

# Poornima Group of Colleges, Jaipur

Session: 2011-12 (ODD Sem.)

**Name of College: Poornima College of Engineering**

**Department of Electronics & Communication**

## Zero Lecture

Name of Faculty: Manisha kumawat

Branch: Electronics & Communication

**1). Name of Subject with Code:** Analog Communication (5EC04)

### **2). Self-Introduction:**

a). Name: *Manisha kumawat*

b). Qualification: *B.Tech.(Hons.)*

c). Designation: *Lecturer*

d). Research Area: *Communication*

e). E-mail Id: *manishakumawat@poornima.org*

f). Other details: *Subject taught: Analog Communication, Microwave Engg-II, Logic Synthesis  
Lab taken: Digital electronic lab, Logic synthesis lab, Communication lab,  
Microprocessor lab*

### **3). Introduction of Students:**

a). *Identifying and keeping records* of students based on merit/ weak in academics, smart/ dull in extra & co-curricular activity, day scholar/ hosteller, Hindi or English medium, urban or rural family background, their learning style (seeing, hearing, doing) etc.

b). *Achievement of students in previous years*

Sr. No.	Year	Result At PCE	Univ. Result (In %)	Name of student scored highest marks with the scored marks.	Fail (no. of students)	Marks between 40%-60% (no. of students)	Marks 60% above (no. of students)
1.	2007-08		87.50%		8	30	1
2.	2008-09		95.38% (A) 100% (B)		3 0	30 23	23 29
3.	2009-10		94.37% (A) 96.97% (B)		4 2	31 34	30 22

**4). Instructional Language: - 75% English; 25% Hindi**

### **5). Introduction to subject: -**

a). *Relevance to Branch:* Communication is a vast area of study. ECE branch students should have the concept of communication systems. The modulation, multiplexing & various communication techniques are taught in this subject to understand the basic idea of communication system.

b). *Relevance to Society:* Communication is used everywhere in the society today. The mobile phones, landline phones, televisions, DTH services, teleconferencing, videoconferencing, internet, Bluetooth etc. all are the latest miracle of communication systems. So study of analog and digital communication will surely enable the students to explore more about the modern communication techniques and devices.

c). *Relevance to Self:* I have keen interest in this subject. I am using cell phone, fixed phones, internet & other modern communication devices.

d). *Relation with laboratory:* In labs we learn to do modulation-demodulation of a signal and hands-on experience on trainer kits of various communication techniques learned in theory classes.

e). *Connection with previous year and next year:* Study of this subject will be great assistance to the students who want to make their career in the telecommunication field. In the upcoming semesters students will study about the digital communication, optical communication and wireless communication in their 6<sup>th</sup>, 7<sup>th</sup> and 8<sup>th</sup> semester respectively.

## 6). Syllabus of Rajasthan Technical University, Kota

a). *Index Terms/ Key Words:* DSB,DSB-SC,SSB,VSB,AM,FM,PM, PAM, PPM,PWM.

b). *RTU Syllabus with Name of Subject & Code:*

### 5EC4 ANALOG COMMUNICATION

**UNIT 1: NOISE EFFECTS IN COMMUNICATION SYSTEMS:** Resistor noise, Networks with reactive elements, Noise temperature, Noise bandwidth, effective input noise temperature, Noise figure. Noise figure & equivalent noise temperature in cascaded circuits.

**UNIT 2 : AMPLITUDE MODULATION :** Frequency translation, Recovery of base band signal, Spectrum & power relations in AM systems. Methods of generation & demodulation of AM-DSB, AM-DSB/SC and AM-SSB signals. Modulation & detector circuits for AM systems. AM transmitters & receivers.

**UNIT 3: FREQUENCY MODULATION :** Phase & freq. modulation & their relationship, Spectrum & band width of a sinusoidally modulated FM signal, phasor diagram, Narrow band & wide band FM.Generation & demodulation of FM signals. FM transmitters & receivers. Comparison of AM, FM & PM. Pre emphasis & deemphasis. Threshold in FM, PLL demodulator.

**UNIT 4: NOISE IN AM AND FM:** Calculation of signal-to-noise ratio in SSB-SC, DSB-SC, DSB with carrier, Noise calculation of square law demodulator & envelope detector. Calculation of S/N ratio in FM demodulators, Super heterodyne receivers.

**UNIT 5: PULSE ANALOG MODULATION :** Practical aspects of sampling: Natural and flat top sampling. PAM, PWM, PPM modulation and demodulation methods, PAM-TDM.

c). *ABC analysis (RGB method) of unit & topics*

### 5EC4 ANALOG COMMUNICATION

**UNIT-1: NOISE EFFECTS IN COMMUNICATION SYSTEMS:** Resistor noise, networks with reactive elements, noise temperature, S/N ratio, noise bandwidth, equivalent noise temperature in cascaded circuits, noise figure , noise figure from equivalent noise temperature.

**UNIT-2 : AMPLITUDE MODULATION:** Frequency translation, Recovery of base band signal, Spectrum & power relations in AM systems. Methods of generation & demodulation of AM-DSB, AM-DSB/SC and AM-SSB signals. Modulation & detector circuits for AM systems. AM transmitters & receivers.

