PERIYAR UNIVERSITY

SALEM – 11

SYLLABUS

B.Sc., TELE- COMMUNICATION

(PRIDE – NON-SEMESTER)

(EFFECTIVE FROM 2007-2008 ONWARDS)

PERIYAR UNIVERSITY, SALEM – 11

{PRIDE – SYLLABUS}

B.Sc., TELE- COMMUNICATION

(Effective From 2007-2008 Onwards)

Regulations

1. Condition for Admission :

A candidate who has passed **Higher secondary examination** as per norms set by the Government of Tamil Nadu or an examination accepted as equivalent thereto by the Syndicate subject to such conditions as may be prescribed thereto are permitted to appear and qualify for the **B.Sc., Tele-communication** Degree Examination of this university after a course of study of three academic years.

2. Duration of the Course :

The course for the degree of Bachelor of **B.Sc Tele communication** shall consist of three academic years divided into three non-semesters.

3. Course of Study :

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

Foundation course

1. Tamil / Hindi / Malayalam / French / German
2. English

Allied subjects

I Year:

1. Mathematics – I

II Year:

1. C++ Programming

Main Subjects:

Title of the Paper

I – year:

Electricity and semiconductor devices
Practical-I Basic Electronics Lab

II year:

Analog and digital communication
Practical- II: Analog and Basic communication lab

III Year

Data communication and network architecture
Tele communication systems
Mobile communication
Microprocessor and interfacing
Practical- III: Microprocessor and Optical Communication lab

4. Examinations:

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

The practical examinations for UG course should be conducted at the end of the year.

5. Scheme of Examinations:

The Scheme of Examinations as follows:

S.No	Code	Title of the Paper	Duration Hrs	Marks
FIRST YEAR				
1	07UFTA01	Tamil – I / Hindi – I/French – I/Malayalam – I	3	100
2	07UFEN01	English – I	3	100
3	07UTEL01	Electricity and Semiconductor devices	3	100
4	07UMAA01	Allied – I: Mathematics I	3	100
5	07UTELP01	Practical-I: Basic Electronics lab	3	100
SECOND YEAR				
6	07UFTA02	Tamil – I / Hindi – I/French – I/Malayalam – I	3	100
7	07UFEN02	English-II	3	100
8	07UTEL02	Analog and digital communication	3	100
9	07UCSA01	Allied –II: C ++ Programming	3	100
10	07UTELP02	Practical- II :Analog and Basic communication lab	3	100
THIRD YEAR				
11	07UTEL03	Data communication and network Architecture	3	100
12	07UTEL04	Tele communication Systems	3	100
13	07UTEL05	Mobile communication	3	100
14	07UTEL06	Microprocessor and interfacing	3	100
15	07UTELP03	Practical- III: Microprocessor and optical Communication lab	3	100
Total Marks				1500

6. Question Paper Pattern for theory:

6.1 Question Paper Pattern with out Practical

Time   : 3 Hours   Max. Marks – 100

Part A: 10 x 2 = 20
(Answer all questions)
(Two questions from each unit)

Part B: 5 x 4 = 20
(Answer all questions)
(One question from each unit with internal choice)
Part C: 5 x 12 = 60
(Answer all questions)
(One question from each unit with internal choice)

6.2 Question paper pattern for practical

Time : 3 Hours   Max. Marks – 100

Answer all the questions
(One question)

Mark Distribution

Circuits	-	40 Marks
Calculations	-	25 Marks
Result	-	15 Marks
Record	-	20 Marks

7. Passing Minimum :

The candidate shall be declared to have passed the examination if the candidate secure not less than 40 marks in the University examination in each theory paper without practical and 30 marks in the theory paper with practical.

For the practical paper, a minimum of 40 marks out of 100 marks in the University Examination and the record notebook taken together is required to pass the examination. In the case of practical paper with 25 as maximum marks a minimum of 10 marks in the University Practical examination and the record notebook taken together is required to pass the examination. There is no passing minimum of the record notebook. However submission of a record notebook is a must.

8. 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 shall 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 of three academic years from the year of admission to the course only are eligible for **University Ranking.**

9. Maximum duration for the completion of the UG Programme :

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

10. 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.

11. Transitory Provision :

Candidates who are admitted to the UG 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.

