



**Lokmanya Tilak Jankalyan Shikshan Sanstha's**

**PRIYADARSHINI COLLEGE OF ENGINEERING**

(Recognised by A.I.C.T.E., New Delhi & Govt. of Maharashtra, Affiliated to R.T.M.Nagpur University)

Near CRPF Campus, Hingna Road, Nagpur-440 019, Maharashtra (India)

Phone : 07104 – 236381, 237307, Fax : 07104 – 237681,

email : principal.pce.ngp@gmail.com, www.pcenagpur.edu.in



### 1.3.2 Average percentage of courses that include experiential learning through project work/field work/internship during last five years

#### B.E – ELECTRONICS AND TELECOMMUNICATION ENGINEERING (2018-19)

Sr. No	Name of the course that include experiential learning through Project work/ Internship	Subject Code	Domain
1	Electronic Devices and Circuits	BEETE302T/P	<b>Analog &amp; Digital Circuits</b>
2	Analog Circuits & Design	BEETE503T/P	
3	Electronics Workshop Practice	BEETE606P	
4	Electromagnetic Fields	BEETE401T	
5	Digital Circuits and Fundamental of Microprocessor	BEETE404T/P	
6	Microprocessor & Microcontroller	BEETE502T/P	
7	Electronics Measurement and Instrumentation	BEETE303T/P	
8	Network Analysis And Synthesis	BEETE406T	<b>Signal Processing</b>
9	Software Workshop	BEETE407P	
10	Control System Engineering	BEETE603T	
11	Signals & Systems	BEETE403T	
12	DSP Processor & Architecture	BEETE701T/P	
13	Digital Signal Processing	BEETE602T/P	
14	Elective 2- Digital Image Processing	BEETE804T	<b>VLSI/Embedded System</b>
15	Advanced Digital System Design	BEETE701T/P	
16	Elective 2- Embedded System	BEETE804T	
17	Elective 1 - VLSI Signal Processing	BEETE705T	
18	Elective 3- Robotics and Automation	BEETE805T	
19	Elective 3- CMOS VLSI Design	BEETE805T	<b>Communication</b>
20	Antenna & Wave Propagation	BEETE501T	
21	Communication Electronics	BEETE504T	
22	Telecommunication Switching Systems	BEETE601T	
23	Digital Communication	BEETE604T/P	
24	Elective-1 Data Compression & Encryption	BEETE705T	
25	Optical Communication	BEETE703T/	
26	Television And Video Engineerin	BEETE702T/P	
27	Wireless & Mobile Communication	BEETE803T	
28	Computer Communication Network	BEETE802T/P	
29	Microwave & Radar Engineering	BEETE801T/P	
30	Elective-2 Artificial Intelligence	BEETE804T	



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31	Elective 3- Satellite Communication	BEETE805T	<b>Others</b>
32	Object Oriented Programming & Data Structure	BEENE304T/P	
33	Applied Mathematics- III	BEETE301T	
34	Applied Mathematics- IV	BEETE401T	
35	Environmental Studies	BEETE406T	
36	Industrial Economics & Entrepreneurship Development	BEENE505T	
37	Industrial Visit	BEETE607P	



**PRIYADARSHINI COLLEGE  
OF ENGG. NAGPUR  
CERTIFIED DOCUMENT**

Page <sup>3</sup> ..... to <sup>20</sup> .....

  
**Principal**

**B. E. Fifth Semester**

**(Electronics / Electronics & Communication/ Electronics & Telecommunication Engg)**

**MICROPROCESSOR AND MICROCONTROLLERS**

**Duration: 3**  
**Hrs. College Assessment: 20**  
**Marks University Assessment:**  
**80 Marks**

**Subject Code: BEENE502T/ BEECE502T/ BEETE502T**

**[4 – 0 – 1 – 5]**

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**Objectives:**

The course objectives are:

1. To study fundamentals of microprocessor and microcontroller systems.
2. To study architecture of microprocessor & to understand the concept of memory organization, stack memory, Assembly language programming.
3. To study different interrupt techniques.
4. To study interfacing of microprocessor & microcontroller with different peripheral devices.

