Grams: "TECHNOLOGY"
Email: dapjntuk@gmail.com

Phone: 0884-2300991
Mobile: +9963993504

Directorate of Academic & Planning

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
KAKINADA-533003, Andhra Pradesh, INDIA
(Established by AP Government Act No. 30 of 2008)

Lr. No. JNTUK/DAP/AC/B. Tech/II Year/2019-20 *Date: 30-05-2019*

Dr. A. Mallikarjuna Prasad
M.E, Ph.D.,
Director, Academic Planning

To
All the Principals of Affiliated Colleges,
JNTUK, Kakinada

ACADEMIC CALENDAR FOR B.TECH II YEAR (2018 BATCH)

I SEMESTER			
Description	**From**	**To**	**Weeks**
Commencement of Class Work	**10.06.2019**		
I Unit of Instructions	10.06.2019	03.08.2019	8W
I Mid Examinations	05.08.2019	10.08.2019	1W
II Unit of Instructions	12.08.2019	05.10.2019	8W
II Mid Examinations	07.10.2019	12.10.2019	1W
Preparation & Practicals	14.10.2019	19.10.2019	1W
End Examinations	21.10.2019	02.11.2019	2W
Commencement of II Semester Class Work	**18.11.2019**		
II SEMESTER			
I Unit of Instructions	**18.11.2019**	11.01.2020	8W
I Mid Examinations	13.01.2020	23.01.2020	1W
II Unit of Instructions	24.01.2020	21.03.2020	8W
II Mid Examinations	23.03.2020	28-03-2020	1W
Preparation	30.03.2020	04.04.2020	1W
End Examinations	06.04.2020	18.04.2020	2W
Commence of III Year Class Work	**08.06.2020**		

A.M.prasad
Director Academic Planning

Copy to the Secretary to the Hon'ble Vice Chancellor, JNTUK.
Copy to PA to the Rector, JNTUK.
Copy to PA to the Registrar, JNTUK.
Copy to PA to the Director of Evaluation, JNTUK.

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SRK INSTITUTE OF TECHNOLOGY VIJAYAWADA	**SRK INSTITUTE OF TECHNOLOGY** **Enikepadu, Vijayawada 521108** **Department of Computer Science Engineering** **RECORD OF SUBJECT WISE ALLOTMENT & RESPONSIBILITIES**	**SRKIT / CSE / 09**

Academic year: 2019-20 **Semester:** II

S. No	Name of the Faculty	Theory subjects		Labs		Work Load / week (Periods)	Other responsibilities	Signature
		Subject Title	Branch	Lab Title	Branch			
1	Dr.D.HARITHA	Machine Learning	CSE	Projects	CSE	6+24	Head of the Department L4G spoc	
2	D.V.SUBBA RAO	Distributed Systems	CSE	----	----	6+6	Exam cell In charge	
3	Dr.B.ASHA LATHA	Formal Languages and Automata Theory	CSE	ADS lab	CSE	6+6+12	ISO In charge	
4	Dr. A.RADHIKA	Operational research	CSE	Projects	CSE	6+6+16+8	Department Exam cell	
5	Dr.N.NEELIMA PRIYANKA	Data ware housing data mining	**CSE**	DMDW and Java	**CSE**	6+8+4	BLC lab in charge	
6	N.SUDHAKAR REDDY	Machine Learning	CSE	Projects	CSE	6+24	NPTL Exams In charge	
7	CH.AMBEDKAR	Software engineering and STM	CSE MCA	STM	CSE MCA	6+6+4	Time tables and discipline in charge	
8	M.V.SUMANTH	C programming	CSE	DMDW	CSE	6+12+4	Department events in charge	
9	M.NARESH BABU	Data ware housing data mining	**CSE**	DMDW	CSE MCA	6+4+6	Alumni In charge	
10	M.NARESH BABU	Advanced Data Structures	CSE	ADS	CSE	6+6+12	Department Library	

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11	M.RITHVIK	Principals of programming languages	CSE	NP	CSE	6+6+8	-----	
12	P.JAYA SREE	DAA	CSE	NP	CSE	6+6+8	-------	
13	.A.KALYAN KUMAR	Computer Organization	CSE	ADS	CSE	6+6+12	------	
14	K.SREE LAKSHMI	HCI and SE	CSE	STM	CSE	6+6+4	-------	
15	N.V.MADHU BINDU	IOT	CSE	DMDW	CSE	6+6+8	Alumni member	
16	T .NAGA RAJU	Computer networks	CSE	NP	CSE	6+6+8	-----	
17	K.Radhika	Java	CSE	Java	CSE	6+6+8	-------	

HOD/ Date 30/11/19

Principal / Date

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Section Wise Time Table

Section - A:

DAY/Hr.	I (9:00-9:50)	II (9:50-10:40)	III (10:45-11:35)	IV (11:35-12:25)	V (1:10-2:00)	VI (2:00-2:45)	VII (2:50-3:35)	VIII (3:35-4:20)
MON	←ADS / JAVA LAB →				JAVA	PPL	FLAT	ADS
TUE	PPL	SE	ADS	PPL	SE	JAVA	CO	FLAT
WED	←ADS / JAVA LAB →				SE	CO	CLUBS	
THU	PPL	CO	SE	CO	FLAT	ADS	FLAT	JAVA
FRI	CO	ADS	JAVA	PPL	SE	FLAT	ADS	**COUNSELING**
SAT	JAVA	CO	ADS	FLAT	PPL	JAVA	SE	***

Section - B:

DAY/Hr.	I (9:00-9:50)	II (9:50-10:40)	III (10:45-11:35)	IV (11:35-12:25)	V (1:10-2:00)	VI (2:00-2:45)	VII (2:50-3:35)	VIII (3:35-4:20)
MON	PPL	CO	SE	PPL	FLAT	ADS	CO	JAVA
TUE	←ADS / JAVA LAB →				CO	FLAT	ADS	JAVA
WED	FLAT	SE	PPL	FLAT	ADS	JAVA	CLUBS	
THU	←ADS / JAVA LAB →				SE	PPL	CO	ADS
FRI	JAVA	PPL	FLAT	ADS	CO	JAVA	SE	**COUNSELING**
SAT	SE	FLAT	JAVA	CO	SE	ADS	PPL	***

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TIME TABLE

Individual Time Table:

Branch & Year: II/IV- CSE **Semester: II** **Subject: CO**

Academic Year: 2019-20 **Faculty: A. KALYAN KUMAR**

Section - A:

DAY/Hr.	I (9:00-9:50)	II (9:50-10:40)	III (10:45-11:35)	IV (11:35-12:25)	V (1:10-2:00)	VI (2:00-2:45)	VII (2:50-3:35)	VIII (3:35-4:20)
MON								
TUE							CO	
WED						CO		
THU		CO		CO				
FRI	CO							
SAT		CO						***

Section - B:

DAY/Hr.	I (9:00-9:50)	II (9:50-10:40)	III (10:45-11:35)	IV (11:35-12:25)	V (1:10-2:00)	VI (2:00-2:45)	VII (2:50-3:35)	VIII (3:35-4:20)
MON		CO					CO	
TUE					CO			
WED								
THU							CO	
FRI					CO			
SAT				CO				***

Signature of the faculty

Signature of HOD

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SRK INSTITUTE OF TECHNOLOGY VIJAYAWADA	**SRK INSTITUTE OF TECHNOLOGY** **Enikepadu, Vijayawada 521108** **Department of Computer Science And Engineering** **TEACHING PLAN CUM REALIZATION**	**SRKIT / CSE/ 12**

Department: CSE **Name of faculty:** A. KALYAN KUMAR **Designation:** Assistant Professor

Semester / Year: II/II CSE - B **Name of the subject:** COMPUTER ORGNIZATION **Course:** B.TECH (R16)

S. No	Unit / Topic	Teaching Planned	Taught on (Date)	No of Periods (actual taken)	Remarks (if any deviation)
1	**Unit-1:Basic Structure of Computers:** Computer Types, Functional Units of Computers	18-11-2019 To 05-12-2019	18,19-11-2019	3	
2	Basic Operational Concepts		20-11-2019	1	
3	Bus Structures		21-11-2019	1	
4	System Software		23-11-2019	1	
5	Performance		22,25-11-2019	2	
6	The History of Computer Developement		25-11-2019	1	
7	**Unit-2: Machine Instruction and Programs:** Instruction and Instruction Sequencing: RTN, ALN	06-12-2019 To 25-12-2019	26-11-2019	1	
8	Basic Instruction Types		28-11-2019	1	
9	Addressing Modes		29-30-11-2019	3	
10	Basic Input / Output Operations		5,7-12-2019	2	
11	The Role Of Stacks and Queues in Computer Programming Equation		9-12-2019	1	
12	Components of Instructions		9-12-2019 10-12-2019	2	

30/11/19.

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13	**Unit-3:** Arithmetic and Logic Instructions	25-12-2019 To 07-01-2020	12-12-2019	2	
14	Branch Instructions		12-12-2019	1	
15	Addressing Modes		23-1-2020	2	
16	Input / Output Operations		16-12-2020	1	
17	**Unit-4: Input / Output Organization:** Accessing I/O Devices	24-01-2020 To 10-02-2020	27-1-2020	2	
18	Interrupts: Interrupt Hardware		28-1-2020	1	
19	Enabling and Disabling Interrupts		30-1-2020	1	
20	Handling Multiple Devices		31-1-2020	1	
21	Direct Memory Access		1-2-2020	1	
22	Buses: Synchronous Bus, Asynchronous Bus		3-2-2020	2	
23	Interface Circuits		5-2-2020	1	
24	Standard I/O Interface: Peripheral Component Interconnect (PCI) Bus		6-2-2020	1	
25	Universal Serial Bus (USB)		7-2-2020	1	
26	**UNIT -5:The MEMORY SYSTEMS:** Basic memory circuits	11-02-2020 To 28-02-2020	10-2-2020	1	
27	Memory System Consideration		11-2-2020	1	
28	Read-Only Memory: ROM, PROM, EPROM, EEPROM, Flash Memory		13-2-2020	1	

31/1/20

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SRK INSTITUTE OF TECHNOLOGY VIJAYAWADA	**SRK INSTITUTE OF TECHNOLOGY** **Enikepadu, Vijayawada 521108** **Department of Computer Science And Engineering** **TEACHING PLAN CUM REALIZATION**	**SRKIT / CSE/ 12**

29	Cache Memories: Mapping Functions, NTERLEAVING	**11-02-2020 To 28-02-2020**	17,24-2-2020	2	
30	Secondary Storage: Magnetic Hard Disks, Optical Disks		24,25-2-2020	2	
31	**UNIT - 6: Processing Unit:** Fundamental Concepts: Register Transfers		25,27-2-2020	2	28/2/20
32	Performing An Arithmetic Or Logic Operation		28-2-20, 2-3-20	2	
33	Fetching A Word From Memory, Execution of Complete Instruction	**01-03-2020 To 21-03-2020**	3,5-3-2020	2	
34	Hardwired Control		9-3-2020	1	
35	Micro programmed Control: Microinstructions		10-3-2020	1	
36	Micro program Sequencing		11,12-3-2020	2	
37	Wide Branch Addressing Microinstructions with next – Address Field		13,17-3-2020	2	20/3/20.

TEXTBOOKS: 1)Computer Organization, Carl Hamacher, Zvonks Vranesic, Safea Zaky, 5th Edition,McGraw Hill.
2) Computer Architecture and Organization, John P. Hayes, 3rd Edition, McGraw Hill.

18/11/19
Faculty/ Date

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18/11/19
HOD/Date

SRK INSTITUTE OF TECHNOLOGY VIJAYAWADA	**SRK INSTITUTE OF TECHNOLOGY** **Enikepadu, Vijayawada 521108** **Department of Computer Science And Engineering** **TEACHING PLAN CUM REALIZATION**	**SRKIT / CSE/ 12**

Department: CSE **Name of faculty:** A. KALYAN KUMAR **Designation:** Assistant Professor

Semester / Year: II/II CSE - A **Name of the subject:** COMPUTER ORGNIZATION **Course:** B.TECH (R16)

S. No	Unit / Topic	Teaching Planned	Taught on (Date)	No of Periods (actual taken)	Remarks (if any deviation)
1	**Unit-1:Basic Structure of Computers:** Computer Types, Functional Units of Computers	18-11-2019 To 05-12-2019	18-11-2019 19-11-2019	3	
2	Basic Operational Concepts		20-11-2019	1	
3	Bus Structures		21-11-2019	1	
4	System Software		21-11-2019	1	
5	Performance		22,23-11-2019	2	
6	The History of Computer Developement		25-11-2019	1	
7	**Unit-2: Machine Instruction and Programs:** Instruction and Instruction Sequencing: RTN, ALN	06-12-2019 To 25-12-2019	26-11-2019	1	
8	Basic Instruction Types		28-11-2019	1	
9	Addressing Modes		28, 29/11, 2, 3, 5/12/2019	5	
10	Basic Input / Output Operations		5-12-2019	2	
11	The Role Of Stacks and Queues in Computer Programming Equation		7-12-2019	1	
12	Components of Instructions		9,10-12-2019	2	

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			Taught on	No of periods	
13	**Unit-3:** Arithmetic and Logic Instructions	**25-12-2019 To 07-01-2020**	11-12-2019	2	
14	Branch Instructions		12-12-2019	1	
15	Addressing Modes		3,3,12-12, 2/1/20	2	
16	Input / Output Operations		13-12-2020	3	
17	**Unit-4: Input / Output Organization:** Accessing I/O Devices	**24-01-2020 To 10-02-2020**	28,31-1-2020	1	Dmaythe 31/1/20
18	Interrupts: Interrupt Hardware		1-2-2020	1	
19	Enabling and Disabling Interrupts		4-2-2020	1	
20	Handling Multiple Devices		5-2-2020	1	
21	Direct Memory Access		6-2-2020	1	
22	Buses: Synchronous Bus, Asynchronous Bus		6-2-2020	2	
23	Interface Circuits		11-2-2020	1	
24	Standard I/O Interface: Peripheral Component Interconnect (PCI) Bus		13-2-2020	1	
25	Universal Serial Bus (USB)		15-2-2020	1	
26	**UNIT -5:The MEMORY SYSTEMS:** Basic memory circuits	**11-02-2020 To 28-02-2020**	25-2-2020	1	
27	Memory System Consideration		25-2-2020	1	
28	Read-Only Memory: ROM, PROM, EPROM, EEPROM, Flash Memory		25-2-2020	1	

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			Taught on	No of periods	
29	Cache Memories: Mapping Functions, NTERLEAVING	**11-02-2020 To 28-02-2020**	25-2-2020	1	
30	Secondary Storage: Magnetic Hard Disks, Optical Disks		26-2-2020	1	
31	**UNIT - 6: Processing Unit:** Fundamental Concepts: Register Transfers	**01-03-2020 To 21-03-2020**	27-2-2020	1	
32	Performing An Arithmetic Or Logic Operation		27-2-2020	1	
33	Fetching A Word From Memory, Execution of Complete Instruction		28,29-2-2020	2	Dr 29/2/20
34	Hardwired Control		3-3-2020	1	
35	Micro programmed Control: Microinstructions		4,5-3-2020	2	
36	Micro program Sequencing		11,12-3-2020	2	
37	Wide Branch Addressing Microinstructions with next – Address Field		17,18-3-2020	2	Dr 20/3/20

TEXTBOOKS: 1)Computer Organization, Carl Hamacher, Zvonks Vranesic, Safea Zaky, 5th Edition,McGraw Hill.
2) Computer Architecture and Organization, John P. Hayes, 3rd Edition, McGraw Hill.

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HOD/Date 18/11/19

UNIT - III

Types of Instructions:-

Arithmetic and Logic Instructions, Branch Instruction, Addressing Modes, Input/output operations.

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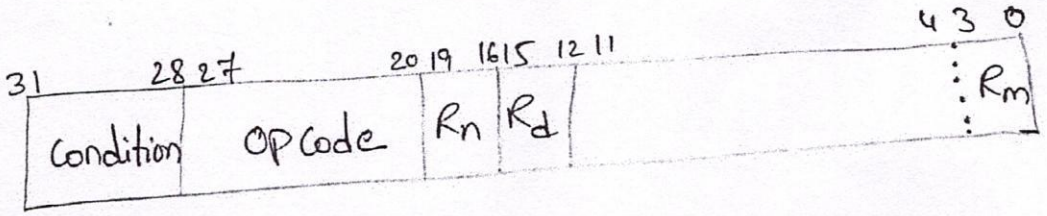
ARITHMETIC AND LOGIC INSTRUCTIONS:-

The ARM instruction set has a number of instructions for arithmetic and logic operations on operands that are either contained in the gene-ral-purpose registers or given as immediate operands in the instruction itself. Memory operands are not allowed for these instructions. There are instructions for different forms of addition and subtraction, and there are two instructions for multiplication. There are instructions for the AND, OR, NOT, XOR, and Bit-Clear logic operations. Instructions such as compare are provided to set condition code flags based on the results from arithmetic or logic operations on two operands. They donot store the actual results in a register. The format for most of these instructions is



ARITHMETIC INSTRUCTIONS:-

The basic assembly language expression for arithmetic instructions is

Opcode Rd, Rn, Rm

where the operation specified by the Opcode is performed using the operands in general-purpose registers Rn and Rm. The result is

placed in register R_d. For example, the instruction

ADD R_0, R_2, R_4

performs the operation

$R_0 \leftarrow [R_2] + [R_4]$

and the instruction

SUB R_0, R_6, R_5

Performs the operation

$R_0 \leftarrow [R_6] - [R_5]$

Instead of being contained in register R_m, the second operand can be given in the Immediate mode. Thus.

ADD $R_0, R_3, \#17$.

Performs the operation

$R_0 \leftarrow [R_3] + 17$.

the immediate value is contained in 8-bit field in bits b_{7-0} of the instruction.

the second operand can be shifted or Rotated before being used in the operation. When a shift or rotation is required, it is Specified last in the assembly language expression for the instruction. The instruction

ADD $R_0, R_1, R_5, LSL \#4$.

Operates as follows: the second operand, which is contained in register R_5, is shifted left 4 bit positions (equivalent to $[R_5] \times 16$), and it

is then added to the contents of register R_1, the sum is placed in Register R_0.

Two versions of a Multiply instructions are provided. The first version multiplies the contents of two registers and places the low-order 32-bits of the product in a third register. The high-order bits of the product, if there are any, are discarded. For example, the Instruction

MUL R_0, R_1, R_2

performs the operation.

$R_0 \leftarrow [R_1] \times [R_2]$.

The second version specifies a fourth register whose contents are added to the product before storing the result in the destination register. Hence, the instruction

MLA R_0, R_1, R_2, R_3

performs the operation

$R_0 \leftarrow [R_1] \times [R_2] + R_3$

this is called a multiply-Accumulate operation. It is often used in numerical Algorithms for digital sig-nal processing.

Operand shift operations:-

We noted that earlier one of the distinctive features of the ARM instruction set is that all instructions are executed conditionally.

Another distinctive feature is the shifting and rotation operations that are incorporated into most instructions. In most other computer instruction sets, shifting operations are done using seperate instructions. This is the case for the motorola 68000 and the Intel IA-32 processors.

By incorporating shifting and rotation operations into instructions, as needed, the ARM architecture saves code space and can potentially improve execution time performance relative to more conventional processor designs. This feature is implemented using a barrel shifter circuit in data path between the registers and the arithmetic and logic unit in the processor.

LOGIC INSTRUCTIONS:-

The logic operations AND, OR, XOR and Bit-clear are implemented by instructions with the OPcodes AND, ORR, EOR, and BIC. They have the same format as the Arithmetic instructions. The instruction.

AND R_d, R_n, R_m

performs the operation

$R_d \leftarrow [R_n] \wedge [R_m]$

which is a bitwise logical AND between the operands in registers R_n and R_m. For example, if register R_0 contains the hexadecimal pattern 02FA62CA and

R_1 contains the pattern 0000FFFF, then the instruction

AND R_0, R_0, R_1

will result in the pattern 000062CA being placed in register R_0.

The Bit-clear instruction (BIC) is closely related to the AND Instruction. It complements each bit in operand Rm before ANDing them with the bits in register Rn. Using the same R_0 and R_1 bit patterns as in the above example, the instruction

BIC R_0, R_0, R_1

results in the pattern 02FA0000 being placed in R_0.

The move Negitive Instruction, with the Op-code mnemonic MVN, complements the bits of the Source operand and places the result in R_d. If the contents of R_3 are the hexadecimal pattern 0F0F0F0F, then the instruction

MVN R_0, R_3

places the result "F0F0F0F0" in register R_0.

Digit packing program:-

The below program shows an ARM program for packing two 4-bit decimal digits into a memory byte location.

```
LDR    R0, POINTER      Load address LOC into R0
LDRB   R1, [R0]         Load ASCII characters
LDRB   R2, [R0, #1]     into R1 and R2
AND    R2, R2, #&F      Clear higher-order 28 bits of R2
ORR    R2, R2, R1, LSL#4  OR [R1] shifted left into [R2]
STRB   R2, PACKED       store packed BCD digits
                        into PACKED.
```

The decimal digits, represented in ASCII code, are stored in byte locations LOC, LOC+1. the program packs the corresponding 4-bit BCD codes into a single byte location PACKED.

the first Load instruction in the above prog-ram, assumes that the address LOC is stored in memory at address pointer. An assembler direc-tive can be used to place LOC in POINTER. this method of loading the address LOC into R_0 is needed because a 32-bit address cannot be included as an immediate operand in an instru-ction. Location POINTER points to the BCD digit characters stored in successive byte locations. the two ASCII characters containing the BCD digits in their low-order four bits are loaded into the low-order byte positions of registers R_1 and R_2 by the next two load instructions. the AND instruction clears the higher-order 28-bits of R_2 to zero, leaving the second BCD digit the four low-order bit positions. The OR instruction then shifts the first BCD digit in

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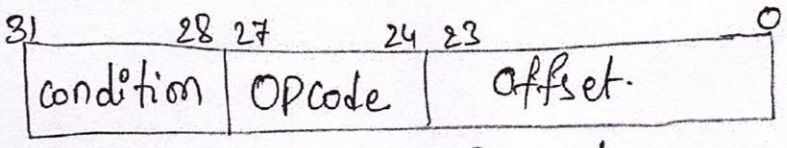
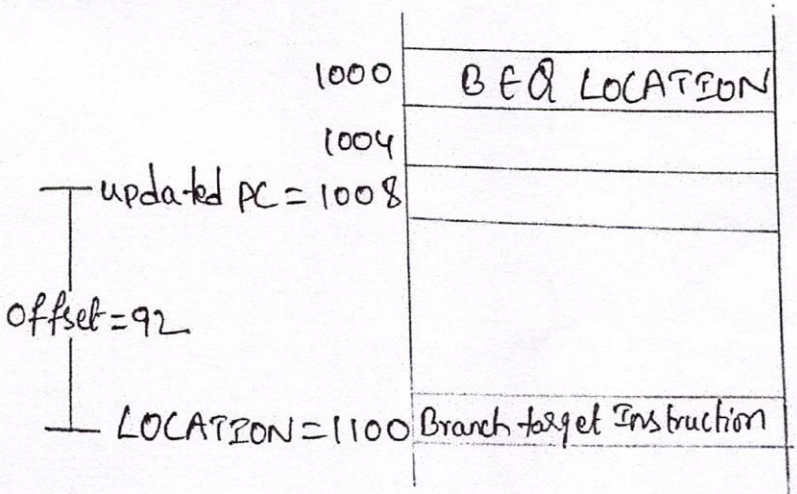
R_1 to the left four positions and places it to the left of the second BCD digit in R_2. The packed digits in the low-order byte of R_2 are then stored into PACKED.

BRANCH INSTRUCTIONS:—

Conditional branch instructions contain a signed, 2's-complement, 24-bit offset that is added to the updated contents of the program Counter to generate the branch target address.



(a) Instruction format



(b) Determination of a branch target Address

The format for the branch instructions is shown in above figure(a), and an example is given in above figure(b). The BEQ instruction (Branch if equal to '0') causes a branch if the Z flag is set to '1'.

