Shri G. S. Institute of Technology and Science, Indore
Department of Electronics and Telecommunication Engineering

Minutes of BoS meeting

Date: 15/03/2025

Meeting of Board of Studies (BoS) for the Department of Electronics and Telecommunication Engineering was held on 13/03/2025 at 4:00 PM in the PG room of department.

Following members were present.

Board of Studies Meeting — Date- 13/03/2025

Attendance Sheet

S.No.	Name of Expert/ Faculty Members	Signature
1.	Prof. S.K. Jain, Chairman & Head of Dept.	
2	Prof. Sanjeev Narayan Sharma (IITDM, Jabalpur) Expert	Online
3	Prof. S. Ghosh (IIT, Indore) Expert	on-line
4	Prof. (Dr.) Akhilesh Jain (RR CAT, INDORE) Expert	Absent
5	Prof. (Dr.) Sandeep Pagey (Industry/ Corporate) Expert	Absent
6	Prof. Suneel Yadav (IIIT, Allahabad)Expert	online
7	Prof.(Mrs.) Anjana Jain	Ajain
8	Prof. Shekhar Sharma	
9	Prof. L.D. Malviya	13/03/2025
10	Prof.(Mrs.) Anjulata Yadav	
11	Prof. (Mrs.) Preeti Trivedi	
12	Mr. Manish Panchal	
13	Mr. Amit Naik	13/3/25
14	Mrs. Rekha Jain	on leave
15	Prof. (Mrs.) Jaya Dipti Lal	
16	Mr. Ashwin Shrivastava	
17	Mr. Ajay Parmar	on leave
18	(Ms.) Vaishali Naik	
19	Mr. Shubham Shrivastava	on leave
20	Ms. Deepali Kothari	on leave
21	Mr. Mohit Khamele	on leave
22	Mr. Neeraj Malviya	
23	Mrs. Ritika Nair,	
24	Mrs. Neeta Sharma	
25.	Mrs. Harshita Kushwah	13/3/25
26.	Mrs. Swati Tiwari	on leave
27.	Mr. Ravi Yadav	
28.	Mr. Nitin chouhan	

HOD
Elx. & TC Deptt.

The Agenda for BoS meeting is as follows:

1) Discussion and finalization of M. Tech. specialization title. Present title of M. Tech. is "Electronics and Communication"
2) Discussion about running the M. Tech. specialization program in hybrid mode.
3) Review and discussion on II and III year B. Tech. scheme.
4) Discussion about changes in the syllabus of II year B. Tech. subject "Signal and systems".
5) Discussion about changes in the syllabus of II year B. Tech. subject "Analog and Digital Communication" .

The members discussed and resolved the following:

Discussion about agenda 1:
Discussion on changing the title of Post Graduate (PG) course M. Tech. (Electronics and Communication) engineering offered by the Department of Electronics and Telecommunication Engineering was held and new title for PG course is approved in the BoS meeting as **M. Tech. (Intelligent Communication Systems).** Experts suggested scheme and syllabus to be prepared and get approved in next BoS.

Discussion about agenda 2:

Proposal for running the PG course M. Tech. with new title (Intelligent Communication Systems) in hybrid mode was put in the BoS meeting. Hybrid mode includes conducting the full M. Tech. course in online + offline mode with the mutual understanding between newly joined PG students and departmental faculty members. This hybrid mode will provide the opportunities to working professionals, academicians and others to join the few M. Tech. theory course/ subject in online mode and rest laboratory sessions in offline mode along with the the regular offline M. Tech. course. BoS approved this agenda as per the convenience/management of department and its faculty members.

Discussion about agenda 3:
Schemes of II Year and III Year B. Tech. (Electronics and Telecommunication) Engineering were discussed and found satisfactory as per the new NEP scheme 2020 and current academic / industrial need.

