**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA**
**KAKINADA – 533 003, Andhra Pradesh, India**
**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**

# COURSE STRUCTURE AND SYLLABUS

**For**

## B. TECH ELECTRONICS AND COMMUNICATION ENGINEERING

*(Applicable for batches admitted from 2019-2020)*

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA**

**KAKINADA - 533 003, Andhra Pradesh, India**

# JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA
## KAKINADA – 533 003, Andhra Pradesh, India
## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

### I Year – I SEMESTER

| Sl. No | Course Code | Subjects | L | T | P | Credits |
|---|---|---|---|---|---|---|
| 1 | HS1101 | English | 3 | 0 | 0 | 3 |
| 2 | BS1101 | Mathematics - I | 3 | 0 | 0 | 3 |
| 3 | BS1106 | Applied Chemistry | 3 | 0 | 0 | 3 |
| 4 | ES1101 | Programming for Problem Solving Using C | 3 | 0 | 0 | 3 |
| 5 | ES1103 | Engineering Drawing | 1 | 0 | 3 | 2.5 |
| 6 | HS1102 | English Lab | 0 | 0 | 3 | 1.5 |
| 7 | BS1107 | Applied Chemistry Lab | 0 | 0 | 3 | 1.5 |
| 8 | ES1102 | Programming for Problem Solving Using C Lab | 0 | 0 | 3 | 1.5 |
| 9 | MC1101 | Environmental Science | 3 | 0 | 0 | 0 |
| **Total Credits** | | | **16** | **0** | **12** | **19** |

### I Year – IISEMESTER

| Sl. No | Course Code | Subjects | L | T | P | Credits |
|---|---|---|---|---|---|---|
| 1 | BS1202 | Mathematics – II | 3 | 0 | 0 | 3 |
| 2 | BS1203 | Mathematics – III | 3 | 0 | 0 | 3 |
| 3 | BS1204 | Applied Physics | 3 | 0 | 0 | 3 |
| 4 | ES1209 | Network Analysis | 3 | 0 | 0 | 3 |
| 5 | ES1211 | Basic Electrical Engineering | 3 | 0 | 0 | 3 |
| 6 | ES1215 | Electronic workshop | 0 | 0 | 2 | 1 |
| 7 | ES1208 | Basic Electrical Engineering Lab | 0 | 0 | 3 | 1.5 |
| 8 | BS1205 | Applied Physics Lab | 0 | 0 | 3 | 1.5 |
| 9 | HS1203 | Communication Skills Lab | 0 | 0 | 2 | 1 |
| 10 | PR1201 | Engineering Exploration Project | 0 | 0 | 2 | 1 |
| | | | **15** | **0** | **12** | **21** |

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## II Year – ISemester

| S. No. | Course | Category | L | T | P | Credits |
|---|---|---|---|---|---|---|
| 1 | Electronic Devices and Circuits | PC | 3 | 0 | 0 | 3 |
| 2 | Switching Theory and Logic Design | PC | 3 | 0 | 0 | 3 |
| 3 | Signals and Systems | PC | 3 | 0 | 0 | 3 |
| 4 | Random Variables and Stochastic Processes | PC | 3 | 0 | 0 | 3 |
| 5 | Object Oriented Programming through Java | ES | 3 | 0 | 0 | 3 |
| 6 | Managerial Economics & Financial Analysis | HS | 3 | 0 | 0 | 3 |
| 7 | Electronic Devices and Circuits - Lab | LC | 0 | 0 | 3 | 1.5 |
| 8 | Switching Theory and Logic Design - Lab | LC | 0 | 0 | 3 | 1.5 |
| 9 | Constitution of India | MC | 3 | 0 | 0 | 0 |
| | | | Sub-Total | | | 21 |

## II Year – IISemester

| S. No. | Course | Category | L | T | P | Credits |
|---|---|---|---|---|---|---|
| 1 | Electronic Circuit Analysis | PC | 3 | 0 | 0 | 3 |
| 2 | Linear Control Systems | PC | 3 | 0 | 0 | 3 |
| 3 | Electromagnetic Waves and Transmission Lines | PC | 3 | 0 | 0 | 3 |
| 4 | Analog Communications | PC | 3 | 0 | 0 | 3 |
| 5 | Computer Architecture and Organization | ES | 3 | 0 | 0 | 3 |
| 6 | Management and Organizational Behavior | HS | 3 | 0 | 0 | 3 |
| 7 | Electronic Circuit Analysis - Lab | LC | 0 | 0 | 3 | 1.5 |
| 8 | Analog Communications - Lab | LC | 0 | 0 | 3 | 1.5 |
| | | | Sub-Total | | | 21 |

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## III Year – I Semester

| S. No. | Course | Category | L | T | P | Credits |
|---|---|---|---|---|---|---|
| 1 | Linear Integrated Circuits and Applications | PC | 3 | 0 | 0 | 3 |
| 2 | Microprocessor and Microcontrollers | PC | 3 | 0 | 0 | 3 |
| 3 | Digital Communications | PC | 3 | 0 | 0 | 3 |
| 4 | Electronic Measurements & Instrumentation | PC | 3 | 0 | 0 | 3 |
| 5 | Professional Elective (PE 1) | PE | 3 | 0 | 0 | 3 |
| 6 | Linear Integrated Circuits and Applications - Lab | LC | 0 | 0 | 3 | 1.5 |
| 7 | Digital Communications Lab | LC | 0 | 0 | 3 | 1.5 |
| 8 | Microprocessor and Microcontrollers - Lab | LC | 0 | 0 | 3 | 1.5 |
| 9 | Mini Project with Hardware Development | PR | 0 | 0 | 3 | 1.5 |
| 10 | Essence of Indian Traditional Knowledge | MC | 3 | 0 | 0 | 0 |
| | | | Sub-Total | | | 21 |