PROGRAMME OF INSTRUCTION ACCORDING TO TIME TABLE AND ALMANC

Name of Teacher (s) 1. 2. II Year II Semester B Tech Course CSE-A Branch CO Subject

Theory ✓
Drawing
Practical

Academic Year

Periods			Topic Covered	Sl. No.	Periods			Topic Covered
Day	Time	Date			Day	Time	Date	
(2)	(3)	(4)	UNIT-I (5)	(1)	(2)	(3)	(4)	(5)
MON	2	18/11/2019	Introduction to Computer & Computer organization	21	MON	4	9/12/2019	Shift Instructions.
MON	4	18/11/2019	Types of Computers	22	TUE	7	10/12/2019	Rotate Instructions.
TUE	5	19/11/2019	Functional units of Computer	23	WED	4	11/12/2019	UNIT-3: Arithmetic Instructions
WED	6	20/11/2019	Basic Operational Concepts	24	WED	6	11/12/2019	Logic Instructions.
THUR	2	21/11/2019	Bus Structures.	25	THUR	4	12/12/2019	Branch Instructions
THUR	4	21/11/2019	System Software.	26	FRI	4	13/12/2019	I/O operations. DS 16/12
FRI	7	22/11/2019	Performance, Processor clock	27	WED	6	18/12/2019	Types of Computers,
SAT	2	23/11/2019	Basic Performance equation, compilers, Pipelining, CISC, RISC, performance measurement	28	THUR	4	19/12/2019	functional units & operational Concepts
MON	6	25/11/2019	Historical perspective.	29	SAT	2	21/12/2019	performance, System software
TUES	7	26/11/2019	UNIT-2: Instructions & Instruction sequencing, RTN, ALN	30	TUE	7	24/12/2019	Historical perspective
THUR	2	28/11/2019	Instruction Types.	31	FRI	4	27/12/2019	Instruction Types.
THUR	4	28/11/2019	Addressing modes.	32	TUE	7	31/12/2019	Addressing modes DS 2/1/2020
FRI	7	29/11/2019	Implementation of variables & Constants	33	THUR	4	2/1/2020	Addressing modes (Continues)
SAT	2	30/11/2019	unit-1 Revision class.	34	FRI	4	3/1/2020	Basic I/O operations.
MON	6	2/12/2019	Indirection & Pointers.	35	SAT	2	4/1/2020	Components of Instructions
TUE	7	3/12/2019	Indexing & Arrays.	36	TUE	7	7/1/2020	Arithmetic & Logic Instructions
WED	6	4/12/2019	Relative Addressing, Additional modes	37	THUR	4	9/1/2020	Branch Instructions
THUR	2	5/12/2019	Basic I/O operations: program controlled I/O	38	FRI	4	10/1/2020	I/O operations in ARM DS 10/1
THUR	4	5/12/2019	Memory mapped I/O.	39			28/1/2020	Unit-4: Accessing I/O Devices
SAT	2	7/12/2019	The Role of stacks & Queues.	40			31/1/2020	Example program

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PROGRAMME OF INSTRUCTION ACCORDING TO TIME TABLE AND ALMANC

II Year II Semester BTech Course CSE-A Branch CO Subject

Theory ✓
Drawing
Practical

Name of Teacher (s) 1.
2.

Academic Year

Periods			Topic Covered	Sl. No.	Periods			Topic Covered
Day	Time	Date			Day	Time	Date	
(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
SAT	2	1/2/2020	Interrupt: Interrupt Hardware	61	THUR	2	5/3/2020	Micro Instructions.
TUE	5	4/2/2020	Enabling & Disabling Interrupts	62	THUR	4	5/3/2020	Micro program sequencing
WED	6	5/2/2020	Handling multiple Devices	63	TUE	5	10/3/2020	Register transfers-Revision
THUR	2	6/2/2020	Direct memory Access	64	WED	6	11/3/2020	Micro program sequencing
THUR	4	6/2/2020	Buses: Synchronous Bus	65	THUR	2	12/3/2020	Micro program sequencing.
THUR	8	6/2/2020	Asynchronous Bus	66	THUR	4	12/3/2020	wide Branch
TUE	5	11/2/2020	Interface circuits	67	FRI	7	13/3/2020	Addressing Micro operations
WED	6	12/2/2020	Standard I/O Interfaces.	68	TUE	5	17/3/2020	with next-
THUR	2	13/2/2020	PCI Bus	69	WED	6	18/3/2020	Address field. 20
SAT	2	15/2/2020	USB Bus.	70				
TUE	2	25/2/2020	Basic memory Circuit Memory System Consideration	71				
TUE	5	25/2/2020	Read only memory: Rom, PRom, Eeprom, Sram	72				
TUE	8	25/2/2020	Cache memories: Mapping function, Interleaving	73				
WED	6	26/2/2020	Secondary Storage: Magnetic hard disks	74				
THUR	2	27/2/2020	optical Disks, Registertransfers	75				
THUR	4	27/2/2020	performing An Arithmetic or Logic operation	76				
FRI	7	28/2/2020	Fetching A word from memory	77				
SAT	2	29/2/2020	Execution of Complete Instruction	78				
TUE	5	3/3/2020	Hard wired Control.	79				
WED	6	4/3/2020	Micro Instructions	80				

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PROGRAMME OF INSTRUCTION ACCORDING TO TIME TABLE AND ALMANC

Theory ✓
Drawing
Practical

me of Teacher (s) 1.

II Year II Semester BTech Course CSE-B Branch CO Subject

2.

Academic Year 2019-20.

Periods			Topic Covered	Sl. No.	Periods			Topic Covered
Day	Time	Date			Day	Time	Date	
(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
MON	2	18/11/2019	Introduction to Computers & Computer organization	21	TUE	5	10/12/2019	Rotate Instructions.
MON	4	18/11/2019	Types of Computers	22	~~THUR~~	7	12/12/2019	Unit-2 Arithmetic Instructions
TUE	5	19/11/2019	functional units of Compute	23	THUR	8	12/12/2019	Logic instructions, Branch instructions.
WED	7	20/11/2019	Basic operational Concepts	24	MON	4	16/12/2019	I/O operations
THUR	~~7~~	21/11/2019	Bus Structures.	25	TUE	5	17/12/2019	Types & functional units 16/12/19.
FRI	5	22/11/2019	Performance, Processor clock	26	THUR	7	19/12/2019	Basic operational Concepts
SAT	4	23/11/2019	System Software.	27	FRI	5	20/12/2019	Bus structures, System Software
MON	2	25/11/2019	Basic Performance eqn, Compiler, Pipelining, CISC, RISC, Performance measurement	28	SAT	4	21/12/2019	performance.
MON	7	25/11/2019	Historical Perspective.	29	TUE	5	24/12/2019	Historical perspective.
TUE	5	26/11/2019	UNIT-2: Instruction & Instruction seq, RTN, ALN.	30	FRI	5	27/12/2019	Instructions & Instruction seq
THUR	7	28/11/2019	Basic Instruction Types.	31	MON	2	30/12/2019	Instruction Types.
FRI	5	29/11/2019	Addressing modes	32	THUR	7	2/1/2020	Addressing modes. 31/12
SAT	4	30/11/2019	Unit-1 Revision class.	33	FRI	5	3/1/2020	Addressing modes.
SAT	7	30/11/2019	Implementation of variables & Constants.	34	SAT	4	4/1/2020	Basic I/O operations
MON	4	2/12/2019	Indirection & Pointers.	35	MON	2	6/1/2020	Arithmetic & Logic Instructions
TUE	5	3/12/2019	Indexing & Arrays.	36	MON	7	6/1/2020	Branch Instructions
~~THUR~~	7	5/12/2019	Basic I/O operations: Program controlled I/O	37	TUE	5	7/1/2020	I/O Operations in ARM 23/1
SAT	4	7/12/2019	Memory mapped I/O.	38	MON	2	27/1/2020	Accessing I/O devices
MON	2	9/12/2019	The Role of STACKS & QUEUES	39	MON	4	27/1/2020	Accessing I/O Devices
~~THUR~~	~~7~~	9/12/2019	Shift Instructions	40	TUE	5	28/1/2020	Interrupts: Interrupt Hardware.

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PROGRAMME OF INSTRUCTION ACCORDING TO TIME TABLE AND ALMANC

II Year II Semester B.Tech Course CSE-B Branch CO Subject

Theory ✓
Drawing
Practical

Name of Teacher (s) 1.
2.

Academic Year

Sl. No.	Periods			Topic Covered	Sl. No.	Periods			Topic Covered
	Day	Time	Date			Day	Time	Date	
(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
1	THUR	7	30/1/2020	Enabling & Disabling Interrupts	61	THUR	7	5/3/2020	Execution of Complete Instruction
2	FRI	5	31/1/2020	Handling multiple Devices	63	MON	2	9/3/2020	Hard wired control
3	SAT	4	1/2/2020	Direct memory Access	63	MON	4	9/3/2020	Hard wired Control
4	MON	2	3/2/2020	Buses: Synchronous Bus	64	TUE	5	10/3/2020	micro Instruction
5	TUE	5	4/2/2020	Asynchronous Bus	65	WED	7	11/3/2020	Microprogram sequencing
6	WED	7	5/2/2020	Interface circuits.	66	THUR	7	12/3/2020	micro program sequencing
	THUR	7	6/2/2020	PCI Bus	67	FRI	5	13/3/2020	wide Branch, Addressing
	FRI	5	7/2/2020	USB Bus	68	TUE	5	17/3/2020	Microoperations with next-Address field
	MON	2	10/2/2020	Basic memory circuits	69				20/3/20
	TUE	5	11/2/2020	memory System Coliderations	70				
	THUR	7	13/2/2020	Read only memory.	71				
	MON	2	17/2/2020	Cache memory.	72				
	MON	4	24/2/2020	Interleaving	73				
	MON	8	24/2/2020	magnetic Harddisks.	74				
	TUE	5	25/2/2020	Optical Disks	75				
	TUE	8	25/2/2020	Fundamental Concepts	76				
	THUR	7	27/2/2020	Register transfers	77				
	FRI	5	28/2/2020	performing an Arithmetic	78				
	MON	2	2/3/2020	or logic operation	79				
	TUE	5	3/3/2020	fetch a word from memory	80				

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Directorate of Academic & Planning
JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
KAKINADA-533003, Andhra Pradesh, INDIA
(Established by AP Government Act No. 30 of 2008)

Lr. No. JNTUK/DAP/Aca.Cal/ IV B.Tech & B.Pharm/2018-19 Date: 24-05-2018

Dr. Ch. Satyanarayana
M.Tech, Ph.D.,
Director, Academic & Planning

To
The Principals of All Affiliated Colleges,
JNTUK, Kakinada

ACADEMIC CALENDAR
for
B.TECH& B.PHARM IV YEAR
2015 BATCH

B.TECH & B.PHARM IV YEAR I Semester			
Description	**From**	**To**	**Weeks**
Commencement of Class Work	**11-06-2018**		
I Unit of Instructions	11-06-2018	04-08-2018	8W
I Mid Examinations	06-08-2018	11-08-2018	1W
II Unit of Instructions	13-08-2018	06-10-2018	8W
II Mid Examinations	08-10-2018	13-10-2018	1W
Preparation & Practicals	15-10-2018	20-10-2018	1W
End Examinations	22-10-2018	03-11-2018	2W
Commencement of Class Work	**19-11-2018**		
B.TECH & B.PHARM IV YEAR II Semester			
I Unit of Instructions	**19-11-2018**	12-01-2019	8W
I Mid Examinations	17-01-2019	23-01-2019	1W
II Unit of Instructions	24-01-2019	23-03-2019	8W
II Mid Examinations	25-03-2019	30-03-2019	1W
Preparation & Practicals	01-04-2019	06-04-2019	1W
End Examinations	08-04-2019	20-04-2019	2W

Director Academic and Planning

Copy to the Secretary to the Hon'ble Vice Chancellor
Copy to the Rector
Copy to the Registrar
Copy to the Director of Evaluation
Copy to the Controller of Examination

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SRK INSTITUTE OF TECHNOLOGY
Enikepadu, Vijayawada 521108
Approved by AICTE, Affiliated to JNTUK, Kakinada
(ISO 9001:2015 Certified Institution)

Academic Calender: 2018-19

S.No	DATE	EVENT
		JUNE
1	6/11/2018	**Commencement of Class Work for I-I, II-I, III-I, and IV-I B. Tech Students and III-I IMBA (Sem V) Students, and IV-I IMBA (Sem VII) students, I Unit of Instructions starts**
		JULY
1	7/2/2018	II Mid Examinations starts for V-I IMBA (Sem IX) Students
2	7/7/2018	II Mid Examinations ends for V-I IMBA (Sem IX) Students
3	09-07-2018 to 14-07-2018	Preparation and Practicals for V-I IMBA (Sem IX) Students
4	7/9/2018	**Commencement of Project Work for II year M. Tech, sem III & IV**
5	09-07-2018 to 08-12-2018	Project Work for II year M. Tech, sem III
6	7/9/2018	**Commencement of Class Work for II-I MCA Students (Sem III) and II-I IMBA (Sem III), I Unit of Instructions starts**
7	7/14/2018	Second Saturday
8	7/16/2018	End Examinations starts for V-I IMBA (Sem IX) Students
9	7/24/2018	Holiday
10	7/28/2018	End Examinations completed for V-I IMBA (Sem IX) Students
11	7/30/2018	**Commencement of Class Work for II-I , MBA Students, I Unit of Instructions starts**
12	7/30/2018	**Commencement of Project work for V-II IMBA (Sem X) Students**
		AUGUST
1	8/4/2018	I Unit of Instructions ends for I-I,II-I, III-I, and IV-I, B. Tech Students , III-I IMBA (Sem V) Students, and IV-I IMBA (Sem VII) Students
2	8/6/2018	I Mid Examinations starts for I-I, II-I, III-I, and IV-I, B. Tech Students, III-I IMBA (Sem V) Students, and IV-I IMBA (Sem VII) Students
3	8/11/2018	I Mid Examination ends for I-I, II-I, III-I, and IV-I, B. Tech Students,III-I IMBA (Sem V) Students, and IV-I IMBA (Sem VII) Students
4	11-08-2018 to 13-08-2018	A Three day Faculty development program on "Advances in reinforced cement concrete design" organized by Department of Civil Engineering
5	8/13/2018	II Unit of Instructions starts for I-I, II-I, III-I, and IV-I, B. Tech Students and III-I IMBA (Sem V) Students, and IV-I IMBA (Sem VII) Students
6	8/13/2018	**Commencement of Class Work for I-I MBA and I-I IMBA Students, I Unit of Instructions starts**
7	8/15/2018	Independence Day
8	8/20/2018	**Commencement of Class Work for I year MCA, sem I**
9	8/20/2018	I Unit of Instructions starts for I-I MCA Students
10	8/20/2018	Holiday
11	8/22/2018	Bakr Id
12	8/27/2018	**Commencement of Class Work for I year M. Tech, sem I**
13	8/27/2018	I Unit of Instructions starts for I-I M. Tech Students
		SEPTEMBER
1	9/1/2018	I Unit of Instructions ends for II-I MCA Students (Sem III) and II-I IMBA (Sem III) students
2	9/3/2018	Sri Krishna Janmastami
3	9/3/2018	I Mid Examinations starts for II-I MCA Students (Sem III) and II-I IMBA (Sem III) students
4	9/5/2018	Teacher's day
5	9/8/2018	I Mid Examinations ends for II-I MCA Students (Sem III) and II-I IMBA (Sem III) students
6	9/10/2018	II Unit of Instructions starts for II-I MCA Students (Sem III) and II-I IMBA (Sem III) students
7	9/10/2018	Holiday
8	9/13/2018	Viayaka Chaturdhi
9	9/15/2018	Engineer's Day
10	9/22/2018	I Unit of Instructions ends for II-I MBA Students
11	9/24/2018	I Mid Examinations starts for II-I MBA Students

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	OCTOBER	
1	10/1/2018	II Unit of Instructions starts for II-I MBA Students
2	10/2/2018	Gandhi Jayanthi
3	10/3/2018	Second Saturday
4	10/6/2018	I Unit of Instructions ends for I-I MBA and I-I IMBA Students
5	10/6/2018	II Unit of Instructions ends for I-I, II-I, III-I, and IV-I, B. Tech Students and III-I IMBA (Sem V) Students, and IV-I IMBA (Sem VII) Students
6	10/8/2018	I Mid Examinations starts for I-I MBA and I-I IMBA Students
7	10/8/2018	II Mid Examinations starts for I-I, II-I, III-I, and IV-I, B. Tech Students and III-I IMBA (Sem V) Students, and IV-I IMBA (Sem VII) Students
8	10/13/2018	II Mid Examination ends for I-I, II-I, III-I, and IV-I, B. Tech Students and III-I IMBA (Sem V) Students, and IV-I IMBA (Sem VII) Students
9	10/13/2018	I Mid Examinations ends for I-I MBA and I-I IMBA Students
10	10/15/2018	II Unit of Instructions starts for I-I MBA and I-I IMBA Students
11	15-10-2018 to 20-10-2018	Preparation and Practicals for I-I, II-I, III-I, and IV-I, B. Tech Students and preparation for III-I IMBA (Sem V) Students, and IV-I IMBA (Sem VII) Students
12	15-10-2018 to 18-10-2018	Faculty development program on "AUTOMOTIVE DESIGN USING CATIA" organized by Department of ME
13	17-10-2018 to 21-10-2018	Dussehra Vacation
14	10/20/2018	I Unit of Instructions endss for I-I M. Tech Students
15	10/20/2018	I Unit of Instructions endss for I-I MCA Students
16	10/22/2018	I Mid Examinations starts for I-I M. Tech Students
17	10/22/2018	I Mid Examinations starts for I-I MCA Students
18	10/22/2018	End Examinations starts for I-I, II-I, III-I, and IV-I, B. Tech Students and III-I IMBA (Sem V) Students, and IV-I IMBA (Sem VII) Students
19	10/27/2018	I Mid Examinations ends for I-I M. Tech Students
20	10/27/2018	I Mid Examinations ends for I-I MCA Students
21	10/29/2018	II Unit of Instructions starts for I-I M. Tech Students
22	10/29/2018	II Unit of Instructions starts for I-I MCA Students
	NOVEMBER	
1	11/3/2018	End Examinations completed for I-I, II-I, III-I, and IV-I, B. Tech Students and III-I IMBA (Sem V) Students, and IV-I IMBA (Sem VII) Students
2	11/3/2018	II Unit of Instructions ends for II-I MCA Students(sem III) (Sem III) and II-I IMBA (Sem III) students
3	04-11-2018 to 18-11-2018	**Sem Break for B. Tech students**
4	11/5/2018	II Mid Examinations starts for II-I MCA Students (Sem III) and II-I IMBA (Sem III) students
5	11/5/2018	**Commencement of Class Work for III-II IMBA (Sem IV) Students, I Unit of Instructions starts**
6	11/17/2018	Completion of Project work for V-II IMBA (Sem X) Students
7	11/19/2018	**Commencement of Class Work of Semester II for I-II, II-II, III-II, and IV-II, B. Tech Students, and IV-I IMBA (Sem VII) Students**
8	11/19/2018	I Unit of Instructions starts for I-II, II-II, III-II, and IV-II, B. Tech Students
9	11/7/2018	Diwali
10	11/10/2018	Second Saturday
11	11/12/2018	II Mid Examinations ends for II-I MCA Students (Sem III) and II-I IMBA (Sem III) students
12	13-11-2018 to 17-11-2018	Preparation and Practicals for II-I MCA Students (Sem III) and II-I IMBA (Sem III) students
13	11/19/2018	End Examinations starts for II-I MCA Students (Sem III) and II-I IMBA (Sem III) students
14	11/21/2018	Milad un-nabi
15	11/24/2018	II Unit of Instructions ends for II-I MBA Students
16	11/26/2018	II Mid Examinations starts for II-I MBA Students
	DECEMBER	
1	12/1/2018	II Mid Examinations ends for II-I MBA Students
2	12/1/2018	End Examinations completed for II-I MCA Students (Sem III) and II-I IMBA (Sem III) students
3	12/3/2018	**Commencement of Class Work for II-II MCA Students (Sem IV) and II-II IMBA (Sem IV) students, I Unit of Instructions starts**
4	03-12-2018 to 08-12-2018	Preparation for II-I MBA Students

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5	12/8/2018	Second Saturday
6	12/8/2018	II Unit of Instructions ends for I-I MBA and I-I IMBA Students
7	12/10/2018	End Examinations starts for II-I MBA Students
8	12/10/2018	II Mid Examinations starts for I-I MBA and I-I IMBA Students
9	10-12-2018 to 11-05-2019	Project Work for II year M. Tech, sem IV
10	12/15/2018	II Mid Examinations ends for I-I MBA and I-I IMBA Students
11	17-12-2018 to 22-12-2018	Preparation for I-I MBA and I-I IMBA Students
12	12/17/2018	Holiday

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13	12/22/2018	End Examinations completed for II-I MBA Students
14	12/22/2018	II Unit of Instructions ends for I-I M. Tech Students
15	12/22/2018	II Unit of Instructions ends for I-I MCA Students
16	12/24/2018	II Mid Examinations starts for I-I M. Tech Students
17	12/24/2018	II Mid Examinations starts for I-I MCA Students
18	24-12-2018 to 25-12-2018	Christmas Holidays
19	12/24/2018	**Commencement of Class Work for II-II MBA Students, I Unit of Instructions starts**
20	12/26/2018	End Examinations starts for I-I MBA and I-I IMBA Students
21	12/29/2018	II Mid Examinations ends for I-I M. Tech Students
22	12/29/2018	II Mid Examinations ends for I-I MCA Students
23	12/29/2018	I Unit of Instructions ends for III-II IMBA (Sem IV) Students
24	31-12-2018 to 12-01-2019	Preparation and Practicals for I-I M. Tech Students
25	31-12-2018 to 05-01-2019	Preparation and Practicals for I-I MCA Students
26	12/31/2018	New year Eve
27	12/31/2018	I Mid Examinations starts for III-II IMBA (Sem IV) Students
		JANUARY
1	1/1/2019	New year
2	1/5/2019	I Mid Examinations ends for III-II IMBA (Sem IV) Students
3	1/7/2019	II Unit of Instructions starts for III-II IMBA (Sem IV) Students
4	1/7/2019	End Examinations completed for I-I MBA and I-I IMBA Students
5	1/7/2019	End Examinations starts for I-I MCA Students
6	1/8/2019	**Commencement of Class Work for I-II MBA and I-II IMBA Students, I Unit of Instructions starts**
7	1/12/2019	I Unit of Instructions ends for I-II, II-II, III-II, and IV-II, B. Tech Students, and IV-I IMBA (Sem VII) Students
8	12-01-2019 to 16-01-2019	Pongal Vacation
9	1/17/2019	I Mid Examinations starts for I-II, II-II, III-II, and IV-II, B. Tech Students, and IV-I IMBA (Sem VII) Students
10	1/17/2019	End Examinations starts for I-I M. Tech Students
11	1/19/2019	End Examinations completed for I-I MCA Students
12	1/23/2019	I Mid Examinations ends for I-II, II-II, III-II, and IV-II, B. Tech Students, and IV-I IMBA (Sem VII) Students
13	1/24/2019	II Unit of Instructions starts for I-II, II-II, III-II, and IV-II, B. Tech Students, and IV-I IMBA (Sem VII) Students
14	1/25/2019	Sports Day
15	1/26/2019	I Unit of Instructions ends for II-II MCA Students (Sem IV) and II-II IMBA (Sem IV) students
16	1/26/2019	Republic Day
17	1/28/2019	I Mid Examinations starts for II-II MCA Students (Sem IV) and II-II IMBA (Sem IV) students
18	1/28/2019	**Commencement of Class Work for I year MCA, sem II, I Unit of Instructions starts**
19	1/30/2019	End Examinations completed for I-I M. Tech Students
20	1/31/2019	**Commencement of Class Work for I year M. Tech, sem II,**
21	1/31/2019	I Unit of Instructions starts for I-II M. Tech Students
		FEBRUARY
1	2/1/2019	Holiday
2	2/2/2019	I Mid Examinations ends for II-II MCA Students (Sem IV) and II-II IMBA (Sem IV) students
3	2/4/2019	II Unit of Instructions starts for II-II MCA Students (Sem IV) and II-II IMBA (Sem IV) students
4	2/9/2019	Second Saturday
5	13-02-2019 to 14-02-2019	Explorers Meet 2K19
6	2/16/2019	I Unit of Instructions ends for II-II MBA Students

