



### List of New Course(s) Introduced

**Department** : **Electronics and Communication Engineering**

**Programme Name** : **B.Tech.**

**Academic Year** : **2019-20**

### List of New Course(s) Introduced

Sr. No.	Course Code	Name of the Course
01.	EC03TMC02	Constitution of India
02.	EC04TPC07	Microcontrollers
03.	EC04THS03	Effective Technical Communication
04.	EC106	Optimization Techniques
05.	EC107	Antenna for Modern Wireless Communication
06.	EC108	Wireless and Computer Network
07.		
08.		
09.		
10.		

वर्षगाध्यक्ष (इले. एव संचार अभियंत्रिकी)  
H.O.D. (Elect. & Comm. Engineering)  
प्रौद्योगिकी संस्थान  
Institute of Technology  
गु. घा. वि., बिलासपुर (छ.ग.)  
G. G. V. Bilaspur (C.G.)

## Minutes of Meetings (MoM) of Board of Studies (BoS)

Academic Year : 2019-20	
School	: School of Studies of Engineering and Technology
Department	: Electronics and Communication Engineering
Date and Time	: June 27, 2019 - 11:00 AM
Venue	: E-Class Room

The scheduled meeting of member of Board of Studies (BoS) of Department of Electronics and Communication Engineering, School of Studies of Engineering and Technology, Guru Ghasidas Vishwavidyalaya, Bilaspur was held to design and discuss the B. Tech. Second year (III and IV semesters) scheme and syllabi.

The following members were present in the meeting:

1. Prof. Shrish Verma (External Expert Member BoS, Dept. of ECE, NIT Raipur)
2. Mr. Vikas Patel, (External Expert Member BoS, Senior SDE, BSNL Bilaspur)
3. Mr. Nipun Kumar Mishra (HOD, Assistant Prof., Dept. of ECE-cum Chairman, BOS)
4. Mr. Shrawan K. Patel (Member BoS, Assistant Professor, Dept. of ECE)
5. Dr. P.S. Shrivastava (Invited Member, Assistant Professor, Dept. of ECE)
6. Dr. Sandeep Singh (Invited Member, Assistant Professor, Dept. of Mathematics)

Following points were discussed during the meeting

1. CBCS based evaluation scheme of B. Tech. Second year (III and IV semesters) was discussed and finalized.
2. Courses of B. Tech. Second year (III and IV semesters) are discussed one by one and the changes have been incorporated as per the valuable suggestions of Expert member.

The committee discussed and approved the scheme and syllabi. The following courses were revised in the of B. Tech. Second year (III and IV semesters):

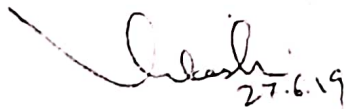
- ❖ Electronic Devices (EC03TPC01)
- ❖ Digital System Design (EC03TPC02)
- ❖ Signal and Systems (EC03TPC03)
- ❖ Network Theory (EC03TPC04)
- ❖ Mathematics-III (EC03TPC05)
- ❖ Analog and Digital Communication (EC04TPC05)
- ❖ Analog Circuits (EC04TPC06)
- ❖ Electronics Measurement & Instrumentation (EC04TES05)

The following new courses were introduced in the of B. Tech. Second year (III and IV Semesters):

- ❖ Constitution of India (EC03TMC02)
- ❖ Microcontrollers (EC04TPC07)
- ❖ Effective Technical Communication (EC04THS03)

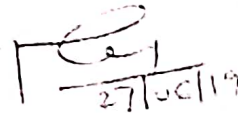
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Prof. Shrish Verma  
(External Subject Expert)



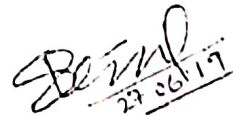
27.6.19

Mr. Vikash Patel  
(Industrial Expert)



27/06/19

Mr. Nipun Kumar Mishra  
(Chairman, BOS)



27.06.19

Mr. Shrawan K. Patel  
(Member, BOS)

## Minutes of Meetings (MoM) of Board of Studies (BoS)

<b>Academic Year : 2019-20</b>	
<b>School</b>	<b>: School of Studies of Engineering and Technology</b>
<b>Department</b>	<b>: Electronics and Communication Engineering</b>
<b>Date and Time</b>	<b>: April 30, 2019 - 03:00 AM</b>
<b>Venue</b>	<b>: E-Class Room</b>

The scheduled meeting of member of Board of Studies (BoS) of Department of Electronics and Communication Engineering, School of Studies of Engineering and Technology, Guru Ghasidas Vishwavidyalaya, Bilaspur was held to design and discuss the Pre-PhD scheme and syllabi.