## III Year – IISemester

| S. No. | Course | Category | L | T | P | Credits |
|---|---|---|---|---|---|---|
| 1 | Wired and Wireless Transmission Devices | PC | 3 | 0 | 0 | 3 |
| 2 | VLSI Design | PC | 3 | 0 | 0 | 3 |
| 3 | Digital Signal Processing | PC | 3 | 0 | 0 | 3 |
| 4 | Professional Elective (PE2) | PE | 3 | 0 | 0 | 3 |
| 5 | Open Elective (OE1) | OE | 3 | 0 | 0 | 3 |
| 6 | Internet of Things | PC | 3 | 0 | 0 | 3 |
| 7 | VLSI Lab | LC | 0 | 0 | 3 | 1.5 |
| 8 | Digital Signal Processing Lab | LC | 0 | 0 | 3 | 1.5 |
| 9 | Intellectual Property Rights (IPR) & Patents | MC | 3 | 0 | 0 | 0 |
| | | | Sub-Total | | | 21 |

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## IV Year – ISemester

| S. No. | Course | Category | L | T | P | Credits |
|---|---|---|---|---|---|---|
| 1 | Microwave and Optical Communication Engineering | PC | 3 | 0 | 0 | 3 |
| 2 | Data Communications & Computer networks | PC | 3 | 0 | 0 | 3 |
| 3 | Digital Image and Video Processing | PC | 3 | 0 | 0 | 3 |
| 4 | Professional Elective (PE3) | PE | 3 | 0 | 0 | 3 |
| 5 | Professional Elective (PE4) | PE | 3 | 0 | 0 | 3 |
| 6 | Internet of Things Lab | LC | 0 | 0 | 3 | 1.5 |
| 7 | Microwave and Optical Communication Engineering LAB | LC | 0 | 0 | 3 | 1.5 |
| 8 | Project - Part I | PR | 0 | 0 | 6 | 3 |
| | | | Sub-Total | | | **21** |

## IV Year – II Semester

| S. No. | Course | Category | L | T | P | Credits |
|---|---|---|---|---|---|---|
| 1 | Professional Elective (PE5) | PE | 3 | 0 | 0 | 3 |
| 2 | Open Elective (OE2) | OE | 3 | 0 | 0 | 3 |
| 3 | Project - Part II | PR | 0 | 0 | 18 | 9 |
| | | | Sub-Total | | | **15** |
| | | | **Total** | | | **160** |

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| II Year-I Semester | | L | T | P | C |
|---|---|---|---|---|---|
| | | 3 | 0 | 0 | 0 |

## CONSTITUTION OF INDIA

**Course Objectives:**

- To Enable the student to understand the importance ofconstitution
- To understand the structure of executive, legislature andjudiciary
- To understand philosophy of fundamental rights andduties
- To understand the autonomous nature of constitutional bodies like Supreme Court and high court controller and auditor general of India and election commission ofIndia.
- To understand the central and state relation financial andadministrative.

**UNIT-I**

Introduction to Indian Constitution: Constitution meaning of the term, Indian Constitution - Sources and constitutional history, Features - Citizenship, Preamble, Fundamental Rights and Duties, Directive Principles of State Policy.

**Learning outcomes:**

After completion of this unit student will

- Understand the concept of Indianconstitution
- Apply the knowledge on directive principle of statepolicy
- Analyze the History, features of Indianconstitution
- Evaluate Preamble Fundamental Rights andDuties

**UNIT-II**

Union Government and its Administration Structure of the Indian Union: Federalism, Centre-State relationship, President: Role, power and position, PM and Council of ministers, Cabinet and Central Secretariat, LokSabha, RajyaSabha, The Supreme Court and High Court: Powers andFunctions;

**Learning outcomes:**-After completion of this unit student will

- Understand the structure of Indiangovernment
- Differentiate between the state and centralgovernment
- Explain the role of President and PrimeMinister
- Know the Structure of supreme court and Highcourt

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## UNIT-III

State Government and its Administration Governor - Role and Position - CM and Council of ministers, State Secretariat: Organization, Structure and Functions

**Learning outcomes:**-After completion of this unit student will

- Understand the structure of stategovernment
- Analyze the role Governor and ChiefMinister
- Explain the role of stateSecretariat
- Differentiate between structure and functions of statesecretariat

## UNIT-IV

A.Local Administration - District's Administration Head - Role and Importance, Municipalities - Mayor and role of Elected Representative - CEO of Municipal Corporation PachayatiRaj: Functions PRI: ZilaPanchayat, Elected officials and their roles, CEO ZilaPanchayat: Block level Organizational Hierarchy - (Different departments), Village level - Role of Elected and Appointed officials - Importance of grass root democracy

**Learning outcomes:**-After completion of this unit student will

- Understand the localAdministration
- Compare and contrast district administration role andimportance
- Analyze the role of Myer and elected representatives ofMunicipalities
- Evaluate Zillapanchayat block levelorganisation

## UNIT-V

Election Commission: Election Commission- Role of Chief Election Commissioner and Election Commissionerate State Election Commission:, Functions of Commissions for the welfare of SC/ST/OBC and women

**Learning outcomes:**-After completion of this unit student will

- Know the role of Election Commission applyknowledge
- Contrast and compare the role of Chief Election commissioner andCommissiononerate
- Analyze role of state electioncommission
- Evaluate various commissions of viz SC/ST/OBC andwomen

**References:**

1. Durga Das Basu, Introduction to the Constitution of India, Prentice – Hall of India Pvt. Ltd.. NewDelhi
2. SubashKashyap, Indian Constitution, National BookTrust
3. J.A. Siwach, Dynamics of Indian Government &Politics
4. D.C. Gupta, Indian Government andPolitics

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| III Year - I Semester | | L | T | P | C |
|---|---|---|---|---|---|
| | | 3 | 0 | 0 | 0 |

## ESSENCE OF INDIAN TRADITIONAL KNOWLEDGE

**Course Objectives:**
To facilitate the students with the concepts of Indian traditional knowledge and to make them understand the Importance of roots of knowledge system