Discussion about agenda 4:

BoS suggested the changes of subject "Signals and Systems" in the semester III of II Year scheme of B.Tech (Electronics and Telecommunication) Engineering. The syllabus of "Signals and Systems" is now replaced with the new syllabus.

Discussion about agenda 5:
BoS suggested the changes of subject "Analog and Digital Communication" in the semester IV of II Year scheme of B.Tech (Electronics and Telecommunication) Engineering. The syllabus of "Analog and Digital communication" is now replaced with the new syllabus.

Discussion about any other agenda:

For the students opting diploma in Electronics and Telecommunication Engineering after II Year the following subjects of 2 credits each are to be completed along with project / Internship of 6 credits. Thus a total of 10 credits will be allotted to students opting diploma.

i. Emerging Communication Technologies
ii. Electronics design and simulation

Head
Electronics and Telecommunication
SGSITS Indore

EC 25017: SIGNALS AND SYSTEMS (New March 2025)

COURSE OUTCOMES:

At the end of this course students will demonstrate the ability to:

1. Represent mathematically and analyze different types of signals and systems.
2. Define various properties of LTI systems and determine the response of an arbitrary excitation.
3. Analyze continuous and discrete systems in time and frequency domain using Fourier transforms.
4. Apply the knowledge of Laplace Transform and z-Transforms to analyze LTI systems.
5. Apply concepts of signals and systems in sampling and reconstruct a signal and in communication systems.

Hours / Week			Maximum Marks				Total Marks	Credits		
			Theory		Practical					
L	T	P	End Sem	CW	SW	End Sem		Th	Pr	Total
3	-	-	70	30	0	0	100	3	-	3

UNIT 1: Signals and Systems:

Introduction to signals and systems. Type of signals: periodic and aperiodic signals, continuous and discrete-time signals, continuous and discrete amplitude signals, energy and power signals, even and odd signals, deterministic and random signals. Elementary continuous-time and discrete-time signals: unit impulse, unit step, ramp, exponential, signum and sync functions. Operations on signals, continuous-time and discrete-time systems, systems with and without memory, system properties: linearity, time-invariance, causality, stability.

UNIT 2: Linear and Time-Invariant (LTI) systems:

Discrete-time LTI systems: The convolution sum, Continuous-time LTI systems: The convolution integral, impulse response and step response of LTI systems, properties of LTI systems: causality, stability and invertibility. System representation through linear constant coefficient differential and difference equations (LCCDE).

UNIT 3: Fourier analysis of signals and systems:

Exponential Fourier series representation of periodic signals, properties of Fourier series, Continuous-time and Discrete-Time Fourier transform representation of signals and their properties, Fourier transforms of standard signals, signal transmission through LTI systems, Parseval's theorem, the impulse response and frequency response of LTI systems and their relationship, Magnitude and Phase response, filtering. The sampling theorem.

UNIT 4: Laplace and Z transform:

Review of Laplace transform: its ROC, Properties of Laplace transform, Transfer function of LTI systems, inverse Laplace transform, Unilateral Laplace Transform.

z-transform, ROC of z-transform, properties of z-transform, inverse z-transform, analysis and characterization of LTI systems using z-transform: system function of discrete time LTI systems, system behavior, causality, stability, Unilateral z-transform, solving difference equations using Unilateral z-transform.

UNIT 5: Applications of signals and systems in Communication systems:

The sampling theorem, Time-domain and frequency-domain analysis of sampled signals, aliasing. Reconstruction of signals from its samples: ideal interpolator, zero-order hold, first- order hold.
Sinusoidal amplitude modulation, Demodulation for sinusoidal AM, Frequency division multiplexing, single side band amplitude modulation, amplitude modulation with a pulse train carrier. Pulse Amplitude Modulation, Sinusoidal frequency modulation. Discrete time modulation.

ASSESMENT: Mid-term test, Assignment, Tutorial, Quiz and End semester exam.

