

BR23
ACADEMIC REGULATIONS,
COURSE STRUCTURE
&
SYLLABUS
FOR
FOUR YEAR B.TECH COURSE
IN
COMPUTER SCIENCE AND ENGINEERING (ARTIFICIAL
INTELLIGENCE AND DATA SCIENCE)



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (ARTIFICIAL
INTELLIGENCE AND DATA SCIENCE)
BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE
(AUTONOMOUS)
(Approved by A.I.C.T.E, New Delhi & Permanently Affiliated to J.N.T.U.K, Kakinada)
(Accredited by NAAC)
ODALAREVU, ALLAVARAM MANDAL, E. G. Dt – 533210



BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE
(AUTONOMOUS), ODALAREVU
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
(ARTIFICIAL INTELLIGENCE&DATA SCIENCE)
Constitution of Board of Studies for CSE(AI&DS)

Date: 30/09/2023

AGENDA for BOS Meeting (BR23 Regulation)

1. Welcome Address by BOS Chairperson
2. Presentation of I Year B.Tech. Computer Science and Engineering (Artificial Intelligence and Data Science) Course Structure and its Ratification
3. Discussion on the Proposed changes in I Year B.Tech. Syllabus & Text/Reference Books for the Engineering Science & Professional Core Courses related to Computer Science and Engineering (Artificial Intelligence and Data Science) and Ratification of the same after incorporating Suggested Changes
4. Discussion on Academic Regulations of UG Programme for Evaluation of Theory, Lab, Internship, Project and Mandatory Non-Credit Courses
5. Presentation of Model Question Papers for mid-term and end semester examinations and their ratification
6. Any other item

Copy Circulation through e-mail:

External BoS Members

Sl. No	Name	Designation
1	Dr N Ramakrishnaiah	Professor CSE, UCEK, JNTUK, Kakinada.
2	Dr. Jimson Mathew	Associate Professor CSE, IIT Patna
3	Dr. Ch Sudhakar	Professor CSE, NIT, Warangal.
4	Mr. K Rambabu	Director, Monster India Pvt, Bangalore
5	Dr S Rao Chintalapudi	Professor CSE CMR Tech Campus, Hyderabad

Chairperson-BOS


(Dr. P. Subba Rao)

Head of the
CAD, AIML & CSM
BVC Engineering College, Odalarevu
East Godavari, A.P. 533 210





BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE
(AUTONOMOUS), ODALAREVU
COMPUTER SCIENCE AND ENGINEERING
(ARTIFICIAL INTELLIGENCE AND DATA SCIENCE)

Date: 04/10/2023

MINUTES OF MEETING

RESOLUTIONS TAKEN

1. Consider Item No.2.

- Resolved to ratify the proposed course structure for I Year Computer Science and Engineering (AI&DS).
- The approved course structures are enclosed herewith.

2. Consider Item No. 3:

- Resolved to approve the detailed syllabus for the Engineering Science & Professional Core Courses related to Computer Science and Engineering(AI&DS).
- Required text books/reference books are approved.

3. Consider Item No. 4:

- Resolved to ratify the academic regulations of UG Programme.

4. Consider Item No. 5:

- Resolved to ratify the Model Question papers for Internal and External semester examinations of both theory and Laboratory subjects.

5. Consider Item No. 6:

- Resolved to follow the JNTUK course structure and regulations pertaining to PG (M.Tech)

6. Experts suggested to incorporate Graph traversals in Introduction to Programming subject in the beginning unit.

7. Experts suggested to include sorting and searching programs in Computer Programming Laboratory.

8. Experts suggested to incorporate exercises on Graphs in Data Structures Laboratory.

9. Experts suggested to incorporate the text books of latest editions.

10. Suggested to verify and update all text book author names/editions/publisher.

11. Expert from JNTUK suggested to depute senior faculty/professor to teach IT Workshop.

Finally, Chairman of BOS thanked all the members of their valuable inputs and active participation in the meeting.

Members Presented:

External Bos Members:

Sl. No	Name	Designation	Signature
1	Dr N Ramakrishnaiah	Professor CSE, UCEK, JNTUK, Kakinada.	<i>N. Ramakrishnaiah</i>
2	Dr. Jimson Mathew	Associate Professor CSE, IIT Patna	<i>online</i>
3	Dr. Ch Sudhakar	Professor CSE, NIT, Warangal.	<i>online</i>
4	Mr. K Rambabu	Director, Monster India Pvt, Bangalore	<i>online</i>
5	Dr S Rao Chintalapudi	Professor CSE CMR Tech Campus, Hyderabad	<i>online</i>



Department of CSE
University College of Engg.
JNTUK Kakinada.

Internal BoS Members:

Sl. No	Name	Designation
1	Dr. Chandra Mouli VSA	Professor
2	Dr. Gunamani Jena	Professor
3	Dr. P Devabalan	Professor
4	Mr. B P N Madhu Kumar	Associate Professor
5	Mr. Y M S D Sastry	Associate Professor
6	Mr. B Narasimha Rao	Associate Professor
7	Mrs. B Ganga Bhavani	Associate Professor
8	Mrs. B Sirisha	Assistant Professor
9	Mr. K N V P S B Ramesh	Assistant Professor
10	Mr. P Ramesh	Assistant Professor
11	Ms. N Jeevana Jyothi	Assistant Professor
12	Mr. M V K Subhash	Assistant Professor
13	Mr. V Swami Naidu	Assistant Professor
14	Mr. T V L Srinivas	Assistant Professor
15	Mr. D S V Prasad	Assistant Professor
16	Mr. S S Venu Madhav	Assistant Professor
17	Ms. V Ganga Bhavani	Assistant Professor
18	Mrs. B Srilatha	Assistant Professor
19	Ms. T Priyanka	Assistant Professor
20	Ms. A Priyanka	Assistant Professor
21	Mr. Sayyad Khalisha	Assistant Professor
22	Ms. K Lakshmi Devi	Assistant Professor
23	Mr. U Sandeep	Assistant Professor
24	Mr. P M Athinarayana	Assistant Professor
25	Mr. P Ravisankar	Assistant Professor
26	Mrs. Deepa Pandian	Assistant Professor
27	Mrs. K Phani Sirisha	Assistant Professor
28	Mr. O Siva Ramakrishna	Assistant Professor
29	Mr. V Narasimham	Assistant Professor
30	Mr. N Ramesh	Assistant Professor
31	Mr. K V Ram Kumar	Assistant Professor
32	Mrs. A Lakshmi	Assistant Professor



Chairperson-BOS

PS
30/09/23

(Dr. P. SUBBA RAO)

Head of the
CAD, AIML & CSM
BVC Engineering College, Odalarevu
East Godavari, A.P. 533 210
Page 2 of 2

Approval of Board of Studies Meeting for the Department of Computer Science and Engineering (Artificial Intelligence and Data Science)

4 messages

HoD CAD <hodcad.bvce@bvcgroup.in>

Mon, Oct 30, 2023 at 10:35 AM

To: Jimson Mathew <jimson@iitp.ac.in>, chapram@nitw.ac.in, KALLAKURI N V P S BRAHMA RAMESH <ramesh.kb17@gmail.com>, srao.chintalapudi@gmail.com

Respected Sir(s)

As we conducted a Board of Studies Meeting for the Department of Computer Science and Engineering (Artificial Intelligence and Data Science) to approve First year course structure and its syllabus on 04.10.2023, it is required to give your approval for the same by giving your signatures. But, it is difficult to send hard copies of the relevant documents in person to all of you. Hence I request you to kindly give your approval by replying to this mail, so that we can keep it as a record of proof.

For your reference I am here by sending the minutes of the meeting.

Thank you sir.

With regards

Dr Subba Rao Polamuri
HOD of CSE Allied Branches
BVCEC Odalarevu
7013585831/9885127710

 **CSE (AI&DS) Minutes of Meetings for BoS.pdf**
491K

Jimson Mathew <jimson@iitp.ac.in>

Mon, Oct 30, 2023 at 10:40 AM

To: HoD CAD <hodcad.bvce@bvcgroup.in>

PFA .

Dr. Jimson Mathew
Professor
Dept of Computer Science and Engg.
Indian Institute of Technology Patna,
Patna 801106
+91- 6115233347 (office)
+91-9110956262 (mob)

From: HoD CAD <hodcad.bvce@bvcgroup.in>

Sent: Monday, October 30, 2023 10:35 AM

To: Jimson Mathew; chapram@nitw.ac.in; KALLAKURI N V P S BRAHMA RAMESH; srao.chintalapudi@gmail.com

Subject: Approval of Board of Studies Meeting for the Department of Computer Science and Engineering (Artificial Intelligence and Data Science)

[Quoted text hidden]

2 attachments

 **CSM-AI-ML.pdf**
1358K

 **CSE (AI&DS) Minutes of Meetings for BoS.pdf**
519K

2/17/24, 10:43 AM

BVC Group Mail - Approval of Board of Studies Meeting for the Department of Computer Science and Engineering (Artificial Intelli...

Sudhakar Ch <chapram@nitw.ac.in>
To: HoD CAD <hodcad.bvce@bvcgroup.in>

Mon, Oct 30, 2023 at 10:51 AM

Dear sir,
BoS meeting minutes are Approved.
Thank you,

Prof. Chapram Sudhakar
Professor, Department of CSE,
National Institute of Technology,
Warangal - 506 004
Telangana, INDIA
email: chapram@nitw.ac.in; sudhakarchapram@gmail.com; sudhakarchapram@yahoo.co.in;
Phone: 0870-2462731 (O), 9440647945 (M)

[Quoted text hidden]

Subhash Ch <srao.chintalapudi@gmail.com>
To: HoD CAD <hodcad.bvce@bvcgroup.in>

Wed, Nov 1, 2023 at 1:35 PM

Dear sir,
I approve the syllabus as discussed.
[Quoted text hidden]

Approval of Board of Studies Meeting for the Department of Computer Science and Engineering (Artificial Intelligence and Machine Learning) / Artificial Intelligence and Machine Learning

2 messages

HoD CAD <hodcad.bvce@bvcgroup.in>

Mon, Oct 30, 2023 at 10:32 AM

To: Jimson Mathew <jimson@iitp.ac.in>, bdsahu@nitrrkl.ac.in, KALLAKURI N V P S BRAHMA RAMESH
<ramesh.kb17@gmail.com>, srao.chintalapudi@gmail.com

Respected Sir(s)

As we conducted a Board of Studies Meeting for the Department of Computer Science and Engineering (Artificial Intelligence and Machine Learning) / Artificial Intelligence and Machine Learning to approve First year course structure and its syllabus on 04.10.2023, it is required to give your approval for the same by giving your signatures. But, it is difficult to send hard copies of the relevant documents in person to all of you. Hence I request you to kindly give your approval by replying to this mail, so that we can keep it as a record of proof.

For your reference I am here by sending the minutes of the meeting.

Thank you sir.