The following members were present in the meeting:

1. Prof. Shrish Verma (External Expert Member BoS, Dept. of ECE, NIT Raipur)
2. Mr. Vikas Patel, (External Expert Member BoS, Senior SDE, BSNL Bilaspur)
3. Mr. Nipun Kumar Mishra (HOD, Assistant Prof., Dept. of ECE-cum Chairman, BOS)
4. Mr. Shrawan K. Patel (Member BoS, Assistant Professor, Dept. of ECE)
5. Dr. P.S. Shrivastav (Invited Member, Assistant Professor, Dept. of ECE)
6. Mrs Pragati Patharia (Invited Member, Assistant Professor, Dept. of ECE)
7. Dr. Soma Das (Invited Member, Assistant Professor, Dept. of ECE)

Following points were discussed during the meeting

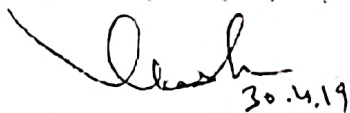
1. ECS based evaluation scheme of Pre-PhD was discussed and finalized.
2. Courses of Pre-PhD are discussed one by one and the changes have been incorporated as per the valuable suggestions of Expert member.

The committee discussed and approved the scheme and syllabi. The following courses were introduced in the of Pre-PhD:

- ❖ Optimization Techniques (EC106)
- ❖ Antenna for Modern Wireless Communication (EC107)
- ❖ Wireless and Computer Network (EC108)

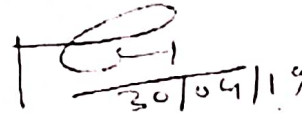
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Prof. Shrish Verma  
(External Subject Expert)



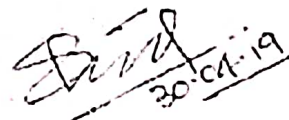
30.4.19

Mr. Vikash Patel  
(Industrial Expert)



30/04/19

Mr. Nipun Kumar Mishra  
(Chairman, BOS)



30.04.19

Mr. Shrawan K. Patel  
(Member, BOS)



## Scheme and Syllabus

**SCHEME OF EXAMINATION**  
**B.TECH (FOUR YEAR) DEGREE COURSE**  
**SECOND YEAR, ELECTRONICS & COMMUNICATION ENGINEERING**  
**SCHOOL OF ENGINEERING & TECHNOLOGY, GGVV BILASPUR (CG) 495009**  
**SEMESTER III (SECOND YEAR)**  
**EFFECTIVE FROM SESSION 2019-20**

Sr. No.	Course Code	Course Title	L	T	P	Periods/ week	Evaluation Scheme			Credit
							IA	ESE	Total	
<b>Theory</b>										
1	EC03TPC01	Electronic Devices	3	0	0	3	30	70	100	3
2	EC03TPC02	Digital System Design	3	0	0	3	30	70	100	3
3	EC03TPC03	Signals and Systems	3	0	0	3	30	70	100	3
4	EC03TPC04	Network Theory	3	0	0	3	30	70	100	3
5	EC03TBS05	Mathematics-III	3	1	0	4	30	70	100	4
6	EC03THS02	Engineering Economics	3	0	0	3	30	70	100	3
7	EC03TMC02	Constitution of India	2	0	0	2	0	0	0	0
<b>Practical</b>										
1	EC03PPC01	Electronics Devices Lab	0	0	3	3	30	20	50	1
2	EC03PPC02	Digital System Design Lab	0	0	3	3	30	20	50	1
<b>Total Credits</b>									<b>21</b>	

**SEMESTER IV (SECOND YEAR)**  
**EFFECTIVE FROM SESSION 2019-20**

Sr. No.	Course Code	Course Title	L	T	P	Periods/ week	Evaluation Scheme			Credit
							IA	ESE	Total	
<b>Theory</b>										
1	EC04TPC05	Analog and Digital Communication	3	1	0	4	30	70	100	4
2	EC04TPC06	Analog Circuits	3	0	0	3	30	70	100	3
3	EC04TPC07	Microcontrollers	3	0	0	3	30	70	100	3
4	EC04TBS06	Numerical Methods	3	1	0	4	30	70	100	4
5	EC04TES05	Electronics Measurement & Instrumentation	3	0	0	3	30	70	100	3
6	EC04THS03	Effective Technical Communication	3	0	0	3	30	70	100	3
<b>Practical</b>										
1	EC04PPC03	Analog and Digital Communication Lab	0	0	2	2	30	20	50	1
2	EC04PPC04	Analog Circuits Lab	0	0	2	2	30	20	50	1
3	EC04PPC05	Microcontrollers Lab	0	0	2	2	30	20	50	1
<b>Total Credits</b>									<b>23</b>	