12. Course Objectives:

1. The Syllabus of B.Sc., Tele-Communication enable the students acquire more knowledge in theory and practicals.
2. The syllabus focuses on advanced experiments / technical skills in the field of communication.
3. After completion of the course, students can pursue higher degree courses like M.Sc Tele communication/M.Sc., (Electronics)/M.Sc., (Applied Electronics)/ M.Sc., (Electronics and communication) / M.Sc., (Computer Science) / MCA / M.Sc., (Bio-medical Instrumentation) and MBA.
4. After completion of the course students are eligible to work as Tele communication Engineer /Electronic Service Engineer / Electronic Hardware and Software Engineer / Maintenance Engineer etc.,

PAPER 3: ELECTRICITY AND SEMICONDUCTOR DEVICES

Unit – I

Structure of solids – crystal structures – structure of atom – atomic no, valence electrons, energy level diagram – bonding in solids, Insulators, Conductors- and semi conductors. Electric field – potential difference, electric current. Electric resistance.

Unit – II

Direct current (D.C) Alternating current (A.C) comparison of DC voltage and AC voltage, ohms law, electrical power, series current, voltage drop, voltage division rule, parallel circuit, current division rule.

Unit – III

Introduction of semiconductor, intrinsic and extrinsic semiconductors – donors and acceptors – majority & minority charge carriers of N & P type semiconductors – mobile & immobile charges – hall effect – energy band diagrams for conductors, insulators & semiconductors – depletion layer.

Unit – IV

Junction diode, construction, characteristics, static resistance, dynamic resistance, average ac resistance, diode application – Zener diode – Construction –characteristics, application of seven segment LCD, LED, tunnel diode, PIN diode, varactor, varistor.

Unit – V

Introduction of transistor – Construction and operation of transistors – Configuration and characteristics of CB, CE, CC –, JFET, - MOSFET construction – characteristics, MOSFET as resistor, MOSFET handling, UJT – construction, operation, Intrinsic stand off ratio – V-I characteristics, Construction and operation of UJT, SCR, TRIAC.

Text books

1. Applied electronics – R. Sedha – S. Chand-PHI

Reference Books

1. Basic electronics – B.L. Theraja – S. Chand .
   –Ed4:S.CHAND-1993.
2. Basic Electronics – V.K. Metha1-2002-S.Chand.
3. Electricity and Magnetism – Brijlal and Subramaniam (2005)S.Chand&Co
4. Electricity and Magnetism – R. Murugesan(2005) S. Chand& Co
5.Physics of semiconductor devices – AMSLEY, willey Interscienc

ALLIED -I
PAPER 4: MATHEMATICS

(Marks : 100)

Unit – I
Matrices

Characteristic equation – Eigen values and Eigen vectors – properties – problems – rank of a matrix – problems – solution of simultaneous equations using matrices – consistency condition.

Unit – II
Theory Of Equations

Polynomial equations – relation between roots and coefficients – imaginary roots and irrational roots – solving equations under given conditions – transformation of equations – Descarte's rule of signs.

Unit – III
Differential Calculus

Definition of a derivative, different types of differentiation – standard formula – successive differentiation – nth derivative – Leibnitz formula – problems.

Unit –IV

Partial differentiation – Euler's theorem – Curvature – Radius of Curvature in Cartesian and polar co – ordinates.

Unit – V
Vector Analysis

Gradientϕ, divergence and curl of a vector point function – solenoid and irrotational vectors – unit normal vector – directional derivative – problems - Second order derivatives.

Text books

1. T.K. Manickavasagam pillai – Allied mathematics
2. P.R. Vittal – Allied Mathematics
3. S.P. Rajagopalan – Allied Mathematics.

PRACTICAL- I
PAPER 5: Basic Electronics Lab
(Any 15)

1. Basic Logic gates using diode / Transistors
2. V-I Characteristics of Junction Diode
3 .Zener diode characteristics
4. Photoconductive in semiconductor (LDR)
5. Phototransistor characteristics
6. Transistor Characteristics (CB configuration)
7. SCR Characteristic
8 Low pass, High Pass, Band Pass and band reject filters.
9. Verification of logic gates using Ic's
10 .NAND / NOR as a universal g
11. Design of Sum of products
12. Half and full adder
13. Half and full subtractor
14. Multiplexer and Demultiplexer
15. Encoder, Decoder
16. Study of flip flops – RS and D flip flop flip flop
17. Shift register
18. Astable multi vibrator
19.   Monostable multi vibrator
20. Bistable multi vibrators

Reference Books

1. Electronics Laboratory Primer - A Design Approach - S. Poorna Chandar B. Sasikala – S. Chand

PAPER 8 : ANALOG AND DIGITAL COMMUNICATION

Unit – I
Amplitude Modulation

Definition of Amplitude modulation – Generation and detection of AM – Generation and detection SSB / DSB VSB modulation – Block diagram of AM radio transmitter and receiver – Pre-emphasis – de-emphasis.