CSM- AI&ML Minutes of Meeting for BoS.pdf

1280K

Subhash Ch <srao.chintalapudi@gmail.com>

Wed, Nov 1, 2023 at 1:36 PM

To: HoD CAD <hodcad.bvce@bvcgroup.in>

Dear sir,

I approve the syllabus as discussed.

[Quoted text hidden]

Approval for Board of Studies Meeting

2 messages

HoD CAD <hodcad.bvce@bvcgroup.in>

Mon, Oct 30, 2023 at 12:06 PM

To: chapram@nitw.ac.in

Sir,

Please send to below subject mail sir

Approval of Board of Studies Meeting for the Department of Computer Science and Engineering (Artificial Intelligence and Machine Learning) / Artificial Intelligence and Machine Learning

Sudhakar Ch <chapram@nitw.ac.in>

Mon, Oct 30, 2023 at 4:48 PM

To: HoD CAD <hodcad.bvce@bvcgroup.in>

Already sent.

--

Prof. Chapram Sudhakar

Professor, Department of CSE,

National Institute of Technology,

Warangal - 506 004

Telangana, INDIA

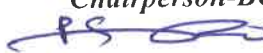
email: chapram@nitw.ac.in; sudhakarchapram@gmail.com; sudhakarchapram@yahoo.co.in;

Phone: 0870-2462731 (O), 9440647945 (M)

[Quoted text hidden]

Internal BoS Members:

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1	Dr. Chandra Mouli VSA	Professor
2	Dr. Gunamani Jena	Professor
3	Dr. P Devabalan	Professor
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31	Mr. K V Ram Kumar	Assistant Professor
32	Mrs. A Lakshmi	Assistant Professor

**Chairperson-BOS**
(Dr. P. Subba Rao)**Head of the
CAD, AIML & CSM
BVC Engineering College, Odalarevu
East Godavari, A.P. 533 210**

Website: www.jntuk.edu.in
E-mail: registrar@jntuk.edu.in



Phone: Off: 0884-2300900
Fax: 0884-2300901

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA
KAKINADA-533003, Andhra Pradesh, India
(Established by A.P Act.30 of 2008)

File No. JNTUK/DAP/Jan-7/BVC EC(22)/Nominee/2020

Dated: 11.02.2021

Dr. Ch. Satyanarayana

M. Tech., Ph.D.,

REGISTRAR

To
The Principal,
Bonam Venkata Chalamayya Engineering College
Odalarevu, Allavaram (M), East Godavari Dist.

Sir,

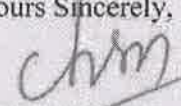
Sub: JNTUK, Kakinada – DAP – BVC EC, Odalarevu, Allavaram (M), East Godavari Dist. – University Nominee – BoS – CSE (AIDS) – Reg.

Ref: 1. Your Letter No. dated 08.01.2021.
2. Note orders dated 08.02.2021 of the Hon'ble Vice-Chancellor, JNTUK.
3. File No: SCHE-14023/51/2021 - JNTUK - CHE73

With reference to your letter (1) cited, I am by direction of the Hon'ble Vice-Chancellor, JNTUK, it is informed that the following faculty member is nominated for Board of Studies of CSE (Artificial Intelligence & Data Science) of Bonam Venkata Chalamayya Engineering College, Odalarevu, Allavaram (M), East Godavari Dist. for Two Academic Years (i.e., 2020-21 & 2021-22).

Dr. N. Ramakrishnaiah,
Professor of Computer Science and Engineering,
UCEK, JNTU Kakinada.

Yours Sincerely,


REGISTRAR
REGISTRAR

J.N.T. University Kakinada
KAKINADA-533003

Copy to Dr. N. Ramakrishnaiah, Professor of CSE, UCEK, JNTUK Kakinada

Copy to the Secretary to the Vice-Chancellor, JNTU Kakinada.

Copy to the Director, Academics Planning, JNTU Kakinada.



BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE
ODALAREVU – 533 210, Andhra Pradesh, India

Autonomous

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
(AI&DS)

Course Structure – BR23

For UG - B.Tech: Computer Science and Engineering
(Artificial Intelligence and Data Science)

I Year Course Structure

Semester-I							
S.No.	Course Category	Course Code	Course Name	L	T	P	Credits
1.✓	BSC	23BS1T01	Linear Algebra& Calculus	3	0	0	3
2.✓	BSC	23BS1T03	Chemistry	3	0	0	3
3.✓	ESC	23ES1T01	Basic Civil & Mechanical Engineering	3	0	0	3
4.✓	ESC	23ES1T03	Engineering Graphics	1	0	4	3
5.	ESC	23ES1T04	Introduction to Programming	3	0	0	3
6.✓	BSC	23BS1L02	Chemistry Lab	0	0	2	1
7.✓	ESC	23ES1L02	Engineering Workshop	0	0	3	1.5
8.✓	ESC	23ES1L03	IT Workshop	0	0	2	1
9.✓	ESC	23ES1L04	Computer Programming Lab	0	0	3	1.5
10.	BSC	23BS1L05	NSS/NCC/Scouts & Guides/Community Service	0	0	1	0.5
Total				13	0	15	20.5

<i>N. R. Rao</i>	<i>online</i>	<i>online</i>	<i>online</i>	<i>online</i>	<i>PS Rao</i>
Dr. N Ramakrishnaiah, Professor of CSE, UCEK, JNTUK Kakinada.	Dr. Jimson Mathew, Professor of CSE, IIT Patna.	Dr. Ch Sudhakar, Professor of CSE, NIT Warangal.	Mr. K Rambabu, Director, Monster India Pvt, Bangalore.	Dr. S Rao Chintalapudi, Professor and HoD, CSE(AIML) CMR Technical Campus, Hyderabad.	Dr. P. Subba Rao, Professor of CSE(AI&DS), BVCEC.