**UNIT-3: FREQUENCY MODULATION:** Phase & freq. modulation & their relationship, Spectrum & band width of a sinusoidally modulated FM signal, phasor diagram, **Narrow band & wide band FM.** Generation & demodulation of FM signals. FM transmitters & receivers. Comparison of AM, FM & PM. **Pre emphasis & de-emphasis. Threshold in FM, PLL demodulator.**

**UNIT-4 : NOISE IN AM and FM:** Calculation of  $S/N$  ratio in DSB,DSB-SC,SSB, SSB-SC, FM Demodulators, **square law detectors, super heterodyne receivers, envelope detectors.**

**UNIT-5: PULSE ANALOG MODULATION:** Practical aspects of sampling: Natural and flat top sampling. **PAM, PWM, PPM modulation and demodulation methods, PAMTDM.**

**7). Books/ Website/Journals & Handbooks/ Association & Institution:**

a). *Recommended Text & Reference Books and Websites:*

S. No.	Title of Book	Authors	Publisher	Cost (Rs.)	No. of books in Library
<b>Text Books</b>					
T1	Communication system	Sanjay Sharma	Kataria& sons		35
T2	Analog and digital Communication	John Kennedy	PHI		30
T3	Principles of Comm. system	Taub & Schilling	TMH		94
<b>Reference Books</b>					
R1	Modern Analog and Digital Communication System	B.P. Lathi	PHI		35
R2	Analog and Digital Comm. system	Singh & Sapre	TMH		30
<b>Websites related to subject</b>					
1					
2					

b). *Journals & Handbooks:* -

- i) IETE Journal of Research (National)
- ii) IETE Technical Review (National)
- iii)Electronic Today(National)
- iv)International Journal of Advanced Mechatronics & Robotics

c). *Associations and Institutions:* -

- i) ISTE
- ii) IETE

**8). Syllabus Deployment: -**

a). *Total weeks available for academics (excluding exams/ holidays) as per PGC calendar-*

Semester	I	III	V	VII
No. of Working days available(Approx.)	79	76	76	72
No. of Weeks (Approx.)	13	12.5	12.5	12

- Total weeks available for covering RTU syllabus- 10-11 weeks (Approx.)
- Total weeks available for special activities (as mentioned below)- 02 weeks (Approx.)

b). *Special Activities:*

- Open Book Test- Once in a semester
- Quiz (50% Technical & 50% Aptitude)- Once in a semester
- Special Lectures (SPL)- 10% of total no. of lectures including following
  - i. One PPT by the faculty, who is teaching the subject
  - ii. SPL by expert faculty at PGC level
  - iii. SPL by expert from industry/academia (other institution)
- Revision classes:- 1 to 3 turn at the end of semester (Before II Mid Term Exam)
- Solving Important Question Bank- 1 Turn before I & II Mid Term Exam (each) - Total Two turn.

c). *Lecture schedule per week*

- i). University scheme (L+T+P) = 3+1/0+0
- ii). PGC scheme (L+T+P) = 4+3+0

Sr. No.	Name of Unit	No. of lectures	Broad Area	Degree of difficulty (High/Medium/Low)	No. of Question in RTU Exam.	Text/ Reference books
1.	NOISE EFFECTS IN COMMUNICATION SYSTEMS	9	Noise effect in signal transmission	Medium	2	John Kennedy, B.P. Lathi, Sanjay Sharma
2.	AMPLITUDE MODULATION	11	Technique of modulation	Medium	2	John Kennedy, B.P. Lathi, Sanjay Sharma
3.	FREQUENCY MODULATION	11	Technique of modulation	Medium	2	Taub & Schilling, Sanjay Sharma
4.	NOISE IN AM and FM	4	Noise in system	Medium+High	2	Taub & Schilling, Sanjay Sharma
5.	PULSE ANALOG MODULATION	6	Pulse modulation	Medium+High	2	Taub & Schilling, Sanjay Sharma

d). *Introduction & Conclusion:* Each subject, unit and topic shall start with introduction & close with conclusion. In case of the subject, it is Zero lecture.

e). *Time Distribution in lecture class:* - Time allotted: 60 min.

- i. First 5 min. should be utilized for paying attention towards students who were absent for last lecture or continuously absent for many days + taking attendance by calling the names of the students and also sharing any new/relevant information.
- ii. Actual lecture delivery should be of 50 min.
- iii. Last 5 min. should be utilized by recapping/ conclusion of the topic. Providing brief introduction of the coming up lecture and suggesting portion to read.
- iv. After completion of any Unit/Chapter a short quiz should be organized.
- v. During lecture student should be encouraged to ask the question.

**9). Tutorial: - An essential component of Teaching- Learning process in Professional Education.**

Objective: - To enhance the recall mechanism.

To promote logical reasoning and thinking of the students.

To interact personally to the students for improve numerical solving ability.

a). *Tutorial processing:* - Tutorial sheet shall be provided to each students

1<sup>st</sup> Phase: - It is consisting of questions to be solved in the class assignment session in test mode on perforated sheet given in tutorial notebook and to be collected & kept by respective faculty for review & analysis (20 minutes).

II<sup>nd</sup> Phase: - Indicating/Initializing the weak issues/ drawback and Evaluating and providing the grade. Making a group with good student for assisting the weak students to explain/solve questions by every student on plain papers given in tutorial note book (20 minutes).

III<sup>rd</sup> Phase: - Solving/ explaining difficulties of lecture class and providing the new home assignment (20 minutes). To be done in tutorial note book.

b). *Home assignment shall comprise of two parts:*

Part (i) Minimum essential questions, which are to be solved and submitted by all with in specified due date.

Part (ii) Other important questions, which may also be solved and submitted for examining and guidance by teacher.

### 10). Examination Systems:

Sr. No.	Name of the Exam	Max. Marks	% of passing marks	Nature of paper Theory + Numerical	Syllabus coverage (in %)	Conducted by
1.	Ist Mid Term Exam	40	40%	Theory+ Numerical	60%	PGC
2.	IInd Mid Term Exam	40	40%	Theory+ Numerical	40%	PGC
3.	University (End) Term Exam	80	30%	Theory+ Numerical	100%	RTU

Place & Date:

Name: Manisha kumawat  
Lecturer: ECE Deptt.