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**Outcome:**

After completing this course students shall be able to:

1. Describe internal organization of 8086/8088 microprocessors & 8051 microcontrollers.
  2. Describe the concept of addressing modes and timing diagram of Microprocessor.
  3. Interface 8086 & 8051 with Keyboard/ Display, ADC/DAC, Stepper motor etc.
  4. Demonstrate the concept of interrupts and its use.
  5. Demonstrate the concept of Serial & parallel data communication
  6. Describe Handshaking concept and interfacing with peripheral devices.
  7. Describe the concept of DMA & Pentium.
  8. Describe 8087 Numeric coprocessor & its use in practical application.
  9. Interface various hardware with microprocessor.
- 

**Unit I: Intel 8086/8088 microprocessor & Programming:**

**(09)**

8086/8088 microprocessor, Pin diagram, Architecture, features and operating modes, Clock generator 8284, memory organization & interfacing, Addressing modes, complete instruction set.

**Unit II: 8086 & Peripheral Interfacing I:**

**(11)**

Assembly language programming of 8086, Interrupt structure, I/O interfacing, Interfacing of peripherals like 8255 PPI, multiplexed 7-seg display & matrix keyboard interface using 8255. Programmable Keyboard/Display controller 8279, Organization, Working modes, command words & interfacing.

**Unit III: 8086 & Peripheral Interfacing II:**

**(10)**

Programmable interval timer/counter 8254;  
PIC,

Architecture, working modes, interfacing 8259

Organization, control words, interfacing, cascading of 8259's. Serial communication, Classification & transmission formats. USART 8251, Pins & block diagram, interfacing with 8086 & programming.  
**Unit - IV: Numeric Co-processor & DMA Controller: (10)**

8086 maximum mode pin diagram, Closely coupled & loosely coupled multiprocessor system, 8087 Numeric coprocessor, architecture, interfacing with 8086, instruction set. DMAC 8237, Architecture, interfacing & programming, Introduction to Pentium.

**Unit - V: 8051 microcontroller & programming: (10)**

Introduction to 8051 microcontroller; Pin diagram, architecture, features & operation, Ports, memory organization, SFR's, Flags, Counters/Timers, Serial ports. Interfacing of external RAM & ROM with 8051. 8051 Interrupt structure, Interrupt vector table with priorities, enabling & disabling of interrupts

**Unit - VI: 8051 microcontroller interfacing: (10)**

Instruction set of 8051; data transfer, logical, arithmetic & branching instructions, Addressing modes, Assembly language programming examples, counter/timer programming in various modes. Serial communication, Operating modes, serial port control register, Baud rates. I/O expansion using 8255, Interfacing keyboard, LED display, ADC & DAC interface, stepper motor interface

**Books:**

**Text Books:**

1. Programming & Interfacing of 8086/8088, D.V. Hall, TMH.
2. Microprocessor 8086/8088 Family Programme Interfacing: Liu & Gibson
3. M.A. Mazidi & J.G. Mazidi, the 8051 Microcontroller and Embedded system, 3<sup>rd</sup> Indian reprint, Pearson Education
4. The Intel Microprocessor 8086 & 80486 Pentium and Pentium Pro. Architecture Programming and Interfacing – Brey.

**Reference Books:**

1. Intel Reference Manuals, Microprocessors & Microcontrollers: Intel
2. Microcontrollers – Peatman, Mc Graw Hill.
3. Microprocessors & Microcomputers based system design by Md. Rafiquzzaman.
4. 8086/8088 Microprocessors, Walter Triebel & Avtar Singh
5. Introduction to Microprocessors for Engineers and Scientists, P. K. Ghosh, P. R. Sridhar, PHI Publication.
6. The 8051 Microcontroller & Embedded Systems, Kenneth J. Ayala, Dhanvijay V. Gadre, CENGAGE Learning.

