



ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY

A Unit of Alva's Education Foundation (R)

(Affiliated to Visvesvaraya Technological University, Belagavi

Approved by AICTE, New Delhi & Recognised by Government of Karnataka)

Shobhavana Campus, Mijar, Moodbidri - 574 225, Mangalore, D.K., Karnataka State.

Phone : 08258-262724 (O), 262725 (P), Telefax:08258-262726

Email : principalaiet08@gmail.com, Web:www.aiet.org.in

Ref: AIET/ACA/2018-19/3654 (A)

Date: 27/07/2018

To,

The Chairman,

Board of Studies (BoS)

Electronics and communication Engineering

VTU, Belagavi

Sir,

Sub:- Curricular Gap Identified for 2015 Scheme -VTU Syllabus reg.

With reference to the above cited subject, we hereby enclosed Curricular gap identified w.r.t few courses/subjects of 2015 Scheme V.T.U syllabus in Electronics and communication Engineering. We request Chairman and members to consider these curricular gaps in next syllabus revise.

Thanking you

Head of the Department

Electronics and communication Engineering

H. O. D.

Dept. Of Electronics & Communication
Alva's Institute of Engg & Technology
Mijar, MOODBIDRI - 574 225

Principal

AIET, Moodbidri
Alva's Institute of Engg. & Technology,
Mijar, MOODBIDRI - 574 225, D.K

Curricular Gaps and Proposed Suggestions

1. In 2015 scheme, concepts of Statistics and linear algebra is not included which is very important concept to organize and integrate data in Machine Learning. We suggest BoS team to include Statistics and linear algebra as per the increasing trends of Machine learning and Artificial Intelligence.
2. In the present scheme mini-project is not included which is very much necessary to make students aware about the applications of technical knowledge in design of electronics instruments.
3. Most of the companies are looking for students with the knowledge of Big Data Analytics, Python Programming. Hence we suggest you to consider these courses in the forth coming revised syllabus.
4. As per the current trends in Robotics, we suggest you to include a course related to robotics in the coming revised scheme.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI
Scheme of Teaching and Examination 2018 – 19
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
(Effective from the academic year 2018 – 19)

Programme: B.E: Electronics & Communication Engineering

IV SEMESTER

Sl. No	Course and Course code		Course Title	Teaching Department	Teaching Hours /Week			Examination				Credits	
					Theory Lecture	Tutorial	Practical/ Drawing	Duration in hours	CIE Marks	SEE Marks	Total Marks		
					L	T	P						
1	BSC	18MAT41	Complex Analysis, Probability and Statistical Methods	Mathe matics	2	2	--	03	40	60	100	3	
2	PCC	18EC42	Analog Circuits		3	2	--	03	40	60	100	4	
3	PCC	18EC43	Control Systems		3	0	--	03	40	60	100	3	
4	PCC	18EC44	Engineering Statistics & Linear Algebra		3	0	--	03	40	60	100	3	
5	PCC	18EC45	Signals & Systems		3	0	--	03	40	60	100	3	
6	PCC	18EC46	Microcontroller		3	0	--	03	40	60	100	3	
7	PCC	18ECL47	Microcontroller Laboratory		--	2	2	03	40	60	100	2	
8	PCC	18ECL48	Analog Circuits Laboratory		--	2	2	03	40	60	100	2	
9	HSMC	18KVK39/49	Vyavaharika Kannada (Kannada for Communication)	HSM C	--	2	--	--	100	--	100	1	
		18KAK39/49	Aadalitha Kannada (Kannada for Administration)										
		OR											
		18CPC39/49	Constitution of India, Professional Ethics and Cyber Law		1	--	--	02	40	60			
					Examination is by objective type questions								
TOTAL					17	10	04	24	420	480	900	24	
					OR	OR		OR	OR	OR			
					18	08		26	360	540			

D.V. [Signature]

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Note: BSC: Basic Science, PCC: Professional Core, HSMC: Humanity and Social Science, NCMC: Non-credit mandatory course.

18KVK39/49 Vyavaharika Kannada (Kannada for communication) is for non-Kannada speaking, reading and writing students and
18KAK39/49 Aadalitha Kannada (Kannada for Administration) is for students who speak, read and write Kannada.

Course prescribed to lateral entry Diploma holders admitted to III semester of Engineering programs

10	NCMC	18MATDIP41	Additional Mathematics – II	Mathematics	02	01	--	03	40	60	100	0
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(a) The mandatory non – credit courses Additional Mathematics I and II prescribed for III and IV semesters respectively, to the lateral entry Diploma holders admitted to III semester of BE/B.Tech programs, shall attend the classes during the respective semesters to complete all the formalities of the course and appear for the University examination. In case, any student fails to register for the said course/ fails to secure the minimum 40% of the prescribed CIE marks, he/she shall be deemed to have secured F grade. In such a case, the students have to fulfill the requirements during subsequent semester/s to appear for SEE.

(b) These Courses shall not be considered for vertical progression, but completion of the courses shall be mandatory for the award of degree.

Courses prescribed to lateral entry B. Sc degree holders admitted to III semester of Engineering programs

Lateral entrant students from B.Sc. Stream, shall clear the non-credit courses Engineering Graphics and Elements of Civil Engineering and Mechanics of the First Year Engineering Programme. These Courses shall not be considered for vertical progression, but completion of the courses shall be mandatory for the award of degree.

AICTE activity Points: In case students fail to earn the prescribed activity Points, Eighth semester Grade Card shall be issued only after earning the required activity Points. Students shall be admitted for the award of degree only after the release of the Eighth semester Grade Card.