TEXT BOOKS RECOMMENDED:

1. Signals and Systems : Alan. V. Oppenheim, Allan S. Willsky and S. Hamid Nawab, 2nd Edition, Prentice Hall.
2. Signals and Systems: Hwei P Hsu, Schaum's Outline Series, 2nd Edition, Tata Mc- Graw Hill Education Private Limited.
3. Signals and Systems: Tarun Rawat, Oxford Higher education.

REFERENCE BOOKS RECOMMENDED:

1. B.P. Lathi, "Signal Processing and Linear Systems", Oxford University Press, 1998.

2. Simon Haykin, Barry van Veen, "Signals and Systems", John Wiley and Sons (Asia) Private Limited, 1998.

3. Haykin S., "Communications Systems", John Wiley and Sons, 2001.

EC 25017: SIGNALS AND SYSTEMS (Old)

COURSE OUTCOMES:

At the end of this course students will demonstrate the ability to:

1. Represent mathematically and analyze different types of signals and systems.
2. Define various properties of LTI systems and determine the response of an arbitrary excitation.
3. Analyze continuous and discrete systems in time and frequency domain using Fourier transforms.
4. Apply the knowledge of Laplace Transform and z-Transforms to analyze LTI systems.
5. Apply sampling and reconstruct a signal and understand applications of signals and systems.

Hours / Week			Maximum Marks				Total Marks	Credits		
			Theory		Practical					
L	T	P	End Sem	CW	SW	End Sem		Th	Pr	Total
3	-	-	70	30	0	0	100	3	-	3

UNIT 1: Signals and Systems:

Introduction to signals and systems and their applications in engineering and science. Type of signals: periodic and aperiodic signals, continuous and discrete-time signals, continuous and discrete amplitude signals, energy and power signals, even and odd signals, deterministic and random signals. Elementary continuous-time and discrete-time signals: unit impulse, unit step, ramp, exponential, signum and sync functions. Operations on signals, Types of systems, continuous-time and discrete-time systems, systems with and without memory, system properties: linearity, time-invariance, causality, stability, invertibility and inverse systems.

UNIT 2: Linear Time-Invariant (LTI) systems:

Discrete-time LTI systems: The convolution sum, Continuous-time LTI systems: The convolution integral, impulse response and step response of LTI systems, properties of LTI systems: causality, stability and invertibility. System representation through linear constant coefficient differential and difference equations (LCCDE).

UNIT 3: Fourier analysis of signals and systems:

Fourier series representation of periodic signals: Trigonometric and exponential forms, properties of Fourier series, Continuous-time and Discrete-Time Fourier transform representation of signals and their properties, Fourier transforms of standard signals, aperiodic and periodic signal transmission through LTI systems, Parseval’s theorem, the impulse response and frequency response of LTI systems and their relationship, Magnitude and Phase response, Time and frequency domain aspects of systems, filtering.

UNIT 4: Laplace and Z transform:

Laplace transform, the region of convergence of Laplace transform, transfer function, poles and zeros of a continuous-time system, properties of Laplace transform, inverse Laplace transform, analysis and characterization of LTI systems using Laplace transform: Transfer function of LTI systems, system behavior, causality, stability and Unilateral Laplace Transform.

Z-transform, ROC of Z-transform, properties of Z-transform, inverse Z-transform, analysis and characterization of LTI systems using Z-transform: system function of discrete time LTI systems, system behavior, causality, stability, Unilateral Z Transform.

UNIT 5: Sampling and applications of signals and systems:

The sampling theorem, Time-domain and frequency-domain analysis of sampled signals, aliasing. Reconstruction of signals from its samples: ideal interpolator, zero-order hold, first-order hold. Applications of signals and systems.

ASSESMENT: Mid-term test, Assignment, Tutorial, Quiz and End semester exam.