**PROJECT REPORT**  
**on**  
**“MEDICINE ASSIST ROBOT”**

Submitted in partial fulfillment of requirement for the *degree of*  
Bachelor of Engineering in  
**Electronics and Telecommunication Engineering**

Submitted By

**PAYAL TAKBHOWARE**

**POONAM BANDHEKAR**

**AKANKSHA KAMBLE**

**ASHU MENDHE**

**ABHILASHA DADURE**

Under the guidance of  
**Prof. Mr. M.K.DEMDE**



**Department of Electronics and Telecommunication**  
**Engineering**  
**Priyadarshini College of Engineering,**  
**Nagpur - 440019**  
**2016-17**

## CERTIFICATE

This is to certify that the project entitled "MEDICINE ASSIST ROBOT" has been carried out by

PAYAL TAKBHOWARE

POONAM BANDHEKAR

AKANKSHA KAMBLE

ASHU MENDHE

ABHILASHA DADURE

under my guidance and submitted the partial fulfillment for the degree of Bachelor of Engineering (B.E.) in Electronics and Telecommunication Engineering, during the academic year 2016-17 is a bonafide work prepared by them.

This work fulfills the requirements relating the standard of work for the award of Bachelor of Engineering in Electronics and Telecommunication to be awarded by Rashtrasant Tukdoji Maharaj Nagpur University, Nagpur.

Place: Nagpur

Date:

*Mawp*  
21/03/17

**Mr. M.K.DEMDE**

Guide

*S*  
22/03/17

**Dr. (Mrs.) S.W. Varade**

Head of Department

H.O.D.

Deptt. of E&T

Priyadarshini College of Engineering  
Nagpur-19

*m.p.singh*

**Dr. M.P.Singh**

Principal



# CHAPTER - 1

## 1.1 INTRODUCTION

Arduino is an open-source platform used for building electronics projects. Arduino consists of both a physical programmable circuit board (often referred to as a microcontroller) and a piece of software, or IDE (Integrated Development Environment) that runs on your computer, used to write and upload computer code to the physical board.

The Arduino platform has become quite popular with people just starting out with electronics, and for good reason. Unlike most previous programmable circuit boards, the Arduino does not need a separate piece of hardware (called a programmer) in order to load new code onto the board – you can simply use a USB cable. Additionally, the Arduino IDE uses a simplified version of C++, making it easier to learn to program. Finally, Arduino provides a standard form factor that breaks out the functions of the micro-controller into a more accessible package.

The Uno is one of the more popular boards in the Arduino family and a great choice for beginners. We'll talk about what's on it and what it can do later in the tutorial.

Believe it or not, those 10 lines of code are all you need to blink the on-board LED on your Arduino. The code might not make perfect sense right now, but, after reading this tutorial and the many more Arduino tutorials waiting for you on our site, we'll get you up to speed in no time!

### **You Will Learn**

In this tutorial, we'll go over the following:

- What projects can be accomplished using an Arduino
- What is on the typical Arduino board and why
- The different varieties of Arduino boards
- Some useful widgets to use with your Arduino

PROJECT REPORT ON  
**TRANSMISSION LINE FAULT DETECTION USING IOT**

Submitted in partial fulfillment of requirement for the degree of  
Bachelor of Engineering in  
**Electronics and Telecommunication Engineering**

SUBMITTED BY

1. MINAL GAJBHIYE      2. AKANKSHA GODBOLE  
3. POOJA BIJAWA      4. KAJAL GANVIR

UNDER THE GUIDANCE OF  
**DR. P.U. CHATI**



Department of Electronics and Telecommunication Engineering  
Priyadarshini College of Engineering,  
Nagpur - 440019  
2018-19



## CERTIFICATE

This is to certify that the project entitled "TRANSMISSION LINE FAULT DETECTION USING IOT" has been carried out by

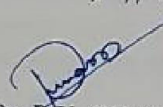
**MINAL GAJBHIYE**  
**PUJA BIJWE**

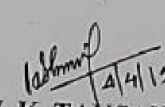
**AKANKSHA GODBOLE**  
**KAJAL GANVIR**

Under my guidance and submitted the partial fulfillment the degree of Bachelor of Engineering (B.E) in Electronic and Telecommunication to be awarded by Rashtrasant Tukdoji Maharaj Nagpur university, Nagpur.

