



Anand Nagar, Krishnankoil - 626126, Srivilliputtur (via), Virudhunagar District, Tamilnadu.

APPLICATION FOR ADMISSION TO Ph.D. PROGRAMMES

Date of Application:27-06-2020

Department	ELECTRONICS AND COMMUNICATION ENGINEERING	Application No.	20200153
Area of Research	METAMATERIALS	Research Mode	FULL TIME

Name :VEMULA RAJESH
Date of Birth / Age :12-04-1984 / 36 Years
Gender :MALE
Category :OC
e-Mail ID :rajeshraovemula@gmail.com
Mobile :9391926620



Rajesh Vemula

Father's/Husband's Name	V MUNEAIH	Father's/Husband's Occupation	FARMER
Family Income	2,00,000	Residential Type	RURAL
Birth Place	B N KANDRIGA, CHIOOR DT, ANDHRA PRADESH	Mother Tongue	TELUGU
Religion	HINDU	Martial Status	MARRIED
Aadhaar No.	429608761978	PAN No.	AHLPV0723B
Physically Challenged	NO	Type of Disability	-

Address for Communication: 1-144 B N KANDRIGA B N KANDRIGA CHITTOOR DISTRICT ANDHRA PRADESH INDIA Pin-517640	Permenant Address: 1-144 B N KANDRIGA B N KANDRIGA CHITTOOR DISTRICT ANDHRA PRADESH INDIA Pin-517640
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Qualification						
Degree	Discipline	College/university	Year Passed	AVG/CGPA	Class	Mode
B.E	ELECTRONICS AND COMMUNICATION ENGINEERING	ANNA UNIVERSITY/SRI NANDHANAM COLLEGE OF ENGINEERING AND TECHNOLOGY	2006	69	FIRST	REGULAR
M.B.A	BUSINESS ADMINISTRATION	ANNA UNIVERSITY/SRI NANDHANAM COLLEGE OF ENGINEERING AND TECHNOLOGY	2010	70	FIRST	REGULAR
M.TECH	VLSI SYSTEM DESIGN	JNTUH/ST MARYS COLLEGE OF ENGINEERING AND TECHNOLOGY	2014	75.5	FIRST CLASS WITH DISTINCTION	REGULAR

Experience

Organization	Designation	Experience From	Experience TO	Work Nature
SANT SAMARTH ENGINEERING COLLEGE	LECTURER	2006-09-04	2008-11-25	TEACHING FOR UG
AURORAS SCIENTIFIC TECHNOLOGICAL AND RESEARCH ACADEMY	ASSISTANT PROFESSOR	2009-06-12	2010-05-31	TEACHING FOR UG

Payment Details				
Transaction ID	Reference	Date of transaction	Amount	Status
20200153_200627175612	SHMP8938576992	27-06-2020	600	SUCCESS

RESEARCH PROPOSAL

TITLE:

Design Wearable antenna with metamaterials for biomedical applications

INTRODUCTION:

Communication technologies and biomedical sensors can provide services for the patient's vital signs to be monitored outside the clinical environment. The need for wearable or implantable telecommunication devices for medical applications has been growing rapidly over the past ten years. Microwave antennas and sensors are key components of telemetry systems related to medical applications. Metamaterials are artificial materials which have the electromagnetic properties that may not be found in nature. The unusual properties of a metamaterial have led to the development of metamaterial antennas, sensors and metamaterial lenses for miniature wireless systems which are more efficient than their conventional counterparts. Metamaterials exhibit a very sensitive response to the strain, dielectric media, chemical and biological sensing applications. The design concept of wearable metamaterial antenna in ISM band for biomedical applications is the fundamental theory and recent progress of metamaterial in antenna for various healthcare applications towards its practical implementation. This proposal is to design wearable metamaterial antenna for various biomedical applications.

OVERVIEW:

In Recent years, need for the deployment of wireless telemetry systems in medicine has significantly increased due to necessity for early diagnosis of diseases and continuous monitoring of physiological parameters. Microwave antennas and sensors are key components of these telemetry systems since they provide the communication between the patient and base station. Metamaterials can have their electromagnetic properties altered to something beyond what can be found in nature. Hence metamaterials have been attracted great interest among microwave engineers and physicists, due to showing exotic electromagnetic properties at microwave frequencies. A split-ring resonator (SRR) is one of the metamaterial particles that offer negative permeability, while complementary split-ring resonator (CSRR), the duality of SRR, interacts