L : LECTURE T: TUTORIAL P: PRACTICAL IA: INTERNAL ASSESSMENT ESE: END SEMESTER EXAM



ANNEXURE -II

**DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING,  
INSTITUTE OF TECHNOLOGY, GURU G HASIDAS VISHWAVIDYALAYA  
BILASPUR (C.G.)**

**EVALUATION SCHEME OF Pre-PhD, COURSE WORK  
EFFECTIVE FROM 2018-19**

S.NO.	NAME OF SUBJECT	SUBJECT CODE	PERIODS/ WEEK L-T-P	ESE DURATION	ESE MARKS		CREDIT
					MAX	MIN	
1.	Research Methodology in engineering	ET 7100	3-1-0	3 hrs	100	50	4
2.	Elective-I		3-1-0	3 hrs	100	50	4
3.	Elective-II		3-1-0	3 hrs	100	50	4
	<b>Total</b>		9-3-0	9 hrs	300		12
	<b>LIST OF ELECTIVES</b>	**					
<b>S.NO.</b>	<b>NAME OF SUBJECT</b>	<b>SUBJECT CODE</b>	Duration of the semester will be 6 months. • Candidate has to score minimum 55% of aggregate marks to qualify in ESE. • Two subjects as Electives (4 credits each) can be taken from the list of Electives				
1.	VACCUME TECHNOLOGY	ECE 102					
2.	FINITE ELEMENT METHOD	ECE 103					
3.	SENSORS MEASUREMENT SCIENCE & TECHNOLOGY	ECE 104					
4.	ARTIFICIAL INTELLIGENCE	ECE 105					
5.	OPTIMIZATION TECHNIQUES	ECE 106					
6.	ANTENNA FOR MODERN WIRELESS COMMUNICATION	ECE 107					
7.	WIRELESS AND COMPUTER NETWORK	ECE 108					

ESE: End Semester Examination, L: Lecture, T: Theory, P: Practical

Max: Maximum Marks in ESE

Min: Minimum Pass Marks in each subject as 50%





Sub Code	L	T	P	Duration	IA	ESE	Credits
EC03TMC02	2	0	0	2 hours	0	0	0

### CONSTITUTION OF INDIA

#### Course Objectives:

Students will try to learn:

1. To understand the need for a constitution.
2. To explain the role of constitution in a democratic society.
3. To list the key features of the constitution.
4. To appreciate the fundamental rights of the citizens of India.

**UNIT – I:** Introduction: Constitution – Meaning of the term, Sources and Constitutional history, Features, Citizenship, Preamble.

**UNIT-II:** Fundamental Rights & Duties: Fundamental Rights & Duties, Directive Principles of State Policy.

**UNIT-III:** Union Government: Structure of the Indian Union: Federalism, Centre-State relationship, President : Role, Power and Position, PM and Council of ministers, Cabinet & Central Secretariat, Lok Sabha, Rajya Sabha.

**UNIT-IV:** State Government: Governor: Role & Position, CM and Council of ministers, State Secretariat: Organisation Structure & Functions.

**UNIT-V:** Relation between Centre & States: Distribution of Legislative Powers, Administrative relations, Coordination between States.

#### Text /Reference Books:

1. V. N. Shukla; "Constitution of India"
2. J.N.Pandey; "Constitutional Law of India"
3. M. P. Jain; "Indian Constitutional Law"

#### Course Outcomes:

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

1. To enhance their knowledge about society and public welfare.
2. To become a responsible citizen and give an active & positive support in Indian democracy
3. Students will understand the importance of their duties towards the society and nation and be aware about their rights for their overall development



Sub Code	L	T	P	Duration	IA	ESE	Credits
EC04TPC07	3	0	0	3 hours	30	70	3

### MICROCONTROLLERS

#### Course Objectives:

Students will try to learn:

1. To develop background knowledge and core expertise of microcontroller.
2. To know the importance of different peripheral devices and their interfacing to microcontrollers.
3. To know the design aspects of microcontrollers.
4. To write assembly language programs of microcontrollers for various applications.

**UNIT-I:** Overview of microcomputer systems and their building blocks, types of microprocessor, Multiplexing concept of buses, buffer.