Place -

Date - 03/09/2019


  
**Dr. P. U. CHATI**  
Guide

  
**Dr. V. K. TAKSANDE**  
Head of Department

**H.O.D.**  
Deptt. of E&T  
Priyadarshini College of  
Engineering, Nagpur-19

  
**Dr. M. P. SINGH**  
Principal



  
31/4/19

## ABSTRACT

The fault occurred in transmission line is very much dangerous for the locality. In HV and EHV transmission line there are less fault occurrence but in locality the fault occurrence is more as compared to outer transmission line. In our prototype we design a model which is to be detect the fault in transmission line by comparing the voltage signal between the transmission line and a reference value, the reference value is predetermined and if the transmission line voltage is more than or less than reference value then fault is to be shown in display. The information regarding fault occurrence in particular phase is send to web page via IOT device which is NODE MCU(Esp8266) and also shown in display. The potential transformer is used to sense the voltage and send output to microcontroller IC. Here **microcontroller** IC ATMEGA 16 is used, in this IC programming is done which compare the voltage signal and send output to IOT module and display. The power supply is provided to supply 5 volt dc power to all component this supply is separate from the supply which is used to check the fault occurrence.

**Keywords:** Internet of things, **Microcontroller IC Atmega16**, potential transformer.

**PROJECT REPORT**  
**ON**  
**“ REMOTE MONITORING OF SENSOR DATA FROM MACHINES ”**

Submitted in partial fulfillment of requirement for the degree of  
Bachelor of Engineering in

**Electronics and Telecommunication Engineering**

Submitted By

**SIDDHESH S. THEMDEO**  
**KIRAN D. MANDHARE**

**CHETAN G. KURVE**  
**RAJESH S. IPPA**

Under the guidance of  
**MS. V. G. NASRE**



**Department of Electronics and Telecommunication Engineering**  
**Priyadarshini College of Engineering,**  
**Nagpur – 440019**  
**2018-19**

## ABSTRACT

Automation plays a vital role in the safe and reliable operation in various manufacturing industries. This system focuses on an innovative, intelligent control & Monitoring system for machines and workstation in industries by using “IoT” And “microcontroller”. This system is an attempt to develop a cost effective real-time remote monitoring system. For this “microcontroller system” is used to monitor and check system status. It is an automated device that can provide a safe, affordable and readily available for industrial usage. The system proposed is used for the remotely monitoring of machine health/status by continuously observing the sensors specified. It is based on soft-real-time system which will detects a minor fluctuations in the machine parameter values and predicts the problem accordingly. Previously, an operator or manual surveillance is required to detects the problem in machines. The proposed system uses IoT concept i.e., Internet of Things, which will monitor and store data automatically, which results in easier for analysis. Internet of Things (IoT) is a latest technology which works on the principle of control system such as computer to control the physical devices over the internet. Here various machines parameters are monitored at real-time using IoT i.e., Internet of Things. This is a smart and better way for industry automation that allows user to efficiently control industry appliances/machines over the internet.



**B. E. Fourth Semester**

**(Electronics / Electronics & Communication / Electronics & Telecommunication Engg)**

**ELECTROMAGNETIC FIELDS**

**Duration : 3 Hr.**

**College Assessment : 20 Marks**

**University Assessment : 80 Marks**

**Subject Code : BEENE403T/ BEECE403T/ BEETE403T**

**[ 4 – 0 – 1 –5]**

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**Objectives :** To provide the students of Engineering with a clear and logical presentation of basic concepts and principles of electromagnetic.

**Outcomes :**

After the completion of this subjects, the students will

5. Understand the concepts of Electric, Magnetic and **Electromagnetic fields** required to understand the concepts of Electronic Communication.
  6. Understand the different coordinate system for mathematical analysis of Electromagnetic Engineering.
  7. Understand the different theorems and their use in Electromagnetic field.
  8. Understand the use of waveguides for the transmission of electromagnetic waves at higher frequencies.
  9. Understand the basic concepts of Radiation and Elements used for radiation along with the basic terminologies.
- 

**UNIT I : ELECTROSTATICS**

**(12)**

Introduction to Cartesian, Cylindrical and Spherical coordinate systems, Electric field intensity, flux density, Gauss's law, Divergence, Divergence Theorem, Electric potential and potential gradient.



