a File – File Pointers Manipulation – Template Classes and Functions – Exception Handling: Try, Catch, Throw.

UNIT IV   Introduction to Java – Features of Java – Methods and Classes – Array, Strings and Vector – Inheritance – Packages and Interfaces.

UNIT V

Exception Handling – Multithreading – Applets – Graphics Programming.

REFERENCE BOOKS:

1.   E.Balagurusamy, "Object Oriented Programming with C++", TMH, Second Edition, 2001.

2.   Ravichandran, "Programming with C++", TMH, 1996.

3.   Bjarne Stroustrup, "The C++ Programming Language", Addision Wesley, 2004.

4.   Patrick Naughton and Hilbert Schildt, "The Complete Reference Java 2", TMH, 2003.

5.   E.Balagurusamy, "Programming with Java A Primer", TMH, Second Edition, 1999.

PAPER 9: MICROPROCESSOR AND COMMUNICATION LAB

(Any 15)

Using 8085:

1. 8- bit addition, subtraction

2. 8 -bit Multiplication and division

3. 16- bit addition, subtraction

4. 16 -bit Multiplication and division

5. Stepper motor interfacing

6. ADC

7. DAC

8. Traffic light controller

Communication:

1. AM modulation
2. FM modulation and detection
3. Automatic gain control
4. Voltage gain control
5. Pulse amplitude modulation
6. Pulse width modulation
7. Pulse position modulation
8. Study of PLL characteristics
9. Digital phase detector
10. Pulse code modulation
11. Study of cable TV system
12. Microwave experiments – Klystron

Paper 10 : Project viva-voce