TEXT BOOKS RECOMMENDED:

1. Signals and Systems : Alan. V. Oppenheim, Allan S. Willsky and S. Hamid Nawab, 2nd Edition, Prentice Hall.
2. R.F. Ziemer, W.H. Tranter and D.R. Fannin, "Signals and Systems - Continuous and Discrete", 4th edition, Prentice Hall, 1998.
3. Signals and Systems: Tarun Rawat, Oxford Higher education.

REFERENCE BOOKS RECOMMENDED:

1. Signals and Systems: Hwei P Hsu, Schaum’s Outline Series, 2nd Edition, Tata Mc-Graw Hill Education Private Limited.
2. B.P. Lathi, "Signal Processing and Linear Systems", Oxford University Press, 1998.
3. Simon Haykin, Barry van Veen, "Signals and Systems", John Wiley and Sons (Asia) Private Limited, 1998.

EC25XXX: ANALOG AND DIGITAL COMMUNICATION
(NEW March 2025)

COURSE OUTCOMES:

At the end of this course students will demonstrate the ability to:

1. Analyze and compare different analog modulation schemes for their efficiency and bandwidth
2. Analyze the behaviour of a communication system in presence of noise
3. Investigate pulsed modulation systems and analyze their system performance
4. Analyze different digital modulation schemes and compute the bit error performance
5. Relate the concepts of information theory and coding with digital communication systems.

Hours / Week			Maximum Marks				Total Marks	Credits		
			Theory		Practical					
L	T	P	End Sem	CW	SW	End Sem		Th	Pr	Total
3	-	-	70	30	-	-	100	3	-	3

Unit 1: Analog Modulation: Review of signals and systems: Frequency domain representation of signals, modulation and demodulation of AM signals, Power relations in AM, Superheterodyne receivers; Angle Modulation and demodulation, Spectra of AM, and FM.

Unit 2: Random variables, Random Processes and Noise: Random variables (RV): Discrete and Continuous RV, CDF, PDF, Gaussian PDF, Statistical averages. Random processes: Ensemble averages and correlation functions, Ergodic and Wide Sense Stationary process, Power spectrum. Filtered random signals. Sources of noise, Noise Figure, Noise Equivalent Temperature, Gaussian and white noise characteristics; Noise in analog modulation systems, Pre-emphasis and De-emphasis, SNR comparisons.

Unit 3: Pulse modulation & Baseband Pulse Transmission: Sampling of low-pass and bandpass signals, Quantization, Encoding, Pulse code modulation (PCM), Time Division multiplexing (TDM); Differential pulse code modulation (DPCM), Delta modulation (DM), Adaptive Delta modulation (ADM); Noise considerations. Baseband Pulse Transmission: Inter symbol Interference and Nyquist criterion for zero ISI, Equalization.

Unit 4: Optimum Receivers, Digital Modulation & Multiple-Access Techniques: Geometric representation of signals, Optimum detection of signals in noise: MAP, ML detection, Optimum receivers; Pass band Digital Modulation: ASK, PSK, FSK and QAM, their generation, detection and Probability of Error evaluations, Synchronization. Spread Spectrum Techniques. Overview of Multiple-Access Techniques: TDMA, FDMA, CDMA.

Unit 5: Introduction to Information Theory & Coding: Concept of information, entropy, Source Coding, Discrete memory-less channels, Mutual Information and channel capacity; Linear Block Code, Cyclic Code, Convolutional Code. Digital Modulation-coding trade-offs.

ASSESMENT: Mid-term test, Assignment, Tutorial, Quiz and End semester exam.

TEXT BOOKS RECOMMENDED:

1. Haykin S., "Communications Systems", John Wiley and Sons, 2001.
2. Taub H. and Schilling D.L., "Principles of Communication Systems", Tata McGraw Hill,2001.
3. H. P. Hsu, "Analog & Digital Communications", Schaum's outlines, The McGraw Hill, Second Edition.

