PERIYAR UNIVERSITY

PERIYAR PALKALAI NAGAR

SALEM – 636011

DEGREE OF MASTER OF PHILOSOPHY

CHOICE BASED CREDIT SYSTEM

SYLLABUS FOR

M.PHIL. ELECTRONICS & COMMUNICATION

(SEMESTER PATTERN)

**(For Candidates admitted in the Colleges affiliated to
Periyar University from 2017-2018 onwards)**

REGULATIONS

1. **OBJECTIVE OF THE PROGRAMME:**

   It is a pre-research degree in Electronics & Communication for Post Graduate in Electronics & Communication /Applied Electronics/ Electronics Instrumentation /Physics/ Computer Science /Telecommunication or any other equivalent programme recognized by this University. It is aimed to explore the various research areas in Electronics & Communication and Applications.

2. **ELIGIBILITY:**

   Candidates who have qualified their Postgraduate degree in Electronics & Communication /Applied Electronics/ Electronics Instrumentation /Physics/ Computer Science /Telecommunication or any other University recognized by the Syndicate as equivalent thereto shall be eligible to register for the Degree of Master of Philosophy (M.Phil.) in Electronics & Communication and undergo the prescribed course of study in an approved institution or Department of this University. Candidates who have qualified their postgraduate degree on or after 1 January 1991 shall be required to have obtained a minimum of 55% of marks in their respective postgraduate degrees to become eligible to register for the Degree of Master of Philosophy (M.Phil.) and undergo the prescribed course of study in an approved institution or department of this University. For the candidates belonging to SC/ST community and those who have qualified for the Master's degree before 01.01.1991 the minimum eligibility marks shall be 50% in their Master's Degree.

3. **DURATION:**

   The M.Phil. Programme spans over a period of one year from the commencement of the programme comprising of two semesters.

4. **COURSE OF STUDY:**

   There are three courses for semester I and Dissertation and viva-voce for semester II. The third course in the first semester shall be a specialization related to the Dissertation. The student in consultation with the research supervisor must select the third course and the research supervisor should frame the syllabus.

5. COURSE OF STUDY AND SCHEME OF EXAMINATION

Part	Paper Code	Subject Title	Hrs./Week	Credits	Internal (25%)	External (75%)	Total
					University Examination		
I SEMESTER							
I	Paper I	Research Methodology	4	4	25	75	100
I	Paper II	Advanced Electronics	4	4	25	75	100
I	Paper III	Special Paper (Guide Paper)	4	4	25	75	100
II SEMESTER							
II	Paper IV	Dissertation and Viva voce	-	12	50	150	200

Evaluation by external examiner   100 Marks * Joint viva   voce 50 Marks

(Research supervisor 25 Marks + External 25 Marks)

The distribution of marks for Sessional Assessment and /External Examination will be 25% and 75% respectively. The Sessional Assessment is distributed to tests, seminar and attendance as 10%, 10% and 5% respectively.

 The Examination for courses I, II and III shall be held at the end of the first semester.

The Examination for specialization course will be conducted by the controller of examination along with courses I and II. Two different sets of question papers should be sent to the controller of examinations along with the syllabus for specialization course by the respective research supervisors.

  Semester II - Dissertation and Viva Voce

The area of the Dissertation, which should   be relevant to the specialization course, shall be intimated to the office of the controller of examinations within   a month from the date of the commencement of the second semester. Candidates shall submit two copies of the Dissertation to the controller of examination   through the Supervisor and Head of the Department concerned at the end of the second semester. The supervisor should submit a panel of four examiners along with the dissertation

for the evaluation of specialization course, dissertation and to conduct the viva voce. The respective supervisors shall be an internal examiner. The viva board should consist of the research supervisor, head of the department and external examiner.

The Examiners who value the Dissertation shall report on the merit of Candidates as "Highly Commended" (75% and Above) or "Commended" (50% and Above and Below 75%) or "Not Commended" (Below 50%).

Submission or re - submission of the dissertation will be allowed twice a year.

6. PASSING MINIMUM:

A Candidate shall be declared to have passed if he/she secures not less than 50% of the marks in each course.

7. RESTRICTION IN NUMBER OF CHANCES:

No Candidate shall be permitted to reappear for the written examination in any course on more than two occasions or to resubmit a Dissertation more than once. Candidates shall have to Qualify for the Degree passing all the theory courses and Dissertation within a period of four years from the date of commencement of the programme.

8. CONFERMENT OF DEGREE:

No Candidate shall be Eligible for conferment of the M.Phil Degree unless he/she is declared to have passed all the courses of the Examination as per the Regulations.

9. ELIGIBILITY FOR RESEARCH SUPERVISORS CONDUCTING THE M.PHIL. PROGRAMME:

As per the regulations of Periyar University.

QUESTION PAPTTERN

Max. Marks : 75

PART – A

5 X 5 = 25 Marks (Either or Choice)

PART – B

5 X 10 = 50 Marks (Either or Choice)

M.PHIL. ELECTRONICS AND COMMUNICATION
PART I
PAPER I - RESEARCH METHODOLOGY

UNIT I HIGHER EDUCATION AND LEARNING

Historical perspective – objectives and role of higher education – learning and learning hierarchy – information processing – learning events and outcomes – motivation. Teaching technology designs: Meaning, concept and scope – instructional designs: objective based, skill based, competency based, learning style based and model based.