**UNIT-II:** Introduction to 8085, bus architecture, pin diagram, demultiplexing of buses, Instruction set of 8085.

**UNIT-III:** Stack, stack related instructions, concept of interrupts, Direct memory access, Memory interfacing.

**UNIT-IV :** Interfacing with peripherals - timer, serial I/O, parallel I/O, A/D and D/A converters; Arithmetic Coprocessors; System level interfacing design; Concepts of virtual memory, Cache memory,

**UNIT-V:** Advanced coprocessor Architectures- 8086, 286, 486, Pentium; Microcontrollers: 8051 systems, Introduction to RISC processors; ARM microcontrollers interface designs.

#### Text/Reference Books:

1. R. S. Gaonkar, Microprocessor Architecture: Programming and Applications with the 8085/8080A, Penram International Publishing, 1996
2. D A Patterson and J H Hennessy, "Computer Organization and Design The hardware and software interface. Morgan Kaufman Publishers.
3. Douglas Hall, Microprocessors Interfacing, Tata McGraw Hill, 1991.
4. Kenneth J. Ayala, The 8051 Microcontroller, Penram International Publishing, 1996.

#### Course Outcomes:

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

1. Do assembly language programming
2. Do interfacing design of peripherals like, I/O, A/D, D/A, timer etc.
3. Develop systems using different microcontrollers
4. Understand RISC processors and design ARM microcontroller based systems



Sub Code	L	T	P	Duration	IA	ESE	Credits
EC04THS03	3	0	0	3 hours	30	70	3

### EFFECTIVE TECHNICAL COMMUNICATION

#### Course Objectives:

Students will try to learn:

1. To participate actively in writing activities (individually and in collaboration)
2. To understand how to apply technical information and knowledge in practical documents
3. To practice the unique qualities of professional writing style, including sentence conciseness, readability, clarity, accuracy, honesty, avoiding wordiness or ambiguity, previewing.
4. To recognize, explain, and use the genres of technical communication: technical abstracts, data based research reports, instructional manuals, technical descriptions, and web pages
5. To recognize and develop professional format features in print, html, and multimedia modes, as well as use appropriate nonverbal cues and visual aids.

**UNIT-I: Information Design and Development-** Different kinds of technical documents, Information development life cycle, Organization structures, factors affecting information and document design, Strategies for organization, Information design and writing for print and for online media.

**UNIT-II: Technical Writing, Grammar and Editing-** Technical writing process, forms of discourse, Writing drafts and revising, Collaborative writing, creating indexes, technical writing style and language. Basics of grammar, study of advanced grammar, editing strategies to achieve appropriate technical style. Introduction to advanced technical communication, Usability, Human factors, Managing technical communication projects, time estimation, Single sourcing, Localization.

**UNIT-III: Self Development and Assessment-** Self assessment, Awareness, Perception and Attitudes, Values and belief, Personal goal setting, career planning, Self-esteem. Managing Time; Personal memory, Rapid reading, Taking notes; Complex problem solving; Creativity

**UNIT-IV: Communication and Technical Writing-** Public speaking, Group discussion, Oral; presentation, Interviews, Graphic presentation, Presentation aids, Personality Development. Writing reports, project proposals, brochures, newsletters, technical articles, manuals, official notes, business letters, memos, progress reports, minutes of meetings, event report.

**UNIT-V: Ethics-** Business ethics, Etiquettes in social and office settings, Email etiquettes, Telephone Etiquettes, Engineering ethics, Managing time, Role and responsibility of engineer, Work culture in jobs, Personal memory, Rapid reading, Taking notes, Complex problem solving, Creativity.

#### Text/Reference Books:

1. David F. Beer and David McMurrey, Guide to writing as an Engineer, John Willey, NewYork, 2004.
2. Diane Hacker, Pocket Style Manual, Bedford Publication, New York, 2003. (ISBN0312406843)
3. Shiv Khera, You Can Win, Macmillan Books, New York, 2003.
4. Raman Sharma, Technical Communications, Oxford Publication, London, 2004.





### OPTIMIZATION TECHNIQUES

SUB CODE	L	T	P	DURATION	ESE	CREDITS
ECE 106	03	01	0	3 HRS	100	4

Objective: Aims to teach various optimization techniques for wireless communication and antenna design.

Outcome.. Understand the fundamental optimization techniques in wireless communication for real time application.

#### Unit I: Introduction Linear Programming

Linear Programming: Graphical method, simplex method, Non-Simplex Method, revised simplex method, Big-ICI method. 2- phase method, alternate optimal solutions, unbounded LPs, degeneracy and convergence, duality in linear programming. sensitivity analysis. dual simplex method,

#### Unit II: Non-Linear Programming

Non-Linear Programming: Nonlinear Programming - Elimination methods, Interpolation methods, unconstrained optimization techniques - Direct search methods - Indirect search methods. Constrained Optimization methods — Direct methods. Indirect methods.