- The course aim of the importing basic principle of third process reasoning and inference sustainability is at the course of Indian traditional knowledgesystem
- To understand the legal framework and traditional knowledge and biological diversity act 2002 and geographical indication act2003
- The courses focus on traditional knowledge and intellectual property mechanism of traditional knowledge andprotection
- To know the student traditional knowledge in differentsector

**Course Outcomes:**
After completion of the course, students will be able to:

- Understand the concept of Traditional knowledge and itsimportance
- Know the need and importance of protecting traditionalknowledge
- Know the various enactments related to the protection of traditionalknowledge
- Understand the concepts of Intellectual property to protect the traditionalknowledge

**UNIT I**
Introduction to traditional knowledge: Define traditional knowledge, nature and characteristics, scope and importance, kinds of traditional knowledge, the physical and social contexts in which traditional knowledge develop, the historical impact of social change on traditional knowledge systems. Indigenous Knowledge (IK), characteristics, traditional knowledge vis-à-vis indigenous knowledge, traditional knowledge Vs western knowledge traditional knowledge vis-à-vis formal knowledge
Learning Outcomes:
At the end of the unit, the student will able to:

- Understand the traditionalknowledge.
- Contrast and compare characteristics importance kinds of traditionalknowledge.
- Analyze physical and social contexts of traditionalknowledge.
- Evaluate social change on traditionalknowledge.

**UNIT II**
Protection of traditional knowledge: the need for protecting traditional knowledge Significance of TK Protection, value of TK in global economy, Role of Government to harness TK.
Learning Outcomes:
At the end of the unit, the student will able to:

- Know the need of protecting traditionalknowledge.
- Apply significance of tkprotection.

- Analyze the value of tk in globaleconomy.
- Evaluate role ofgovernment

**UNIT III**

Legal framework and TK: A: The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, Plant Varieties Protection and Farmers Rights Act, 2001 (PPVFR Act);B:The Biological Diversity Act 2002 and Rules 2004, the protection of traditional knowledge bill, 2016. Geographical indications act 2003.

Learning Outcomes:

At the end of the unit the student will able to:

- Understand legal framework ofTK.
- Contrast and compare the ST and other traditional forestdwellers
- Analyze plant variantprotections
- Evaluate farmers rightact

**UNIT IV**

Traditional knowledge and intellectual property: Systems of traditional knowledge protection, Legal concepts for the protection of traditional knowledge, Certain non IPR mechanisms of traditional knowledge protection, Patents and traditional knowledge, Strategies to increase protection of traditional knowledge, global legal FORA for increasing protection of Indian Traditional Knowledge.

Learning Outcomes:

At the end of the unit, the student will ableto:

- Understand TK andIPR
- Apply systems of TKprotection.
- Analyze legal concepts for the protection ofTK.
- Evaluate strategies to increase the protection ofTK.

**UNIT V**

Traditional knowledge in different sectors: Traditional knowledge and engineering, Traditional medicine system, TK and biotechnology, TK in agriculture, Traditional societies depend on it for their food and healthcare needs, Importance of conservation and sustainable development of environment, Management of biodiversity, Food security of the country and protection of TK.

Learning Outcomes:

At the end of the unit, the student will able to:

- Know TK in differentsectors.
- Apply TK inengineering.
- Analyze TK in varioussectors.
- Evaluate food security and protection of TK in thecountry.

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| III Year - II Semester | | L | T | P | C |
|---|---|---|---|---|---|
| | | 3 | 0 | 0 | 0 |

## Intellectual Property Rights (IPR) & Patents

**UNIT I**

Introduction to Intellectual Property Rights (IPR): Concept of Property - Introduction to IPR – International Instruments and IPR - WIPO - TRIPS – WTO -Laws Relating to IPR - IPR Tool Kit - Protection and Regulation - Copyrights and Neighboring Rights – Industrial Property – Patents - Agencies for IPR Registration – Traditional Knowledge –Emerging Areas of IPR - Layout Designs and Integrated Circuits – Use and Misuse of Intellectual PropertyRights.

**UNIT II**

Copyrights and Neighboring Rights: Introduction to Copyrights – Principles of Copyright Protection – Law Relating to Copyrights - Subject Matters of Copyright – Copyright Ownership – Transfer and Duration – Right to Prepare Derivative Works –Rights of Distribution – Rights of Performers – Copyright Registration – Limitations – Infringement of Copyright – Relief and Remedy – Case Law - Semiconductor Chip ProtectionAct.

**UNIT III**

Patents: Introduction to Patents - Laws Relating to Patents in India – Patent Requirements – Product Patent and Process Patent - Patent Search - Patent Registration and Granting of Patent - Exclusive Rights – Limitations - Ownership and Transfer — Revocation of Patent – Patent Appellate Board - Infringement of Patent – Compulsory Licensing –- Patent Cooperation Treaty – New developments in Patents – Software Protection and Computer relatedInnovations

**UNIT IV**

Trademarks: Introduction to Trademarks – Laws Relating to Trademarks – Functions of Trademark – Distinction between Trademark and Property Mark – Marks Covered under Trademark Law - Trade Mark Registration – Trade Mark Maintenance – Transfer of rights - Deceptive Similarities

Likelihood of Confusion - Dilution of Ownership – Trademarks Claims and Infringement – Remedies – Passing Off Action.

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**UNIT V**

Trade Secrets & Cyber Law and Cyber Crime: Introduction to Trade Secrets – General Principles - Laws Relating to Trade Secrets–
Maintaining Trade Secret – Physical Security – Employee Access Limitation – Employee Confidentiality Agreements – Breach of Contract –Law of Unfair Competition – Trade Secret Litigation – Applying State Law.
Cyber Law – Information Technology Act 2000 - Protection of Online and Computer Transactions –
E-commerce - Data Security – Authentication and Confidentiality - Privacy - Digital Signatures – Certifying Authorities - Cyber Crimes - Prevention and Punishment – Liability of Network Providers.