Professor
Department of CSE
University College of Engg.
JNTUK Kakinada.



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BVC Engineering College, Odalarevu
East Godavari, A.P. 533 210



BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE
ODALAREVU – 533 210, Andhra Pradesh, India
Autonomous

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
(AI&DS)

Course Structure – BR23

For UG - B.Tech: Computer Science and Engineering
(Artificial Intelligence and Data Science)

I Year Course Structure

Semester-II							
S.No.	Course Category	Course Code	Course Name	L	T	P	Credits
1.	HMC	23HM2T01✓	Communicative English	2	0	0	2
2.	BSC	23BS2T01✓	Differential Equations & Vector Calculus	3	0	0	3
3.	BSC	23BS2T02✓	Engineering Physics	3	0	0	3
4.	ESC	23ES2T02✓	Basic Electrical & Electronics Engineering	3	0	0	3
5.	PCC	23ML2T01✓	Data Structures	3	0	0	3
6.	HMC	23HM2L01✓	Communicative English Lab	0	0	2	1
7.	BSC	23BS2L01✓	Engineering Physics Lab	0	0	2	1
8.	ESC	23ES2L01✓	Electrical & Electronics Engineering Workshop	0	0	3	1.5
9.	PCC	23ML2L01✓	Data Structures Lab	0	0	3	1.5
10.	BSC	23BS2L04✓	Health & Wellness, Yoga & Sports	0	0	1	0.5
Total				14	0	11	19.5

<i>Dr. N</i>	<i>online</i>	<i>online</i>	<i>online</i>	<i>online</i>	<i>PSR</i>
Dr. N Ramakrishnaiah, Professor of CSE. UCEK, JNTUK Kakinada.	Dr. Jimson Mathew, Professor of CSE, IIT Patna.	Dr. Ch Sudhakar, Professor of CSE, NIT Warangal.	Mr. K Rambabu, Director, Monster India Pvt, Bangalore.	Dr. S Rao Chintalapudi, Professor and HoD, CSE(AIML) CMR Technical Campus, Hyderabad.	Dr. P. Subba Rao, Professor of CSE(AI&DS), BVCEC.

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East Godavari, A.P. 533 210

I Year - I Semester	Code: 23ES1T04	L	T	P	C
		3	0	0	3

INTRODUCTION TO PROGRAMMING

(Common to All branches of Engineering)

Course Objectives:

- To introduce students to the fundamentals of computer programming.
- To provide hands-on experience with coding and debugging.
- To foster logical thinking and problem-solving skills using programming.
- To familiarize students with programming concepts such as data types, control structures, functions and arrays.
- To encourage collaborative learning and team work in coding projects.

Course Outcomes:

A student after completion of the course will be able to

CO1: Understand basics of computers, the concept of algorithm and algorithmic thinking.

CO2: Analyze a problem and develop an algorithm to solve it.

CO3: Implement various algorithms using the C programming language.

CO4: Understand more advanced features of C language.

CO5: Develop problem-solving skills and the ability to debug and optimize the code

UNIT-I: Introduction to Programming and Problem Solving: Computer System: History of Computers, Introduction to Components of Computer System, compilation and execution, Program Counter

Basics of a Computer Program-Programming Languages and History of C, Basics Structure of a Computer Program, Software Development Process: Characteristics Algorithm, Flowchart, Pseudo Code, Header file, Errors in compilation time, Primitive Data Types, Formatted I/O's, Format Modifiers. Variable Rules, Keywords, Constants, String and Operators. Type Conversions, Priority Table

Problem solving strategies: Top-down and Bottom-up approach, Time and space complexities.

UNIT -II: Control Structures (Flow of Controls):

Decision Branching Statement (Selection): Two-way selection: if, if-else, nested if

Multi-way selection: switch, else-if ladder

Decision Looping Statement (Repetition/Iterative): while (Pretest/Condition-Controlled Loops) and do-while (Posttest) Loops, for loop (Counter Controlled) and Unconditional statements, Nested Loops

<i>Dr. N</i>	<i>online</i>	<i>online</i>	<i>online</i>	<i>online</i>	<i>PS</i>
Dr. N Ramakrishnaiah, Professor of CSE. UCEK, JNTUK Kakinada.	Dr. Jimson Mathew, Professor of CSE, IIT Patna.	Dr. Ch Sudhakar, Professor of CSE, NIT Warangal.	Mr. K Rambabu, Director, Monster India Pvt, Bangalore.	Dr. S Rao Chintalapudi, Professor and HoD, CSE(AIML) CMR Technical Campus, Hyderabad.	Dr. P. Subba Rao, Professor of CSE(AI&DS), BVCEC.

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UNIT-III Arrays & Pointers:

Arrays: Arrays definition and indexing, Types of Arrays

One-Dimensional Arrays: Initialization, declaration and accessing, input and output of array

Two-Dimensional Arrays: Initialization, declaration, accessing, input and output of array

Case Study: Matrices, Larger Dimensional Arrays

Pointers: Concept of a pointer, Initialization of pointer variables and access, Pointer dereferencing and address operators, array manipulation using pointers, Dynamic Memory Management functions, pointers to pointers, command line arguments

UNIT-IV: Functions & Strings:

Functions: Definition of Function, Categorization of User define functions, Local, Global variables and Actual and Formal parameters, Scope life time variables, pass by value and reference, Recursive function

Case Study: Factorial, Fibonacci Series, Basics of Sorting/and Searching

Strings: Introduction to String, String Handling Functions

UNIT-V: User Defined Data Types & File Handling:

User Defined Data Types: Structures: declaration, Initialization, accessing, nested structures, self-referential structure, structures to array, pointer and functions, Union, typedef and enum

File Handling: Basics of File Handling (only if time is available, otherwise should be done as part of the lab).

