



# GANDHI INSTITUTE OF TECHNOLOGY AND MANAGEMENT (GITAM)

(Declared as Deemed to be University u/s 3 of UGC Act, 1956)

Visakhapatnam | Hyderabad | Bengaluru

Accredited by **NAAC** with **A++** Grade

Website: [www.gitam.edu](http://www.gitam.edu)

## GITAM SCHOOL OF TECHNOLOGY

Department of Electrical, Electronics & Communication Engineering

PhD in Engineering: Electronics & Communication Engineering

PhD Entrance Test Syllabus - 2023-2024

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### PhD in Engineering: Electronics & Communication Engineering

**Signals & Systems:** Continuous-time signals: Fourier series and Fourier transform representations, Laplace Transforms; sampling theorem and applications, Discrete-time signals: discrete-time Fourier transform (DTFT), DFT, Z-transform; LTI systems: definition and properties, causality, stability, impulse response, convolution.

**Electronic Devices & Analog circuits :** P-N junction, Zener diode, BJT, MOS capacitor, MOSFET, LED; , BJTs and MOSFETs; Simple diode circuits: clipping, clamping and rectifiers; Single-stage BJT and MOSFET amplifiers: biasing, bias stability, BJT and MOSFET amplifiers: multi-stage, differential, feedback, Simple op-amp circuits; Active filters; Sinusoidal oscillators: criterion for oscillation.

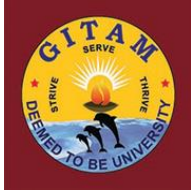
**Digital circuits:** Number systems, Combinatorial circuits: minimization of switching functions using Boolean identities and Karnaugh map, logic gates and their static CMOS implementations, arithmetic circuits, multiplexers, decoders. Sequential circuits: latches and flip-flops, counters, shift-registers

**Communications:** Random processes: autocorrelation and power spectral density, properties of white noise, filtering of random signals through LTI systems; Analog and digital modulation schemes; matched filter receiver, calculation of bandwidth, SNR and BER for digital modulation.

**Electromagnetics:** Electrostatics; Maxwell's equations: differential and integral forms and their interpretation, boundary conditions, wave equation, Poynting vector; Plane waves and properties: reflection and refraction, polarization, phase and group velocity, propagation through various media, skin depth.

### Reference Books

1. Alan V. Oppenheim, Alan S. Wilsky, Signals and Systems, 2/e, Pearson Education, 1997.
2. Adel S. Sedra, Kenneth C. Smith, Arun N. Chandorkar, Microelectronic Circuits, 6/e, Oxford University Press, 2013
3. Jacob Millman, Christos C. Halkias, Chetan Parikh, Integrated Electronics-Analog and Digital Circuits, 2/e, Tata Mc Graw Hill, 2011.
4. Michael D. Ciletti, M. Morris Mano, Digital Design, 4/e. Pearson Education, 2007.



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5. Simon Haykin, Communication Systems 4/e, Wiley Student Edition, 2002.
6. J.G.Proakis, Masood Salehi, Fundamentals of Communication Systems, 2/e, Pearson Education, 2013.
7. William H. Hayt, John A. Buck, Engineering Electromagnetics, 8/e, TataMcGraw Hill, 2012.
8. Edward C. Jordan, Keith G. Balmain, Electromagnetic Waves and Radiating Systems, 2/e, Prentice Hall, 2012.