**References:**


1) Intellectual Property Rights (Patents & Cyber Law), Dr. A. Srinivas. Oxford University Press, NewDelhi.
2) Deborah E.Bouchoux: Intellectual Property, Cengage Learning, NewDelhi.
3) PrabhuddhaGanguli: Intellectual Property Rights, Tata Mc-Graw –Hill, NewDelhi
4) Richard Stim: Intellectual Property, Cengage Learning, NewDelhi.
5) Kompal Bansal &Parishit Bansal Fundamentals of IPR for Engineers, B. S. Publications (Press).
6) Cyber Law - Texts & Cases, South-Western's Special TopicsCollections.
7) R.Radha Krishnan, S.Balasubramanian: Intellectual Property Rights, Excel Books. New Delhi.
8) M.Ashok Kumar and MohdIqbal Ali: Intellectual Property Rights, SerialsPub.


**Course Outcomes:**

- IPR Laws and patents pave the way for innovative ideas which are instrumental for inventions to seekPatents
- Student get an insight on Copyrights, Patents and Software patents which are instrumental for furtheradvancements
- advanced Technical and Scientific disciplines
- Imparting IPR protections and regulations for further advancement, so that the students can familiarize with the latestdevelopments

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**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**

# COURSE STRUCTURE AND SYLLABUS

## For UG – R20

## B. TECH - ELECTRONICS AND COMMUNICATION ENGINEERING

*(Applicable for batches admitted from 2020-2021)*

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# DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

## COURSE STRUCTURE

### I Year –I SEMESTER

| S. No. | Category | Subjects | L | T | P | Credits |
|---|---|---|---|---|---|---|
| 1 | HS | Communicative English | 3 | 0 | 0 | 3 |
| 2 | BS | Mathematics –I( Calculus) | 3 | 0 | 0 | 3 |
| 3 | BS | Applied Chemistry | 3 | 0 | 0 | 3 |
| 4 | ES | Programming for Problem Solving Using C | 3 | 0 | 0 | 3 |
| 5 | BS | Engineering Drawing | 2 | 0 | 2 | 3 |
| 6 | LC | English Communication Skills Laboratory | 0 | 0 | 3 | 1.5 |
| 7 | LC | Applied Chemistry Lab | 0 | 0 | 3 | 1.5 |
| 8 | LC | Programming for Problem Solving Using C Lab | 0 | 0 | 3 | 1.5 |
| | | | | | **Total Credits** | **19.5** |

### I Year – II SEMESTER

| S. No | Category | Subjects | L | T | P | Credits |
|---|---|---|---|---|---|---|
| 1 | BS | Mathematics –II<br>(Linear Algebra and Numerical Methods) | 3 | 0 | 0 | 3 |
| 2 | BS | Applied Physics | 3 | 0 | 0 | 3 |
| 3 | ES | Object Oriented Programming through Java | 2 | 0 | 2 | 3 |
| 4 | ES | Network Analysis | 3 | 0 | 0 | 3 |
| 5 | ES | Basic Electrical Engineering | 3 | 0 | 0 | 3 |
| 6 | LC | Electronic workshop Lab | 0 | 0 | 3 | 1.5 |
| 7 | LC | Basic Electrical Engineering Lab | 0 | 0 | 3 | 1.5 |
| 8 | LC | Applied Physics Lab | 0 | 0 | 3 | 1.5 |
| 9 | MC | Environmental Science | 3 | 0 | 0 | 0.0 |
| | | | | | **Total Credits** | **19.5** |

# JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY:: KAKINADA
## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

### II Year –I Semester

| S. No | Category | Name of the Subject | L | T | P | Credits |
|---|---|---|---|---|---|---|
| 1 | PC | Electronic Devices and Circuits | 3 | 1 | 0 | 3 |
| 2 | PC | Switching Theory and Logic Design | 3 | 1 | 0 | 3 |
| 3 | PC | Signals and Systems | 3 | 1 | 0 | 3 |
| 4 | BS | Mathematics-III (Transforms and Vector Calculus) | 3 | 1 | 0 | 3 |
| 5 | BS | Random Variables and Stochastic Processes | 3 | 1 | 0 | 3 |
| 6 | LC | OOPS through Java Lab | 0 | 0 | 2 | 1.5 |
| 7 | LC | Electronic Devices and Circuits -Lab | 0 | 0 | 2 | 1.5 |
| 8 | LC | Switching Theory and Logic Design–Lab | 0 | 0 | 2 | 1.5 |
| 9 | SC | Python Programming | 0 | 0 | 4 | 2 |
| | | | | | **Total Credits** | **21.5** |

### II Year – II Semester

| S. No | Category | Name of the subject | L | T | P | Credits |
|---|---|---|---|---|---|---|
| 1 | PC | Electronic Circuit Analysis | 3 | 1 | 0 | 3 |
| 2 | PC | Digital IC Design | 3 | 1 | 0 | 3 |
| 3 | PC | Analog Communications | 3 | 0 | 0 | 3 |
| 4 | ES | Linear control Systems | 3 | 1 | 0 | 3 |
| 5 | HS | Management and Organizational Behavior | 3 | 0 | 0 | 3 |
| 6 | LC | Electronic Circuit Analysis Lab | 0 | 0 | 3 | 1.5 |
| 7 | LC | Analog Communications Lab | 0 | 0 | 3 | 1.5 |
| 8 | LC | Digital IC Design Lab | 0 | 0 | 3 | 1.5 |
| 9 | SC | Soft Skills | 0 | 0 | 4 | 2 |
| 10 | MC | Constitution of India | 3 | 0 | 0 | 0 |
| | | | | | **Total Credits** | **21.5** |
| **Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)** | | | | | | **4** |

# JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY:: KAKINADA
## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