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Programme: B.E: Electronics & Communication Engineering


VI SEMESTER

SL No	Course and Course code		Course Title	Teaching Department	Teaching Hours /Week			Examination				Credits
					Theory Lecture	Tutorial	Practical/ Drawing	Duration in hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P					
1	PCC	18EC61	Digital Communication		3	2	--	03	40	60	100	4
2	PCC	18EC62	Embedded Systems		3	2	--	03	40	60	100	4
3	PCC	18EC63	Microwave and Antennas		3	2	--	03	40	60	100	4
4	PEC	18XX64X	Professional Elective -I		3	--	--	03	40	60	100	3
5	OE	18XX65X	Open Elective -A		3	--	--	03	40	60	100	3
6	PCC	18ECL66	Embedded Systems Laboratory		--	2	2	03	40	60	100	2
7	PCC	18ECL67	Communication Laboratory		--	2	2	03	40	60	100	2
8	MP	18ECMP68	Mini-project		--	--	2	03	40	60	100	2
9	Internship	--	Internship	To be carried out during the vacation/s of VI and VII semesters and or VII and VIII semesters								
TOTAL					15	10	6	24	320	480	800	24

Note: PCC: Professional core, PEC: Professional Elective, OE: Open Elective, MP: Mini-project.

Professional Elective -I

Course code under 18XX64X	Course Title
18EC641	Operating System
18EC642	Artificial Neural Networks
18EC643	Data Structures using C++
18EC644	Digital System Design Using Verilog
18EC645	Nanoelectronics
18EC646	Python Application Programming


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Course Code	18EC44	CIE Marks : 40
Lecture Hours/Week : 03		SEE Marks : 60
Total Number of Lecture Hours: 40 (8 Hrs / Module)		Exam Hours : 03
CREDITS – 03		

Course Learning Objectives: This course will enable students to:

- Understand and Analyze Single and Multiple Random Variables, and their extension to Random Processes.
- Familiarization with the concept of Vector spaces and orthogonality with a qualitative insight into applications in communications.
- Compute the quantitative parameters for functions of single and Multiple Random Variables and Processes.
- Compute the quantitative parameters for Matrices and Linear Transformations.

Module-1

Single Random Variables: Definition of random variables, cumulative distribution function continuous and discrete random variables; probability mass function, probability density functions and properties; Expectations, Characteristic functions, Functions of single Random Variables, Conditioned Random variables. Application exercises to Some special distributions: Uniform, Exponential, Laplace, Gaussian, Binomial, and Poisson distribution. (Chapter 4 Text 1), **L1, L2, L3**

Module -2

Multiple Random variables: Concept, Two variable CDF and PDF, Two Variable expectations (Correlation, orthogonality, Independent), Two variable transformation, Two Gaussian Random variables, Sum of two independent Random Variables, Sum of IID Random Variables – Central limit Theorem and law of large numbers, Conditional joint Probabilities, Application exercises to Chi-square RV, Student-T RV, Cauchy and Rayleigh RVs. (Chapter 5 Text 1), **L1, L2, L3**

Module-3

Random Processes: Ensemble, PDF, Independence, Expectations, Stationarity, Correlation Functions (ACF, CCF, Addition, and Multiplication), Ergodic Random Processes, Power Spectral Densities (Wiener Khinchin, Addition and Multiplication of RPs, Cross spectral densities), Linear Systems (output Mean, Cross correlation and Auto correlation of Input and output), Exercises with Noise. (Chapter 6 Text 1), **L1, L2, L3**

Module -4

Vector Spaces: Vector spaces and Null subspaces, Rank and Row reduced form, Independence, Basis and dimension, Dimensions of the four subspaces, Rank-Nullity Theorem, Linear Transformations

Orthogonality: Orthogonal Vectors and Subspaces, Projections and Least squares, Orthogonal Bases and Gram- Schmidt Orthogonalization procedure.

(Refer Chapters 2 and 3 Text 2),

L1, L2, L3

Module -5

Determinants: Properties of Determinants, Permutations and Cofactors.
(Refer Chapter 4, Text 2)

Eigen values and Eigen vectors: Review of Eigenvalues and Diagonalization of a Matrix, Special Matrices (Positive Definite, Symmetric) and their properties, Singular Value Decomposition.

(Refer Chapter 5, Text 2),

L1, L2, L3

Course Outcomes: After studying this course, students will be able to:

1. Analyze and evaluate single and multiple random variables.
2. Identify and associate Random Variables and Random Processes in Communication events.
3. Analyze and model the Random events in typical communication events to extract quantitative statistical parameters.
4. Analyze and model typical signal sets in terms of a basis function set of Amplitude, phase and frequency.
5. Demonstrate by way of simulation or emulation the ease of analysis employing basis functions, statistical representation and Eigen values.

Question paper pattern:

- Examination will be conducted for 100 marks with question paper containing 10 full questions, each of 20 marks.
- Each full question can have a maximum of 4 sub questions.
- There will be 2 full questions from each module covering all the topics of the module.
- Students will have to answer 5 full questions, selecting one full question from each module.
- The total marks will be proportionally reduced to 60 marks as SEE marks is 60.

Text Books:

1. Richard H Williams, "Probability, Statistics and Random Processes for Engineers" Cengage Learning, 1st Edition, 2003, ISBN 13: 978-0-534- 36888-3, ISBN 10: 0-534-36888-3.

2. Gilbert Strang, "Linear Algebra and its Applications", Cengage Learning, 4th Edition, 2006, ISBN 97809802327

Reference Books:

1. Hwei P. Hsu, "Theory and Problems of Probability, Random Variables, and Random Processes" Schaums Outline Series, McGraw Hill. ISBN 10: 0-07- 030644-3.
2. K. N. HariBhat, K Anitha Sheela, Jayant Ganguly, "Probability Theory and Stochastic Processes for Engineers", Cengage Learning India, 2019



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