with the electric field and introduces negative permittivity, which are most commonly used in biomedical sensors. It is well known that SRRs are resonant structures, and consequently, it is possible to employ these resonances as well as radiating modes. SRRs are very compact and it is easy to design them with dual band characteristic. Metamaterials gain their properties not from their composition, but from their exactly designed structures. These metamaterials achieve desired effects by incorporating structural elements of sub-wavelength sizes, i.e. features that are actually smaller than the wavelength of the waves they affect. Metamaterial antennas are a class of antennas which use metamaterials to increase performance of miniaturized (electrically small) antenna systems. Their purpose, as with any electromagnetic antenna, is to launch energy into free space. However, these incorporate metamaterials, which are materials engineered with novel, often microscopic, structures to produce unusual physical properties. Antenna designs incorporating metamaterials can step-up the radiated power of an antenna. Novel components such as compact resonators and metamaterial loaded waveguides offer the possibility of previously unavailable applications. The metamaterial, on the other hand, makes the antenna behave as if it were much larger than it really is, because the novel antenna structure stores energy, and re-radiates it. Hence, these novel antennas appear to be useful for wireless systems that continue to decrease in size for applications such as portable interaction with satellites, wide angle beam steering, emergency communications devices, micro-sensors and portable ground-penetrating radars to search for tunnels, caverns and other geophysical features. In addition, already established lithography techniques can be used to print metamaterial elements on a PC board.

GENERAL MECHANISM:

One of the major applications is cancer removal by burning tumour. Cancer is the uncontrolled growth of abnormal cells in the body, called as malignant cells. By developing microwave devices and combining it with structures inspired by metamaterials, it can lead to a very cost-effective device that can localize with high precision an abnormality within the human body. The basic principle behind the cancer detection is, a small change in the water content of biological tissues produces changes in the permittivity (ϵ) and conductivity (σ) values of the tissues. The malignant cells have significantly higher water content than normal tissues. Hence the permittivity and the conductivity of the tumor are higher than those ones of a normal tissue at

microwave frequencies. The proposed biosensor consists of an array of complementary metallic metamaterial resonators. The reason for choosing SRRs are their strong response to an electromagnetic field.

OBJECTIVE:

The Objective is to design an antenna with perfect hardware for minor and major invasive procedures. The key idea behind the wearable metamaterial antenna is the simultaneous application of biomedical, telemetry, wireless, radar, and satellite etc. This antenna designed with metamaterials for major advancement for lower density, lightweight, small, enhancing, performance, compact and easy to design. This technology can be easily used to kill the cancer tissue by alone or in adjuvant with other measures.

PROBLEM DEFENITION:

Biomedical field requires circuit design which has a broader range of material parameters resulting in negative refractive index has resulted in antennas that are innovative. Combining a left-handed transmission line segments with a conventional (right-handed) transmission line results in novel configurations with advantages over antenna designs for biomedical applications.

SCOPE OF THE PROJECT:

There is growing need for engineers and physicists to concentrate and develop equipment's specifically suitable for healthcare. Metamaterials is one of the active fields of research in the past decade which has potential application in healthcare. This proposal summarizes the extensive use of metamaterials in biomedical applications. In particular, an overview to design the metamaterial antenna to operate at ISM band and the use for wide applications of metamaterials in cancer detection, microwave hyperthermia, strain sensing, reduction of SAR. Apart from these, metamaterials are also applied in glucose monitoring for diabetes management. Also, the use of resorbable metamaterials will overcome the issues associated with retrieval of implantable devices after their operational lifetime. The metamaterials in biomedical applications opens a wide area of research with high compact size, high performance, low density are more applicable.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

HYDERABAD - 500 085, TELANGANA STATE, INDIA

TS 626720



H.T No.: **11D01D5728**

College Code : D0 (S M C E T, DESHMUKHI)

Mr. Rajesh V
S/o. V Muneaih

having fulfilled the academic requirements and passed the examination held during *April, 2014* in *First Class With Distinction* has this day been admitted by the Executive Council to the Degree of

Master Of Technology
VLSI System Design

Given under the Seal of the University

Date: 04-09-2014



DIRECTOR OF EVALUATION

REGISTRAR

VICE CHANCELLOR

CMM No
20198005558



45200198155220

PC No
30198005395

Anna University



Reg. No.51408631036/RG

The Syndicate of the Anna University hereby makes known that **RAJESH VEMULA** has been admitted to the **DEGREE OF MASTER OF BUSINESS ADMINISTRATION** under the Faculty of Management Sciences, having completed the prescribed programme of study and having been certified by the duly appointed examiners to be qualified to receive the same, and has been placed in **FIRST CLASS** at the Examination held in **JUNE 2010**.