UNIT II: METHODS AND TECHNIQUES OF TEACHING

Large group techniques: lecture – modified lecture – seminar – symposium – panel discussion– team teaching – project approach and workshop. Small group techniques: group discussion – simulation – role playing – buzz techniques – brain storming – case discussion – assignment – system approach in education. Evaluation: A Conceptual Framework - Methods of Evaluation – Self Evaluation and Student Evaluation in Higher Education - Diagnostic Testing and Remedial Teaching.

UNIT III : RESEARCH METHODOLOGY

Meaning of Research - Objectives of Research - Motivations in Research - Types of Research - Research Approaches - Significance of Research - Research Methods v/s Methodology - Research and Scientific Methods - Research Process - Criteria of Good Research - Funding agencies. Defining the Research Problem: Research Problem - Selecting the Problem - Necessity of Techniques in defining the Problem.

UNIT IV: RESEARCH DESIGN

Meaning – Need - Features of Good Design – Concepts – Types - Basic Principles of Experimental Design, Developing a Research Plan. Sample Design: Implication – Steps - Criteria for selecting a sample procedure - Characteristics of Good sampling Procedure - Types of Sample Design - Selecting Random Samples - Complex random sampling Design.

UNIT V: SCIENTIFIC PAPERS, PRESENTATIONS AND REPORT WRITING

Organizing and writing a rough draft – searching and reviewing scientific literature – publishing in scientific journals – ethical and legal issues – scientific presentations – oral presentation – poster presentation. Preparation of research report - steps involved in writing a good report - concepts of bibliography and references. Developing a Research Proposal: Format of research proposal - Individual research proposal - Institutional proposal.

Simultaneous Conversion – Counter Method– Continuous A/D conversion - A/D Techniques- A/D Accuracy and Resolution.

REFERENCE BOOK

1. E.G. Vedanayagam, —Teaching technology for College Teachers, Sterling Publishers(P) Ltd., 1989.

2. C. R. Kothari, "Research Methodology Methods and Techniques, New AgeInternational Pvt. Ltd., Publishers, 2nd revised edition, 2009.

3. Wayne Goddard and Stuart Melville, —Research Methodology: An Introduction JutaAcademic Publication, 2nd edition, 2004.

4. Ranjit Kumar, —Research Methodology: A Step by Step Guide for Beginners, SagePublications, 2nd edition, 2005

5. Martha Davis, "Scientific Papers and Presentations   San Diego: Academic Press, 1997.

M.PHIL. ELECTRONICS AND COMMUNICATION
PART I
PAPER II - ADVANCED ELECTRONICS

UNIT I Digital Communication

Amplitude Shift Keying (ASK) – Frequency Shift Keying (FSK) Minimum Shift Keying (MSK) –Phase Shift Keying (PSK) – BPSK – QPSK – 8 PSK – 16 PSK - Quadrature Amplitude Modulation (QAM) – 8 QAM – 16 QAM – Bandwidth Efficiency– Comparison of various Digital Communication System (ASK – FSK – PSK – QAM).

UNIT II CMOVLSI Design

CMOS processing technology – Layout design rules – Circuit characterization and performance estimation –CMOS process enhancements- technology related CAD issues- Manufacturing issues – Delay estimation – Logical Effort and transistor sizing –Power distribution- interconnect –design Margin –Reliability –Scaling

UNIT III MEMS & Microsystems

Overview of MEMS and Microsystems – Working principles of Microsystems – Micro sensors –Micro actuation – MEMS Micro actuators – Materials for MEMS- Active substrate materials - Silicon as a substrate material – Silicon Compounds – silicon Piezo-resistors Gallium arsenide – Micro system Manufacturing –Bulk Micro manufacturing –Surface Micro machining – The LIGA Process.

UNIT IV Embedded Systems

Introduction – Application of embedded systems – embedded systems development process –Round Rabin-Round Rabin with interrupts – Function Queue –Scheduling architecture – Kernel architecture – Types of embedded operating system – RTOS – Mobile handheld operating system

8051 Micro controller architecture – Assembly language programming for 8051 micro controller family- Introduction to ARM processor.

UNIT V Thin Film Technology

Introduction to Thin Films – Thin Films growth process – Thermal Evaporation – Resistive Heating – Flash Evaporation – Are Evaporation – Laser Evaporation – RF Heating – Electro Bombardment Heating

Cathode Sputtering- Glow Discharge Sputtering –RF Sputtering – Ion Beam Sputtering – Chemical Vapor Deposition – APCVD- Substrate Materials – Substrate Cleaning – Thin film Resistors, Capacitors, Diodes and Transistors- Photo Conductive detectors – Thin Films Solar cells – Information storage devices

TEXT BOOKS:

1. Bernard Sklar , Digital Communication Fundamentals and Applications, II Edition Pearson Education.

2. Neil H.E.Weste, David Harris and Ayan Banerjee, CMOS VLSI Design, III Edition Pearson Education.

3. Tai-Ran Hsu, MEMS and Microsystems: Design and Manufacture, Tata McGraw Hill- .

4. Daniel W. Lewis: Fundamentals of Embedded software, Prentice Hall of India, New Delhi.

5. David E. Simon, An Embedded software primer Pearson Education.

6. Kasturi Lal Chopra and Inderjeet Kaur- Thin film Device Applications – II Edition EEE

7. K.L. Chopra- Thin Film Phenomena, I Edition, Mc Graw- Hill, New York.

M.PHIL. ELECTRONICS AND COMMUNICATION
PART I
PAPER III- SPECIAL PAPER

(Syllabus will be framed by Guide)