Unit – II
Angle Modulation

Definition of Frequency and phase modulation – FM generation and demodulation – Block diagram of FM radio transmitter and receiver – Narrow band and wide band.

Unit – III
Pulse Modulation

Sampling theorem – Basic principles of pulse Amplitude modulation – Pulse width modulation – Pulse position modulation.
Multiplexing: TDM- FDM-WDM-DWDM

Unit – IV
Pulse Code Modulation and Basics of data Transmission and Reception

Principle of PCM – Quantization and quantization error Delta Modulations – Adaptive delta modulation – Time division multiplexing in PCM – Coherent reception – Binary ASK, - FSK – PSK-Comparison of ASK, FSK, PSK.

Unit – V
Microwave Propagation and Devices

Introduction to antennas – Propagation of Radio waves- Ground wave – sky wave – Space Wave – Introduction to microwave system – Frequency range – Waveguides (qualitative analysis only) – cavity resonators – Two cavity Klystron – reflex klystron – Magnetron .

Text Books

1. Fundamentals of communication systems – Sanjeeva Gupta-kanna publishers.
2. Principles of communication system – Anok Singh.

Reference books
1. Electronics communication Systems - Kennedy - TMH
2. Principles of communication systems – Taub and Schiling - TMH
3. Communication Electronics - ND. Deshpande, DA. Deshpande, Rangole – Tata McGraw Published

PAPER 9: C++ PROGRAMMING

Unit I

Introduction to OOPS concepts – the object model Evolution – Elements – Applications – classes and Objects – Nature – Relationship among classes and objects – Building classes and objects. The method : Importance of classification – Identifying classes and objects – key abstraction and mechanisms – elements of notation – class diagram – state transition diagram – interaction diagram module diagrams – process diagrams – applying notations.

Unit II

Data types in C++ - Derived types, loops and relational – Branching statement and logical operators – functions in C++ Programming, modules.

Unit III

Classes and objects – working with classes – class inheritance – constructors and destructors.

Unit IV

Operator overloading and type conversions – inheritance – pointers, virtual functions and polymorphism.

Unit V

Managing console I/O operations working with files – input & output files – templates and exception handling.

Text books

1. "Object oriented programming", E. Balagurusamy, TMH (Unit –I)
1. "Object oriented Analysis Design", Grady booch, The Benjamin cummings publishing company. (Unit II-V)

Reference Books

1. "Mastering C++", K.R. Venugopal, Rajkumar and T.Ravishankar, TMH, 1998. (Unit II-V).
2. "Object oriented modeling and designing", James Rumbaugh et al, PHI, 1998 (Unit I).
3. "Programming with c++", D.Ravichandran, TMH, 1998.
4. C++ Primer Plus, Stephen Prata, Galgotia, 1998. (Unit II-V)

RACTICAL - II
PAPER 10: ANALOG AND BASIC COMMUNICATION LAB
(ANY 15)

1. Characteristics of Solar Cell.
2. Half and full wave rectifiers using filters
3. Regulated power supply using zener diode
4. IC regulated power supply
5. R.C coupled amplifier – single stage
6. Hartley oscillator – Transistor
7. Colpitts oscillator – Transistor
8. Phase shift oscillator
9. Inverting amplifier / Non – Inverting amplifier
10. D/A Converter using ladder op-amp
11. Voltage integrator / Differentiator
12. Astable Multivibrator using op-amp
13. Monostable Multivibrator using op-amp
14. Sine Wave generator using op-amp
15. Basic filters using op-amp
16. AM modulation and detection
17. FM modulation and detection
18. PAM modulation and demodulation
19. Voltage controlled oscillator
20. Study of Satellite operations and frequency

Reference Books

1. Electronics Laboratory Primer - A Design Approach - S. Poorna Chandar B. Sasikala – S. Chand

Paper :11 DATA COMMUNICATION AND NETWORK ARCHITECTURE

UNIT-I

Introduction: Data communications – Networks-Protocols and standards - OSI Model- Digital Transmission: Line coding - **Block** coding - Sampling - Transmission mode -Analog Transmission: Modulation of Digital Data-Telephone, Modems-Guided Media-Unguided Media. Circuit switching and telephone Network: Circuit Switching-Telephone Network.