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7	2/18/2019	I Mid Examinations starts for II-II MBA Students
8	2/23/2019	I Mid Examinations ends for II-II MBA Students
9	2/25/2019	II Unit of Instructions starts for II-II MBA Students
		MARCH
1	3/2/2019	Cultural Day
2	3/2/2019	II Unit of Instructions ends for III-II IMBA (Sem IV) Students
3	3/2/2019	I Unit of Instructions ends for I-II MBA and I-II IMBA Students
4	3/4/2019	II Mid Examinations starts for III-II IMBA (Sem IV) Students
5	3/4/2019	I Mid Examinations starts for I-II MBA and I-II IMBA Students
6	3/4/2019	Maha Siva Rathri
7	3/8/2019	Women's day
8	3/9/2019	II Mid Examinations ends for III-II IMBA (Sem IV) Students
9	3/9/2019	I Mid Examinations ends for I-II MBA and I-II IMBA Students
10	3/9/2019	Second Saturday
11	11-03-2019 to 16-03-2019	Preparation for III-II IMBA (Sem IV) Students
12	3/11/2019	II Unit of Instructions starts for I-II MBA and I-II IMBA Students
13	3/16/2019	Annual Day
14	3/18/2019	End Examinations starts for III-II IMBA (Sem IV) Students
15	3/21/2019	Holi
16	3/23/2019	I Unit of Instructions ends for I-II MCA Students
17	3/23/2019	II Unit of Instructions ends for I-II, II-II, III-II, and IV-II, B. Tech Students, and IV-I IMBA (Sem VII) Students
18	3/25/2019	I Mid Examinations starts for I-II MCA Students
19	3/25/2019	II Mid Examinations starts for I-II, II-II, III-II, and IV-II, B. Tech Students, and IV-I IMBA (Sem VII) Students
20	3/30/2019	II Mid Examinations ends for I-II, II-II, III-II, and IV-II, B. Tech Students, and IV-I IMBA (Sem VII) Students
21	3/30/2019	I Mid Examinations ends for I-II MCA Students
22	3/30/2019	II Unit of Instructions starts for II-II MCA Students (Sem IV) and II-II IMBA (Sem IV) students
23	3/30/2019	I Unit of Instructions ends for I-II M. Tech Students
24	3/30/2019	End Examinations completed for III-II IMBA (Sem IV) Students
25	3/31/2019	Farewell Day
		APRIL
1	4/1/2019	II Mid Examinations starts for II-II MCA Students (Sem IV) and II-II IMBA (Sem IV) students
2	4/1/2019	**Commencement of Class Work for IMBA IV-VII sem I Unit of Instructions starts**
3	01-04-2019 to 06-04-2019	Faculty development program on "APPLIED ROBOTICS CONTROL" organized by department of Mechanical Engineering
4	01-04-2019 to 06-04-2019	Preparation and Practicals for I-II, II-II, III-II, and IV-II, B. Tech Students, and IV-I IMBA (Sem VII) Students
5	4/1/2019	II Unit of Instructions starts for I-II MCA Students
6	4/1/2019	I Mid Examinations starts for I-II M. Tech Students
7	4/5/2019	Babu Jagjivan Ram Jayanthi
8	4/6/2019	I Mid Examinations ends for I-II M. Tech Students
9	4/6/2019	Holiday
10	4/8/2019	End Examinations starts for I-II, II-II, III-II, and IV-II, B. Tech Students, and IV-I IMBA (Sem VII) Students
11	4/8/2019	II Unit of Instructions starts for I-II M. Tech Students
12	4/8/2019	II Mid Examinations ends for II-II MCA Students (Sem IV) and II-II IMBA (Sem IV) students
13	09-04-2019 to 13-04-2019	Preparation and Practicals for II-II MCA Students (Sem IV) and II-II IMBA (Sem IV) students
14	11-04-2019 to 13-04-2019	Holidays
15	4/14/2019	Dr.B.R. Ambedkar Jayanthi

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17	4/15/2019	End Examinations starts for II-II MCA Students (Sem IV) and II-II IMBA (Sem IV) students
18	4/20/2019	End Examinations completed for I-II, II-II, III-II, and IV-II, B. Tech Students, and IV-I IMBA (Sem VII) Students
19	4/20/2019	II Unit of Instructions ends for II-II MBA Students
20	4/22/2019	II Mid Examinations starts for II-II MBA Students
21	22-04-2019 to 08-06-2019	Summer vacation for IV-I IMBA (Sem VII) Students
22	4/27/2019	II Mid Examinations ends for II-II MBA Students
23	4/27/2019	End Examinations completed for II-II MCA Students (Sem IV) and II-II IMBA (Sem IV) students
24	29-04-2019 to 04-05-2019	Preparation for II-II MBA Students
25	29-04-2019 to 01-06-2019	Summer vacation for II-II IMBA (Sem IV) students
	MAY	
1	01-05-2019 to 12-05-2019	Faculty development program on "CISCO (CCNA)"organized by Department of CSE
2	04-05-2019	II Unit of Instructions ends for I-II MBA and I-II IMBA Students
3	06-05-2019	II Mid Examinations starts for I-II MBA and I-II IMBA Students
4	06-05-2019	End Examinations starts for II-II MBA Students
5	11-05-2019	II Mid Examinations ends for I-II MBA and I-II IMBA Students
6	13-05-2019 to 18-05-2019	Preparation for I-II MBA and I-II IMBA Students
7	13-05-2019 to 03-08-2019	Thesis submission for M. Tech students, Sem IV
8	18-05-2019	End Examinations completed for II-II MBA Students
9	20-05-2019	End Examinations starts for I-II MBA and I-II IMBA Students
10	25-05-2019	II Unit of Instructions ends for I-II MCA Students
11	25-05-2019	I Unit of Instructions ends for IMBA IV-VII sem
12	27-05-2019	II Mid Examinations starts for I-II MCA Students
13	27-05-2019 to 01-06-2019	I Mid Examinations for IMBA IV-VII sem
14	01-05-2019 to 14-05-2019 & 20-05-2019 to 31-05-2019	Summer Vacation
	JUNE	
1	6/1/2019	II Unit of Instructions ends for I-II M. Tech Students
2	6/1/2019	End Examinations completed for I-II MBA and I-II IMBA Students
3	6/1/2019	II Mid Examinations ends for I-II MCA Students
4	6/3/2019	II Mid Examinations starts for I-II M. Tech Students
5	03-06-2019 to 06-0-2019	Project work starts for I-II MBA Students
6	03-06-2019 to 08-06-2019	Preparation and Practicals for I-II MCA Students
7	6/5/2019	Ramzan
8	6/8/2019	II Mid Examinations ends for I-II M. Tech Students
9	6/8/2019	Second Saturday
10	6/10/2019	End Examinations starts for I-II MCA Students
11	10-06-2019 to 15-06-2019	Preparation and Practicals for I-II M. Tech Students
12	6/17/2019	End Examinations starts for I-II M. Tech Students
13	6/22/2019	End Examinations completed for I-II MCA Students
14	6/29/2019	End Examinations completed for I-II M. Tech Students

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SRKIT / ME / 09

RECORD OF SUBJECT WISE ALLOTMENT & RESPONSIBILITIES

Academic year:2018 – 19 **Semester:II Sem**

S. No	Name of the Faculty	Theory subjects		Labs		Work Load / week (Periods)	Other responsibilities	Signature
		Subject Title	Branch	Lab Title	Branch			
1	Dr. T. S. S. Balaji						HOD	
2	A. Stanley Kumar	Robotics	ME-III_A&B	CFD	III Mech	24	In charge HOD, NAAC Coordinator	
3	V. Bala Chinalingam	KOM	ME-II_A&B	FM & HM	II Mech	24	ISO, Anti Ragging, Industrial Visit, Class Teacher	
4	V. Kranthi Kumar	ICS	ME-III_A&B	ICS / MET	III Mech	24	ISO Auditor, Machine Tool Lab In charge, ARC Coordinator	
5	G. Durga Prasad	Machine Drawing	ME-II_A&B	PT	II Mech	24	ISO In charge, SIM Lab In charge	
6	D. Rognath Rao	PPE	ME-IV_A&B	Workshop	I Mech	24	Mentor, Anti Ragging, NAAC	
7	Z. Jithendra	EM	CSE& IT	Drawing Assistant	I	24	Mentor, Workshop	
8	P. Bhagya Lakshmi	Metrology	ME-III_A&B	ICS / MET	III Mech	24	Class In charge, PT Lab In charge, ISO File, Mentor	
9	V. Pavan Kumar	DMM – I	ME-II_A&B	FM & HM	II Mech	24	Mentor, Anti Ragging	
10	G. Vijaya Rao	GES	ME-IV_A&B	-	-	18	TE Lab In charge	

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RECORD OF SUBJECT WISE ALLOTMENT & RESPONSIBILITIES

S. No	Name of the Faculty	Theory subjects		Labs		Work Load / week (Periods)	Other responsibilities	Signature
		Subject Title	Branch	Lab Title	Branch			
11	R. Sambath Kumar	NDE	ME-IV_A&B	PT Lab	II Mech	21	Placement Coordinator, Class Teacher, Mentor	
12	D. Sree Ram Prasad	TE – I	ME-II_A&B	HT	III Mech	21	HT lab,In charge	
13	Y. Durga Bhavani	HT	ME-III_A&B	HT	III Mech	21	Mentor, Anti Ragging	
14	R. Karun Kumar	PT	ME-II_A&B	Workshop		21	Class Teacher	
15	R. Kiran Kumar	IEM, EM	ME-II_A&B	-	-	21	Anti-Ragging	
16	M. Chaitanya	R & AC, PPC	ME-III_A&B	-	-	21	Anti-Ragging	
17	U. Tanoj	EMT, EME	CE, ECE-I, IV	Drawing Assistant	I Civil	21	Class Teacher	
18	D. Haritha	Engineering Drawing	Civil, Mech-I	-	-	21	Anti-Ragging	

HOD/ Date

Principal / Date

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(ISO 9001:2015 Certified Institution)

Academic Year: 2018 - 2019 **Class: II ME** **Semester: II**

SECTION A									
Time	9:00 to 9:50	9:50 to 10:40	10:45 to 11:35	11: 35 to 12:25	LUNCH	1:10 to 2:00	2:00 to 2:45	2:50 to 3:35	3:35 to 4:20
Period	1	2	3	4		5	6	7	8
MON	MD					DMM-1	TE-1	PT	IEM
TUE	KOM	TE-1	PT	IEM		KOM	PT LAB/FMHM		
WED	IEM	MD				KOM	TE-1	DMM-1	PT
THU	PT	TE-1	KOM	DMM-1		IEM	PT LAB/FMHM		
FRI	DMM-1	TE-1	IEM	DMM-1		KOM	PT	KOM	IEM
SAT	IEM	TE-1	PT	DMM-1		KOM	SEMINAR		---

Design of Machine Members – I	Mr. V. Pavan Kumar	**Kinematics of Machinery**	Mr. V. Bala Chinalingam
Production technology	Mr. Y N V Santosh	**Machine Drawing**	Mr. G. Durga Prasad
Thermal Engineering – I	Mr. D. Sree Ram Prasad	**Production technology Lab**	Mr. G. Durga Prasad, Mr. R. Sambath
Industrial Engineering & Management	Mr. R. Kiran Kumar	**Fluid Mechanics & Hydraulic Machinery**	Mr. V. Bala Chinalingam, Mr. V. Pavan Kumar

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Faculty Individual Time Table

Academic Year: 2018 - 2019 **Class: II ME** **Semester: II**

R. KIRAN KUMAR									
Time	9:00 to 9:50	9:50 to 10:40	10:45 to 11:35	11: 35 to 12:25	LUNCH	1:10 to 2:00	2:00 to 2:45	2:50 to 3:35	3:35 to 4:20
Period	1	2	3	4		5	6	7	8
MON									IEM(A)
TUE				IEM(A)					
WED	IEM(A)								
THU						IEM(A)			
FRI			IEM(A)						IEM(A)
SAT	IEM(A)								

Signature of Faculty: ---------- Signature of HOD: ----------

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SRK INSTITUTE OF TECHNOLOGY VIJAYAWADA	**SRK INSTITUTE OF TECHNOLOGY** **Enikepadu, Vijayawada 521108** **Department of MECHANICAL ENGINEERING** **TEACHING PLAN CUM REALIZATION**	**SRKIT / ME /12**

Department: **MECHANICAL ENGINEERING** Name of faculty: **R.KIRAN KUMAR** Designation: **ASSISTANT PROFESSOR**

Semester / Year: **II/II** Name of the subject: **INDUSTRIAL ENGINEERING AND MANAGEMENT** Section: **A**

S. No	Unit / Topic	Teaching Planned	Taught on (Date)	No of Periods (actual taken)	Remarks (if any deviation)
	Unit - 1				
1	**INTRODUCTION:** Definition of industrial engineering		22/11/2018	1	-
2	Development, applications, role of an industrial engineer		23/11/2018	1	-
3	Differences between production management and industrial engineering		28/11/2018	1	-
4	Quantitative tools of industrial engineering		29/11/2018	1	-
5	Productivity measurement	**From:22/11/2018**	29/11/2018	1	-
6	Concepts of management		30/11/2018	1	-
7	Importance, functions of management	**To: 7/12/2018**	30/11/2018	1	-
8	Scientific management		1/12/2018	1	-
9	Taylor's principles		6/12/2018	1	-
10	Theory X and theory Y		6/12/2018	1	-
11	Fayol's principles of management		7/12/2018	1	-

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	Unit - 2				
12	**PLANT LAYOUT:** Factors governing plant location		7/12/2018	1	-
13	Types of production layouts		12/12/2018	1	-
14	Types of production layouts		13/12/2018	1	-
15	Advantages, disadvantages and applications of process layout	**From: 07/12/2018**	13/12/2018	1	-
16	Advantages, disadvantages and applications product layout	**To:20/12/2018**	14/12/2018	1	-
17	Quantitative techniques for optimal design of layouts		14/12/2018	1	-
18	Plant maintenance		15/12/2018	1	-
19	Preventive maintenance		19/12/2018	1	-
20	Breakdown maintenance		20/12/2018	1	-
21	Breakdown maintenance and preventive maintenance causes and remedies		20/12/2018	1	-
	Unit - 3				
22	**OPERATIONS MANAGEMENT:** Importance ofOperations management	**From:21/12/2018**	21/12/2018	1	-
23	Types of production		27/12/2018	1	-
24	Applications, work study	**To: 09/01/2019**	27/12/2018	1	-
25	Method study and time study		28/12/2018	1	-

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26	Work sampling		29/12/2018	1	-
27	Pre determined motion time system (pmts)		2/1/2019	1	-
28	Micro-motion study		3/1/2019	1	-
29	Rating techniques		4/1/2019	1	-
30	Method time measurement (MTM), work factor system		4/1/2019	1	-
31	Principles of Ergonomics, Flow process charts		4/1/2019	1	-
32	String diagrams and Therbligs		5/1/2019	1	-
33	Approaching industries diagram		9/1/2019	1	-
			9/1/2019	1	-
	Unit - 4				
34	**STATISTICAL QUALITY CONTROL:** Definition of Quality control		10/1/2019	1	-
35	Methods of quality control	**From:10/1/2019**	10/1/2019	1	-
36	Quality control importance		18/1/2019	1	-
37	SQC, attribute sampling inspection		23/1/2019	1	-
38	Single and Double sampling, examples	**To: 21/2/2019**	24/1/2019	1	-
39	Control charts, Types of Control charts		24/1/2019	1	-
40	$\overline{X}$and R charts		25/1/2019	1	-
41	$\overline{X}$ AND S charts		25/1/2019	1	-
42	Control charts applications, Numerical calculation		30/1/2019	1	-

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43	**Total quality management:** zero defect concept		13/2/2019	1	-
44	Quality circles, implementation, applications		20/2/2019	1	-
45	ISO quality systems		21/2/2019	1	-
46	Six sigma – definition, Basic concepts		21/2/2019	1	-
	Unit - 5				
47	**RESOURCE MANAGEMENT:** Concept of human resource Management		22/2/2019	1	-
48	Personnel management, And industrial relations		23/2/2019	1	-
49	Functions of personnel management	**From:22/02/2019**	28/2/2019	1	-
50	Functions of industrial relations		28/2/2019	1	-
51	Job-evaluation and importance		1/3/2019	1	-
52	Types of job-evaluation	**To:8/03/2019**	6/3/2019	1	-
53	Merit rating		7/3/2019	1	-
54	Quantitative methods		7/3/2019	1	-
55	Wage plans, Incentive plans Types		8/3/2019	1	-
	Unit - 6				
56	**VALUE ANALYSIS:** Value engineering	**From: 13/03/2019**	13/3/2019	1	-
57	Implementation procedure		14/3/2019	1	-
58	Enterprise resource planning	**To: 23/03/2019**	14/3/2019	1	-
59	And supply chain management.		15/3/2019	1	-

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60	Project management- pert, Critical path		15/3/2019	1	-
61	Project management -Cpm		16/3/2019	1	-
62	Differences & applications		16/3/2019	1	-
63	Value engineering and its Importance		20/3/2019	1	-
64	Determination of floats		22/3/2019	1	-
65	Project crashing		22/3/2019	1	-
66	Smoothing and numerical examples		23/3/2019	1	-

27/3/19

Faculty/ Date

I/C

HOD/Date

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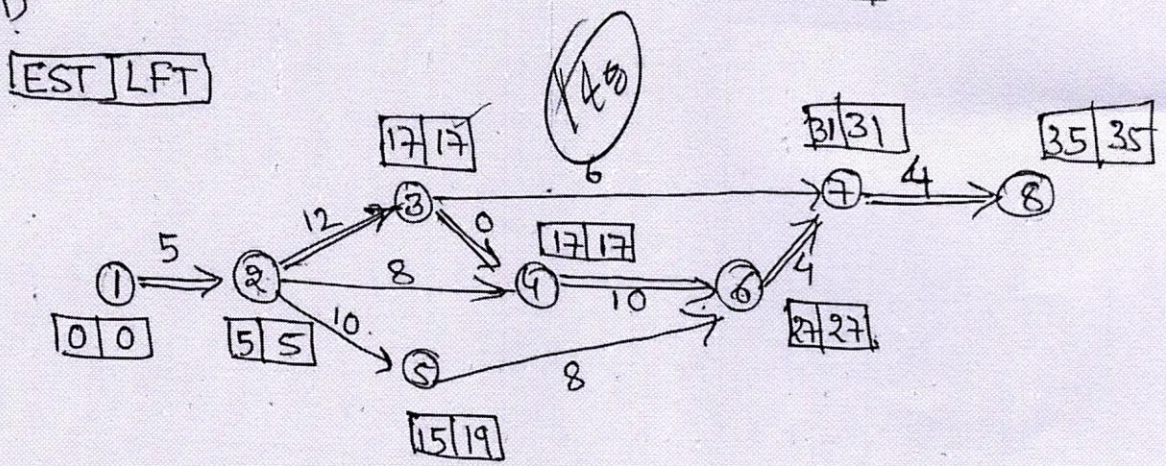
Ans

Activity	t_o	t_m	t_p	t_e	S_t	V_t
1-2	2	5	8	5	1	1
2-3	8	11	20	12	2	4
3-4	0	0	0	0	0	0
2-4	4	7	16	8	2	4
2-5	4	9	20	10	2.66	7.11
4-6	7	10	13	10	1	1
5-6	3	7	17	8	2.33	5.44
3-7	3	5	13	6	1.66	2.77
6-7	2	3	10	4	1.33	1.77
7-8	2	4	6	4	0.66	0.44

(i)



$$t_e = \frac{t_o + 4t_m + t_p}{6}$$

t_e = estimated time (or) Duration.

$$S_t = \left[\frac{t_p - t_o}{6}\right]$$

S_t = Standard Deviation time

$$V_t = \left[\frac{t_p - t_o}{6}\right]^2$$

V_t = Variance time

t_e = Estimated time.

t_o = Optimistic time.

t_m = Most likely time

t_p = Pessimistic time

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PERT PROBLEM.

(1) The table given below shows the activity details for a construction project, with the time estimates of each activity in days.

Activity	Time estimate.		
	optimistic	most likely	pessimistic
1-2	2	5	8
2-3	8	11	20
3-4	0	0	0
2-4	4	7	16
2-5	4	9	20
4-6	7	10	13
5-6	3	7	17
3-7	3	5	13
6-7	2	3	10
7-8	2	4	6

(i) Construct the network.
(ii) Find the critical path and project duration.
(iii) Determine the probability of completion of project in 40 days.
(iv) Also determine slack.

P.T.O.

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Question or statement possesses certain points which when totalled together for all the relevant questions indicate the ratings of an employee.

③ Employee comparison method:-

The method compares a worker on a job with all other workers on the same job, in pairs. Suppose there are four workers namely W, X, Y and Z. Then

W is compared with X and suppose W is better.
W is compared with Y and suppose Y is better.
W is compared with Z and suppose W is better.

Next

X is compared with Y and suppose Y is better
X is compared with Z and suppose Z is better.

Next

Y is compared with Z and suppose Y is better.

The summary of the result shows that

W - turned out to be better - 2 times
X - turned out to be - Nill
Y - turned out to be better - 3 times (max)
Z - turned out to be better - 1 time

∴ the worker Y is taken to be the best worker.

This method consumes much time especially when the no. of employees to be compared

(a) Refine the merit factors to rate the employees. The different factors, according to the nature of job may be as follows.

(i) Standard of output (ii) Quantity of output
(iii) Intelligence (iv) Job Knowledge
(v) Leadership (vi) Integrity.
(vii) Dependability (viii) Education & experience
(ix) co-operation (x) Adaptability.
(xi) Efforts & initiative (xii) Judgement.
(xiii) character (xiv) Loyalty.
(xv) Health & appearance.

The number of factors employed for rating an employee may vary from six to ten.

(b) Divide each factor into 3 to 5 different grades or degrees like Excellent, very good, Good, Fair & unsatisfactory.

(c) Impart certain points to each grades.

(d) The worth of an employee can be determined from the total points he gets for all his merit factors. On the basis of these points different workers can also be compared.

(2) Check list method:-

This method employs a list of questions and several statements which are concerned with the employee performance on various aspects of the job. Each

UNIT-5.

(8) Why an employee must be rated? State and explain different methods of employee rating.

Ans:- Merit rating is a systematic and orderly approach to assess the relative worth of an employee working in an organization in terms of his job performance, integrity, leadership, intelligence, behaviour, etc...

→ Merit rating provides a record of the worth of employees; therefore they can be put on the most appropriate jobs depending upon their capabilities.

→ Merit rating unfolds the limitations of an employee and thus helps in employee improvement.

→ Merit rating records form a basis for:

1. Wage - increase.
2. Promotion.
3. Special assignments
4. Training
5. Transfer &
6. Discharge.

Methods:-

1. Rating scale method:- Rating scale method the steps involved in Rating scale are

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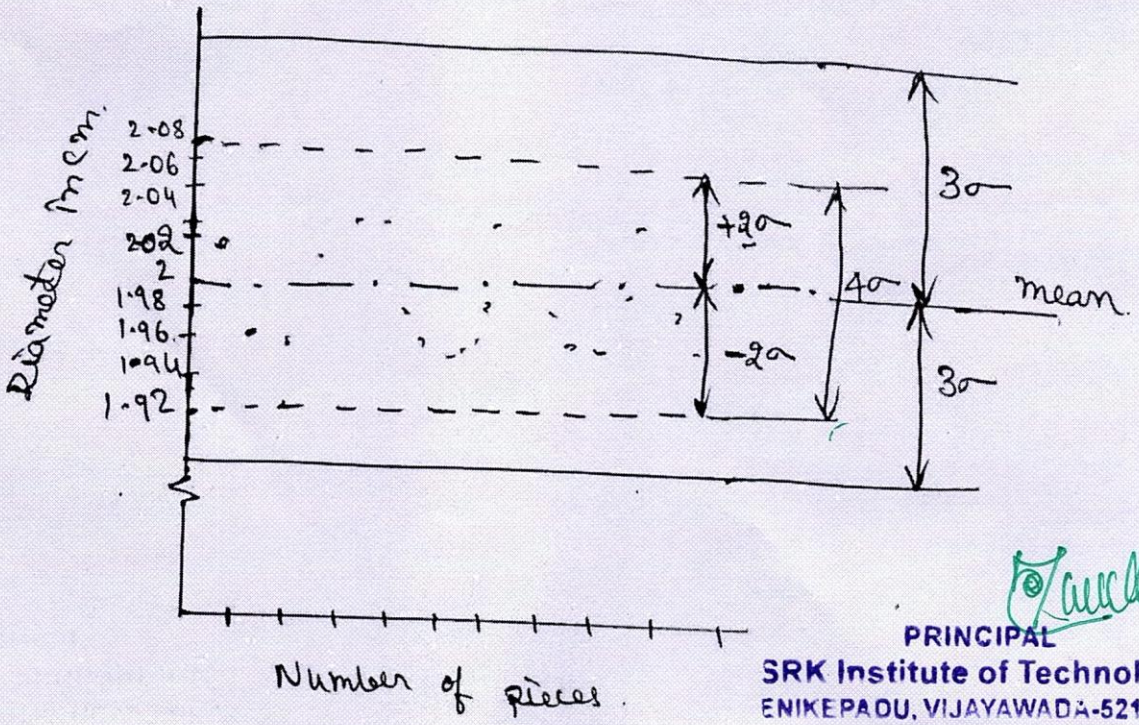
2) What do you mean by control chart and discuss control charts for attributes?