Note: The syllabus is designed with C Language as the fundamental language of implementation.

Text Books:

1. "The C Programming Language", Brian W. Kernighan and Dennis M. Ritchie, Prentice-Hall, Second Edition 2015.
2. Schaum's Outline of Programming with C, Byron S Gottfried, McGraw-Hill, Second Edition.
3. Problem Solving and Programming in C by RS Salaria, Khanna Book Publishing, Fifth Edition.

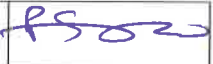
Reference Books:

1. Computing fundamentals and C Programming, E Balagurusamy, McGraw-Hill Education.
2. Programming in C, Rema Thiraja, Oxford, 2016, 2nd edition
3. C Programming-A Problem Solving Approach, Forouzan, Gilberg, Cengage
4. C Programming- A Beginners Guide by Prof. Mangesh, Dr. D R Shashirag, Prof. Bodapati Narasimha Rao, Prof. B P N Madhu Kumar.

	Online	Online	Online	Online	
Dr. N Ramakrishnaiah, Professor of CSE. UCEK, JNTUK Kakinada. Professor Department of CSE College of Engg. JNTUK Kakinada.	Dr. Jimson Mathew, Professor of CSE, IIT Patna.	Dr. Ch Sudhakar, Professor of CSE, NIT Warangal.	Mr. K Rambabu, Director, Monster India Pvt, Bangalore.	Dr. S Rao Chintalapudi, Professor and HoD, CSE(AIML) CMR Technical Campus, Hyderabad	Dr. P. Subba Rao, Professor of CSE(AI&DS), BVCEC. Head of the CAD, AIML & CSM BVC Engineering College, Odalarevu East Godavari, A.P. 533 210



I Year - I Semester	Code: 23ES1L03	L	T	P	C
		0	0	2	1
IT WORKSHOP (Common to CSE(AI&DS)/ CSE(AIML)/AIML)					
Course Objectives: • To introduce the internal parts of a computer, peripherals, I/O ports, connecting cables • To demonstrate configuring the system as Dual boot both Windows and other Operating Systems Viz. Linux, BOSS • To teach basic command line interface commands on Linux. • To teach the usage of Internet for productivity and self-paced life-long learning • To introduce Compression, Multimedia and Antivirus tools and Office Tools such as Word processors, Spread sheets and Presentation tools					
Course Outcomes: CO1: Perform Hardware troubleshooting. CO2: Understand Hardware components and inter dependencies. CO3: Safeguard computer systems from viruses/worms. CO4: Document/ Presentation preparation. CO5: Perform calculations using spreadsheets					
PC Hardware & Software Installation					
Task 1: Identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral and submit to your instructor.					
Task 2: Every student should disassemble and assemble the PC back to working condition. Lab instructors should verify the work and follow it up with a Viva. Also students need to go through the video which shows the process of assembling a PC. A video would be given as part of the course content.					
Task 3: Every student should individually install MS windows on the personal computer. Lab instructor should verify the installation and follow it up with a Viva.					
Task 4: Every student should install Linux on the computer. This computer should have windows installed. The system should be configured as dual boot (VMWare) with both Windows and Linux. Lab instructors should verify the installation and follow it up with a Viva					
Task 5: Every student should install BOSS on the computer. The system should be configured as dual boot (VMWare) with both Windows and BOSS. Lab instructors should verify the installation and follow it up with a Viva					

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Internet & World Wide Web

Task1: Orientation & Connectivity Boot Camp: Students should get connected to their Local Area Network and access the Internet. In the process they configure the TCP/IP setting. Finally students should demonstrate, to the instructor, how to access the websites and email. If there is no internet connectivity preparations need to be made by the instructors to simulate the WWW on the LAN.

Task 2: Web Browsers, Surfing the Web: Students customize their web browsers with the LAN proxy settings, bookmarks, search toolbars and pop up blockers. Also, plug-ins like Macromedia Flash and JRE for applets should be configured.

Task 3: Search Engines & Netiquette: Students should know what search engines are and how to use the search engines. A few topics would be given to the students for which they need to search on Google. This should be demonstrated to the instructors by the student.

Task 4: Cyber Hygiene: Students would be exposed to the various threats on the internet and would be asked to configure their computer to be safe on the internet. They need to customize their browsers to block pop ups, block active x downloads to avoid viruses and/or worms.

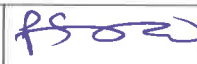
LaTeX and WORD

Task 1 – Word Orientation: The mentor needs to give an overview of La TeX and Microsoft (MS) office or equivalent (FOSS) tool word: Importance of La TeX and MS office or equivalent (FOSS) tool Word as word Processors, Details of the four tasks and features that would be covered in each, Using La TeX and word – Accessing, overview of toolbars, saving files, Using help and resources, rulers, format painter in word.

Task 2: Using LaTeX and Word to create a project certificate. Features to be covered:- Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Using Date and Time option in both La TeX and Word.

Task 3: Creating project abstract Features to be covered:-Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check, Track Changes.

Task 4: Creating a Newsletter: Features to be covered:- Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes, Paragraphs and Mail Merge in word.