#### Unit in: Dynamic Programming

Dynamic Programming Multistage decision process. Concept (Asa) optimization and principle of optimality, computational procedure in dynamic programming

#### Unit IV: Optimization Methods

Simulated annealing, Particle Swarm optimization, Ant colony optimization, Bee colony optimization. Bat Algorithms, Firefly Algorithms.

#### Unit V: Advanced Topics in Optimization

Advanced Topics in Optimization for wireless communication and antenna design.

#### References Books:

- 1, Singiresu S Rao, "Engineering Optimization: Theory and Practice", 4th Edition, John Wiley and Sons..2009
2. K. Deb, "Optimization for Engineering Design. Algorithms and Examples", Prentice-Hall of India Pvt. Ltd., New Delhi, 1995.
- 3, Edwin K P Chong and Stanislaw S Zak, "An Introduction to Optimization", Fourth Edition. John Wiley and Sons, 2013
- 4\_55.Rao, "Engineering Optimization: Theory and practice", New Age International Pvt. nLtd., New Delhi, 2000.



**ANTENNAS FOR MODERN WIRELESS COMMUNICATION**

SUB CODE	L	T	P	DURATION	ESE	CREDITS
ECE 107	03	01	0	3 HRS	100	4

**Unit 1: Concepts of Radiation and Antenna Fundamentals**

Fundamental parameters of antennas. Near and Far Field regions, S Parameters, Antenna Measurements: Radiation pattern, gain, directivity, phase and polarization measurement

**Unit 2: Printed Antenna**

Microstrip Antennas & Dielectric Resonator Antenna: Radiation mechanism - parameters and applications - feeding methods.

**UNIT 3: Reconfigurable Antenna**

Reconfigurable methodologies, Design Considerations for Reconfigurable systems, Reconfigurable Planar/printed antenna configurations. Active reconfigurable systems. Concept of Smart Antenna,

**Unit 4: Array of Antennas**

Linear and planar array fundamentals, Mutual Coupling in Arrays. Multidimensional Arrays, Phased Arrays, Array Feeding Techniques. Array optimization techniques.

**Unit 5 : MIMO System**

Concept of MIMO Types of MIMO Systems Design Parameters of MIMO system.

**Reference Books:**

1. Jordan E C and Bahl-lain K G, "Electromagnetic Waves and Radiating Systems", 2nd Edition, Pearson Education
2. Balanis C A, "Antenna Theory: Analysis and Design". 4th Edition, John Wiley and Sons, New Jersey, 2016.
3. Kraus J D and Viharhefka R J, "Antennas for All Applications", 3rd Edition, TataMcGraw Hill, 2001.
4. Girish Kumar and Ray K P. "Broadband Microstrip Antennas", Artech House, 2003.



#### Wireless Communication & Network

SUB CODE	L	T	P	DURATION	ESE	CREDITS
ECE 108	03	01	0	3 HRS	100	4

**Module 1:** Overview of wireless communication, cellular communication, different generations of cellular communication system, satellite Communication including, wireless local loop, cordless phone,

**Module 2:** Recent wireless technologies: multicarrier modulation, OFDM, MIMO system, diversity-multiplexing trade-off, MIMO-OPOM system, smart-antenna; beamforming and MIMO, cognitive radio,

**Module 3:** Multiple access techniques in wireless communication: contention-free multiple access schemes (FDMA TDMA, CDMA, SDMA and Hybrid), contention-based multiple access schemes (ALOHA and CSMA)

**Module 4:** Wireless personal area networks (Bluetooth, UW(3 and ZigBee), wireless local area networks (IEEE 802.11, network architecture, medium access methods, WLAN standards

**Module 5:** Ad-hoc wireless networks: Design Challenges in Ad-hoc wireless networks, concept of cross layer design, security in wireless networks MANET and WS.N. Wireless system protocols.

#### Books recommended:

**Textbooks:** 1. Andrea Goldsmith, "Wireless Communications", Cambridge University Press, 2005.7, Sanjay Kumar, "Wireless Communication the Fundamental and Advanced Concepts" River Publishers, Denmark, 2015 (Indian reprint).

**Reference books:** 1. Vijay K.Garg, "Wireless Communications and Networks", Morgan Kaufmann Publishers an Imprint of Elsevier, USA 2009 (Indian reprint) 2...1. Schiller, "Mobile Communication" 2/e, Pearson Education, 2012. Iti Saharvilisra, "Wireless Communication and Networks: 3 G and Beyond", 2/e, McGraw Hill (India) Private Ltd, New Delhi, 2013