Given under the Seal of the University



Chennai 600 025

India

December 2010

GPM6310365

V. Jayaram

Controller of Examinations

S. Jayaram

Registrar

S. Srinivasan

Vice-Chancellor

SRILAKSHMIDEVATHI@ANNAUNIVERSITY



The Syndicate of the Anna University hereby makes known that
RAJESH VEMULA *has been admitted to the* **DEGREE OF BACHELOR**
OF ENGINEERING *in* **ELECTRONICS AND COMMUNICATION**
ENGINEERING *under the Faculty of Information and Communication*
Engineering having completed the prescribed programme of study and having
been certified by duly appointed examiners to be qualified to receive the same and
having been placed by them in the **FIRST CLASS** *at the Examination held in*
NOVEMBER 2006.

Given under the Seal of the University



Chennai 600 025
 India
 March 2007

CSUM410601603

V. Jayaraman

Controller of Examinations

K. J. S. S. S.

Registrar

allan...

Vice-Chancellor

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
HYDERABAD - 500 085, ANDHRA PRADESH, INDIA

CONSOLIDATED MARKS MEMO / CREDIT SHEET



Master of Technology- VLSI SYSTEM DESIGN

CMM. No. : **C 0469974**

Serial No. : 20198005558

Name : **RAJESH V**

Name of the College : **S M C E T, DESHMUKHI**

Month & Year of Final Exam : **April, 2014**

Hall Ticket No. : 11D01D5728

Year of Admission : 2011-2012

Class Awarded : **FIRST CLASS WITH DISTINCTION**

S.No	SUBJECT TITLE	INT MARKS	EXT MARKS	Total Marks	Pass(P)/ Fail(F)
	Maximum Marks in Theory	40	60	100	
	Maximum Marks in Lab	40	60	100	
I SEMESTER					
1	MICROCONTROLLERS FOR EMBEDDED SYSTEM DESIGN	39	24	63	P
2	CPLD & FPGA ARCHITECTURES AND APPLICATIONS	39	28	67	P
3	VLSI TECHNOLOGY & DESIGN	39	25	64	P
4	ALGORITHMS FOR VLSI DESIGN AUTOMATION	39	24	63	P
5	DIGITAL SYSTEM DESIGN	39	24	63	P
6	ADVANCED DIGITAL SIGNAL PROCESSING	39	33	72	P
7	SIMULATION LAB (VLSI)	39	55	94	P
8	SEMINAR	50	-	50	P
II SEMESTER					
1	SYSTEM ON CHIP ARCHITECTURE	39	30	69	P
2	CMOS ANALOG & MIXED SIGNAL DESIGN	39	26	65	P
3	EMBEDDED REAL TIME OPERATING SYSTEMS	39	35	74	P
4	DESIGN OF FAULT TOLERANT SYSTEMS	39	25	64	P
5	DIGITAL SIGNAL PROCESSORS AND ARCHITECTURES	39	39	78	P
6	LOW POWER VLSI DESIGN	39	40	79	P
7	EMBEDDED SYSTEMS DESIGN LAB	39	59	98	P
8	SEMINAR - II	50	-	50	P
III SEMESTER					
1	COMPREHENSIVE VIVA - VOCE	-	95	95	P
	(Comprehensive VIVA External= 100)				
IV SEMESTER					
1	PROJECT WORK*	-	B	-	P
	(* A - Excellent, B - Good, C - Satisfactory, D - Un Satisfactory)				

Aggregate Marks Secured **1208 OUT OF 1600 (75.50%)**

Date of Issue : **June 23, 2014**

(see overleaf for Rules concerned to award of class)



(*Courses registered but not counted for calculation of aggregate)