**UNIT II: MAGNETOSTATICS:****(10)**Current

density and continuity equation, Biot-Savart's law, Ampere's circuital law and applications, Magnetic flux and Flux density, Scalar and Vector magnetic potentials.

**UNIT III: MAXWELL'S EQUATIONS AND BOUNDARY CONDITIONS:****(08)**

Maxwell's equations for steady fields. Maxwell's equations for time varying fields. Electric and magnetic boundary conditions.

**UNIT IV :ELECTROMAGNETIC WAVES****(10)**

Electromagnetic wave equation, wave propagation in free space, in a perfect dielectric, and perfect conductor, skin effect, Poynting vector and Poynting theorem, reflection and refraction of uniform plane wave at normal incidence plane, reflection at oblique incident angle

**UNIT V: WAVEGUIDES****(10)**

Introduction, wave equation in Cartesian coordinates, Rectangular waveguide, TE, TM, TEM waves in rectangular guides, wave impedance, losses in wave guide, introduction to circular waveguide.

**UNIT VI: RADIATION****(10)**

Retarded potential, Electric and magnetic fields due to oscillating dipole (alternating current element), power radiated and radiation resistance, application to short monopole and dipole. Antenna Efficiency, Beam-width, Radiation Intensity, Directive Gain Power Gain & Front To Back Ratio. Advance topics on the subject