**III Year - I Semester**

| S. No | Category | Name of the subject | L | T | P | Credits |
|---|---|---|---|---|---|---|
| 1 | PC | Analog ICs and Applications | 3 | 0 | 0 | 3 |
| 2 | PC | Electromagnetic Waves and Transmission Lines | 3 | 0 | 0 | 3 |
| 3 | PC | Digital Communications | 3 | 0 | 0 | 3 |
| 4 | OE1 | Open Elective Course/Job oriented elective-1 | 2 | 0 | 2 | 3 |
| 5 | PE1 | Professional Elective courses -1 | 3 | 0 | 0 | 3 |
| 6 | LC | Analog ICs and Applications LAB | 0 | 0 | 3 | 1.5 |
| 7 | LC | Digital Communications Lab | 0 | 0 | 3 | 1.5 |
| 8 | SC | Data Structures using Java Lab | 0 | 0 | 4 | 2 |
| 9 | MC | Indian Traditional Knowledge | 2 | 0 | 0 | 0 |
| | **Summer Internship 2 Months (Mandatory) after second year (to be evaluated during V semester** | | 0 | 0 | 0 | 1.5 |
| | | **Total credits** | | | | **21.5** |
| | **Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)** | | | | | **4** |

| **PE1:** | **OE1:** |
|---|---|
| 1. Antenna and Wave Propagation<br>2.Electronic Measurements and Instrumentation<br>3.Computer Architecture & Organization | Candidate should select the subject from list of subjects offered by other departments |

# JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY:: KAKINADA
## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

**III Year –II Semester**

| S. No | Category | Name of the subject | L | T | P | Credits |
|---|---|---|---|---|---|---|
| 1 | PC | Microprocessor and Microcontrollers | 3 | 1 | 0 | 3 |
| 2 | PC | VLSI Design | 3 | 0 | 0 | 3 |
| 3 | PC | Digital Signal Processing | 3 | 0 | 0 | 3 |
| 4 | PE2 | Professional Elective courses - 2 | 3 | 0 | 0 | 3 |
| 5 | OE 2 | Open Elective Course/Job oriented elective -2 | 2 | 0 | 2 | 3 |
| 6 | LC | Microprocessor and Microcontrollers - Lab | 0 | 0 | 3 | 1.5 |
| 7 | LC | VLSI Design Lab | 0 | 0 | 3 | 1.5 |
| 8 | LC | Digital Signal Processing Lab | 0 | 0 | 3 | 1.5 |
| 9 | SC | ARM based/ Aurdino based Programming | 1 | 0 | 2 | 2 |
| 10 | MC | Research Methodology | 2 | 0 | 0 | 0 |
| | | | | | Total credits | 21.5 |
| | Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also) | | | | | 4 |

**Industrial/Research Internship (Mandatory) 2 Months during summer vacation**

| PE2: | OE2: |
|---|---|
| 1. Microwave Engineering<br>2. Mobile & Cellular Communication<br>3. Embedded Systems<br>4. CMOS Analog IC Design | Candidate should select the subject from list of subjects offered by other departments |

# JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY:: KAKINADA
## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
## IV Year –I Semester

| S. No | Category | Name of the subject | L | T | P | Credits |
|---|---|---|---|---|---|---|
| 1 | PE | Professional Elective courses -3 | 3 | 0 | 0 | 3 |
| 2 | PE | Professional Elective courses -4 | 3 | 0 | 0 | 3 |
| 3 | PE | Professional Elective courses -5 | 3 | 0 | 0 | 3 |
| 4 | OE | Open Elective Courses/ Job oriented elective -3 | 2 | 0 | 2 | 3 |
| 5 | OE | Open Elective Courses/ Job oriented elective -4 | 2 | 0 | 2 | 3 |
| 6 | HS | ***Humanities and Social Science Elective** | 3 | 0 | 0 | 3 |
| 7 | SC | **Designer tools (HFSS,** Microwave Studio CST. Cadence Virtuoso. Synopsys, Mentor Graphics, Xilinx.) | 1 | 0 | 2 | 2 |
| **Industrial/Research Internship 2 Months (Mandatory) afterthird year (to be evaluated during VII semester** | | | 0 | 0 | 0 | 3 |
| | | **Total credits** | | | | **23** |
| | **Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)** | | | | | **4** |

| PE 3: | PE5: |
|---|---|
| 1. Optical Communication<br>2. Digital Image Processing<br>3. Low Power VLSI Design | 1. Radar engineering<br>2.Pattern recognition & Machine Learning<br>3.Internet of Things |
| PE4:<br><br>1.Satellite Communications<br>2.Soft Computing Techniques<br>3.Digital IC Design using CMOS | |

## IV Year – II Semester

| S. No. | Category | Code | Course Title | Hours per week | | | Credits |
|---|---|---|---|---|---|---|---|
| 1 | Major Project | PROJ | Project work, seminar and internship inindustry | - | - | - | 12 |
| **INTERNSHIP (6 MONTHS)** | | | | | | | |
| | | | | | | **Total credits** | **12** |

# JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
## KAKINADA – 533 003, Andhra Pradesh, India
## DEPARTMENT OF CIVIL ENGINEERING

| IV-Year – I Semester | HUMANITIES AND SOCIAL SCIENCE ELECTIVE | L | T | P | C |
|---|---|---|---|---|---|
| | | 3 | 0 | 0 | 3 |
| HSC701-INTELLECTUAL PROPERTY RIGHTS AND PATENTS | | | | | |

**Course Outcomes (CO):**

After studying these units, the student is expected to be able to:

i) understood the significance of innovations, distinguish different kinds of IPRs and know the legislative framework, practice and procedure relating to Patents, Copyrights, Trademarks, Designs, Trade Secrets, Geographical Indications, Traditional Knowledge and certain emerging areas.

ii) understood the various components of copyright law, its protection and enforcement to know the application of copyright law, its duration, advantages and the issues of 'fair use' and 'plagiarism' in the digital era.

iii) Understood the Patent law in India and its global instruments and spell out the procedural requirements of novelty, non-obviousness and inventive step involved in obtaining a Patent, its exclusive rights besides assignment and licensing patterns and how the patent does benefit the society.

iv) understood the conceptual and legal framework, procedural requirements relating to Trade Marks and its infringement and gives an insight how the Trademark is commercially advantageous to its owner and to prevent unfair competition and further safeguarding the trade secrets of the business enterprises.

v) Understood the importance of E-commerce, data security, online transactions and how the confidentiality and privacy can be safeguarded through the digital signatures and the prevention and punishment of cybercrimes under the law.