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EXCEL

Excel Orientation: The mentor needs to tell the importance of MS office or equivalent (FOSS) tool Excel as a Spreadsheet tool, give the details of the four tasks and features that would be covered in each. Using Excel – Accessing, overview of toolbars, saving excel files, Using help and resources.

Task 1: Creating a Scheduler - Features to be covered: Gridlines, Format Cells, Summation, auto fill, Formatting Text

Task 2: Calculating GPA -. Features to be covered:- Cell Referencing, Formulae in excel – average, std. deviation, Charts, Renaming and Inserting worksheets, Hyper linking, Count function,

LOOKUP/VLOOKUP

Task 3: Split cells, freeze panes, group and outline, Sorting, Boolean and logical operators, Conditional formatting

POWER POINT

Task 1: Students will be working on basic power point utilities and tools which help them create basic power point presentations. PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in PowerPoint.

Task 2: Interactive presentations - Hyperlinks, Inserting –Images, Clip Art, Audio, Video, Objects, Tables and Charts.

Task 3: Master Layouts (slide, template, and notes), Types of views (basic, presentation, slide slotter, notes etc), and Inserting – Background, textures, Design Templates, Hidden slides.

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AI TOOLS – ChatGPT

Task 1: Prompt Engineering: Experiment with different types of prompts to see how the model responds. Try asking questions, starting conversations, or even providing incomplete sentences to see how the model completes them.

• Ex: Prompt: "You are a knowledgeable AI. Please answer the following question: What is the capital of France?"

Task 2: Creative Writing: Use the model as a writing assistant. Provide the beginning of a story or a description of a scene, and let the model generate the rest of the content. This can be a fun way to brainstorm creative ideas

Ex: Prompt: "In a world where gravity suddenly stopped working, people started floating upwards. Write a story about how society adapted to this new reality."

Task 3: Language Translation: Experiment with translation tasks by providing a sentence in one language and asking the model to translate it into another language. Compare the output to see how accurate and fluent the translations are.

Ex: Prompt: "Translate the following English sentence to French: 'Hello, how are you doing today?'"

Text Books:

Reference Books:

1. Comdex Information Technology course tool kit, Vikas Gupta, WILEY Dream tech, 2003
2. The Complete Computer upgrade and repair book, Cheryl A Schmidt, WILEY Dream tech, 2013, 3rd edition
3. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education, 2012, 2nd edition

Reference Books:

4. PC Hardware - A Handbook, Kate J. Chase, PHI (Microsoft)
5. LaTeX Companion, Leslie Lamport, PHI/Pearson.
6. IT Essentials PC Hardware and Software Companion Guide, David Anfinson and Ken Quamme. – CISCO Press, Pearson Education, 3rd edition
7. IT Essentials PC Hardware and Software Labs and Study Guide, Patrick Regan– CISCO Press, Pearson Education, 3rd edition

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Dr. N Ramakrishnaiah, Professor of CSE. UCEK, JNTUK Kakinada.	Dr. Jimson Mathew, Professor of CSE, IIT Patna.	Dr. Ch Sudhakar, Professor of CSE, NIT Warangal.	Mr. K Rambabu, Director, Monster India Pvt, Bangalore.	Dr. S Rao Chintalapudi, Professor and HoD, CSE(AIML) CMR Technical Campus, Hyderabad.	Dr. P. Subba Rao, Professor of CSE(AI&DS), BVCEC.

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I Year - I Semester	Code: 23ES1L04	L	T	P	C
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COMPUTER PROGRAMMING LAB (Common to All branches)					
Course Objectives: The course aims to give students hands – on experience and train them on the concepts of the C- programming language.					
Course Outcomes: CO1: Read, understand, and trace the execution of programs written in C language. CO2: Select the right control structure for solving the problem. CO3: Develop C programs which utilize memory efficiently using programming constructs like pointers. CO4: Develop, Debug and Execute programs to demonstrate the applications of arrays, functions, basic concepts of pointers in C.					
UNIT I					
WEEK 1:					
Objective: Getting familiar with the programming environment on the computer and writing the first program.					
Suggested Experiments/Activities:					
Tutorial 1: Problem-solving using Computers.					
Lab1: Familiarization with programming environment					
i) Basic Linux environment and its editors like Vi, Vim & Emacs etc.					
ii) Exposure to Turbo C, gcc					
iii) Writing simple programs using printf(), scanf()					
WEEK 2:					
Objective: Getting familiar with how to formally describe a solution to a problem in a series of finite steps both using textual notation and graphic notation.					
Suggested Experiments /Activities:					
Tutorial 2: Problem-solving using Algorithms and Flow charts.					
Lab 2: Converting algorithms/flow charts into C Source code.					
Developing the algorithms/flowcharts for the following sample programs					
i) Sum and average of 3 numbers ii) Conversion of Fahrenheit to Celsius and vice versa					
ii) Simple interest calculation					
WEEK 3:					
Objective: Learn how to define variables with the desired data-type, initialize them with appropriate values and how arithmetic operators can be used with variables and constants.					
Suggested Experiments/Activities:					
Tutorial 3: Variable types and type conversions:					
Lab 3: Simple computational problems using arithmetic expressions.					
i) Finding the square root of a given number ii) Finding compound interest					
iii) Area of a triangle using heron’s formulae iv) Distance travelled by an object					

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UNIT II

WEEK 4:

Objective: Explore the full scope of expressions, type-compatibility of variables & constants and operators used in the expression and how operator precedence works.