UNIT -II
Internetworking: principles of internet working – tunneling- internet work routing-fragmentations- firewalls.

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

The internet transport protocol(TCP and UDP): the TCP service model-TCP protocol-TCP segment header-TCP connection management –TCP congestion control – UDP. - IEEE 802.2, 802.3, 802.4 Standards.

Unit IV
ISDN: 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.
ATM based service and applications- B-ISDN.

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.

Text and Rerence books:
1. Andrew S.Tananbaumn-computer networks- 4 TH Ed-2003.

2. David angel- ISDN for dummies- comuter pub II Ed-1996.

3. Data Communications and Networking" Behrouz A.Forouzan TMH, New Delhi. 3rd Edition.

Paper : 12 Telecommunication systems

Unit -1

An over view of Telecommunication:

Introduction- history of telecommunication-telecommunication network-internet –classification of data network—telecommunication standards.

Unit –II

Electronics for telecommunication:

Introduction-communication system parameters- FDM –TDM-WDM.

Transmission media; introduction – fiber optic cables- cabling architecture.

Unit –III

Voice communication:

Introduction- Public telephone network-the telephone types-circuit – out going – incoming calls-line signaling –intelligent network services- business telephone systems.

Unit- IV

Wide area network and broad band technologies:

Introduction –packet switchingnetwork-X.25-Frame relay-SMDS-ISDN-SONET-ATM-POS-DTM-DSL-CMs-PON.

Unit –V

Network management:

Introduction-policy management-evolution of network hardware and software-network administration and maintenance-network security-configuration management – telecommunication management network.

Text books

1.Introduction to telecommunication-Gokhale-Delmar- Thomson.

Reference books

1. Telecommunicatin switching , traffic networks – JE Flood – pearson – eight ed 2003.
2. Telecommunication switching systems and networks – thiyagarajan viswanath- PHI 2002- First edn.
3. Introduction to telecommunication –marion cole – pearson – 2 nd edn 2006.

Paper :13 Mobile communication

Unit-I

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.

Text book

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

Reference books:

1. Introduction to wireless mobile systems- dhama prakash agarwal-Thomson -2007.
2. Mobile cellular telecommunications – William C.Y.Lee-McGraw Hill- 2nd edn 2000.

PAPER 14: MICROPROCESSOR AND INTERFACING

Unit – I

Microcomputer system and hardware: Introduction to microcomputer – microprocessor and assembly language – Microprocessor architecture and microcomputer system – 8085 based microcomputer systems.

Unit – II

Introduction to basic instruction and programming techniques: Data transfer (copy) instruction – arithmetic operations – logic operations – branch operation – writing assembly language programs – addressing modes ..

Unit – III .

Interfacing ; 8255 programmable peripheral interface – 8259 programmable interrupt controller – 8279 keyboard /display interface – 8253 programmable interval timer.

Unit – IV

16 Bit microprocessor – Register set- block diagram – addressing modes .

Unit-V

Pentium microprocessor – Register set – Block diagram – integer and floating pipe lining- addressing modes.

Text Books

1.Ramesh S Gaonakar "Microprocessor Architecture Programming and Application with 8085/8080A" Iind Edition - Pentram Publications
2. Advanced microprocessor – Daniel dabak.
3. Introduction to Microprocessor – A.P. Mathur - TMH

PRACTICAL -III
PAPER : 15 MICROPROCESSOR AND OPTICAL COMMUNICATION LAB
(ANY15)

MICROPROCESSOR 8085:

1. Addition, Subtraction, 8 bit and 16 bit
2. Multiplication, Division, 8 bit and 16 bit
3. Square and Square root of the given number.
4. Finding Maximum / Minimum numbers in an array
5. Ascending / Descending of array
6. Number of Zero, Positive, and Negative number of array.
7. Fill a block and transfer a block
8. ADC
9. DAC
10. Stepper motor control
11. Traffic light control
12. Speed control of DC motor
13. Rolling Display

Optical fiber communication:
14. study of LED module
15. study of LASER module
16. study of PHOTO DETECTOR
17. study of optical power source
18. study of optical fiber links
19. RF transmitter
20. RF receiver.