**SYLLABUS:**

**Unit I: Introduction to Intellectual Property Rights (IPR)**

Concept of Property - Introduction to IPR – IPR Tool Kit – International Instruments and IPR – WIPO - TRIPS – WTO – IPR Laws - IPR Protection and Regulation - Copyrights and Neighboring Rights – Industrial Property – Patents – Designs - Traditional Knowledge – Geographical Indications - Emerging Areas of IPR.

Law of Unfair Competition – Competition Commission.

**Unit II: Copyrights and Neighboring Rights**

Introduction to Copyrights – Principles of Copyright Protection – Law Relating to Copyrights - Subject Matters of Copyright – Copyright Ownership – Transfer and Duration – Right to Prepare Derivative Works – Rights of Distribution – Rights of Performers – Copyright Registration – Limitations – Infringement of Copyright – Case Law.

**Unit III: Patents**

Introduction to Patents - Patent Laws in India – Patent Requirements – Product Patent and Process Patent - Patent Search - Registration and Grant of Patent – Exclusive and Monopoly Rights – Limitations - Ownership - Transfer — Revocation of Patent – Patent Appellate Board - Infringement of Patent – Double Patenting — Compulsory Licensing - Patent Cooperation Treaty – New developments - Software Protection and Computer related Innovations.

**Unit IV: Trademarks & Trade Secrets**

Introduction to Trademarks – Trademark Laws – Functions of Trademark – Marks Covered under Trademark Law - Trade Mark Registration – Maintenance – Transfer - Deceptive Similarities - Infringement – Remedies.

Introduction to Trade Secrets – Laws Relating to Trade Secrets – Safeguarding Trade Secrets – Physical Security – Employee Access Limitation – Confidentiality Agreements – Breach of Contract – Remedies.

**Unit V: Cyber Laws and Cyber Crime**

Introduction to Cyber Laws – Information Technology Act 2000 - Protection of Online and Computer Transactions - E-commerce - Data Security – Privacy - Authentication - Confidentiality - Digital Signatures – Certifying Authorities - Cyber Crimes - Prevention - Punishment – Liability of Network Providers.

**Texts Books:**

1. Intellectual Property Rights (Patents & Cyber Law), Dr. A. Srinivas. Oxford University Press, New Delhi.
2. Deborah E.Bouchoux: Intellectual Property, Cengage Learning, New Delhi.
3. PrabhuddhaGanguli: Intellectual Property Rights, Tata Mc-Graw –Hill, New Delhi
4. Richard Stim: Intellectual Property, Cengage Learning, New Delhi.
5. Kompal Bansal &Parishit Bansal Fundamentals of IPR for Engineers, B. S. Publications (Press).
6. Cyber Law - Texts & Cases, South-Western's Special Topics Collections.
7. R.Radha Krishnan, S.Bala Subramanian: Intellectual Property Rights, Excel Books. New Delhi.
8. M.Ashok Kumar and MohdIqbal Ali: Intellectual Property Rights, Serials Pub.

# V.K.R, V.N.B & A.G.K COLLEGE OF ENGINEERING

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An ISO 9001:2015 Certified Institute
Gudivada, Krishna District, Andhra Pradesh – 521301

## NSS UNIT

**Date: 01-11-2021**

| Program Report | |
|---|---|
| NSS Unit Code: | 90214608 |
| Title of the Event: | FREE COVID VACCINATION DRIVE |
| Event Start Date: | 30/10/2021 |
| Event End Date: | 30/10/2021 |
| Description: | NSS Unit of V.K.R , V.N.B & A.G.K College of Engineering has organized Free Covid Vaccination Drive with the support of Sachivalayam and government has assigned these duties to Asha workers. They vaccinated our faculty members and students also. Principal sir Dr.S.H.V.Prasada Rao garu appreciated efforts of Asha workers. |

**Photo: Vaccination Drive**

# ఇంజనీరింగ్ కళాశాలలో కోవిడ్ వ్యాక్సినేషన్ డ్రైవ్

గుడివాడ, స్థానిక వికెఆర్ విఎన్‌బి & ఏజికె ఇంజనీరింగ్ కాలేజీలో శనివారం కోవిడ్ డ్రైవ్‌లో భాగంగా సిబ్బంది మరియు 18 సంll‌లు నిండిన విద్యార్థినీ విద్యార్థులకు కోవిషీల్డ్ వ్యాక్సిన్ మొదటి మరియు రెండవ డోసులను కళాశాల ప్రాంగణంలో అందించారు. రాజేంద్రనగర్ 2వ సచివాలయం కార్యదర్శులు మరియు మెడికల్ సిబ్బంది పాల్గొన్నారు. ఈ డ్రైవ్‌లో మొత్తం 140మందికి వ్యాక్సిన్ వేసినట్లు కళాశాల కరస్పాండెంట్ వేములపల్లి కోదండరామయ్య తెలిపారు.

**Photo: Newspaper clipping about Vaccination Program**

D. Dileep

**NSS PROGRAM OFFICER**

PROGRAMME OFFICER-NSS
V.K.R.V.N.B & A.G.K. COLLEGE OF ENGINEERING
GUDIVADA - 521 301, Krishna Dist. A.P.