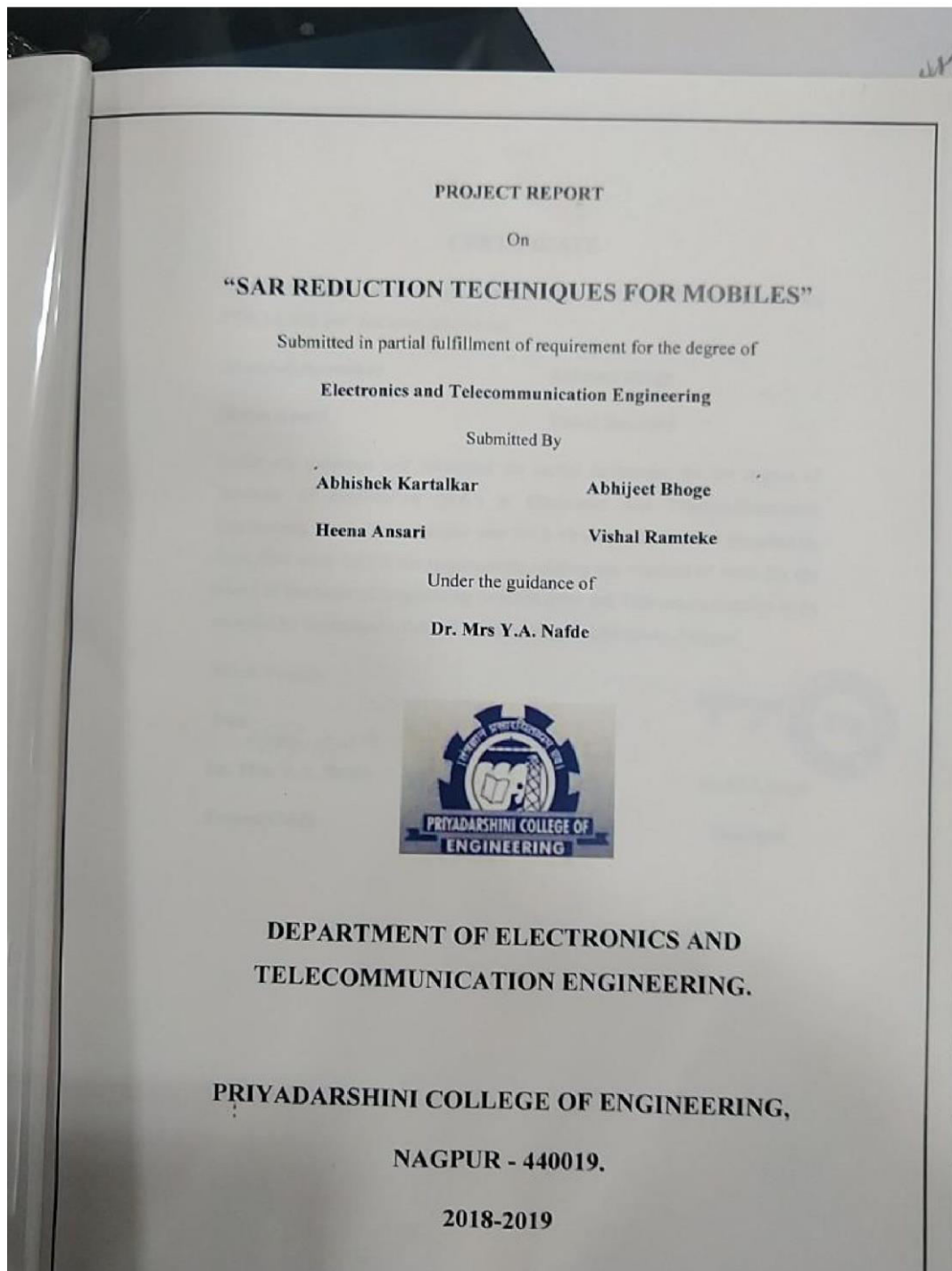
**TEXT BOOKS:**

5. W.H Hayt. and J.A. Buck : "Engineering Electromagnetics", McGraw Hill Publications.
6. Antenna & wave propagation, by K. D. Prasad, PHI Publication.
7. E.C. Jordan and K.C. Balmain : "Electromagnetic Waves and Radiating System", PHI Publications.

**REFERENCE BOOKS:**

5. Rao : "Elements of Engineering Electromagnetics", Pearson education
6. E J.D Krauss : "Electromagnetics", Mc-Graw Hill Publications. Fields and Waves in Communication Electronics (3rd edition), by S. Ramo and R. Whinnery, John Wiley and Sons.

7. R.S. Kshetrimayum: "Electromagnetic Field Theory", CENGAGE Learning Publications.
8. John Reitz, F. Milford, R.W. Christy: "Foundations of Electromagnetic Theory",  
Pearson Publications.



### CERTIFICATE

This is to certify that the project entitled "SAR REDUCTION TECHNIQUES FOR MOBILES" has been carried out

**Abhishek Kartalkar**

**Abhijeet Bhoge**

**Heena Ansari**

**Vishal Ramteke**

Under my guidance and submitted the partial fulfillment for the degree of Bachelor of Engineering (B.E.) in Electronics and Telecommunication Engineering, during the academic year 2018-19 is a bonafide work prepared by them. This work fulfills the requirements relating the standard of work for the award of Bachelor of Engineering in Electronics and Telecommunication to be awarded by Rashtrasant Tukdoji Maharaj Nagpur University, Nagpur.

Place: Nagpur

Date:

**Dr. Mrs. Y.A. Nafde**

**Project Guide**

**Dr. V.K. Taksande**

**Head of Department**



**Dr. M.P. Singh**

**Principal**

## ABSTRACT

Specific absorption rate (SAR) is a measure of the rate at which energy is absorbed by the human body when exposed to a radio frequency (RF) electromagnetic field. It can also refer to absorption of other forms of energy by tissue, including ultrasound. It is defined as the power absorbed per mass of tissue and has units of watts per kilogram (W/kg). SAR is usually averaged either over the whole body, or over a small sample volume (typically 1 g or 10 g of tissue). The value cited is then the maximum level measured in the body part studied over the stated volume or mass. This will cause the many health issues like cancer, brain hemorrhage, paralysis. Thus we have attempted to lower the SAR by using the different techniques like changing the antenna position situated in mobile phones, by using RF shield which lowers the radiation. This is solved through simulation which has been done on FEKO software for antenna design by Altair and try to reduce the SAR value.