Control chart is a (day to day) graphical presentation of the collected information. the information pertains to the measured or otherwise judged quality characteristics of the items or the samples. the purpose of control chart is to detect these changes in dimensions and indicate ~~the~~ if the component parts being manufactured are within the specified tolerance or not.

Assume a turret was set to produce 1000 spindles of 2cm diameter. After they were made, their diameters were measured and plotted as below. (8)



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control:-

control is a system for measuring and checking a phenomenon. It suggests when to inspect, how often to inspect and how much to inspect. In addition, it incorporates a feedback mechanism which explores the causes of poor quality and takes corrective action.

Benfits of statistical Quality control:-

1. It provides a means of detecting error at inspection.
2. It leads to more uniform quality of production.
3. It improves the relationship with the customer.
4. It reduces Inspection costs.
5. It reduces the number of rejects & saves the cost of material.
6. It provides a basis for attainable specifications.
7. It points out the bottleneck and trouble ~~spots~~ spots.
8. It provides a means of determining the capabilities of the manufacturing process.

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Define SQC. what are its benefits?

Statistics:-

Statistics means data, a good amount of data to obtain reliable results. The science of statistics handles this data in order to draw certain conclusions. Statistical techniques find extensive application in quality control, production planning & control, business charts, linear programming, etc. (79)

Quality:-

Quality is a relative term and is generally explained with reference to the end use of the product. For example, a gear used in a sugar-cane juice extracting machine though not of the same material and without possessing good finish, tolerances and accuracy as that of a gear used in the head stock of a sophisticated lathe may be considered of good quality if it works satisfactorily in the juice extracting machine. Thus, a component is said to be of good quality if it works well in the equipment for which it is meant. Quality is thus defined as fitness for purpose.

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method being practised is the same or it has deviated from the authorised one. Reasons for deviation if any should be explored and the necessary changes may be made in the procedure being practised so that it reverts to the authorised one. Views of the workers, supervisors and other persons related with the authorised method can be of much help in exploring further improvements.

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④ Develop

Develop the best method as resulted from critical examination and record it. The developed method should be,

(i) Practical and feasible,
(ii) Safe and effective,
(iii) economical, and
(iv) Acceptable to design, Production control, quality control and sales departments.

⑤ Install

Install the best developed method or the improved method. Installation involves three phases, namely - Planning, arranging and implementing. During first two stages the programme of installation and a time table, are planned and the necessary arrangements of resources, equipments, tools and instructions to workers, over-time, etc, are made. Installation phase is complete as soon as the new method starts working smoothly and satisfactorily and gives encouraging results (like saving in time, scrap reduction, etc.)

⑥ Maintain.

Maintain the new method, i.e.; ensure the proper functioning of the installed method by periodic checks and verifications. The purpose of checks and reviews is to find if the

(3) Examine.

Examine the recorded events critically and in sequence. Critical examination involves answer to a number of questions. An activity can be eliminated, simplified or combined with another. the basic questions are,

Purpose. what is done?

Person. who does it?

Place. where it is done?

Means. How is it done?

Sequence. when is it done?

The above-mentioned five basic questions, individually are further subjected to enquiries like,

Why. why is it necessary, why he does it, why it is done there, why is it done by that method and why is it done at that time?

Alternative ways of Doing.

what else could be done, who else could do it, where else it could be done, how else it could be done and when else it could be done.

Best method of Doing.

what should be done, who should do it, where it should be done, how it should be done, and when it should be done.

1. Explain method study procedure.

Ans. The various steps involved are:

① Select

Select the work worth studying and define the objectives to be achieved. An objective may be to reduce the manufacturing cost, or to reduce bottlenecks or to reduce fatigue incurred by the workers in order to increase their efficiency.

② Record

Record all the relevant informations pertaining to the existing method in details and in the form of a chart to obtain a more clear picture about the same. Recording can be done with the help of following aids: (14)

(a) Process chart
   (i) outline process chart
   (ii) Flow process chart, Man type, material type and equipment type.
   (iii) Two handed process chart and
   (iv) Multiple activity chart.

(b) Diagrams:
   (i) Flow diagrams
   (ii) string diagrams
   (iii) Cyclegraph &
   (iv) Chronocyclegraph.

(c) Motion & Film Analysis.
   (i) Simo chart.

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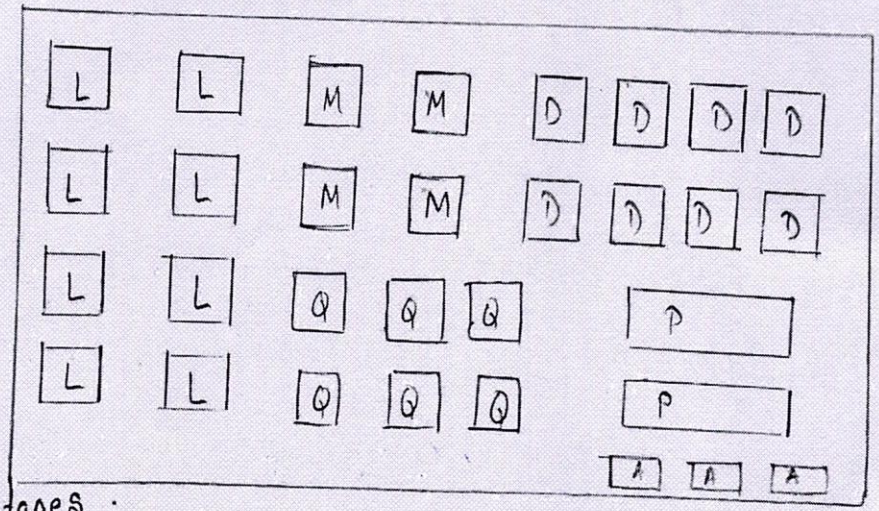
5. Explain different types of plant layout ?

* Process layout
* Product layout
* Combination layout
* Fixed position layout

Process layout : The process layout is particularly useful where low volume of production is needed. In this type of layout, the machines and not arranged according to the sequence of operations but are arranged according to nature or type of operations. This layout is suitable for non repetitive jobs. Same type of operation facilities are grouped together such as lathes will be placed at one place, all the drill machines at another place and so on



Advantages :

→ Total investment in equipment purchase will be reduced
→ It offers better and more efficient supervision through specialization at various levels
→ Better utilization of equipment available is possible

(vi) local laws, Regulations and Taxes :
laws prohibit the Setting up of polluting industries in prone areas particularly which are environmentally Sensitive. Air (prevention and Control of pollution) Act, 1981 is a classical example of Such laws prohibiting putting up polluting industries in prone areas. Therefore, in order to control industrial growth, laws are enforced to decongest Some areas while Simultaneously encourage certain Other areas.

(vii) Ecological and Environmental factors : In Case of certain industries, the ecological and environmental factors like water and air pollution may turnout to be negative factor in deciding enterprise location. The industries which are likely to damage the ecology and environment of an area will not be established in ecologically and environmentally Sesitive areas. (21)

(viii) Competition : In case of Some enterprises like retail store where the revenue of a particular Site depends on the the degree of Competition from other competitors. The areas where there is more competition among industries, the new units will not be established in these areas. On, the Other hand where there is either no or very less competition, new enterprises will tend to be established in Such areas.

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Therefore, while considering the market an entrepreneur has not only to assess the existing segment and the region but also the potential growth, newer regions and location of competitors. If transportation costs add substantially to one's product costs, then also a location close to market becomes more essential.

iii) Infrastructural facilities : They play a major deciding role in the location selection of an industry. The infrastructural facilities include power, transport and communication, water, banking etc. Depending upon the types of industry these could assume disproportionate properties. power, water supply at low cost may become a dominant decisional factor in case of selection of industrial location for [leather] many industries.

iv) Government Policy : In order to promote the balanced regional development, the government also offers several incentives, concessions, tax holidays for number of years, cheaper power supply, factory shed etc., to attract the entrepreneurs to set up industries in less developed & backward areas.

v) Availability of Manpower : Availability of required manpower skilled in specific trades may be yet another deciding factor for location of skill-intensive industries. As regards, the availability of skilled labour the [illegible] of technical training institutes in area proves

UNIT-2.

What are the factors governing plant location.

Plant: A plant is a place where men, materials, money, equipment, machinery, etc are brought together for manufacturing products.

Plant location:

Plant location means deciding a suitable location, area, place, etc where the plant or factory will start functioning.

Factors Governing plant location are:

(i) Availability of Raw materials:

One of the most important considerations involved in selection of industrial location has been the availability of raw materials required. The biggest advantage of availability of raw material at the location of industry is that it involves less cost in terms of transportation cost. If the raw materials are perishable and to be consumed as such, then industries always tend to locate nearer to raw material source.

(ii) Proximity to Market:

Production has no value without consumption. Consumption involves market that is, selling goods and products to the consumers. Thus an industry cannot be thought without market

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d) Supervision:

Supervision is necessary in order to ensure

i) That the work is going on as per the plan established

ii) That the workers are doing as they were directed to do

e) Coordinating

Coordinating means achieving harmony of individual effort towards the accomplishment of company objectives.

f) Controling: Controlling is the Process that measures the current performance and guides it towards some Predetermined goals.

(4)

g) Decision Making: Decision making is the Process by which a course of action is chosen from available alternatives for the Purpose of achieving desired results.

(3) Describe the tools and techniques of Industrial Engineering.

The tools and techniques of Industrial Engineering aim at improving the Productivity of the organisation by optimum utilisation of organisation's resources, i.e men, materials and machines. The various tools and techniques of Industrial engineering are

* Method study: To establish a standard method of Performing a job or an operation after thorough analysis of the jobs and to establish the layout of Production facilities to have on uniform flow of material without back tracking

* Time study (work measurement): This is a technique used to establish a standard time for a job or for an operation.

* Motion economy: This is used to analyse the motions employed by the operations to do the work. The Principles of

4) Staffing: staffing is the Process by which a manager select, train, Promote and retair their subordinates. staffing involves the developing and placing of qualified People in the various jobs in the organization. staffing is a continuous process. the aim is to have appropriate Persons to move into vacated Positions.

5) Diricting: Directing is the Process by which actual Performance of subordinates is guided towards common goals of the enterprize.

Diricting includes:
- Giving instructions to subordinates
- Guiding the subordinates to do work
- Supervising the subordinates.

Directing involves

1) Leadership.

It is the quality of the behaviour of the Persons where by they inspire confidence and trust in thair subordinates, get maximum cooperation from them and guide their activities in organized effort.

2) communication:

communication is the Process by which ideas are transmitted, received and understood by other for the purpose of effecting desired result

3) Motivation: Motivating means inspiring the subordinates to do a work or to achieve company objectives effectively and efficiently.

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2) Discuss the function of management.

Ans 1) Forecasting

It estimates the future work or what should be done in future, may be regards sales or Production or any other aspect of business activities.

2) Planning

Planning is a total rational, economic, systematic way of making decision today which will affect the future. Planning is deciding in advance - what to do. when to do and how to do. & how It bridges the gap from where we are and where we want to be. It is an exercise in Problem solving and decision making. Planning is determination of courses of action to achieve desired goals. Thus, Planning is a systematic thinking about ways & means for accomplishment of predetermined goals. Planning is necessary to ensure Proper utilization of human & non-human resources. It is all Pervasive, It is an Intellectual activity and it also helps in avoiding confusion, uncertainties, risks, wastages etc.

3) Organising: Organising is the Process by which the structure and allocation of job is determined. It is the Process of bringing together physical, financial and human resources and developing Productive relationship amongst them for achievement of organizational goals. organizing as a Process involves.

* Identification of activities
* Classification of grouping of activities

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Define Industrial Engineering. what is its Importance?

American Institute of Industrial Engineers [AIIE] defines Industrial Engineering as follows, "Industrial Engineering is concerned with the design, Improvement and Installation of Integrated system of men, materials and equipment. It draws upon specialized knowledge and skills in the mathematical, Physical sciences together with the Principles and methods of engineering analysis and design to specify Predict and evaluate the results to be obtained from such system.

Industrial Engineering is engineering approach to the detailed analysis of the use and cost of the resources of an organization. The main resources are men, money, material, equipment and machinery.

An Industrial engineer is associated with organization, structure, administrative techniques, human problems and at the same time he understand the relationship efficiency and concept. An Industrial Engineer is engaged in the design of the system and his function is Primarily that of management.

An Industrial engineer had to focus on only one concept to describe his field of interest, It would have to be Productivity improvement

Productivity improvement implies

) a more efficient use of resources

Less waste Per unit of input supplied

) higher level of output for fixed level of input supplied and soon.

The inputs may be human effort, materials, energy, invested capital in any of its multiple forms

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(ii) Critical path is

① → ② → ③ → ④ → ⑥ → ⑦ → ⑧

which consumes maximum resources and maximum time.

The project duration is - 35 days.

(iii) completion of project in 40 days

(19)

$$Z = \frac{D - Te.}{St}$$

Te - total project duration - 35 days.

D - scheduled time - 40 days.

St - standard deviation = $\sqrt{\text{variance of project}}$

To calculate variance consider critical path of the project and note down the corresponding variance values.

Critical Path

① → ② → ③ → ④ → ⑥ → ⑦ → ⑧

1 4 0 1 1.77 0.44

$St = \sqrt{Vt}$

$St = \sqrt{1+4+0+1+1.77+0.44} = 2.865$

$$Z = \frac{D - Te.}{St} = \frac{40 - 35}{2.865} = 1.745.$$

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PROGRAMME OF INSTRUCTION ACCORDING TO TIME TABLE AND ALMANC

Theory / Drawing / Practical

Name of Teacher (s) 1. P. Kiran kumar — II Year — II Semester — B.Tech Course — Mech Branch — IEM Subject

2. Academic Year 2018-19

Sl. No.	Periods			Topic Covered	Sl. No.	Periods			Topic Covered
	Day	Time	Date			Day	Time	Date	
(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
1	Thursday	10:45-11:35	22/11/18	Def of industrial engg	21	Thursday	3:35-4:20	20/12/18	Break down maintenance & Preventive maintenance Causes & remedies
2	Friday	10:45-11:35	23/11/18	Development, App, role of an IE	22	Friday	10:45-11:35	21/12/18	Imp of operations management
3	Wednesday	2:00-2:45	28/11/18	Diff b/w Production mgmt & IE	23	Thursday	11:35-12:25	27/12/18	Types of Production
4	Thursday	10:45-11:35	29/11/18	quantitative tools of IE	24	Thursday	3:35-4:20	27/12/18	APP, Work Study
5	Thursday	11:35-12:25	29/11/18	Productivity measurement	25	Friday	10:45-11:35	28/12/18	Method Study & time Study
6	Friday	10:45-11:35	30/11/18	Concepts of management	26	Saturday	9:00-9:50	29/12/18	Work Sampling
7	Friday	3:35-4:20	30/11/18	IMA, functions of management	27	Wednesday	11:35-12:25	2/1/19	PMTS
8	Saturday	9:00-9:50	1/12/18	Scientific management	28	Thursday	11:35-12:25	3/1/19	Micro-motion Study
9	Thursday	11:35-12:25	6/12/18	Taylor's Principle	29	Friday	10:45-11:35	4/1/19	Rating Techniques
10	Thursday	3:35-4:20	6/12/18	Theory X & Theory Y	30	Friday	3:35-4:20	4/1/19	MTM, work factor system
11	Friday	10:45-11:35	7/12/18	Fayol's Principles	31	Friday	3:35-4:20	4/1/19	Ergonomics, Flow Process charts
12	Friday	3:35-4:20	7/12/18	factors governing plant location	32	Saturday	9:00-9:50	5/1/19	String diagram & Therbligs
13	Wednesday	11:35-12:25	12/12/18	Types of Production layout	33	Wednesday	11:35-12:25	9/1/19	APP Teaching industries diagram
14	Thursday	11:35-12:25	13/12/18	Types of Production layout	34	Thursday	11:35-12:25	10/1/19	Def of QC
15	Thursday	3:35-4:20	13/12/18	Adv, disAdv & APP of process layout	35	Thursday	3:35-4:20	10/1/19	Methods of QC
16	Friday	10:45-11:35	14/12/18	Adv, disAdv & APP of Product layout	36	Friday	10:45-11:35	11/1/19	Imp of QC
17	Friday	3:35-4:20	14/12/18	Quantitative techniques for Plant	37	Wednesday	11:35-12:25	23/1/19	SQC, attribute sampling inspection
18	Saturday	9:00-9:50	15/12/18	plant maintenance	38	Thursday	11:35-12:25	24/1/19	single & double sampling examples
19	Wednesday	11:35-12:25	19/12/18	Preventive maintenance	39	Thursday	3:35-4:20	24/1/19	Control charts APP, Numericals
20	Thursday	11:35-12:25	20/12/18	Break down maintenance	40	Friday	10:45-11:35	25/1/19	$\bar{x}$ & R chart

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PROGRAMME OF INSTRUCTION ACCORDING TO TIME TABLE AND ALMANC

II Year III Semester B.Tech Course Mech Branch I EM Subject

Theory / Drawing / Practical

Name of Teacher (s) 1. R. Kiran Kumar

2.

Academic Year 2018-19

Sl. No.	Periods			Topic Covered	Sl. No.	Periods			Topic Covered
	Day	Time	Date			Date	Time	Date	
(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
41	Friday	3:35-4:20	25/1/19	$\bar{x}$ & s chart	61	16/3/19	9:50-10:40	saturday	Project management - CPM
42	Wednesday	11:35-12:25	30/1/19	control charts applications & Num	62	16/3/19	2:00-2:45	saturday	Differences & APP
43	Wednesday	11:35-12:25	13/2/19	Zero defect Concept	63	20/3/19	11:35-12:25	wednesday	Value Engineering & its Imp
44	Wednesday	11:35-12:25	20/2/19	quality circles, implem, APP	64	22/3/19	10:45-11:35	friday	Determination of floats
45	Thursday	11:35-12:25	21/2/19	ISO quality systems	65	22/3/19	3:35-4:20	friday	Project crashing
46	Friday	10:45-11:35	22/2/19	six Sigma - def, Basic Concepts	66	23/3/19	9:00-9:50	saturday	smoothing & numerical examples
47	Friday	3:35-4:20	22/2/19	Concepts of human resource manage	67				
48	saturday	9:50-10:40	23/2/19	personal manag & industrial relations	68				
49	Thursday	11:35-12:25	28/2/19	functions of personal management	69				
50	Thursday	3:35-4:20	28/2/19	functions & industrial relations	70				
51	Friday	10:45-11:35	1/3/19	Job Evaluation & Imp	71				
52	Wednesday	11:35-12:25	6/3/19	Types of Job Evaluation	72				
53	Thursday	11:35-12:25	7/3/19	Merit rating	73				
54	Thursday	3:35-4:20	7/3/19	Quantitative Method	74				
55	Friday	10:45-11:35	8/3/19	Wage plans, Incentive Plan Types	75				
56	Wednesday	11:35-12:25	13/3/19	Value Engg	76				
57	Thursday	11:35-12:25	14/3/19	Implementation Procedure	77				
58	Thursday	3:35-4:20	14/3/19	Enterprise Resource Planning	78				
59	Friday	10:45-11:35	15/3/19	supply chain management	79				
60	Friday	3:35-4:20	15/3/19	PERT, critical path	80				

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KAKINADA-533003, Andhra Pradesh, INDIA
(Established by AP Government Act No. 30 of 2008)

Lr. No. JNTUK/DAP/Aca.Cal/ IV B.Tech & B.Pharm/2018-19 Date: 24-05-2018

Dr. Ch. Satyanarayana
M.Tech, Ph.D.,
Director, Academic & Planning

To
The Principals of All Affiliated Colleges,
JNTUK, Kakinada

ACADEMIC CALENDAR
for
B.TECH& B.PHARM IV YEAR
2015 BATCH

B.TECH & B.PHARM IV YEAR I Semester			
Description	**From**	**To**	**Weeks**
Commencement of Class Work	**11-06-2018**		
I Unit of Instructions	11-06-2018	04-08-2018	8W
I Mid Examinations	06-08-2018	11-08-2018	1W
II Unit of Instructions	13-08-2018	06-10-2018	8W
II Mid Examinations	08-10-2018	13-10-2018	1W
Preparation & Practicals	15-10-2018	20-10-2018	1W
End Examinations	22-10-2018	03-11-2018	2W
Commencement of Class Work	**19-11-2018**		
B.TECH & B.PHARM IV YEAR II Semester			
I Unit of Instructions	**19-11-2018**	12-01-2019	8W
I Mid Examinations	17-01-2019	23-01-2019	1W
II Unit of Instructions	24-01-2019	23-03-2019	8W
II Mid Examinations	25-03-2019	30-03-2019	1W
Preparation & Practicals	01-04-2019	06-04-2019	1W
End Examinations	08-04-2019	20-04-2019	2W

Director Academic and Planning

Copy to the Secretary to the Hon'ble Vice Chancellor
Copy to the Rector
Copy to the Registrar
Copy to the Director of Evaluation
Copy to the Controller of Examination

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SRK INSTITUTE OF TECHNOLOGY
Enikepadu, Vijayawada 521108
Approved by AICTE, Affiliated to JNTUK, Kakinada
(ISO 9001:2015 Certified Institution)

Academic Calender: 2018-19

S.No	DATE	EVENT
		JUNE
1	6/11/2018	**Commencement of Class Work for I-I, II-I, III-I, and IV-I B. Tech Students and III-I IMBA (Sem V) Students, and IV-I IMBA (Sem VII) students, I Unit of Instructions starts**
		JULY
1	7/2/2018	II Mid Examinations starts for V-I IMBA (Sem IX) Students
2	7/7/2018	II Mid Examinations ends for V-I IMBA (Sem IX) Students
3	09-07-2018 to 14-07-2018	Preparation and Practicals for V-I IMBA (Sem IX) Students
4	7/9/2018	**Commencement of Project Work for II year M. Tech, sem III & IV**
5	09-07-2018 to 08-12-2018	Project Work for II year M. Tech, sem III
6	7/9/2018	**Commencement of Class Work for II-I MCA Students (Sem III) and II-I IMBA (Sem III), I Unit of Instructions starts**
7	7/14/2018	Second Saturday
8	7/16/2018	End Examinations starts for V-I IMBA (Sem IX) Students
9	7/24/2018	Holiday
10	7/28/2018	End Examinations completed for V-I IMBA (Sem IX) Students
11	7/30/2018	**Commencement of Class Work for II-I , MBA Students, I Unit of Instructions starts**
12	7/30/2018	**Commencement of Project work for V-II IMBA (Sem X) Students**
		AUGUST
1	8/4/2018	I Unit of Instructions ends for I-I,II-I, III-I, and IV-I, B. Tech Students , III-I IMBA (Sem V) Students, and IV-I IMBA (Sem VII) Students
2	8/6/2018	I Mid Examinations starts for I-I, II-I, III-I, and IV-I, B. Tech Students, III-I IMBA (Sem V) Students, and IV-I IMBA (Sem VII) Students
3	8/11/2018	I Mid Examination ends for I-I, II-I, III-I, and IV-I, B. Tech Students,III-I IMBA (Sem V) Students, and IV-I IMBA (Sem VII) Students
4	11-08-2018 to 13-08-2018	A Three day Faculty development program on "Advances in reinforced cement concrete design" organized by Department of Civil Engineering
5	8/13/2018	II Unit of Instructions starts for I-I, II-I, III-I, and IV-I, B. Tech Students and III-I IMBA (Sem V) Students, and IV-I IMBA (Sem VII) Students
6	8/13/2018	**Commencement of Class Work for I-I MBA and I-I IMBA Students, I Unit of Instructions starts**
7	8/15/2018	Independence Day
8	8/20/2018	**Commencement of Class Work for I year MCA, sem I**
9	8/20/2018	I Unit of Instructions starts for I-I MCA Students
10	8/20/2018	Holiday
11	8/22/2018	Bakr Id
12	8/27/2018	**Commencement of Class Work for I year M. Tech, sem I**
13	8/27/2018	I Unit of Instructions starts for I-I M. Tech Students
		SEPTEMBER
1	9/1/2018	I Unit of Instructions ends for II-I MCA Students (Sem III) and II-I IMBA (Sem III) students
2	9/3/2018	Sri Krishna Janmastami
3	9/3/2018	I Mid Examinations starts for II-I MCA Students (Sem III) and II-I IMBA (Sem III) students
4	9/5/2018	Teacher's day
5	9/8/2018	I Mid Examinations ends for II-I MCA Students (Sem III) and II-I IMBA (Sem III) students
6	9/10/2018	II Unit of Instructions starts for II-I MCA Students (Sem III) and II-I IMBA (Sem III) students
7	9/10/2018	Holiday
8	9/13/2018	Viayaka Chaturdhi
9	9/15/2018	Engineer's Day
10	9/22/2018	I Unit of Instructions ends for II-I MBA Students
11	9/24/2018	I Mid Examinations starts for II-I MBA Students