11/11/2021

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**NSS UNIT**

**Date: 08/01/2022**

| Program Report | |
|---|---|
| NSS Unit Code: | 90214608 |
| Title of the Event: | Blood Donation Camp |
| Event Start Date: | 07/01/2022 |
| Event End Date: | 07/01/2022 |
| Description: | Voluntary blood donors are the cornerstone of a safe and adequate supply of blood and blood products. The safest blood donors are voluntary, non-remunerated blood donors from low-risk populations. For a safe blood service in our country, where comprehensive laboratory tests are neither possible nor pragmatic, it is best to switch over to 100% voluntary donations, as it is now established that only voluntary non-remunerated regular donation is the safest. Thus, one of our key strategies to enhance blood safety is to focus on motivating non-remunerated blood donors and phasing out even replacement donors. On this theme our college students and Faculty has participated in blood donation program organized by Andhra Hospitals, Vijayawada. |

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## NSS UNIT


**Photo: Students participating in Blood Donation Program**


**Photo: Students participating in Blood Donation Program**

D. Dileep

**NSS PROGRAM OFFICER**

PROGRAMME OFFICER-NSS
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## NSS UNIT


**Date: 13/05/2022**

## Program Report

| | |
|---|---|
| NSS Unit Code: | 90214608 |
| Title of the Event: | Disha App Mega Registartion Drive |
| Event Start Date: | 12/05/2022 |
| Event End Date: | 12/05/2022 |
| Description: | The Disha App uses GPS to track the users location and seek help from local police and authorities in case of an emergency. The app claims that police and relevant authorities can reach the scene of emergency in just six minutes. The Chief Minister of Andhra Pradesh Sri.Y.S. Jagan Mohan Reddy garu dismayed at the scale of atrocities against women and children reported since 2014.DISHA means District Development Coordination and Monitoring.<br>S.P Siddhardh Koushal Delivered his valuable messages for the safety of Women and encouraged all the girl students to use the app whenever needed. All the girl students and lady faculty of our college has successfully installed and registered in Disha app. |

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## NSS UNIT


**Photo: Students Registered in Disha App**

**Photo: S.P. Siddhardh Koushal Speaking in the Program**

# దిశ యాప్ మహిళలకు రక్షా కవచం

ఆర్.ఆర్.న్యూస్.గుడివాడ: గుడివాడ పట్టణంలో జరుగుతున్న దిశ యాప్ మెగా రిజిస్ట్రేషన్ డ్రైవ్ ను కృష్ణా జిల్లా ఎస్పీ సిద్ధార్థ్ కౌశల్ పరిశీలించారు. ఈ సందర్భంగా యాప్ విశిష్టతపై ప్రజానీకానికి సరైన అవగాహన కల్పించాలని సిబ్బందికి సూచించారు.ఆర్టీసీ ఐస్టాండ్ లో ప్రయాణికులకు దిశ యాప్ ప్రత్యేకతను ఎస్పీ వివరించారు. అనంతరం ఏలూరు రోడ్డులోని ఇంజనీరింగ్ కళాశాల ప్రాంగణంలో పోలీస్ శాఖ వారి ఆధ్వర్యంలో నిర్వహించిన దిశ యాప్ మెగా రిజిస్ట్రేషన్ డ్రైవ్ ను ఎస్పీ సిద్ధార్థ్ కౌశల్ ప్రారంభించారు. అనేక ప్రత్యేకతలతో రూపొందిన దిశ యాప్ పై నేటి యువతరం అవగాహన కలిగి ఉండాలని ఈ సందర్భంగా జరిగిన సభలో సిద్ధార్థ్ కౌశల్ అన్నారు. మహిళల సంరక్షణకు రాష్ట్ర ప్రభుత్వం అనేకమైన చర్యలు తీసుకుంటుందని ఆయన చెప్పారు. ఈ కార్యక్రమంలో డిఎస్పీ సత్యానందం, ఇంజనీరింగ్ కళాశాల


కరస్పాండెంట్ వేములపల్లి కోదండ రామయ్య, సీఐలు గోవిందరాజు, జయ కుమార్, పోలీస్ సిబ్బంది, విద్యార్థిని ,విద్యార్థులు పాల్గొన్నారు.

**Fig: News Paper Clipping about the Mega Registration Drive of Disha App**

D. Dileep

**NSS PROGRAM OFFICER**

PROGRAMME OFFICER-NSS
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13/5/2022

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## NSS UNIT

**Date: 23/10/2020**

| Program Report | |
|---|---|
| NSS Unit Code: | 90214608 |
| Title of the Event: | Distributing Face Masks |
| Event Start Date: | 21/10/2020 |
| Event End Date: | 21/10/2020 |
| Description: | The main objective of distributing Face Masks is strived to educate the people first and taking adequate precautionary measures from COVID-19. NSS Unit of V.K.R, V.N.B & A.G.K College of Engineering believes that masks are a simple barrier to help prevent your respiratory droplets from reaching others. Masks reduce the spray of droplets when worn over the nose and mouth. We should wear a mask, even if you do not feel sick. Face covering limits the volume and travel distance of expiratory droplets dispersed when talking, breathing and coughing. NSS volunteers and NSS PO were distributed facemasks near Kudaravalli village. |



**Photo: NSS Volunteers distributing Facemasks to the village people**

D. Dileep

**NSSPROGRAM OFFICER**

PROGRAMME OFFICER-NSS
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GUDIVADA - 521 301, Krishna Dist A.P

23/10/20

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## NSS UNIT

**Date: 30/11/2020**

| Program Report | |
|---|---|
| NSS Unit Code: | 90214608 |
| Title of the Event: | **Food Distribution to Poor People** |
| Event Start Date: | 28/11/2020 |
| Event End Date: | 28/11/2020 |
| Description: | **"No one deserves to go through the pain of starvation, that's why we should all provide food for the poor."**<br>People need energy to work and food is one of the main things needed to have energy. By eating at work it can increase your productivity by 20% on average. People living in poverty cannot afford nutritious food for themselves and their families. This makes them weaker and less able to earn the money that would help them escape poverty and hunger. If you don't have food, you don't have energy and if you don't have energy, you can't work and provide the necessities needed to be healthy and mainly to stay alive. Giving people the food to become healthier will give them a head start on earning their own food and living a healthy life. Our college NSS unit came with a wonderful theme to serve the poor as much as they can. On this theme, our NSS volunteers distributed food packets to poor people in Gudivada surroundings. |