**Keywords:** Simulation, Microstrip patch antenna, FEKO.

**B. E. Eighth Semester**

**(Electronics & Communication/ Electronics & Telecommunication Engg)**

**WIRELESS & MOBILE COMMUNICATION**

**Duration: 3 Hr.**

**College Assessment: 20 Marks**

**University Assessment: 80 Marks**

**Subject Code: BEECE803T/ BEETE803T**

**[4 – 0 – 0 – 4]**

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**Objectives:**

- 10. To impart the fundamental concept of mobile communication system.**
  - 11. To give the student the idea about cellular communication theory & technology**
  - 12. To introduce various technology and protocol involved in mobile communication**
  - 13. To provide the student with an understanding the cellular concept.**
- 

**Outcome: By the end of the course, the students shall be able to:**

- 1. Design a model of cellular system communication and analyze their operation and performance.**
  - 2. Quantify the causes and effects of path loss and signal fading on received signal characteristics.**
  - 3. to construct and analyze the GSM system**
- 

**Unit 1: The cellular concept**

**(06)**

Evolution of mobile radio communication. Cellular telephone system, frequency reuse, channel assignment and handoff strategies, interference and system capacity, trunking and grade of service, improving capacity in cellular system.

**Unit 2:- The mobile radio environment**

**(08)**

Causes of propagation path loss, causes of fading-long and short term, definition of sample average, statistical average, probability distribution, level crossing rate and average duration of fade, delay spread, coherence bandwidth, inter-symbol interference.

**Unit 3:- Equalization, diversity and channel coding**

**(08)**

Fundamentals of equalization, space polarization, frequency and time diversity techniques, space diversity, polarization diversity, frequency and time diversity, fundamentals of channel coding.

**Unit 4:- GSM**

**(08)**

Global system for mobile: services and features, GSM system architecture, GSM radio subsystem, GSM channel type, GSM frame structure, signal processing in GSM, introduction to CDMA digital



cellular standard, Third generation wireless networks, 3G technology.

#### **Unit 5:-Introduction to wireless networking**

**(08)**

Difference between wireless and fixed telephone networks, development of wireless network, traffic routing in wireless networks.

**Mobile IP and wireless access protocol**, mobile IP, operation of mobile IP, collocated address, Registration, Tunneling, WAP Architecture, overview, WML scripts, WAP service, WAP session protocol.

#### **Unit 6: Wireless LAN Technology**

**(07)**

Infrared LANs, Spread spectrum LANs, Narrow band microwave LANs, IEEE 802 protocol, Architecture, IEEE802 architecture and services, 802.11 medium access control, 802.11 physical layer.

Wireless Application Protocol: architecture, WDP, WTLS, WTP, WSP, WAE, WML scripts.

#### **TEXT BOOKS:**

1. Wireless Communications, Principles, Practice – Theodore, S. Rappaport, PHI, 2nd Edn.
2. Wireless Communication and Networking – William Stallings, PHI, 2003.
3. Mobile Communications- Jochen Schiller, Pearson Education, 2004.

#### **REFERENCES:**

1. Wireless Digital Communications – Kamilo Feher, PHI, 1999.
2. Principles of Wireless Networks – Kaveh Pahlavan and P. Krishna Murthy, Pearson Education, 2002.
3. Fourouzan, Data communications and Networking, third edition, Tata McGraw-Hill Publication, 2004.
4. Mobile Cellular Telecommunications-William C Y Lee, 2 edition, Mc. Graw Hill Publication.

## *Project Report*

### **1.1. Objective:-**

With the development of 4G mobile communication systems, more and more mobile hosts now a day are equipped with multiple network interfaces which are capable of connecting to the internet. As a result, an interesting problem surfaced on how to decide the "best" network to use at a "best" time moment.

The decision to decide best network may be based on static factors such as the bandwidth of each network (capacity), usage charges of each network, power consumption of each network interface and battery level of mobile device. However, Dynamic factors must be considered in handoff decisions for effective network usage. For example, information on current network conditions such as received signal strength(RSS) can help in improving whole system performance; current user conditions, such as a mobile host's moving speed can eliminate certain networks from consideration(i.e. those networks that do not support mobility).

Hence, in this major project, our objective is to develop and implement a *Algorithm* which helps in taking the right vertical handoff decisions by determining the "best" network at "best" time among available networks, based on dynamic factors such as "Received Signal Strength (RSS)" of network and "velocity" of mobile station as well as static factors. This model not only meets the individual user needs but also improve the whole system performance by reducing the unnecessary handoffs.