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	OCTOBER	
1	10/1/2018	II Unit of Instructions starts for II-I MBA Students
2	10/2/2018	Gandhi Jayanthi
3	10/3/2018	Second Saturday
4	10/6/2018	I Unit of Instructions ends for I-I MBA and I-I IMBA Students
5	10/6/2018	II Unit of Instructions ends for I-I, II-I, III-I, and IV-I, B. Tech Students and III-I IMBA (Sem V) Students, and IV-I IMBA (Sem VII) Students
6	10/8/2018	I Mid Examinations starts for I-I MBA and I-I IMBA Students
7	10/8/2018	II Mid Examinations starts for I-I, II-I, III-I, and IV-I, B. Tech Students and III-I IMBA (Sem V) Students, and IV-I IMBA (Sem VII) Students
8	10/13/2018	II Mid Examination ends for I-I, II-I, III-I, and IV-I, B. Tech Students and III-I IMBA (Sem V) Students, and IV-I IMBA (Sem VII) Students
9	10/13/2018	I Mid Examinations ends for I-I MBA and I-I IMBA Students
10	10/15/2018	II Unit of Instructions starts for I-I MBA and I-I IMBA Students
11	15-10-2018 to 20-10-2018	Preparation and Practicals for I-I, II-I, III-I, and IV-I, B. Tech Students and preparation for III-I IMBA (Sem V) Students, and IV-I IMBA (Sem VII) Students
12	15-10-2018 to 18-10-2018	Faculty development program on "AUTOMOTIVE DESIGN USING CATIA" organized by Department of ME
13	17-10-2018 to 21-10-2018	Dussehra Vacation
14	10/20/2018	I Unit of Instructions endss for I-I M. Tech Students
15	10/20/2018	I Unit of Instructions endss for I-I MCA Students
16	10/22/2018	I Mid Examinations starts for I-I M. Tech Students
17	10/22/2018	I Mid Examinations starts for I-I MCA Students
18	10/22/2018	End Examinations starts for I-I, II-I, III-I, and IV-I, B. Tech Students and III-I IMBA (Sem V) Students, and IV-I IMBA (Sem VII) Students
19	10/27/2018	I Mid Examinations ends for I-I M. Tech Students
20	10/27/2018	I Mid Examinations ends for I-I MCA Students
21	10/29/2018	II Unit of Instructions starts for I-I M. Tech Students
22	10/29/2018	II Unit of Instructions starts for I-I MCA Students
	NOVEMBER	
1	11/3/2018	End Examinations completed for I-I, II-I, III-I, and IV-I, B. Tech Students and III-I IMBA (Sem V) Students, and IV-I IMBA (Sem VII) Students
2	11/3/2018	II Unit of Instructions ends for II-I MCA Students(sem III) (Sem III) and II-I IMBA (Sem III) students
3	04-11-2018 to 18-11-2018	**Sem Break for B. Tech students**
4	11/5/2018	II Mid Examinations starts for II-I MCA Students (Sem III) and II-I IMBA (Sem III) students
5	11/5/2018	**Commencement of Class Work for III-II IMBA (Sem IV) Students, I Unit of Instructions starts**
6	11/17/2018	Completion of Project work for V-II IMBA (Sem X) Students
7	11/19/2018	**Commencement of Class Work of Semester II for I-II, II-II, III-II, and IV-II, B. Tech Students, and IV-I IMBA (Sem VII) Students**
8	11/19/2018	I Unit of Instructions starts for I-II, II-II, III-II, and IV-II, B. Tech Students
9	11/7/2018	Diwali
10	11/10/2018	Second Saturday
11	11/12/2018	II Mid Examinations ends for II-I MCA Students (Sem III) and II-I IMBA (Sem III) students
12	13-11-2018 to 17-11-2018	Preparation and Practicals for II-I MCA Students (Sem III) and II-I IMBA (Sem III) students
13	11/19/2018	End Examinations starts for II-I MCA Students (Sem III) and II-I IMBA (Sem III) students
14	11/21/2018	Milad un-nabi
15	11/24/2018	II Unit of Instructions ends for II-I MBA Students
16	11/26/2018	II Mid Examinations starts for II-I MBA Students
	DECEMBER	
1	12/1/2018	II Mid Examinations ends for II-I MBA Students
2	12/1/2018	End Examinations completed for II-I MCA Students (Sem III) and II-I IMBA (Sem III) students
3	12/3/2018	**Commencement of Class Work for II-II MCA Students (Sem IV) and II-II IMBA (Sem IV) students. I Unit of Instructions starts**
4	03-12-2018 to 08-12-2018	Preparation for II-I MBA Students

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5	12/8/2018	Second Saturday
6	12/8/2018	II Unit of Instructions ends for I-I MBA and I-I IMBA Students
7	12/10/2018	End Examinations starts for II-I MBA Students
8	12/10/2018	II Mid Examinations starts for I-I MBA and I-I IMBA Students
9	10-12-2018 to 11-05-2019	Project Work for II year M. Tech, sem IV
10	12/15/2018	II Mid Examinations ends for I-I MBA and I-I IMBA Students
11	17-12-2018 to 22-12-2018	Preparation for I-I MBA and I-I IMBA Students
12	12/17/2018	Holiday

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13	12/22/2018	End Examinations completed for II-I MBA Students
14	12/22/2018	II Unit of Instructions ends for I-I M. Tech Students
15	12/22/2018	II Unit of Instructions ends for I-I MCA Students
16	12/24/2018	II Mid Examinations starts for I-I M. Tech Students
17	12/24/2018	II Mid Examinations starts for I-I MCA Students
18	24-12-2018 to 25-12-2018	Christmas Holidays
19	12/24/2018	**Commencement of Class Work for II-II MBA Students, I Unit of Instructions starts**
20	12/26/2018	End Examinations starts for I-I MBA and I-I IMBA Students
21	12/29/2018	II Mid Examinations ends for I-I M. Tech Students
22	12/29/2018	II Mid Examinations ends for I-I MCA Students
23	12/29/2018	I Unit of Instructions ends for III-II IMBA (Sem IV) Students
24	31-12-2018 to 12-01-2019	Preparation and Practicals for I-I M. Tech Students
25	31-12-2018 to 05-01-2019	Preparation and Practicals for I-I MCA Students
26	12/31/2018	New year Eve
27	12/31/2018	I Mid Examinations starts for III-II IMBA (Sem IV) Students
		JANUARY
1	1/1/2019	New year
2	1/5/2019	I Mid Examinations ends for III-II IMBA (Sem IV) Students
3	1/7/2019	II Unit of Instructions starts for III-II IMBA (Sem IV) Students
4	1/7/2019	End Examinations completed for I-I MBA and I-I IMBA Students
5	1/7/2019	End Examinations starts for I-I MCA Students
6	1/8/2019	**Commencement of Class Work for I-II MBA and I-II IMBA Students, I Unit of Instructions starts**
7	1/12/2019	I Unit of Instructions ends for I-II, II-II, III-II, and IV-II, B. Tech Students, and IV-I IMBA (Sem VII) Students
8	12-01-2019 to 16-01-2019	Pongal Vacation
9	1/17/2019	I Mid Examinations starts for I-II, II-II, III-II, and IV-II, B. Tech Students, and IV-I IMBA (Sem VII) Students
10	1/17/2019	End Examinations starts for I-I M. Tech Students
11	1/19/2019	End Examinations completed for I-I MCA Students
12	1/23/2019	I Mid Examinations ends for I-II, II-II, III-II, and IV-II, B. Tech Students, and IV-I IMBA (Sem VII) Students
13	1/24/2019	II Unit of Instructions starts for I-II, II-II, III-II, and IV-II, B. Tech Students, and IV-I IMBA (Sem VII) Students
14	1/25/2019	Sports Day
15	1/26/2019	I Unit of Instructions ends for II-II MCA Students (Sem IV) and II-II IMBA (Sem IV) students
16	1/26/2019	Republic Day
17	1/28/2019	I Mid Examinations starts for II-II MCA Students (Sem IV) and II-II IMBA (Sem IV) students
18	1/28/2019	**Commencement of Class Work for I year MCA, sem II, I Unit of Instructions starts**
19	1/30/2019	End Examinations completed for I-I M. Tech Students
20	1/31/2019	**Commencement of Class Work for I year M. Tech, sem II,**
21	1/31/2019	I Unit of Instructions starts for I-II M. Tech Students
		FEBRUARY
1	2/1/2019	Holiday
2	2/2/2019	I Mid Examinations ends for II-II MCA Students (Sem IV) and II-II IMBA (Sem IV) students
3	2/4/2019	II Unit of Instructions starts for II-II MCA Students (Sem IV) and II-II IMBA (Sem IV) students
4	2/9/2019	Second Saturday
5	13-02-2019 to 14-02-2019	Explorers Meet 2K19
6	2/16/2019	I Unit of Instructions ends for II-II MBA Students

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7	2/18/2019	I Mid Examinations starts for II-II MBA Students
8	2/23/2019	I Mid Examinations ends for II-II MBA Students
9	2/25/2019	II Unit of Instructions starts for II-II MBA Students
		MARCH
1	3/2/2019	Cultural Day
2	3/2/2019	II Unit of Instructions ends for III-II IMBA (Sem IV) Students
3	3/2/2019	I Unit of Instructions ends for I-II MBA and I-II IMBA Students
4	3/4/2019	II Mid Examinations starts for III-II IMBA (Sem IV) Students
5	3/4/2019	I Mid Examinations starts for I-II MBA and I-II IMBA Students
6	3/4/2019	Maha Siva Rathri
7	3/8/2019	Women's day
8	3/9/2019	II Mid Examinations ends for III-II IMBA (Sem IV) Students
9	3/9/2019	I Mid Examinations ends for I-II MBA and I-II IMBA Students
10	3/9/2019	Second Saturday
11	11-03-2019 to 16-03-2019	Preparation for III-II IMBA (Sem IV) Students
12	3/11/2019	II Unit of Instructions starts for I-II MBA and I-II IMBA Students
13	3/16/2019	Annual Day
14	3/18/2019	End Examinations starts for III-II IMBA (Sem IV) Students
15	3/21/2019	Holi
16	3/23/2019	I Unit of Instructions ends for I-II MCA Students
17	3/23/2019	II Unit of Instructions ends for I-II, II-II, III-II, and IV-II, B. Tech Students, and IV-I IMBA (Sem VII) Students
18	3/25/2019	I Mid Examinations starts for I-II MCA Students
19	3/25/2019	II Mid Examinations starts for I-II, II-II, III-II, and IV-II, B. Tech Students, and IV-I IMBA (Sem VII) Students
20	3/30/2019	II Mid Examinations ends for I-II, II-II, III-II, and IV-II, B. Tech Students, and IV-I IMBA (Sem VII) Students
21	3/30/2019	I Mid Examinations ends for I-II MCA Students
22	3/30/2019	II Unit of Instructions starts for II-II MCA Students (Sem IV) and II-II IMBA (Sem IV) students
23	3/30/2019	I Unit of Instructions ends for I-II M. Tech Students
24	3/30/2019	End Examinations completed for III-II IMBA (Sem IV) Students
25	3/31/2019	Farewell Day
		APRIL
1	4/1/2019	II Mid Examinations starts for II-II MCA Students (Sem IV) and II-II IMBA (Sem IV) students
2	4/1/2019	**Commencement of Class Work for IMBA IV-VII sem I Unit of Instructions starts**
3	01-04-2019 to 06-04-2019	Faculty development program on "APPLIED ROBOTICS CONTROL" organized by department of Mechanical Engineering
4	01-04-2019 to 06-04-2019	Preparation and Practicals for I-II, II-II, III-II, and IV-II, B. Tech Students, and IV-I IMBA (Sem VII) Students
5	4/1/2019	II Unit of Instructions starts for I-II MCA Students
6	4/1/2019	I Mid Examinations starts for I-II M. Tech Students
7	4/5/2019	Babu Jagjivan Ram Jayanthi
8	4/6/2019	I Mid Examinations ends for I-II M. Tech Students
9	4/6/2019	Holiday
10	4/8/2019	End Examinations starts for I-II, II-II, III-II, and IV-II, B. Tech Students, and IV-I IMBA (Sem VII) Students
11	4/8/2019	II Unit of Instructions starts for I-II M. Tech Students
12	4/8/2019	II Mid Examinations ends for II-II MCA Students (Sem IV) and II-II IMBA (Sem IV) students
13	09-04-2019 to 13-04-2019	Preparation and Practicals for II-II MCA Students (Sem IV) and II-II IMBA (Sem IV) students
14	11-04-2019 to 13-04-2019	Holidays
15	4/14/2019	Dr.B.R. Ambedkar Jayanthi

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17	4/15/2019	End Examinations starts for II-II MCA Students (Sem IV) and II-II IMBA (Sem IV) students
18	4/20/2019	End Examinations completed for I-II, II-II, III-II, and IV-II, B. Tech Students, and IV-I IMBA (Sem VII) Students
19	4/20/2019	II Unit of Instructions ends for II-II MBA Students
20	4/22/2019	II Mid Examinations starts for II-II MBA Students
21	22-04-2019 to 08-06-2019	Summer vacation for IV-I IMBA (Sem VII) Students
22	4/27/2019	II Mid Examinations ends for II-II MBA Students
23	4/27/2019	End Examinations completed for II-II MCA Students (Sem IV) and II-II IMBA (Sem IV) students
24	29-04-2019 to 04-05-2019	Preparation for II-II MBA Students
25	29-04-2019 to 01-06-2019	Summer vacation for II-II IMBA (Sem IV) students
		MAY
1	01-05-2019 to 12-05-2019	Faculty development program on "CISCO (CCNA)"organized by Department of CSE
2	04-05-2019	II Unit of Instructions ends for I-II MBA and I-II IMBA Students
3	06-05-2019	II Mid Examinations starts for I-II MBA and I-II IMBA Students
4	06-05-2019	End Examinations starts for II-II MBA Students
5	11-05-2019	II Mid Examinations ends for I-II MBA and I-II IMBA Students
6	13-05-2019 to 18-05-2019	Preparation for I-II MBA and I-II IMBA Students
7	13-05-2019 to 03-08-2019	Thesis submission for M. Tech students, Sem IV
8	18-05-2019	End Examinations completed for II-II MBA Students
9	20-05-2019	End Examinations starts for I-II MBA and I-II IMBA Students
10	25-05-2019	II Unit of Instructions ends for I-II MCA Students
11	25-05-2019	I Unit of Instructions ends for IMBA IV-VII sem
12	27-05-2019	II Mid Examinations starts for I-II MCA Students
13	27-05-2019 to 01-06-2019	I Mid Examinations for IMBA IV-VII sem
14	01-05-2019 to 14-05-2019 & 20-05-2019 to 31-05-2019	Summer Vacation
		JUNE
1	6/1/2019	II Unit of Instructions ends for I-II M. Tech Students
2	6/1/2019	End Examinations completed for I-II MBA and I-II IMBA Students
3	6/1/2019	II Mid Examinations ends for I-II MCA Students
4	6/3/2019	II Mid Examinations starts for I-II M. Tech Students
5	03-06-2019 to 06-0-2019	Project work starts for I-II MBA Students
6	03-06-2019 to 08-06-2019	Preparation and Practicals for I-II MCA Students
7	6/5/2019	Ramzan
8	6/8/2019	II Mid Examinations ends for I-II M. Tech Students
9	6/8/2019	Second Saturday
10	6/10/2019	End Examinations starts for I-II MCA Students
11	10-06-2019 to 15-06-2019	Preparation and Practicals for I-II M. Tech Students
12	6/17/2019	End Examinations starts for I-II M. Tech Students
13	6/22/2019	End Examinations completed for I-II MCA Students
14	6/29/2019	End Examinations completed for I-II M. Tech Students

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RECORD OF SUBJECT WISE ALLOTMENT & RESPONSIBILITIES

Academic year: 2018-19 **Semester: II**

S. No	Name of the Faculty	Theory subjects		Labs		Work Load / week (Periods)	Other responsibilities	Signature
		Subject Title	Branch	Lab Title	Branch			
1	Dr. S.Sri Gowri	AC - A	ECE	-	-	6	Administration, Disciplinary Committee Incharge, II/IV Sec-A Student Counsellor, Anti-Ragging, PRC Member UG&PG, NAAC Criteria-2 Incharge	
2	B.Ravi	ECA - A&B	ECE	ECA-A ECA-B	ECE	6+6+9+4	II/IV Sec-B Student Counsellor, PRC Member PG, Robotics club member, Anti-Ragging duty, ISO Dept. Incharge, NAAC Criteria-4 Dept.coordinator	
3	P.Ratna Bhaskar	CMC - A&B CTA (M.Tech)	ECE	-	-	5+5+4+4	IV/IV Sec-B Student Counsellor, PRC Member UG & PG, Anti-Ragging duty, NAAC Criteria-2 Dept. coordinator ,OCBE coordinator	
4	MD.Shabeena begum	ES - A&B	ECE	MP&MC - A MP&MC - B	ECE	5+5+12	IV/IV Sec-A Student Counsellor, PRC Member UG, Anti-Ragging duty, Disciplinary duty, NAAC Criteria-2,ES club facilitator, APITA coordinator	

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RECORD OF SUBJECT WISE ALLOTMENT & RESPONSIBILITIES

S. No	Name of the Faculty	Theory subjects		Labs		Work Load / week (Periods)	Other responsibilities	Signature
		Subject Title	Branch	Lab Title	Branch			
5	P.Raveendra	EMI - A&B	ECE	ECA - A ECA - B	ECE	5+5+9+4	IV/IV Sec-A Student Counsellor, PRC Member UG, Disciplinary duty, NAAC Criteria-3, NSS coordinator	
6	P.Koteswara Rao	AC - B CMOS ADICA(M.Tech)	ECE	AC - B ECA - B	ECE	5+4+9+4	II/IV Sec-B Student Counsellor, PRC Member UG, Disciplinary duty, NAAC Criteria-2, IIC co-ordinator, VLSI club facilitator	
7	D.Ravi Tej	VLSI – A & B	ECE	VLSI - A VLSI - B	ECE	6+6+12	III/IV Sec-B Class Incharge & Student Counsellor, PRC Member UG, Anti-Ragging duty, Disciplinary duty, NAAC Criteria-3 Dept. coordinator, EDC coordinator, VLSI club facilitator	
8	K.Venkateswara Rao	BMI - A&B	ECE	VLSI - A VLSI - B	ECE	5+5+12+4	IV/IV Sec-A Class Incharge& Student Counsellor PRC Member UG, Disciplinary duty, NAAC Criteria-5 Dept. coordinator	
9	N.V.K.Maha Lakshmi	EM&TL - A&B	ECE	AC - A AC - B	ECE	6+6+9	II/IV Sec-A Class Incharge& Student Counsellor, PRC Member UG &PG, AntiRagging , Disciplinary duty, NAAC Criteria-2,IQAC coordinator	

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S. No	Name of the Faculty	Theory subjects		Labs		Work Load / week (Periods)	Other responsibilities	Signature
		Subject Title	Branch	Lab Title	Branch			
10	N.Mayuri	PDC - A BME	ECE	VLSI - A ECA - B	ECE	5+6+11+2	II/IV Sec-A Student Counsellor, PRC Member UG, NAAC Criteria-5	
11	A.V.P.Sarvari	CS - A CS -B	ECE	DC - A DC - B	ECE	6+6+12+4	II/IV Sec-A Student Counsellor , PRC Member UG &PG, VLSI club facilitator, Anti-Ragging duty, Disciplinary duty, NAAC Criteria-2, APSSDC coordinator	
12	V.Srilakshmi	PDC - B WCN (M.Tech)	ECE	AC - A AC - B	ECE	6+4+12+4	II/IV Sec-B Class Incharge & Student Counsellor, PRC Member UG &PG, Anti-Ragging, NAAC Criteria-1 Dept. coordinator , Sports club facilitator	
13	K.Nandini	DS - A&B	ECE	DS - A & B	ECE	5+5+6	PRC Member UG &PG, NAAC Criteria-2	
14	CH.Siva Rajesh	OTJ OTJ (IV) OTJ (III)	ECE EEE EEE	DS	EEE	6+5+6+4	III/IV Sec-B Student Counsellor, PRC Member UG , NAAC Criteria-6, NL&Journal coordinator	
15	V.Sekhara Babu	DSP – A DSP - B IVP (M.Tech)	ECE			6+7+4	III/IV Sec-A Class Incharge & Student Counsellor, PRC Member UG, Anti Ragging, Disciplinary duty ,NAAC Criteria-5	

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RECORD OF SUBJECT WISE ALLOTMENT & RESPONSIBILITIES

S. No	Name of the Faculty	Theory subjects		Labs		Work Load / week (Periods)	Other responsibilities	Signature
		Subject Title	Branch	Lab Title	Branch			
16	G Surya Prakash	WSN - A	ECE	DC - A DC - B	ECE	5+12+4	IV/IV Sec-B Class Incharge & Student Counsellor, Anti-Ragging, Disciplinary duty NAAC Criteria-7, PRC Member UG, Website information coordinator, Placement cell dept.	
17	B.S.S.Tejesh	MP&MC - A MP&MC - B	ECE	MP&MC – A&B MP&MC	ECE EEE	6+6+8+4	III/IV Sec-B Student Counsellor, PRC Member UG, IOT club facilitator, Anti-Ragging, NAAC Criteria-4, EPCS coordinator	
18	S.Neeraja	MP&MC ESD (M.Tech)	EEE ECE	MP&MC – A&B MP&MC	ECE EEE	6+4+12+4+4	III/IV Sec-A Student Counsellor, Anti-Ragging Duty, PRC Member UG , Disciplinary duty, NAAC Criteria-3	
19	T.Manogna	MWE - A MWE - B	ECE	DC - A DC - B CP-A	ECE	6+6+8+3	III/IV Sec-A Student Counsellor	

S-SriGouri 15/3/19
HOD/ Date

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Principal / Date

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

IV/IV B.TECH II Semester I Sec & II Sec Time Table (A.Y 2018-19)

Time	9:00 to 9:50	9:50 to 10:40	10:45 to 11:35	11: 35 to 12:25		1:10 to 2:00	2:00 to 2:45	2:50 to 3:35	3:35 to 4:20
Period	1	2	3	4		5	6	7	8
MON	**CMC**	ES	EMI	BMI	L U N C H	PROJECT			
TUE	**CMC**	BMI	ES	EMI		PROJECT			
WED	ES	**CMC**	BMI	EMI		PROJECT			
THU	**CMC**	BMI	EMI	ES		PROJECT			
FRI	EMI	ES	BMI	**CMC**		PROJECT			
SAT	PROJECT					PROJECT			

Time	9:00 to 9:50	9:50 to 10:40	10:45 to 11:35	11: 35 to 12:25		1:10 to 2:00	2:00 to 2:45	2:50 to 3:35	3:35 to 4:20
Period	1	2	3	4		5	6	7	8
MON	EMI	WSN	**CMC**	ES	L U N C H	PROJECT			
TUE	ES	EMI	**CMC**	WSN		PROJECT			
WED	WSN	EMI	ES	**CMC**		PROJECT			
THU	EMI	ES	**CMC**	WSN		PROJECT			
FRI	WSN	**CMC**	EMI	ES		PROJECT			
SAT	PROJECT					PROJECT			

Cellular Mobile Communication -P.RATNA BHASKAR Bhat.
Electronic Measurements and Instrumentation -P.RAVEENDRA
Embedded Systems (Elective III) - MD.SHABEENA BEGUM
Bio Medical Instrumentataion (Elective IV) - K.VENKATESWARA RAO
Wireless Sensor Networks (Elective IV) - G.SURYA PRAKASH

S.Sri Gour
HOD ECE

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P RATNA BHASKAR

Time	9:00 to 9:50	9:50 to 10:40	10:45 to 11:35	11: 35 to 12:25		1:10 to 2:00	2:00 to 2:45	2:50 to 3:35	3:35 to 4:20
Period	1	2	3	4		5	6	7	8
MON	CMC-I		CMC-II						
TUE	CMC-I		CMC-II						
WED		CMC-I		CMC-II	L U N C H				
THU	CMC-I		CMC-II						
FRI		CMC-II		CMC-I					
SAT									

Signature of Faculty: Bhat

Signature of HOD:

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SRK INSTITUTE OF TECHNOLOGY VIJAYAWADA	**SRK INSTITUTE OF TECHNOLOGY** **Enikepadu, Vijayawada 521108** **Department of Electronics and Communication Engineering** **TEACHING PLAN CUM REALIZATION**	**SRKIT / ECE /12**

Department:ECE Name of faculty:P. RATNA BHASKAR Designation:ASSISTANT PROFESSOR

Semester / Year:II/IV SEC I Name of the subject:CELLULAR AND MOBILE COMMUNICATIONS

