VEER NARMAD SOUTH GUJARAT UNIVERSITY,

M.Phil
Faculty of Science.
Electronics
Department of Physics

Tentative Scheme for M.Phil in the Subject of Electronics.

1.1 Research Methodology

1.2 Content course - I

1.3 Laboratory course

1.4 Content course - II course offered by the supervisor.
Research Methodology

Nature and scope of research, science and scientific method, main elements in project formulation.

Probabilities and distributions, properties of normal. Poisson distribution binomial and normal distribution, random walk problem, bivariate, normal distribution, sampling, $x^2$ distributions, students' distribution, normal laws of errors, weighted observations, principles of least squares, linear cases, fluctuation which are polynomials of degree $n$, fluctuations which are not polynomials, weighted residues, correlation and regression, linear regression, standard error of estimate.

Research methodology in the field of Electronics
- Introduction to system
- Electronics system development software and hardware methodology
- Problem investigations and objectives
- Hypothesis
- Research design and methodology
- Data collections
- Likely contribution to knowledge
- Project design methodology, Instrumentation and laboratory

Reference :

1. S.K.Mathu 'Probability of errors for physical science.
4. Stan Prentiss : 'Electronics signals & systems'
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Course : 2

Content Course : I

Advanced Electronic Circuits

1. Modeling and signal processing principles. Human/Computer synergism, volt-ampere and transfer characteristics, Ideal Amplifiers, input-output and interstage loading Difference amplifiers, other Amplifier limitation.

2. Operational amplifier circuits. The operational amplifier, Memoryless OP Amp circuits, OP Amp circuits with memory, simulations of Infinite-gain OP Amp circuits, second-order effects in operational amplifiers circuits without negative feedback.


4. Power Circuits and Systems Transistor power dissipation, Power transistor class A amplifiers, Nonlinear distortion, class - B amplifier, class AB amplifier, Power OP Amps class D amplifier and power supplies.


6. Filters Basic filter concepts, second - order active filters, Lowpass active filter of order n Active extension of passive filter theory, switched capacitor circuits.

7. Digital Logic Circuits Idea logic gates and practical approximations, NMDS and PMDS Logic circuits, CMOS Logic Circuits Gallium Arsenide logic circuits TTL logic circuits, Emitter-coupled logic circuits.

REFERENCES:

1. Electronic Circuits Analysis, Simulation and Design By Norbert R. Malik
   Prentice - Hall International, Inc.

2. Sedra & Smith Microelectronics Circuits, Oxford University Press

1.3 Laboratory work.
1. OP Amp applications
   (i) The 741 operational Amplifier:
       As case study
   (ii) Analog Multiplier
2. Phase locked loop
3. Low pass active filters
4. F.M. Modulation / Demodulation
5. Solid State Memories
6. Synchronous Counter
7. S/P and P/S shift register
8. Microprogramming Circuit
9. Digital Companding in 8085
10. Assembly language in 8086
11. Programming in C.
12. Programming in C.

Students are required to prepare detail report of his Laboratory work

REFERENCES :

1. Furht & Parikh : Microprocessor Interfacing and communication using the intel SDK - 85 Prantice - Hall.
5. Sam Series : Programming in C.
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Course : 4
Content Course - III

This course will be framed by the supervising teacher under whom the candidate will be working for his/her dissertation. This course may be different for different candidates.