**Photo: NSS Volunteers involving in Food distribution program**



**Photo: NSS Volunteers Distributing Food to the poor people**

D. Dileep

**NSS PROGRAM OFFICER**

PROGRAMME OFFICER-NSS
V.K.R.V.N.B & AGK COLLEGE OF ENGINEERING
GUDIVADA - 521 301, Krishna Dist A.P

30/11/2020

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## NSS UNIT


**Date: 19/10/2019**

## Program Report

| | |
|---|---|
| NSS Unit Code: | 90214608 |
| Title of the Event: | Blood Donation Camp |
| Event Start Date: | 16/10/2019 |
| Event End Date: | 16/10/2019 |
| Description: | Voluntary blood donors are the cornerstone of a safe and adequate supply of blood and blood products. The safest blood donors are voluntary, non-remunerated blood donors from low-risk populations. For a safe blood service in our country, where comprehensive laboratory tests are neither possible nor pragmatic, it is best to switch over to 100% voluntary donations, as it is now established that only voluntary non-remunerated regular donation is the safest. Thus, one of our key strategies to enhance blood safety is to focus on motivating non-remunerated blood donors and phasing out even replacement donors. |


**Photo: Students participating in Blood Donation Program**

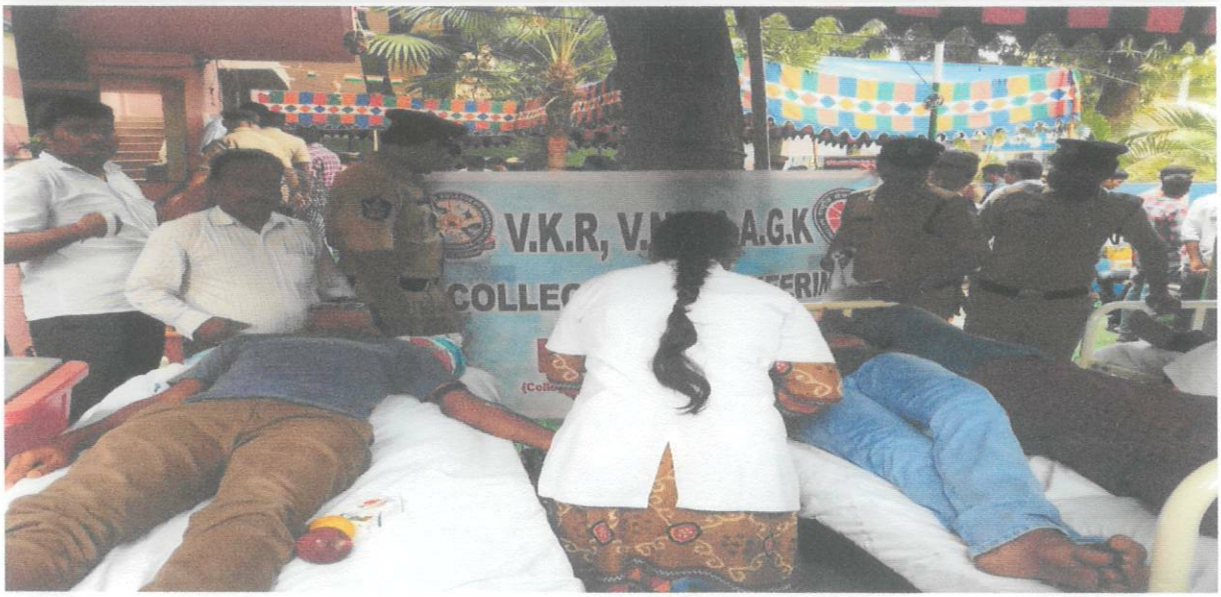

**Photo: Students participating in Blood Donation Program**

# రక్త దాన శిబిరంలో పాల్గొన్న వీ.కే.ఆర్ అండ్ వీ.ఎన్.బి ఎన్.ఎస్.ఎస్ వాలంటీర్లు

గుడివాడ (గుడివాడ టైమ్స్): ఈ నెల 21న పోలీసు అమర వీరుల దినోత్సవాన్ని పురస్కరించుకుని చేపట్టిన వారోత్సవాలలో భాగంగా ది.17-10-2019 గురువారం నాడు వీ.కే.ఆర్ అండ్ వీ.ఎన్.బి ఇంజినీరింగ్ కళాశాల బీ.టెక్ మొదటి సంవత్సరం ఎన్.ఎస్.ఎస్ వాలంటీర్లు విభాగాధిపతి డా.వీ.జె.దేవరాజ్ అధ్వర్యంలో గుడివాడ వన్ టౌన్ పోలీస్ స్టేషన్‌లో నిర్వహించిన రక్త దాన శిబిరంలో పాల్గొన్నారు. ఈ సందర్భంగా 16 మంది విద్యార్థులు రక్తదానం చేసినట్లు కళాశాల ప్రిన్సిపాల్ మరియు ఎన్.ఎస్.ఎస్ చైర్మన్ డా. జి. శ్యామ్ ప్రసాద్ గారు తెలిపారు. ఈ సందర్భంగా దేశం కోసం ప్రాణ త్యాగం చేసిన అమర వీరులను విద్యార్థులు గుర్తుచేసుకుని వారికి అంజలి ఘటించారు. కార్యక్రమంలో ఎన్.ఎస్.ఎస్ ప్రోగ్రామ్ అఫీసర్ ఎల్.దిలీప్ మరియు వన్‌టౌన్ పోలీస్ స్టేషన్ సిబ్బంది పాల్గొన్నారు.

**Photo: News Paper clipping about Blood Donation Program**

D.Dileep

**NSS PROGRAM OFFICER**

PROGRAMME OFFICER-NSS
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9/10/2019

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