S. No	Unit / Topic	Teaching Planned	Taught on (Date)	No of Periods (actual taken)	Remarks (if any deviation)
1	UNIT -I **CELLULAR MOBILE RADIO SYSTEMS**				
2	Introduction of cellular mobile systems		19-11-18	1	
3	Spectrum efficiency considerations		20-11-18	1	
4	Why 800 MHz and history of 800MHz		22-11-18	1	
5	Trunking Efficiency and Basic cellular systems		23-11-18	1	
6	Performance Criteria		26-11-18	1	
7	Uniqueness of Mobile radio environment		28-11-18	1	
8	Delay Spread, Coherence Bandwidth, direct wave path, line of sight path	From: 19-11-18	29-11-18	1	
9	Noise level in cellular system		29-11-18	1	
10	Operation of cellular systems	To: 7-12-18	30-11-18	1	
11	Hexagonal shaped cells		30-11-18	1	
12	Analog and Digital cellular systems		4-12-18	1	
	ELEMENTS OF CELLULAR RADIO SYSTEMS DESIGN				
13	General description of the problem		5-12-18	1	
14	Concept of frequency reuse channels		6-12-18	1	
15	Co-channel interference reduction factor		6-12-18	1	
16	Consideration of the components of cellular systems		10-12-18	1	

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S. No	Unit / Topic	Teaching Planned	Taught on (Date)	No of Periods (actual taken)	Remarks (if any deviation)
17	Desired C/I from a normal case in an Omnidirectional antenna systems		10-12-18	1	
18	Handoff mechanism and cell splitting		6-12-18	1	
	UNIT –2 INTERFERENCE				
19	Introduction of Cochannel Interference		20-12-18	1	
20	Real time cochannel interference measurement at mobile radio transceivers		21-12-18	1	
21	Design of Omnidirectional antenna in a worst case		26-12-18	1	
22	Design of a directional antenna system		27-12-18	1	
23	Lowering the antenna height		4-1-19	1	
24	Notch in a tilted antenna pattern				
25	Umbrella pattern effect		7-1-19	1	
26	Use of parasitic elements	From:20-12-18	7-1-19	1	
27	Diversity receiver				
28	Types of non-Cochannel interference	To: 23-1-19	21-1-19	1	
29	Adjacent channel interference				
30	Near-end-Far-end interference				
31	Interference between systems, UHF and long distance interference				
	CELL COVERAGE FOR SIGNAL AND TRAFFIC				
32	General introduction and problems		21-1-19	1	
33	Mobile point –to-point model (LEE model)				

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SRK INSTITUTE OF TECHNOLOGY VIJAYAWADA	**SRK INSTITUTE OF TECHNOLOGY** **Enikepadu, Vijayawada 521108** **Department of Electronics and Communication Engineering** **TEACHING PLAN CUM REALIZATION**	**SRKIT / ECE /12**

S. No	Unit / Topic	Teaching Planned	Taught on (Date)	No of Periods (actual taken)	Remarks (if any deviation)
34	Phase difference between a direct path and reflected path		21-1-19	1	
35	Constant standard deviation along apath loss slope and general formula for mobile radio propagation		23-1-19	1	
36	Propagation over water or flat open area				
37	Land to mobile transmission over water and problems		23-1-19	1	
38	Foliage loss and propagation in Near –in distance				
39	Long distance propagation and form of a point –to-point model		24-1-19	1	
	UNIT –3 CELLSITE AND MOBILE ANTENNAS				
40	Sum and difference patterns and their synthesis		12-12-18	1	
41	Omni directional antennas at cellsite		12-12-18		
42	Directional antennas for interference reduction	**From:10-12-18**	14-12-18	1	
43	Space diversity antennas		14-12-18	1	
44	Umbrella pattern antennas	**To: 19-12-18**			
45	Unique situation at cellsite antennas		19-12-18	1	
46	Mobile roof mounted and glass mounted antennas and high gain antennas		20-12-18	1	
47	Horizontally and vertically oriented space diversity antennas		20-12-18	1	
	UNIT –4 FREQUENCY MANAGEMENT AND CHANNEL ASSIGNMENT				
48	Frequency management: Numbering and grouping		24-1-19	1	
49	Setup, access channels		25-1-19	1	

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52	Fixed channel assignment, adjacent, channel sharing and borrowing	To: 15-2-19	7-2-19	1	
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54	Non-fixed channel assignment		8-2-19	1	
	UNIT –5 HANDOFF AND DROPPED CALLS	From: 18-2-19 To: 7-3-19			
55	Why handoffs, types of Handoffs and handoff initiation		13,14-2-19	2	
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64	Vehicle- locating methods				
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	UNIT –6 DIGITAL CELLULAR NETWORKS				
67	GSM Architecture	From: 7-3-19 To: 22-3-19	25,26-2-19	3	
68	GSM Channels		28-2-19 & 1-3-19	2	
69	Channel modes		1-3-19	1	
70	Multiple access scheme		5-3-19	1	
71	TDMA Architecture		7-3-19	2	
72	TDMA Frame structure		8-3-19	1	
73	CDMA		11-3-19	1	
74	Comparison of multiple access scheme		14-3-19	1	
75	Problems		15-3-19	1	

Faculty Rbhat.

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S. Sri Gowri
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Department:ECE Name of faculty:P. RATNA BHASKAR Designation:ASSISTANT PROFESSOR

Semester / Year:II/IV SEC II Name of the subject:CELLULAR AND MOBILE COMMUNICATIONS

S. No	Unit / Topic	Teaching Planned	Taught on (Date)	No of Periods (actual taken)	Remarks (if any deviation)
1	UNIT -I **CELLULAR MOBILE RADIO SYSTEMS**				
2	Introduction of cellular mobile systems		19-11-18	1	
3	Spectrum efficiency considerations		20-11-18	1	
4	Why 800 MHz and history of 800MHz		22-11-18	1	
5	Trunking Efficiency and Basic cellular systems		23-11-18	1	
6	Performance Criteria		26-11-18	1	
7	Uniqueness of Mobile radio environment		28-11-18	1	
8	Delay Spread, Coherence Bandwidth, direct wave path, line of sight path	**From: 19-11-18**	29-11-18	1	
9	Noise level in cellular system		29-11-18	1	
10	Operation of cellular systems	**To: 7-12-18**	30-11-18	1	
11	Hexagonal shaped cells		30-11-18	1	
12	Analog and Digital cellular systems		4-12-18	1	
	ELEMENTS OF CELLULAR RADIO SYSTEMS DESIGN				
13	General description of the problem		5-12-18	1	
14	Concept of frequency reuse channels		6-12-18	1	
15	Co-channel interference reduction factor		6-12-18	1	
16	Consideration of the components of cellular systems		10-12-18	1	

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17	Desired C/I from a normal case in an Omnidirectional antenna systems		10-12-18	1	
18	Handoff mechanism and cell splitting		6-12-18	1	
	UNIT –2 INTERFERENCE				
19	Introduction of Cochannel Interference		20-12-18	1	
20	Real time cochannel interference measurement at mobile radio transceivers		21-12-18	1	
21	Design of Omnidirectional antenna in a worst case		26-12-18	1	
22	Design of a directional antenna system		27-12-18	1	
23	Lowering the antenna height		4-1-19	1	
24	Notch in a tilted antenna pattern				
25	Umbrella pattern effect		7-1-19	1	
26	Use of parasitic elements	From:20-12-18	7-1-19	1	
27	Diversity receiver				
28	Types of non-Cochannel interference	To: 23-1-19	21-1-19	1	
29	Adjacent channel interference				
30	Near-end-Far-end interference				
31	Interference between systems, UHF and long distance interference				
	CELL COVERAGE FOR SIGNAL AND TRAFFIC				
32	General introduction and problems		21-1-19	1	
33	Mobile point –to-point model (LEE model)				

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Handoff is a process of automatically changing frequencies as the mobile unit moves into a different frequency zone w/o redialing.

Another disadvantage of the Conventional system is that the no. of active users is limited to the no. of channels assigned to a particular freq. zone.

(ii) Poor Service Performance:

A total of 33 channels were allocated to three mobile telephone systems: a. Mobile Telephone Service (MTS)
b. Improved mobile telephone Service (IMTS) MJ system
c. Improved mobile telephone Service (IMTS) MK system

MTS operates around 40MHz
MJ " " 150MHz } both provide 11 channels each
MK " " 450MHz & provide 12 channels

These 33 channels must cover an area 50miles diameter.

* In 1976, New york city had 6 channels of MJ serving 320 Customers with another 2400 Customers on a waiting list.

* Illy for same Newyork city had 6 channels of MK serving 225 Customers with another 1300 customers on a waiting list.

The large no. of subscribers created a high blocking probability during busy hours. Although the service performance was undesirable, the demand was still great. So a high capacity system for mobile telephones was needed.

(iii) Inefficient frequency Spectrum utilization:

In a Conventional mobile telephone system, the freq. utilization measurement Mo is defined as the maximum no. of Customers that could be served by one channel at the busy hour.

$$Mo = \frac{\text{no. of Customers}}{\text{Channels}}.$$

$$Mo = \begin{cases} \frac{320}{6} \Rightarrow 53 \text{ Customers/channel} & \text{MJ system} \\ \frac{225}{6} = 37 \text{ Customers/channels} & \text{MK system} \end{cases}$$

UNIT-I

CELLULAR MOBILE RADIO SYSTEMS.

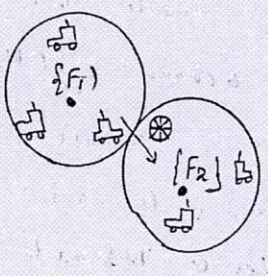
Introduction to Cellular Mobile Systems, Performance Criteria, Uniqueness of mobile radio environment, operation of cellular systems, Hexagonal shaped cells, Analog & Digital cellular system.

Introduction to cellular Mobile Systems:

One of many reasons for developing a cellular Mobile telephone system is because of operational limitations of Conventional mobile telephone systems. There are three important limitations Present in Conventional mobile telephone system, they are

(i) Limited service capability
(ii) poor service performance
(iii) Inefficient frequency spectrum utilization.

(i) Limited Service Capability:



Conventional Mobile System

- Reinitiating calls
- cell site

In a Conventional mobile system
→ High power
→ Larger cell

A Conventional mobile telephone system is usually designed by selecting one or more channels from a specific frequency allocation for use in autonomous geographic zones as shown in above figure. The Communications Coverage area of each zone is normally planned to be as large as possible, which means that txed power should be as high as federal specification allows.

The user who starts a Call in one zone has to reinitiate the Call when moving into a neco zone because the call will be dropped. This is an undesirable radio telephone System since there is no guarantee that a Call Can be Completed w/o a handoff Capability.

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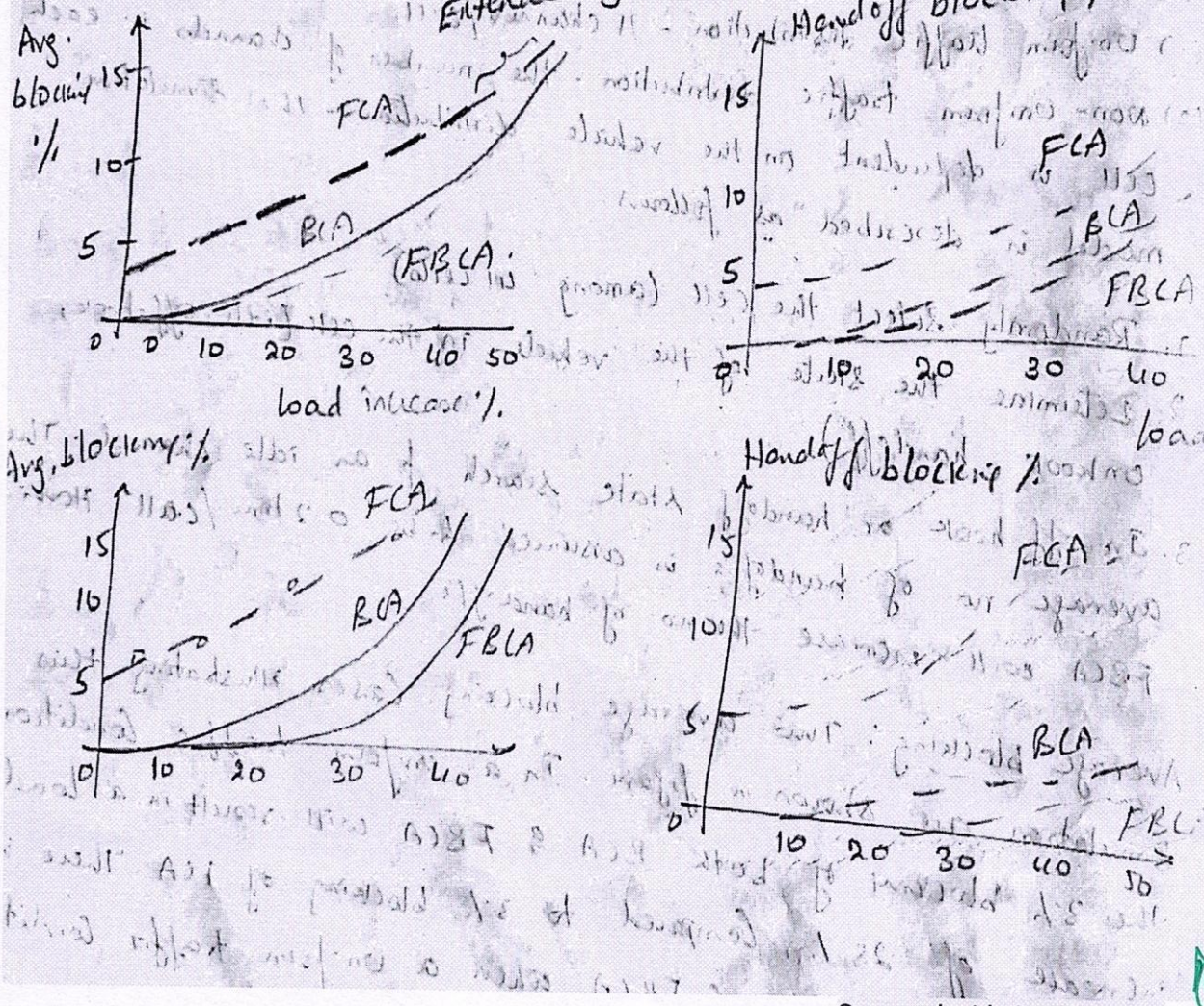
utilized in another way by reducing the no. of channels. The percent increase in load is the same as the percent reduction in the number of channels.

Hand off blocking: Blocking Calls from all handoff Calls occurring in all Cells is shown in figure. Handoff blocking is not considered as the regular Cell blocking which can only occur at the Call setup stage. In both BCA & FBCA, load is increased almost equally to 30% as compared to FCA at 3% handoff blocking in uniform traffic. For a non-uniform traffic distribution, the load increase of both BCA & FBCA at 4% blocking is about 50% which is a big improvement, Considering the reduction in interference & blocking. Otherwise, there would be multiple effects from interference in several neighbouring Cells.



→ In the most common types of cellular systems, one setup channel functions is used for both paging & access. The forward set-up channel functions as the paging channel for responding to the mobile originating call. The reverse setup channels functions as the access channel for the responder to the paging call.

→ The forward set-up channel is tx'ed at the cellsite & the reverse setup channel is tx'ed at the mobile unit. All setup channels carry data information only.

Access channels:

→ In mobile-originating calls, the mobile unit scans its 21-setup channels & choose the strongest one. Bcoz each setup channel is associated with one cell, the strongest setup channel indicates which cell is to serve the mobile-originating calls.

→ The mobile unit detects the system information tx'ed from the cellsite. Also, the mobile unit monitors the Busy/Idle status bits over the desired forward setup channel. When the Idle bits are received, the mobile unit can use the corresponding reverse setup channel to initiate a call.

→ Frequently only one system operates in a given city; for instance, block B system might be operating & the mobile unit could be set to "Preferable A system". When the mobile unit first scans the 21 setup channels in block A, two conditions can occur.

1. If no setup channels of block A are operational, the mobile unit automatically switches to block B.

2. If a strongest set-up channel signal strength is received but no messages can be detected, then the scanner chooses the second strongest setup channel. If the message still cannot be detected, the mobile unit switches to block B &

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Set-up channels:

→ Setup channels also called Control channels, these are the channels designated to set-up calls.

→ we should not be confused by the fact that a call always needs a setup channel. A system can be operated w/o setting up channels.

In each cellular system (block A & block B) can be voice channels; however, each mobile unit must scan 333 channels Continuously & detect the signaling for its call. A customer who wants to initiate a call must scan all the channels & find an idle (unoccupied) one to use.

→ In a cellular system, we are implementing frep-reuse Concepts In this case the set up channels are acting as Control channels The 21-setup channels are taken out from the total no. of channels The no. 21 is derived from a seven-cell frep. reuse pattern with three 120° sectors/cell (or) a total of 21 sectors, which require 21-setup channels. However, now only a few of the 21-setup channels are being used in each system. Theoritically when cell size decreases the use of setup channels should increase

→ Setup channels can be classified by usage into two types:

Access channels & paging channels

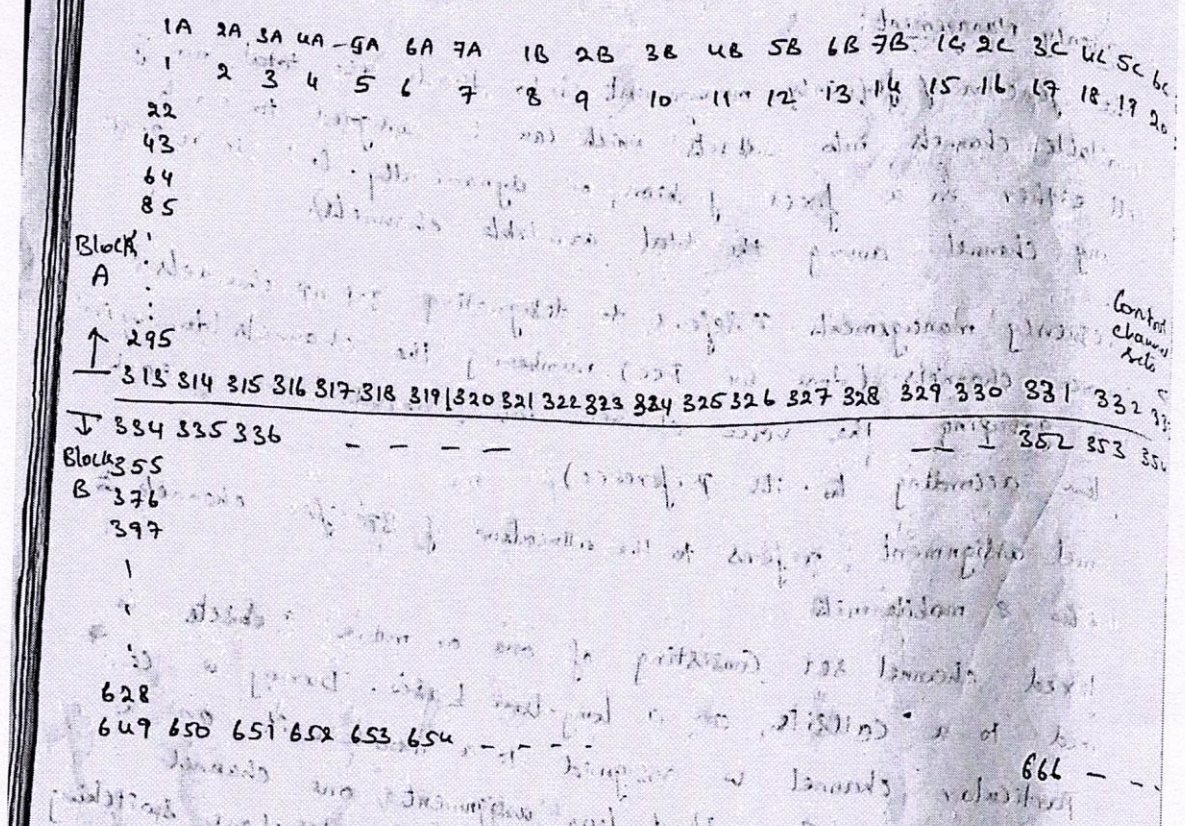
↓ ↳ used for the land-originating calls.

used for mobile originating calls

→ In a low traffic system, access channels & paging channels are same. For this reason, a setup channel is sometimes called access channels & sometimes called paging channels.

→ Every two way channel contains two 30 KHz bandwidths. Normally one setup channel is also specified by two operations as a foward setup channel (using upperband) & a ~~reuse~~ reverse setup channel (using lower band)

* The 666 channels are divided into two groups: block A system & block B system. Each market (i.e each city) has two systems for a duopoly market policy as shown in below chart.



The 42 set up channels are assigned as follows.

channels 313 - 333 block A

channels 334 - 354 block B.

The voice channels are assigned as follows.

channels 1 - 312 (312 voice channels) block A.

channels 355 - 666 (312 voice channels) block B.

* These 42 set-up channels are assigned in the middle of all the assigned channels to facilitate scanning of those channels by frequency synthesizers.

* In the new additional spectrum allocation of 10 MHz, an additional 166 channels are assigned.

* Since 1 MHz is assigned below 825 MHz (or 870 MHz) the future additional channels will be numbered upto 849 MHz (or 894 MHz) & will then go circle back. The last channel number is 1023.

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14/8/12
23rd Aug 2012

UNIT: VI

FREQUENCY MANAGEMENT & CHANNEL ASSIGNMENT

Frequency Management:

* The function of frequency management is to divide the total no. of available channels into subsets which can be assigned to each cell either in a fixed fashion or dynamically. (i.e in response to any channel among the total available channels).

* Frequency management refers to designating set-up channels & voice channels (done by FCC), numbering the channels (done by FCC) and grouping the voice channels into subsets (done by each system according to its preference).

* channel assignment refers to the allocation of specific channels to cellsites & mobile units

* A fixed channel set consisting of one or more subsets is assigned to a cellsite on a long-term basis. During a call a particular channel is assigned to a mobile unit on a short-term basis. For a short-term assignment, one channel assignment per call is handled by the mobile telephone switching office (MTSO).

* Ideally channel assignment should be based on causing the least interference in the system. However, most cellular systems cannot perform this way.

Numbering the channels:

* The total no. of channels at present is 832. But most mobile units and systems are still operating on 666 channels. Therefore we describe the 666 channels numbering first.

* A channel consists of two frequency channel bandwidths, one in the low band & one in the high band.

* The frequencies in channel 1 are 825.030 MHz (mobile on transmit) & 870.030 (cellsite transmit). The two frequencies in channel 666 are 844.98 MHz (mobile transmit) & 889.98 MHz (cell-site transmit)

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Four conditions obtained should be used to compare the results

1. If the $\frac{C}{I}$ is greater than 18dB throughout most of the cell, the system is properly designed

2. If $\frac{C}{I} < 18dB$ & $\frac{C}{N} > 18dB$ in some areas, there is Cochannel interference.

3. If both $\frac{C}{N}$ & $\frac{C}{I} < 18dB$ & $\frac{C}{N} \simeq \frac{C}{I}$ in a given area, there is a Coverage Problem

4. If both $\frac{C}{N}$ & $\frac{C}{I}$ are less than 18dB & $\frac{C}{N} > \frac{C}{I}$ in a given area there is a Coverage problem & Cochannel interference.

Real-Time Cochannel Interference Measurement at Mobile Radio Transceivers

when the Carriers are angularly modulated by the voice Signal & the RF frequency difference between them is much higher than the fading frequency, measurement of the signal Carrier-to-interference ratio C/I reveals that the signal is.

$$e_1 = S(t) \sin(\omega t + \phi_1)$$

& the interference is

$$e_2 = I(t) \sin(\omega t + \phi_2)$$

The received signal is

$$e(t) = e_1(t) + e_2(t) = R \sin(\omega t + \psi)$$

where

$$R = \sqrt{\left[S(t)\cos\phi_1 + I(t)\cos\phi_2\right]^2 + \left[S(t)\sin\phi_1 + I(t)\sin\phi_2\right]^2}$$

& $$\psi = \tan^{-1}\left[\frac{S(t)\sin\phi_1 + I(t)\sin\phi_2}{S(t)\cos\phi_1 + I(t)\cos\phi_2}\right]$$

The envelope R we get as.

$$e_1 = S(t)\left[\cos\omega t \sin\phi_1 + \sin\omega t \cos\phi_1\right]$$

$$e_2 = I(t)\left[\cos\omega t \sin\phi_2 + \sin\omega t \cos\phi_2\right].$$

$$e_1 + e_2 = \left[S(t)\cos\phi_1 + I(t)\cos\phi_2\right]\sin\omega t + \left[S(t)\sin\phi_1 + I(t)\sin\phi_2\right]\cos\omega t.$$

$$R = \sqrt{\text{Squares of sin term} + \text{Squares of Cos term}}$$

$$R \Rightarrow \sqrt{S^2(t)\cos^2\phi_1 + I^2(t)\cos^2\phi_2 + 2S(t)I(t)\cos\phi_1\cos\phi_2 + S^2(t)\sin^2\phi_1 + I^2(t)\sin^2\phi_2 + 2S(t)I(t)\sin\phi_1\sin\phi_2}$$

Squaring both sides

$$R^2 = \left\{S^2(t) + I^2(t) + 2S(t)I(t)\left[\cos\phi_1\cos\phi_2 + \sin\phi_1\sin\phi_2\right]\right\}$$

$$\therefore R^2 = \left\{S^2(t) + I^2(t) + 2S(t)I(t)\cos(\phi_1 - \phi_2)\right\} \quad \text{---(1)}$$

Following Kozono & Sakamotos analysis the term $S^2(t) + I^2(t)$ fluctuates close to the fading frequency v/λ & the term $2S(t)I(t)\cos(\phi_1 - \phi_2)$ fluctuates to a frequency close to $\frac{d}{dt}(\phi_1 - \phi_2)$ which is much higher than the fading frequency.