REFERENCE BOOKS RECOMMENDED:

1. Wozencraft J. M. and Jacobs I. M., ``Principles of Communication Engineering", JohnWiley, 1965.
2. Barry J. R., Lee E. A. and Messerschmitt D. G., ``Digital Communication", Kluwer Academic Publishers, 2004.
3. Proakis J.G., ``Digital Communications", 4th Edition, McGraw Hill, 2000.
4. Proakis J. G. and Salehi M., "Communication Systems Engineering", Pearson Education,2002.

(OLD)

EC25XXX: ANALOG AND DIGITAL COMMUNICATION

COURSE OUTCOMES:

At the end of this course students will demonstrate the ability to:

1. Analyze and compare different analog modulation schemes for their efficiency and bandwidth
2. Analyze the behaviour of a communication system in presence of noise
3. Investigate pulsed modulation systems and analyze their system performance
4. Analyze different digital modulation schemes and compute the bit error performance
5. Outline various advanced communication systems and relate the concepts of information theory and coding with digital communication systems.

Hours / Week			Maximum Marks				Total Marks	Credits		
			Theory		Practical					
L	T	P	End Sem	CW	SW	End Sem		Th	Pr	Total
3	-	-	70	30	-	-	100	3	-	3

Unit 1: Analog Modulation: Review of signals and systems, Frequency domain representation of signals, Modulation and demodulation of AM signals, Power relations in AM, Superheterodyne receivers; Frequency Division Multiplexing; Angle Modulation and demodulation, Spectra of AM, and FM.

Unit 2: Random Processes and Noise: Review of random processes; Line codes, PSD, Transmission of random signals through LTI systems; Sources of noise, Noise Figure, Noise Equivalent Temperature, Gaussian and white noise characteristics; Effects of Noise in amplitude modulation systems and Frequency modulation systems, Pre-emphasis and De-emphasis, SNR comparisons.

Unit 3: Pulse modulation: Sampling of low-pass and bandpass signals, Quantization, Encoding, Pulse code modulation (PCM), Time Division multiplexing (TDM); Differential pulse code modulation (DPCM), Delta modulation (DM), Adaptive Delta modulation (ADM); Noise considerations.

Unit 4: Optimum Receivers and Digital Modulation: Geometric representation of signals, Optimum detection of signals in noise: MAP, ML detection, Optimum receivers. Baseband Pulse Transmission: Inter symbol Interference and Nyquist criterion for zero ISI, Equalization; Pass band Digital Modulation: ASK, PSK, FSK and QAM, their generation, detection and Probability of Error evaluations, Synchronization.
Digital Modulation trade-offs; Overview of Multiple-Access Techniques: TDMA, FDMA, CDMA;

Unit 5: Overview of Information Theory, Coding and Advanced Communication Systems: Overview of information theory and coding: Concept of information, and channel capacity; Hamming codes, CRC Linear Block Code, Cyclic Code, Convolution Code; Digital Modulation trade-offs; Overview of Multiple-Access Techniques: TDMA, FDMA, CDMA; Introduction to Satellite communications: Radio

link analysis, Free-space propagation model, Introduction to Mobile radio, Introduction to Optical communications.

ASSESMENT: Mid-term test, Assignment, Tutorial, Quiz and End semester exam.

TEXT BOOKS RECOMMENDED:

1. Haykin S., "Communications Systems", John Wiley and Sons, 2001.
2. Proakis J. G. and Salehi M., "Communication Systems Engineering", Pearson Education,2002.
3. Taub H. and Schilling D.L., "Principles of Communication Systems", Tata McGraw Hill,2001.

REFERENCE BOOKS RECOMMENDED:

1. Wozencraft J. M. and Jacobs I. M., ``Principles of Communication Engineering", JohnWiley, 1965.
2. Barry J. R., Lee E. A. and Messerschmitt D. G., ``Digital Communication", Kluwer Academic Publishers, 2004.
3. Proakis J.G., ``Digital Communications", 4th Edition, McGraw Hill, 2000.