Suggested Experiments/Activities:

Tutorial 4: Operators and the precedence and as associatively:

Lab4: Simple computational problems using the operator' precedence and associativity

- Evaluate the following expressions.
 - $A+B*C+(D*E) + F*G$
 - $A/B*C-B+A*D/3$
 - $A+++B---A$
 - $J= (i++) + (++i)$
- Find the maximum of three numbers using conditional operator
- Take marks of 5 subjects in integers, and find the total, average in float

WEEK 5:

Objective: Explore the full scope of different variants of “if construct” namely if-else, null-else, if-else if*-else, switch and nested-if including in what scenario each one of them can be used and how to use them. Explore all relational and logical operators while writing conditionals for “if construct”.

Suggested Experiments/Activities:

Tutorial 5: Branching and logical expressions:

Lab 5: Problems involving if-then-else structures.

- Write a C program to find the max and min of four numbers using if-else.
- Write a C program to generate electricity bill.
- Find the roots of the quadratic equation.
- Write a C program to simulate a calculator using switch case.
- Write a C program to find the given year is a leap year or not.

WEEK 6:

Objective: Explore the full scope of iterative constructs namely while loop, do-while loop and for loop in addition to structured jump constructs like break and continue including when each of these statements is more appropriate to use.

Suggested Experiments/Activities:

Tutorial 6: Loops, while and for loops

Lab 6: Iterative problems e.g., the sum of series

- Find the factorial of given number using any loop.
- Find the given number is a prime or not.
- Compute sine and cos series
- Checking a number palindrome
- Construct a pyramid of numbers.

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UNIT III

WEEK 7:

Objective: Explore the full scope of Arrays construct namely defining and initializing 1-D and 2-D and more generically n-D arrays and referencing individual array elements from the defined array. Using integer 1-D arrays, explore search solution linear search.

Suggested Experiments/Activities:

Tutorial 7: 1 D Arrays: searching.

Lab 7: 1D Array manipulation, linear search

- Find the min and max of a 1-D integer array.
- Perform linear search on 1D array.
- The reverse of a 1D integer array
- Find 2's complement of the given binary number.
- Eliminate duplicate elements in an array.

WEEK 8:

Objective: Explore the difference between other arrays and character arrays that can be used as Strings by using null character and get comfortable with string by doing experiments that will reverse a string and concatenate two strings. Explore sorting solution bubble sort using integer arrays.

Suggested Experiments/Activities:

Tutorial 8: 2 D arrays, sorting

Lab 8: Matrix problems, String operations, Bubble sort

- Addition of two matrices
- Multiplication two matrices
- Sort array elements using bubble sort

WEEK 9:

Objective: Explore pointers to manage a dynamic array of integers, including memory allocation & value initialization, resizing changing and reordering the contents of an array and memory de-allocation using malloc (), calloc (), realloc () and free () functions. Gain experience processing command-line arguments received by C

Suggested Experiments/Activities:

Tutorial 9: Pointers and dynamic memory allocation

Lab 9: Pointers and memory dereference.

- Write a C program to find the sum of a 1D array using malloc ()
- Enter n students data using calloc () and display failed students list
- Write a C program to implement realloc ()

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UNIT IV

WEEK 10:

Objective: Explore the Functions, sub-routines, scope and extent of variables, doing some experiments by parameter passing using call by value. Basic methods of numerical integration

Suggested Experiments/Activities:

Tutorial 10: Functions, call by value, scope and extent,

Lab 10: Simple functions using call by value, solving differential equations using Euler's theorem.

- Concatenate two strings without built-in functions
- Reverse a string using built-in and without built-in string functions
- Write a C function to find the length of a string.
- Write a C function to transpose of a matrix.
- Write a C function to demonstrate numerical integration of differential equations using Euler's method

WEEK 11:

Objective: Explore how recursive solutions can be programmed by writing recursive functions that can be invoked from the main by programming at-least five distinct problems that have naturally recursive solutions.

Suggested Experiments/Activities:

Tutorial 11: Recursion, recursive calls

Lab 11: Recursive functions

- Write a recursive function to generate Fibonacci series.
- Write a recursive function to find the lcm of two numbers.
- Write a recursive function to find the factorial of a number.
- Write a C Program to implement Ackermann function using recursion.
- Write a recursive function to find the sum of series.

WEEK 12:

Objective: Explore the basic difference between normal and pointer variables, Arithmetic operations using pointers and passing variables to functions using pointers

Suggested Experiments/Activities:

Tutorial 12: Call by reference, dangling pointers

Lab 12: Simple functions using Call by reference, Dangling pointers.

- Write a C program to swap two numbers using call by reference.
- Demonstrate Dangling pointer problem using a C program.
- Write a C program to copy one string into another using pointer.
- Write a C program to find no of lowercase, uppercase, digits and other characters using pointers.

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UNIT V

WEEK 13:

Objective: Experiment with C Structures, Unions, bit fields and self-referential structures (Singly linked lists) and nested structures

Suggested Experiments/Activities:

Tutorial 13: Structure, Bitfields, Self-Referential Structures, Linked lists

Lab13: Structure, Self-Referential Structures, Bitfields, linked lists

Read and print a date using dd/mm/yyyy format using bit-fields and differentiate the same without using bit- fields

- Write a C program to find the total, average of n students using structures
- Read student name and marks from the command line and display the student details along with the total.
- Create and display a singly linked list using self-referential structure.
- Demonstrate the differences between structures and unions using a C program.
- Write a C program to shift/rotate using bitfields.
- Write a C program to copy one structure variable to another structure of the same type.

WEEK14:

Objective: To understand data files and file handling with various file I/O functions.