The two parts of the squared envelope can be seperated as

$$X = S^2(t) + I^2(t)$$

$$Y = 2S(t)I(t)\cos(\phi_1 - \phi_2)$$

Assume that the random variables $S(t)$, $I(t)$, ϕ_1 & ϕ_2 are independent : then the average processes on x & y are.

$$\overline{X} = \overline{S^2(t)} + \overline{I^2(t)}$$

$$\overline{Y^2} = 4\,\overline{S^2(t)}\;\overline{I^2(t)}\cdot\overline{\cos^2(\phi_1 - \phi_2)}$$

$$\cos 2\theta = 2\cos^2\theta - 1$$

$$\overline{Y^2} = 4\,\overline{S^2(t)}\;\overline{I^2(t)}\left[\frac{\cos 2(\phi_1 - \phi_2) + 1}{2}\right] \qquad \cos^2\theta = \frac{\cos 2\theta + 1}{2}$$

$\because$ ϕ_1 & ϕ_2 are independent the diff is also so it is equal to zero

$$\overline{Y^2} = 4\,\overline{S^2(t)}\;\overline{I^2(t)}\left[0 + \frac{1}{2}\right]$$

$$\overline{Y^2} = 2\,\overline{S^2(t)}\;\overline{I^2(t)}$$

Scans by block B set-up - channels.

The operational functions are described as follows.

1. Power of a forward setup channel (or) forward control channel (FOCC)

The power of a setup channel can be varied in order to control the no. of incoming calls served by the cell. The no. of mobile originating calls is limited by the no. of voice channels in each cellsite. When the traffic is heavy, most voice channels are occupied & the power of the setup channels should be reduced in order to reduce the coverage of the cell for the incoming calls originating from the mobile unit. This will force the mobile unit to originate calls from other cellsites, assuming that all cells are adequately overlapped.

2. The set-up channel received level: (RECC)

The setup channel threshold level is determined in order to control the reception at the reverse control channel (RECC). If the received power level is greater than the given setup threshold level, the call request will be taken

3. Change Power at the Mobile unit:

when the mobile unit monitors the strongest signal strength from all setup channels & selects that channel to receive the messages, there are three types of messages. DCC → Digital Color Code CMAC → Control mobile attenuation code SID → Home system identification MIN → Mobile identification no.

(a). Mobile station Control message: This message is used for paging & consists of one, two or four words - DCC, MIN, SCC & VMAX

(b) System parameter overhead message: This message contains two words, including DCC, SID, CMAX or CPA.

(c) Control-filler message: This message may be sent with a system parameter overhead message, CMAC - a control mobile attenuation code (seven levels)

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4. Direct Call retry:

When a cell site has no available voice channel, it can send a direct call retry message through the setup channel. The mobile unit will initiate the call from a neighbouring cell which is on the list of neighbo cells in the direct call retry message.

SAT → Supervisory audio tone

SCC → SAT Color Code

CPA → Combined Paging/Access

CMAX → No. of access channels

Paging channels:

Each cell site has been allocated its own setup channel (Control ch... The assigned forward setup channel (FOCC) of each cell site is used to page the mobile unit with the same mobile station control message.

→ But the same message is tx'ed by the different setup channels, no simulcast interference occurs in the system. The algorithm for paging a mobile unit can be performed in different ways.

→ The simplest way is to page from all the cell sites. This can occupy a large amount of traffic load. The other way is to page in an area corresponding to the mobile unit phone number. If there is no answer, the system tries to page in other areas. The drawback is that response time is sometimes too long.

→ When the mobile unit responds to the page on the reverse set-up channel the cell site which receives the response checks the signal strength level & makes a decision regarding the voice channel assignment based on least interference in the selected sector or underlay overlay region.

Standard Condition		Correction factor
	At Base station	
Tx'ed power	$P_t = 10W\ (40dBm)$	$a_1 = 10\log \frac{P_t'}{10}$
Antenna height	$h_1 = 100ft\ (30m)$	$a_2 = 20\log \frac{h_1'}{h_1}$
Antenna gain	$g_t = 6dB/dipole$	$a_3 = g_{t_2}' - 6$
	At Mobile unit.	
Antenna height	$h_2 = 10ft\ (3m)$	$a_4 = 10\log \frac{h_2'}{h_2}$
Antenna gain	$g_m = 0dB/dipole$	$a_5 = g_m'$

Obtain area-to-area Prediction Curves for human-made structures:

The area-to-area prediction curves are different in different areas. In area-to-area prediction, all the areas are considered flat even though the data may be obtained from non-flat areas. The reason is that area-to-area prediction is an average process. The Std. deviation of the average value indicates the degree of terrain roughness.

Effect of the human-made structures:

Since the terrain configuration of each city is different, & the human-made structures of each city is also different. we have to find a way to separate these two. The way to factor out the effect due to the terrain configuration from the man-made structures is to work out a way to obtain the pathloss curve for the area as if the area were flat even if it is not.

The path loss curve obtained on virtually flat ground indicates the effect of the signal loss due to human-made structures. This means that the different path loss curve obtained in each city show the different human-made structures in that city: we have to measure signal strength at those high spots & also at the low spots surrounding the cell sites. Then the average path loss slope which is a combination of measurement from high spots & low spots along different radio paths in a general area,

UNIT: V

Roof Mounted Antennas

1. A uniformly distributed pattern is exhibited by roof mounted antenna around the mobile unit
2. The gain of roof-mounted antenna is 3dB
3. The position of roof-mounted antenna is higher than that of glass-mounted antenna
4. The metal content of roof-mounted antenna is less compared to that of a glass-mounted antenna

Glass Mounted Antennas

1. In glass mounted antennas, energy is coupled through the glass.
2. The gain of glass-mounted antenna is ranged b/w 1 to 3 dB. It depends on the operating frequency.
3. The position of glass-mounted antenna is lower than that of roof-mounted antenna
4. The metal content of glass mounted antenna is more compared to that of a roof-mounted antenna.

Mobile High gain antennas:

	Gain, dBi	Linear Ratio	$\theta_0/2$ degrees
Whip antenna (2dB above isotropic)	2	1.58 : 1	39
High gain antennas	6	4 : 1	16
Low-gain antennas	4	2.5 : 1	24

Sum & Difference pattern

General formula.

$$A(\theta) = \sum_{n=1}^{N} I_n \exp\left[j\frac{2n-1}{2}\beta d(\cos\theta - \cos\theta_0)\right] + I_{-n}\exp\left[-j\frac{2n-1}{2}\beta d(\cos\theta - \cos\theta_0)\right]$$

$\beta \rightarrow$ wave number $= 2\pi/\lambda$

I_n = normalized Current distribution

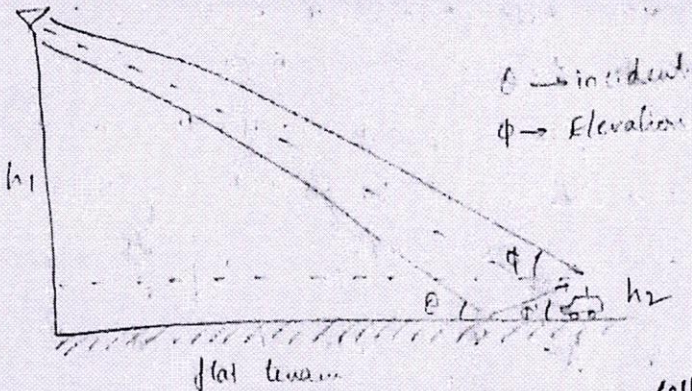
N = total no. of elements

Sum

$I_n = +I_{-n}$.

Diff

$I_n = -I_{-n}$.



flat terrain

Ex: In a mobile unit radio environment, the average cellsite antenna height is about 50m, the mobile antenna height is abt 3m, & the comm. path length is 5km.

The incident angle

$$\theta = \tan^{-1}\frac{50m + 3m}{5km} = 0.61^\circ$$

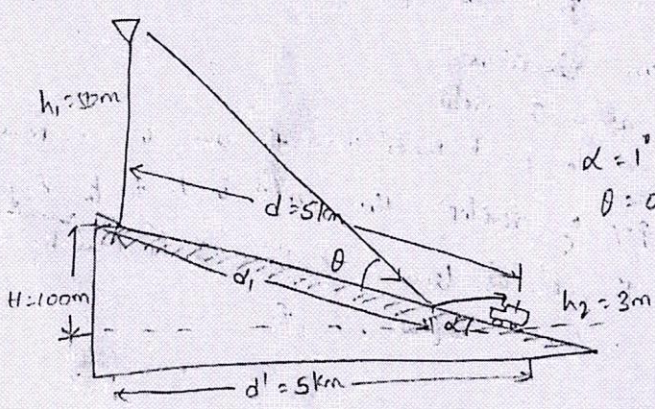
The elevation angle at the antenna of the mobile unit is

$$\phi = \tan^{-1}\frac{50m - 3m}{5km} = 0.54^\circ$$

The elevation angle at the location of the mobile unit is

$$\phi' = \tan^{-1}\frac{50m}{5km} = 0.57^\circ$$

Ground reflection angle & reflection Point:



Based on Snells law, the reflection angle equal to incident angle. Since in graphical display we usually exaggerate the hilly slope & the incident angle by enlarging the vertical scale as shown in figure. As long as the actual hilly slope is less than 10° the reflection point on hilly slope can be obtained by using the same method as if the reflection point were on flat ground. Be sure that two antennas (base & mobile) have been placed vertically not ⊥r to the sloped ground.

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As long as the actual slope of the hill is usually very small & the vertical stands for two antennas are Correct.

Ex: Let $h_1 = 50m$, $h_2 = 3m$ $d = 5km$ & $H = 100m$ as shown in fig.

(a) Using the approximation method ($d \approx d' \approx 5km$),

The slope angle α of the hill is

$$\alpha = \tan^{-1} \frac{100m}{5km} = 1.14576^\circ$$

The incident angle

$$\theta = \tan^{-1} \frac{50m + 3m}{5km} = 0.61$$

The reflection point location from the cell site antenna.

$$d_1 = \frac{50}{\tan\theta} = 4.717km. \quad \tan\theta = \frac{Opp}{Adj} = \frac{50}{d_1}$$

(b) Using accurate method, the slope angle α of the hill is

$$\alpha = \tan^{-1} \frac{100m}{\sqrt{(5km)^2 - (100m)^2}} = \tan^{-1} \frac{100}{4981} = 1.1458^\circ$$

The incident angle & reflection angle are same as above.

d_1, d', H, α

$d'^2 = H^2 + d_1^2$

$d_1^2 = d'^2 - H^2$

$d_1 = \sqrt{d'^2 - H^2}$

$\alpha = \tan^{-1} \frac{H}{d_1}$

$= \tan^{-1} \frac{H}{\sqrt{d'^2 - H^2}}$

$= \tan^{-1} \frac{100}{\sqrt{(5km)^2 - 100^2}}$

Obtaining the Mobile Point-to-Point Model (Lee Model)

This mobile point-to-point model is obtained in three steps

(i) Generate a standard Condition

(ii) Obtain an area to area prediction

(iii) Obtain a mobile point-to-point model using the area-to-area model as basis

The philosophy of developing this model is to try to seperate two effects, one caused by the natural terrain contours & the other by the human made structures, in the received signal strength.

A Standard Condition:

To generate a Std. Condition & provide Correction factors, we have used the standard conditions shown on the left side & the correction factors on the right side. The advantage of using these standard values is to obtain directly a predicted value in decibels above 1mW is expressed in dBm dBM.

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The Signal to interference ratio Γ becomes

$$\Gamma = \frac{\overline{S^2(t)}}{\overline{I^2(t)}} = K + \sqrt{K^2 - 1} \qquad \text{— (2)}$$

where $K = \frac{\overline{X^2}}{\overline{Y^2}} - 1$

$$\therefore \overline{X^2} = \overline{S^4(t)} + \overline{I^4(t)} + 2\overline{S^2(t)}\,\overline{I^2(t)}$$

$$\overline{Y^2} = 2\overline{S^2(t)}\,\overline{I^2(t)}$$

$$\therefore \frac{\overline{X^2}}{\overline{Y^2}} - 1 \Rightarrow \frac{\overline{X^2} - \overline{Y^2}}{\overline{Y^2}} \Rightarrow \frac{\overline{S^4(t)} + \overline{I^4(t)} + 2\overline{S^2(t)}\,\overline{I^2(t)}}{2\overline{S^2(t)}\,\overline{I^2(t)}} - 1$$

$$\Rightarrow \frac{\overline{S^2(t)}\,\overline{S^2(t)} + \overline{I^2(t)}\,\overline{I^2(t)}}{2\overline{S^2(t)}\,\overline{I^2(t)}}$$

$$\Rightarrow \frac{\overline{S^2(t)}}{2\overline{I^2(t)}} + \frac{\overline{I^2(t)}}{2\overline{S^2(t)}} = K.$$

let $\frac{\overline{S^2(t)}}{\overline{I^2(t)}} = \Gamma$

$$\frac{K}{2} + \frac{1}{2K} = 1 \qquad \frac{\Gamma}{2} + \frac{1}{2\Gamma} - K = 0$$

$$2K^2 + 1 - 2K = 0 \qquad \Gamma^2 - 2K\Gamma + 1 = 0$$

$$2K^2 - 2K + 1 = 0$$

$$K^2 - 2K + 1 = 0$$

$$\Rightarrow \frac{2K \pm \sqrt{4K^2 - 4}}{2} \qquad \frac{2K \pm \sqrt{4K^2 - 4}}{2}$$

$$\Rightarrow K \pm \sqrt{K^2 - 1} \qquad \Rightarrow K \pm \sqrt{K^2 - 1}$$

Since X & Y can be seperated in eq (1), the preceding computation of Γ in eq (2) could have been accomplished by means of an envelope detector, & analog to digital Converter & micro Computer. The sampling delay time Δt should be small enough to satisfy

$$S(t) \approx S(t+\Delta t) \;,\; I(t) \approx I(t+\Delta t) \qquad \text{— (3)}$$

& $\cos[\phi_1(t) - \phi_2(t)] \cos[\phi_1(t+\Delta t) - \phi_2(t+\Delta t)] \approx 0$

Determining the delay time Δt to meet the requirement of eq (3) for this Calculation is difficult & is a drawback to this measurement technique. ∴ Real-time cochannel interference measurement is difficult to achieve in Practice.

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19/9/12

UNIT: IV

Cell Coverage for Signal & Traffic

Introduction:

Cell Coverage can be based on Signal Coverage & Traffic Coverage. Signal Coverage can be predicted by Coverage Prediction models & it is usually applied for start-up systems. The task is to Cover the whole area with minimum no. of cellsites. Since 100% Cell Coverage of an area is not possible, the cellsites must be engineered so that the holes are located in the no-traffic conditions. location. The Prediction model is a Point-to-Point model which is going to used in Cell Coverage Concepts. Signal Coverage & traffic Coverages are looked into different environments.

Human made Structures

1. In an open area.
2. In a Suburban area.
3. In an Urban area

natural terains

1. over flat terain
2. over hilly terain
3. over water
4. Through Foliage areas.

There are many field strength prediction models, they all Provide more or less an area-to-area prediction. As long as 68% of the predicted values from a model are within 6 to 8dB (one standard deviation) of their corresponding measured value, the model is considered as good one. But we cannot use the area to area prediction models for cellular system design bcoz of large uncertainty of the Prediction.

The model being introduced here is the point-to-point Prediction model which would Provide a standard deviation from the Predicted value of less than 3dB.

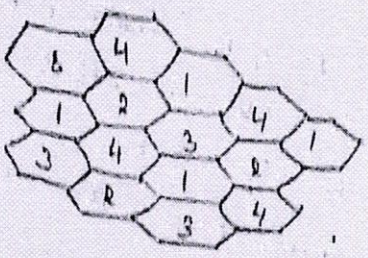
Ground incident angle:

The ground incident angle & the ground elevation angle over a Communication link are described i.e the ground incident angle θ is the angle of wave arrival incidently Pointing to the ground as shown in figure. The ground elevation angle ϕ is the angle of wave arrival at the mobile unit as shown in figure.

The frequency reuse distance D can be determined from.

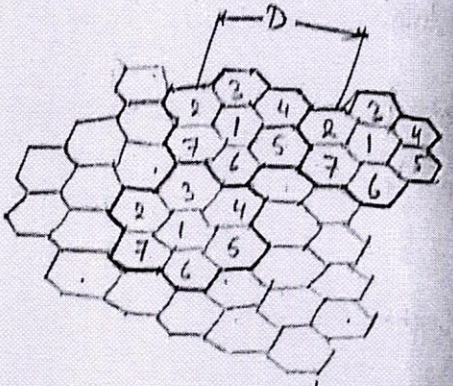
$D = \sqrt{3k}\,R$. k → freq. reuse pattern
R → Radius of the cell.

4)

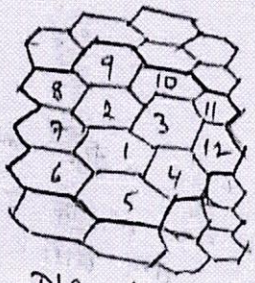


k = 4

b)



D/R = 4.6
k = 7



D/R = 6
k = 12.

$$D = \begin{cases} 3.46R & k = 4 \\ 4.6R & k = 7 \\ 6R & k = 12 \\ 7.55R & k = 19 \end{cases}$$

If all the cell sites transmit the same power, then k increases & the frequency reuse distance D increases. This increased D reduces the chance that cochannel interference.

Theoritically, a large k is desired. However, the total no. of allocated channels is fixed. When k is too large, the no. of channels assign to each of k cells become small. It is always true that if the total no. of channels in k cells is divided as K increases, trunking inefficiency results. The same principle applies to spectrum inefficiency: If the total no. of channels are divided into two network systems serving in the same area, Spectrum inefficiency increases.

The smallest no. k which can still meet our system performance requirements. This involves estimating co-channel interference & selecting the minimum freq. reuse distance D to reduce co-channel interference. The smallest value of k is k=3, obtained by setting i=1, j=1

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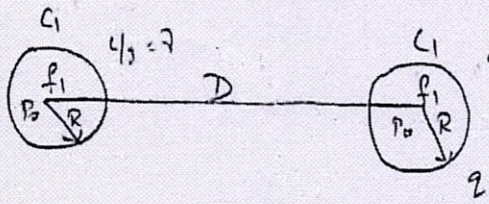


Frequency reuse is the core concept of the cellular mobile radio system. In this frequency reuse system, users in different geographic locations (different cells) may simultaneously use the same frequency channel. The frequency reuse system can drastically increase the spectrum efficiency, but if the system is not properly designed, serious interference may occur. Interference due to the common use of same channel is called co-channel interference & is our major concern in the concept of frequency reuse.

Frequency reuse schemes:

The freq. reuse concept can be used in the time domain & space domain. Frequency reuse in time domain results in the occupation of the same frequency in different time slots. It is called TDM.

Freq. reuse in space domain be divided into two categories.

1. Same frequency assigned in two different geographic areas, such as AM or FM radio stations using the same frequency in different cities.
2. Same frequency repeatedly used in a same general area in one-system the scheme is used in cellular systems. There are many co-channel cells in the system. The total frequency spectrum allocation is divided into K frequency reuse patterns for K = 4, 7, 12 & 19.

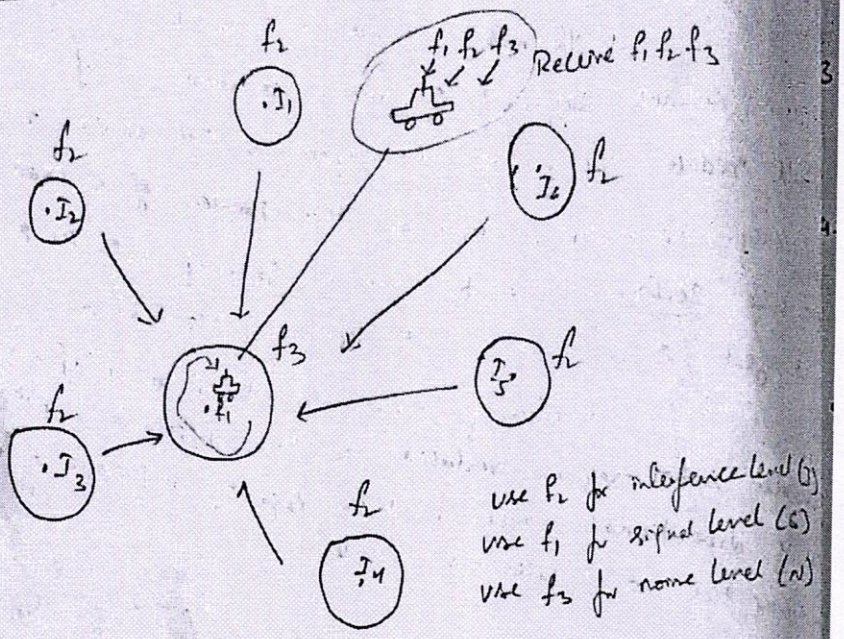
Frequency reuse distance:

The minimum distance which allows the same frequency to be reused will depend on many factors, such as the no. of co-channel cells in the vicinity of the centre cell, the type of geographic terrain contour, the antenna height & the trxed power at each cellsite.

Signal Strength measured in dBm
field strength " in dB(μv/m)

When Customer demand ↑, the channels which are limited in number, have to be repeatedly reused in different areas, which provides many cochannel cells, which increase the system capacity.

Cochannel interference area from a mobile Receiver.



Cochannel interference which occurs in one channel will occur equally in all the other channels in a given area. we can measure the cochannel interference by selecting any one channel (as one channel represents all channels) and tx'ing on that channel at all cochannel sites at night while the mobile receiver is traveling in one of the 6channel cells.

one channel f_1 → records the signal level (no-cochannel Condition)
two " f_2 → " Interference " (six cochannel Condition)
third " f_3 → " noise level.

we can obtain, in decibels, the Carrier to interference ratio C/I by subtracting the result obtained from f_2 from the result obtained from f_1 i.e $\frac{C}{I}$ = Carrier - Interference $(f_1 - f_2)$

$\frac{C}{N}$ = f_2 - f_3 (Carrier - noise (-N)

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3/7/12

UNIT: III

INTERFERENCE

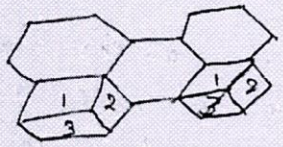
Co-channel Interference:

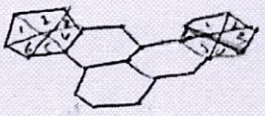
Improper

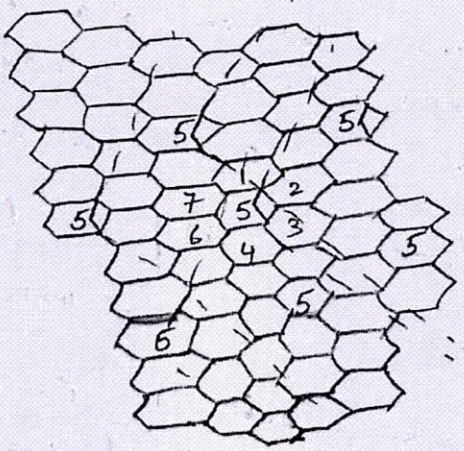
The frequency reuse method is useful for increasing the efficiency of spectrum usage but results in co-channel interference bcoz same frequency channels is used repeatedly in different co-channel cells

In the mobile radio environments, use of a seven-cell reuse pattern is not sufficient to avoid co-channel interference. Increasing K > 7 would reduce the no. of channels/cell S that would reduce spectrum efficiency. In order to overcome this problem of co-channel interference we use Sectoring i.e to increase capacity is to keep the cell radius unchanged & seek methods to decrease D/R ratio

Sectoring increases signal to interference ratio so that cluster size may be reduced. In this approach, if S/R is improved using directional antenna, then capacity improvement is acheived by reducing the no. of cells in a cluster.