Aravind S. G. S.
CONTROLLER OF EXAMINATIONS



**ANNA UNIVERSITY
CHENNAI
M.B.A DEGREE EXAMINATIONS**

Folio No. J187908

R10008751145A

CONSOLIDATED STATEMENT OF MARKS

NAME OF THE CANDIDATE		RAJESH VEMULA	REGISTER NO		51408631036	
COLLEGE OF STUDY		514. Sri Nandhanam College of Engineering and Technology	MONTH & YEAR OF LAST APPEARANCE		June 2010	
PROGRAMME & SPECIALIZATION		M.B.A.	REGULATIONS		2005	
SEM.	SUBJECT CODE	SUBJECT TITLE	MAX	MIN	MARKS SECURED	MONTH & YEAR OF PASSING
01	BA1601	Statistics for Management	100	50	069	NOV 2008
01	BA1602	Economic Foundations of Business Environment	100	50	069	NOV 2008
01	BA1603	Applied Operations Research for Management	100	50	065	NOV 2008
01	BA1604	Organizational Behaviour	100	50	062	NOV 2008
01	BA1605	Communication Skills	100	50	063	NOV 2008
01	BA1606	Accounting for Management	100	50	060	NOV 2008
01	BA1607	Legal Aspects of Business	100	50	071	NOV 2008
02	BA1651	Production Management	100	50	060	NOV 2009
02	BA1652	Financial Management	100	50	062	NOV 2009
02	BA1653	Marketing Management	100	50	065	JUN 2009
02	BA1654	Human Resource Management	100	50	066	JUN 2009
02	BA1655	Management Information System	100	50	059	JUN 2009
02	BA1656	Quality Management	100	50	065	NOV 2009
02	BA1657	Research Method in Business	100	50	061	NOV 2009
02	BA1658	Business Application Software	100	50	089	JUN 2009
03	BA1701	International Business Management	100	50	069	NOV 2009
03	BA1702	Strategic Management	100	50	058	NOV 2009
03	BA1721	Sales Management	100	50	072	NOV 2009
03	BA1723	Advertising and Sales Promotion	100	50	069	NOV 2009
03	BA1724	Consumer Behaviour	100	50	067	NOV 2009
03	BA1734	Entrepreneurship Development	100	50	069	NOV 2009
03	BA1736	Industrial Relations and Labour Welfare	100	50	069	NOV 2009
03	BA1737	Labour Legislations	100	50	064	NOV 2009
03	BA1719	Summer Project Report	100	50	085	NOV 2009
04	BA1770	Project Work	400	200	354	JUN 2010

End of Statement

Classification : FIRST CLASS

Total Marks : 1962 / 2800

Percentage (rounded to nearest integer) : 70



Medium of Instruction : ENGLISH

V. Zy...

Controller of Examinations



ANNA UNIVERSITY, CHENNAI

B. E. DEGREE EXAMINATIONS
CONSOLIDATED STATEMENT OF MARKS

Folio No. D126430

NAME OF THE CANDIDATE		REGISTER NO.	
RAMESH VEMULA		S1402106033	
COLLEGE OF STUDY		MONTH & YEAR OF LAST APPEARANCE	
S14. Sri Nandhanam College of Engineering and Technology		November 2006	
PROGRAMME & BRANCH			
B. E. Electronics and Communication Engineering			
SEM. / SUBJECT CODE		REGULATIONS	
		2001	
SEM.	SUBJECT TITLE	SEM.	SUBJECT TITLE
01	CM131 Chemistry - I	05	EC336 Computer Architecture
01	GE131 Engineering Mechanics	05	EC337 Digital System Design and Signal Processing Lab
01	MA131 Mathematics I	05	EC338 Microprocessor and Control Lab
01	PH131 Physics I	06	EC341 Digital Communication
01	HS041 English - I	06	EC342 EM Waves and Wave Guides
01	GE132 Computer Practice I	06	EC343 Computer Communication Networks
01	GE133 Workshop Practice	06	EC345 Television and Video Engineering
02	EC141 Electronic Devices	06	MG325 Engineering Economics and Financial Accounting
02	EC142 Circuit Theory	06	EC041 Medical Electronics
02	MA132 Mathematics II	06	EC346 Communication System Lab
02	PH135 Material Science	06	EC435 Electronic System Design Lab
02	HS042 English II	07	CE071 Principles of Environmental Science and Engineering
02	EC143 Electric Circuit Lab	07	EC431 Antennas and Propagation
02	GE134 Engineering Graphics	07	EC432 Microwave Engineering
02	GE135 Computer Practice II	07	EC433 Optical Communication
03	EC231 Network Analysis and Synthesis	07	GE035 Professional Ethics
03	EC232 Signals and Systems	07	MG331 Principles of Management
03	EC233 Electromagnetic Fields	07	EC434 Microwave and Optical Communication Lab
03	EC234 Electronic Circuits - I	07	EC440 RF Lab
03	EE233 Electrical Engineering	07	EC439 Comprehension
03	MA231 Mathematics - III	08	GE406 Total Quality Management
03	EC236 Electronic Devices and Circuits Lab	08	EC047 Cellular Mobile Communication
03	EE234 Electrical Engineering Lab	08	EC444 Project Work
04	EC241 Electronic Circuits II		
04	EC242 Digital Electronics		
04	EC243 Programming and Data Structures		
04	EC244 Linear Integrated Circuits		
04	EC245 Measurements and Instrumentation		
04	MA034 Random Processes		
04	EC246 Computer Programming Lab		
04	EC247 Electronic Circuit Design Lab		
05	EC331 Microprocessor and Applications		
05	EC332 Communication Theory and Systems		
05	EC333 Digital Signal Processing		
05	EC334 Control Systems		
05	EC335 Transmission Lines and Networks		