The 120° sectoring reduces interference from co-channel cells. out of the 6 co-channel cells in the first tier, only two of them interfere with the centre cell. If omnidirectional antennas were used at each base station, all six co-channel cells would interfere with the centre cell.

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Frequency - Spectrum utilization:

→ Since the radio - freq spectrum is finite in mobile radio systems the most significant challenge is to use the radio freq spectrum as efficiently as possible.

→ Geographic locations is an important factor in the application of the frequency reuse concept in mobile cellular technology to increase spectrum efficiency.

→ Frequency management involving the assignment of proper channels in different cells can increase spectrum efficiency.

Within a cell, the channel assignment for each call is studied, other factors such as narrowing of the freq. band, off-air call setup, Queuing & call redirect.

→ The techniques for increasing frequency spectrum can be classified as

(1) Increasing the number of radio channels using narrow banding, Spread spectrum or time division.

(2) Improving Spatial frequency - Spectrum reuse.

(3) Frequency management & channel assignment

(4) Improving spectrum efficiency in time

(5) Reducing the load of invalid calls

(a) Off-air call setup - reducing the load of setup channels

(b) voice storage service for No-Answer calls.

(c) Call forwarding

(d) Reducing the customer's Keep-Dialing Cases

(e) Call waiting for Busy-call situations

(f) Queuing.

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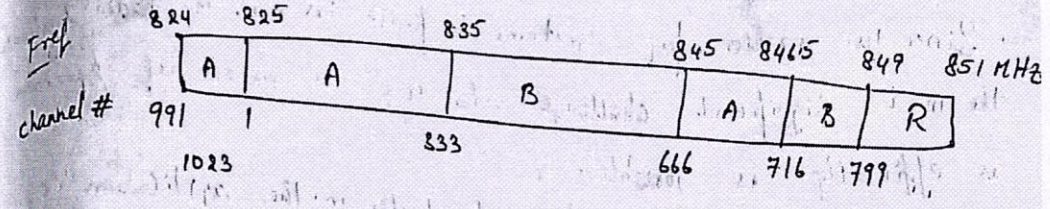
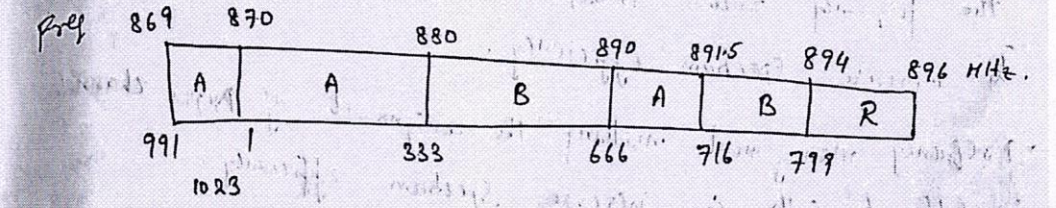
There are no channels between channels 799 & 991.

Mobile Tx



Cell site Tx:



New additional Spectrum allocation

Grouping into Subsets:

* The no. of voice channels for each system is 312. We can group these into any no. of subsets. Since there are 21 setup channels for each system, it is logical to group the 312 channels into 21 subsets.
* Each subset consists of 16 channels. In each set, the closest adjacent channel is 21 channels away, as shown in chart.
* The 16 channels in each subset can be mounted on a frame & connected to a channel combiner. wide seperation b/w adjacent channel combiner is required for meeting the requirement of minimum isolation.
* Each 16 channel subset is dedicated for each 16 channel combiner.
* In a seven cell frequency reuse cell system each cell contains three subsets $iA + iB + iC$, where i is an integer from 1 to 7. The total number of voice channels in a cell is about 45.
* The minimum seperation b/w three subsets is 7 channels. If 3 subsets are equipped in an omnicell site, the minimum seperation b/w two adjacent channels can be only three ($21/6 > 3$). physical channel BW.

Ex:
$1A + 1B + 1C + 4A + 4B + 4C$

(or)

$2A + 1B + 1C + 5A + 5B + 5C$

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1-76

4) If the maximum no. of Calls per hour Q_i in one cell be 5000 & an average Calling time T be 1-76 mins. The blocking Probability 2%. Find the offered load, if Q_i is 30000. Find the offered load Compare this with no. of Channels by using Erlang B modal charts.

(b) Max. no. of Calls per hour $Q_i = 5000$/hour

Avg. Calling time $T = 1.76$ min.

$B = 2\%$.

If $Q_i = 30000$ offered load $A = ?$

Then offered load $A = \frac{Q_i \times T}{60} \Rightarrow \frac{5000 \times 1.76}{60}$

$A = 146.67$ Erlangs

If the max. no. of Calls/hour $Q_i = 30000$ then offered load A is

$A = \frac{Q_i \times T}{60} = \frac{30000 \times 1.76}{60} = 880$ Erlangs.

For $A = 146.67$ Erlangs $B = 2\%$. the no. of chanels from Erlang B modal chart is $N = 160$

(a) $A = 880$ Erlangs $B = 2\%$.

$N = 900$.

∴ If the offered load ↑. the no. of chanels also ↑.

Concept of Frequency Reuse channels:

A radio channel Consists of pair of frequencies, one for each direction of the tx. path that is used for full-duplex operation. A Particular radio channel say f_1 used in one geographic Zone to Call a cell say C_1 with a Coverage radius R Can be used in another cell with the same Coverage radius at a distance D b/w both the cells.

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Problems:

1) During a busy hour the no. of calls per hour Q_i for each of 10 cells is 2000, 1500, 3000, 500, 1000, 1200, 1800, 2500, 2800 & 900. Assume that 60% of the car phones will be used during the busy hour period & that one call is made per phone. Find out the total no. of customers in the system?

Sol The no. of calls per hour for each of 10 cells.

$Q_1 = 2000$ $\quad Q_6 = 1200$

$Q_2 = 1500$ $\quad Q_7 = 1800$

$Q_3 = 3000$ $\quad Q_8 = 2500$

$Q_4 = 500$ $\quad Q_9 = 2800$

$Q_5 = 1000$ $\quad Q_{10} = 900$.

The % of car phones used during the busy period, $\eta_c = 60\%$.

The total no. of customers in the system $M_t = ?$

the total no. of calls per hour per car phone is given by

$$Q_t = \sum_{i=1}^{10} Q_i$$

$$= Q_1 + Q_2 + Q_3 + Q_4 + \cdots + Q_{10}$$

$$= 17,200 \text{ Calls/hour.}$$

The total no. of customers in the system is

$$M_t = \frac{Q_t}{\eta_c} = \frac{17200}{0.6} = 28,667$$

$\therefore M_t = 28,667.$

2. During a busy hour the no. of calls/hour Q_i for each 10 cells is 2000, 1500, 3000, 500, 1000, 1200, 1800, 3200, 2600 & 800. Assume that 20%, 60% & 90% of the car phones will be used during this period & that one call is made per car phone. Find the no. of customers in the system.

Sol $Q_t = \sum_{i=1}^{10} Q_i = 17600$ calls/hour.

$$M_t = \frac{Q_t}{\eta_c} = \frac{17600}{0.6} = 29333.33$$

$\therefore M_t = 29334.$ i/p for 20% & 90%.

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Maximum no. of frequency channels per cell:

The maximum no. of frequency channels per cell N is closely related to an average calling time in the system. The standard users calling habits may change as a result of the charging rate of the system & the general income profile of the users. If the average calling time T is 1.76 mins & the maximum calls per hour per cell Q_i. Then the offered load can be derived as

$$A = \frac{Q_i T}{60} \text{ erlangs}$$

where T → Avg calling time (min)
Q_i → no. of calls/hour/cell.

Assume that the blocking probability is given, then we can find the required no of radio channels in each cell.

Blocking Probability of cellular system:

It is defined as the percentage of initiated calls that get blocked due to insufficient no. of channels. It is generally denoted by B.

Ex: If B = 2%. then for every 100 calls, 2 calls are blocked & 98 calls the system can handle. Hence by using B value the no. of channels in a system can be predicted.

For a good system, the blocking probability must be low.

If the large area is covered by 28 cells, $K_t = 28$; the total no. of customers $M_t = \sum_{i=1}^{K_t} M_i$ in the system increases. Therefore, we may assume that the no. of subscribers per cell M_i, is somehow related to the percentage of car phones used in the busy hours (η_c) & the no. of calls per hour per cell Q_i as

$$M_i = f(Q_i, \eta_c)$$

where the value Q_i is a function of the blocking probability B, the average calling time T, & the no. of channels N

$$Q_i = f(B, T, N)$$

Cell: The each cellular base station is allocated a group of radio channels to be used within a small geographic area called a cell.

UNIT : II

Elements of Cellular Mobile Radio System Design

General Description of the problem:

The cellular mobile radio system design is divided into five major elements, they are divided based on the concept of efficient spectrum utilization.

(i) The Concept of frequency reuse channels
(ii) The Cochannel Interference reduction factor
(iii) The desired Carrier-to-interference ratio
(iv) The handoff mechanism
(v) Cell splitting.

Maximum number of Calls per hour per cell:

Let us Consider the maximum no. of Calls per hour per cell is represented by 'Q'. The parameters which are to be known to Calculate the maximum no. of Calls per hour per cell are

(i) Size of the cell → How small the theoritical cell size can be.
(ii) The traffic Conditions in the cell. → The Control of Coverage of small cells based on technological development

The technological development is the main basis for the Control of the Coverage of small cells. Assume that in a cell of 2 km radius which include many highways & in other areas a few highways. in some areas.

If there are about 60,000 Cars. $(\frac{2}{3})^{rd}$ of the Cars have Car phones & among them $(7/10)^{th}$ will make a Call during the busy hours. Then, the total no. of Calls per hour can be derived as

40,000 — Car phones

70% of 40,000 → Calls during busy hour

Then, the total no. of Calls per hour is given by

$Q = 70\%$ of 40,000

$= \frac{70}{100} \times 40,000 \Rightarrow 28,000$ Calls/hour.

$\therefore Q = 28,000$ Calls/hour.

The above no. of Calls/hour based on an average of one call per hour. This is the way how we can Predict the maximum no. of Calls per hour per a 2 km cell.

Non-fixed channel Assignment Algorithms:

Description of different algorithms:

1. **Fixed channel algorithm**: The fixed channel assignment (FCA) algorithm is the most common algorithm adapted in many cellular systems. In this algorithm, each cell assigns its own radio channel to the vehicles within its cell.

2. **Dynamic channel assignment**: In dynamic channel assignment (DCA) fixed channels are assigned to each cell. Therefore, any channel in a composite of 832 radio channels can be assigned to the mobile unit. This means that a channel is assigned directly to a mobile unit. On the basis of overall system performance, DCA can also be used during a call.

3. **Hybrid channel Assignment**: Hybrid channel assignment (HCA) is a combination of FCA & DCA. A portion of the total frequency channels will use FCA & the rest will use DCA.

4. **Borrowing channel Assignment**: Borrowing channel assignment (BCA) uses FCA as a normal assignment condition. When all the fixed channels are occupied, then the cell borrows channels from the neighbouring cells.

5. **Forcible - borrowing channel assignment**:

In forcible - borrowing channel assignment (FBCA), if a channel is in operation & the situation warrants it, channels must be borrowed from the neighbouring cells & at the same time, another voice channel will be assigned to continue the call in the neighbouring cell ~~& at the same time~~.

There are many different ways of implementing FBCA. In a general sense, FBCA can also be applied which accounting for the forcible borrowing of the channels within a fixed channel set to reduce the chance of cochannel assignment in a reuse cell pattern.

The FBCA algorithm is based on assigning a channel dynamically but obeying the rule of reuse distance. The distance

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between the two cell is reuse distance, which is the minimum distance at which no cochannel interference would occur.

Very infrequently, no channel can be borrowed in the neighbouring cells. Even those channels currently in operation can be forcibly borrowed & will be replaced by a new channel in the neighbouring cell or the neighbouring cell of the neighbouring cell If all the channels in the neighbouring cells cannot be borrowed bcoz of interference problems, the FBCA stops.

Simulation Procen & results:

On the basis of the FBCA, FCA & BCA algorithms, a seven cell reuse pattern with an average blocking of 3% is assumed & the total traffic service in an area is 250 erlangs. The traffic distribution are

(1) Uniform traffic distribution - 11 channels/cell

(2) Non-uniform traffic distribution - the number of channels in each cell is dependent on the vehicle distribution - The simulation model is described as follows.

1. Randomly select the cell (among 41 cells)
2. Determine the state of the vehicle in the cell (idle, off-hook, onhook, handoff)
3. In off hook or handoff state, search for an idle channel. The average no. of handoff's is assumed to be 0.2 times/call. However, FBCA will increase the no. of handoffs.

Average blocking: Two average blocking cases illustrating this simulation are shown in figure. In a uniform traffic condition the 3% blocking of both BCA & FBCA will result in a load increase of 28%, Compared to 3% blocking of FCA. There is no difference b/w BCA & FBCA when a uniform traffic condition exists.

In a non-uniform traffic distribution, the load increase in BCA drops to 23% & that of FBCA increases to 33% as at an average blocking of 3%. The load increase can be

iii. Spread Spectrum (or) freq-hopped, which generates many Codes over a wide freq band.

Why 800 MHz ?

The FCC's decision to choose 800 MHz was made bcoz of severe Spectrum limitations at lower freq. bands → FM broadcasting services operate in the vicinity of 100 MHz.

→ The Television broadcasting service starts at 41 MHz & extends upto 960 MHz
→ Air to ground systems use 118 to 136 MHz
→ Military aircraft use 225 - 400 MHz
→ Maritime mobile service is located in the vicinity of 160 MHz.
→ Fixed station services are allocated portions of the 30 - 100 MHz.

∴ It was hard for the FCC to allocate a spectrum in the lower portions of the 30 - 400 MHz band since the services of this band had become so crowded. On the otherhand, mobile radio tx. cannot be applied at 10 GHz or above bcoz severe propagation loss, multipath fading & rain activity make the medium improper for mobile communications.

Fortunately 800 MHz was originally assigned to educational TV channels, Cable TV service became a big factor in the mid 70's & 800 MHz shared the load of providing TV channels. This situation opened up the 800 MHz band to some extent & the FCC allocated a 40-MHz system at 800 MHz to mobile radio cellular system

History of 800 MHz Spectrum allocation:

→ In 1958, the Bell System proposed a 75 MHz system at 800 MHz, Quite a broadband proposal.
→ In 1970, the FCC tentatively decided to allocate 75 MHz for a wire-line Common Carrier
→ In 1971 December, the Bell system assured technical feasibility by showing how a cellular mobile system could be designed.

Assume an average calling time of 1.76 min & apply the Erlang B model (Lost-calls cleared Condition). Calculate the blocking Probability as follows: Use 6 channels, with each channel serving the two different no. of customers shown in Mo.

The offered load can be obtained by

$$A = \frac{\text{Avg. Calling time (minutes)} \times \text{total Customers (Mo} \times \text{channels)}}{60 \text{ mins}} \text{ erlangs}$$

$$A_1 = \frac{1.76 \times 53 \times 6}{60} = 9.32 \text{ erlangs} \quad (\text{MJ system})$$

$$A_2 = \frac{1.76 \times 37 \times 6}{60} = 6.51 \text{ erlangs} \quad (\text{MK system})$$

Given that the no. of channels is 6 & offered loads are $A_1 = 9.33$ & $A_2 = 6.51$ by using table appendix 1.1 to obtain the blocking Probabilities $B_1 = 50$ Percent (MJ system) & $B_2 = 30$ percent (MK system). It is likely that half the initiating calls will be blocked in the MJ system, a very high blocking probability.

If the actual average calling time is greater than 1.76 mins the blocking probability can be even higher. To reduce the blocking Probability, we must decrease the value of the freq spectrum utilization measurement Mo. As far as freq spectrum utilization is concerned, the Conventional System does not utilize the spectrum efficiently since each channel can only serve one customer at a time in a whole area.

Spectrum efficiency Consideration:

A major problem facing the radio Communication industry is the limitation of the available radio freq. spectrum. In setting allocation policy, the Federal Communications Commission (FCC) seeks systems which need minimal bandwidth but provide high usage & Consumer satisfaction.

The ideal mobile telephone system would operate within limited assigned freq band & would serve an almost unlimited no. of users in unlimited areas. Three major approaches to achieve the ideal are

i. SSB, which divides the allocated freq band into maximum no. of channels.
ii. cellular, which reuses the allocated freq band in different geographic locations

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Academic Year

Sl. No.	Periods			Topic Covered	Sl. No.	Periods			Topic Covered
	Day	Time	Date			Day	Time	Date	
(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
1	Monday	1	19/11/18	Introduction to CMC UNIT: I	21	Friday	6	14/12/18	Tutorial
2	Tuesday	3	20/11/18	limitations of Conventional Mobile	22	Friday	8	14/12/18	Mobile antennas
3	Thursday	3	22/11/18	Spectrum Consideration & why 800MHz?	23	Wednesday	7	19/12/18	High gain horizontal & vertical antennas
4	Friday	2	23/11/18	Trunking efficiency & Basic Cellular System	24	Thursday	4	20/12/18	problems on unit-III Tutorial
5	Monday	5	26/11/18	Performance Criteria	25	Thursday	8	20/12/18	Topic UNIT: II Cochannel Interference
6	Wednesday	8	28/11/18	Uniformity of mobile radio Environment	26	Friday	2	21/12/18	Real time cochannel Interference
7	Thursday	5	29/11/18	fading & A model of tx medium.	27	Wednesday	5	26/12/18	Design of omni directional antenna
8	Thursday	7	29/11/18	NOise in cellular System types, Hexagonal shape	28	Thursday	5	27/12/18	Design of Directional antenna
9	Friday	2	30/11/18	Operation of cellular System	29	Friday	6	28/12/18	Lowering of Antenna height
10	Friday	6	30/11/18	Digital & Analog cellular System	30	Friday	6	4/1/19	parasitic elements & Directivity, Pr'el
11	Tuesday	3	4/12/18	Offered load Problems	31	Monday	1	7/1/19	Types of non-cochannel Interference
12	Tuesday	4	4/12/18	Tutorial	32	Monday	1	21/1/19	Mobile point to point Model
13	Wednesday	3	5/12/18	PART: II Frequency reuse	33	Monday	1	21/1/19	Phase-difference of Lee model
14	Thursday	4	6/12/18	Frequency reuse, cochannel reduction factor interference	34	Monday	3	21/1/19	Propagation over water
15	Thursday	6	6/12/18	Handoff mechanism	35	Wednesday	2	23/1/19	Signal loss & mean distance
16	Monday	1	10/12/18	Cell splitting.	36	Wednesday	4	23/1/19	long distance & point to point Model
17	Monday	5	10/12/18	Derived q/2 ratio for omnidirectional antennas	37	Friday	2	25/1/19	UNIT: IV Introduction.
18	Wednesday	2	12/12/18	UNIT:-III Sum & difference patterns	38	Friday	4	25/1/19	Frequency management Alloc & Reuse channel
19	Wednesday	5	12/12/18	Cellsite antennas	39	Tuesday	3	29/1/19	Tutorial on Real time Cochannel Interf
20	Friday	4	14/12/18	Umbrella pattern, Interference reduction antennas	40	Tuesday	5	29/1/19	Tutorial on Lee Model.

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(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
41	Wednesday	3	30/1/19	Tutorial on Freffuenty management	61	Wednesday	2	6/3/19	overview of GSM
42	Wednesday	1	6/2/19	setup channel & voice channels.	62	Thursday	1	7/3/19	NA-TDMA Architecture
43	Wednesday	3	6/2/19.	Channel assignment.	63	Friday	2	8/3/19	TDMA Time Slots
44	Thursday	4	7/2/19	Fixed channel assignment	64	Monday	1	11/3/19	CDMA
45	Thursday	7	7/2/19	channel sharing & borrowing, reclotTaho	65	Tuesday	3	12/3/19	. CDMA Instructon format.
46	Friday	2	8/2/19	Non-Fixed channel Assignment.	66	Wednesday	2	13/3/19	Revision on GSM
47	Tuesday	1	12/2/19	Tutorial on channel Assignment	67	Thursday	3	14/3/19	Tutorial on on TDMA & CDMA.
48	Wednesday	1	13/2/19	UNIT:V Handoff Introduction.	68	Friday	2	15/3/19	Different Types of Handoff
49	Thursday	3	14/2/19	Handoff Initiation.	69	Monday	1	18/3/19	Dropped call rate
50	Monday	3	18/2/19	Delayed Handoff & Forced Handoff	70	Tuesday	2	19/3/19	Call splitting, vehicle locating methods
51	Tuesday	2	19/2/19	MAHO, SoftHO, CellularHO & Intersystem HO	71	Wednesday	3	20/3/19	Freffuenty management
52	Wednesday	2	20/2/19	Introduction of Dropped call rate	72	Friday	1	22/3/19	Fixed channel assignment.
53	Friday	2	22/2/19	General formula of Dropped Calls, Small Cells	73	Saturday	4	23/3/19	Revision of previous Q. Papers
54	Friday	4	22/2/19	Cell splitting & vehicle locating methods	74				
55	Monday	1	25/2/19	UNIT:VI GSM Architecture	75				
56	Tuesday	1	26/2/19	GSM Architecture Sub Systems	76				
57	Wednesday	3	27/2/19	GSM channels physical & logical	77				
58	Thursday	3	28/2/19	GSM channels signalling & voice/data	78				
59	Friday	2	1/3/19	Tutorial on GSM Architecture	79				
60	Tuesday	3	5/3/19	Multiple Access on GSM	80				

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3	Thursday	3	22/11/18	Spectrum Considerations & Why 800MHz?	23	Wednesday	4	19/12/18	Horizontal & Vertical Space diversity antenna
4	Friday	2	23/11/18	Trunking efficiency & Basic cellular system.	24	Thursday	5	20/12/18	Problems Tutorial hour
5	Monday	7	26/11/18	performance Criteria	25	Thursday	6	20/12/18	UNIT: II Cochannel Interference
6	Wednesday	8	28/11/18	Uniqueness of mobile radio Environment	26	Friday	4	21/12/18	Real time Cochannel Interference
7	Thursday	5	29/11/18	Fading & A-model for tr. media	27	Wednesday	2	26/12/18	Design of Omni directional antenna system
8	Thursday	7	29/11/18	Different users & Hexagonal shaped cells	28	Thursday	7	27/12/18	Design of directional antenna
9	Friday	2	30/11/18	Operation of Cellular System	29	Monday	6	4/1/19	Increase of antenna height
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12	Tuesday	4	4/12/18	Tutorial	32	Monday	1	21/1/19	Mobile point to point Model
13	Wednesday	3	5/12/18	PART: II Frequency reuse	33	Monday	3	21/1/19	Phase difference of Ice Model
14	Thursday	2	6/12/18	Cochannel Interference reduction factor	34	Wednesday	2	23/1/19	Propagation over water
15	Thursday	8	6/12/18	Hand off Mechanism	35	Wednesday	4	23/1/19	Foliage loss & Mean signal
16	Monday	1	10/12/18	Cell splitting.	36	Thursday	3	24/1/19	UNIT: IV Introduction
17	Monday	5	10/12/18	Desired C/I ratio at omnidirectional Antennas	37	Friday	2	25/1/19	Frequency management chart.
18	Wednesday	2	12/12/18	UNIT: III Sum & difference patterns	38	Monday	3	28/1/19	Voice channels Tutorial on C/I ratio
19	Wednesday	5	12/12/18	Cellsite antennas	39	Monday	5	29/1/19	Tutorial on Real time Cochannel Int.
20	Friday	4	14/12/18	Umbrella pattern & Interference reduction antennas	40	Wednesday	5	30/1/19	Tutorial on Ice Model.

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42	Wednesday	3	6/2/19	channel assignment.	62	Friday	2	8/3/19	TDMA Channels
43	Thursday	4	7/2/19	Fixed channel assignment	63	Monday	1	11/3/19	CDMA
44	Thursday	7	7/2/19	Channel theory & Borrowing Sectorization	64	Tuesday	2	12/3/19	CDMA Instruction set
45	Friday	2	8/2/19	Non-Fixed channel assignment	65	Wednesday	3	13/3/19	Tutorial one on GSM
46	Tuesday	1	12/2/19	Tutorial on Fixed assignment	66	Thursday	2	14/3/19	Tutorial One on TDMA & CDMA
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60	Wednesday	1	6/3/19	GSM overviews	80				

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