End of Statement

Classification : FIRST CLASS

Total Marks (from 3rd to 8th semester) : 3095 / 4500

Percentage (rounded to nearest integer) : 69



Medium of Instruction : ENGLISH
Chemical - 600 025.
Date : 15-02-2007

Controller of Examinations

ST. MARY'S GROUP OF INSTITUTIONS HYDERABAD

Approved by AICTE, Permitted by Govt. of T.S. Affiliated to J.N.T. University, Hyderabad

Near Ramoji Film City, Behind Mount Opera, Deshmukhi (V), Pochampally (M), Nalgonda (Dist)
Balasingaram (V), Hayatnagar (M), Ranga Reddy Dist., Greater Hyderabad - 508 284 Under HMDA, T.S., INDIA

ORIGINAL

TRANSFER CERTIFICATE

S.No. 2558

Date: 03/09/16

1. Name of the Student Rajesh Vemula
2. Name of the Father / Guardian Vemula Muneiah
3. Nationality Indian Community -
4. Date of Birth 12/04/1984
5. Year of Admission 2011
6. Hall Ticket No. 1100105728
7. Course M.Tech Branch M.Tech [VLSI]
8. Date of Leaving 03/09/2016
9. Conduct Good
10. General Remarks -

T. Rama
Clerk
03/09/16



A.M.S.
PRINCIPAL
St. Mary's Group of Institutions
Hyderabad



Ref No. 1507 / ASTRA/09-10

31 May 2010

ORDERS

Sub: Establishment - ASTRA Mr. V. Rajesh, Lecturer, ECE Dept. -
Relieving Orders - Issued.

Mr. V. Rajesh, Lecturer of ECE Department is relieved of his duties from this Academy on 31 May 2010 (A.N).

Mr. V. Rajesh, joined this Academy on 25 Jun 2009. During this period he was found to be hardworking and sincere with affable disposition.

We wish him all the success in his future endeavors.


Director
Aurora's Scientific, Technological &
Research Academy
Bandlaguda, Hyderabad - 500 005

To
Mr. V. Rajesh
Lecturer

Copy to

1. The Joint Registrar, Aurora Consortium
2. Head Dept. of ECE, ASTRA
3. Personnel File

आयकर विभाग

INCOME TAX DEPARTMENT



सत्यमेव जयते

भारत सरकार

GOVT. OF INDIA

RAJESH VEMULA

MUNEIAH VEMULA

12/04/1984

Permanent Account Number

AHLPV0723B

V. Rajesh

Signature





భారత ఎన్నికల సంఘము

ELECTION COMMISSION OF INDIA

ఓటరు ఫోటో గుర్తింపు కార్డు - ELECTOR PHOTO IDENTITY CARD



WWR0507830



పేరు : రాజేశ్ వేముల

Name : Rajesh Vemula

తండ్రి పేరు : మునీశ్ వేముల

Father's Name : Muneash Vemula

भारत निर्वाचन आयोग

C No/609/10 Dt 18.6.16

RESIDENCE CERTIFICATE

This is to certify that Sri / Srimathi / Kumari Vernula Rajesh

Son / Daughter of Sri V. Muneiah is a resident of

2-54 House No. and Ward No. B.N. kandruga Street

B.N. kandruga Village / Town in B.N. kandruga

Revenue Mandal of Chittoor District of Andhra Pradesh State.

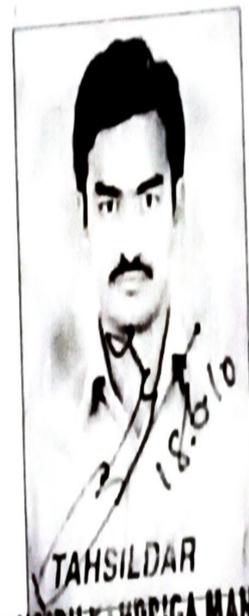


Station :

Date :

Signature

Designation



TAHSILDAR
BUCHIMADU KANDRUGA MANDAL
CHITTOOR DISTRICT, A.P.