Explore the differences between text and binary files.

Suggested Experiments/Activities:

Tutorial 14: File handling

Lab 14: File operations

- Write a C program to write and read text into a file.
- Write a C program to write and read text into a binary file using fread() and fwrite()
- Copy the contents of one file to another file.
- Write a C program to merge two files into the third file using command-line arguments.
- Find no. of lines, words and characters in a file
- Write a C program to print last n characters of a given file.

Text Books:

- Programming in C - A practical approach by Ajay Mittal, Pearson Education, First Edition.
- Schaum's Outline of Programming with C by Byron S. Gottfried, McGraw Hill, Second Edition.

Reference Books:

- Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice-Hall of India
- C Programming, A Problem-Solving Approach, Forouzan, Gilberg, Prasad, CENGAGE

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Page 5 of 6

Subjective Test:I - For I B.Tech. I Semester A.Y. 2023-'24 Branch: Common to All Branches

Subject: Introduction to Programming (BR-23 Regulation) Code: 23ES1T04 Max.Marks:30 Time:1½ Hrs.

Answer all questions

3 x 10 = 30 Marks

Q.NO	QUESTIONS	MARKS	CO	BL
1.(a)	Illustrate the Components of Computer System and Program Counter (or)	10	CO1	BL2
1.(b)	Demonstrate the Primitive Data Types and Formatted I/O's with suitable example	10	CO1	
2. (a)	Make use of the Decision Branching Selection Statement with examples (or)	10	CO2	BL3
2.(b)	Utilize the Unconditional Statements in C Programming with examples	10	CO2	
3. (a)	What are the operators in C Programming with examples ? (or)	10	CO1	BL1
3.(b)	Discuss about the Decision Looping Statements with suitable examples	10	CO2	

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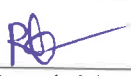
Subjective Test:II - For I B.Tech. I Semester A.Y. 2023-'24 Branch: Common to All branches

Subject: **Introduction to Programming** (BR-23 Regulation) Code: 23ESIT04 Max.Marks:30 Time: 1½ Hrs.

Answer all questions

3 x 10 = 30 Marks

Q.NO	QUESTIONS	MARKS	CO	BL
1.(a)	Illustrate to the Initialization, declaration, accessing, input and output of Two Dimensional Array	10	CO3	BL2
1.(b)	(or) Outline the pointer and declaration, initialization, access variables with examples	10	CO3	
2. (a)	Categorization of the User define functions with examples	10	CO4	BL3
2.(b)	(or) Make use of the String Handling Functions in C Programming with any three string function examples	10	CO4	
3. (a)	Explain about the Structures declaration, Initialization, accessing with example	10	CO5	BL1
3.(b)	(or) What is the File? Discuss about the any three File Handling functions in C with suitable examples	10	CO5	

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Professor

Department of CSE

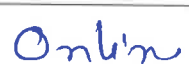
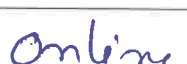
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I Year - II Semester	Code: 23 ^{CS} ML2T01	L	T	P	C
		3	0	0	3
DATA STRUCTURES					
Course Objectives: - To provide the knowledge of basic data structures and their implementations. - To understand importance of data structures in context of writing efficient programs. - To develop skills to apply appropriate data structures in problem solving.					
Course Outcomes: At the end of the course, Student will be able to					
CO1: Explain the role of linear data structures in organizing and accessing data efficiently in algorithms.					
CO2: Design, implement, and apply linked lists for dynamic data storage, demonstrating understanding of memory allocation.					
CO3: Develop programs using stacks to handle recursive algorithms, manage program states, and solve related problems.					
CO4: Apply queue-based algorithms for efficient task scheduling and breadth-first traversal in graphs and distinguish between dequeues and priority queues, and apply them appropriately to solve data management challenges.					
CO5: Devise novel solutions to small scale programming challenges involving data structures such as stacks, queues, Trees.					
CO6: Recognize scenarios where hashing is advantageous, and design hash-based solutions for specific problems.					
UNIT I					
Introduction to Linear Data Structures: Definition and importance of linear data structures, Abstract data types (ADTs), Overview of time and space complexity analysis for linear data structures algorithms.					
Searching Techniques: Linear Search, Binary Search, Sorting Techniques: Bubble Sort, Insertion Sort, Quick Sort, Merge Sort, Selection Sort- Heap sort, Graphs: Introduction.					
UNIT II Stacks:					
Introduction to stacks: properties and operations, implementing and representation of stacks using array, applications of stack in expression evaluation, Infix to postfix expression, reversing list, backtracking (Graph Traversals (DFS))					
UNIT III Queues:					
Introduction to queues: properties and operations, implementing and representation of queues using array, applications of queue in priority queue, round robin algorithm, breadth-first search (Graph Traversals (BFS)), Deques: Introduction to dequeues (double-ended queues), operations on dequeues					
UNIT IV Linked Lists:					
Linked Lists: Introduction, Comparing Arrays and Linked Lists, Singly linked list, representation and operations, Advantages and disadvantages of single linked list, stacks using linked list, queues using linked lists doubly linked lists and circular linked list, Applications of linked lists.					

					
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UNIT V Trees:

Introduction to Linear Data Structures: Define Tree, Binary Tree Properties and Types, Representation of Binary Tree using array and linked lists, Binary Tree Traversals (recursive), Binary search tree and properties, BST Operations-searching, insertion, deletion.

Hashing: Brief introduction to hashing and hash functions, Collision resolution techniques: chaining and open addressing, Hash tables: basic implementation and operations

Text Books:

1. Data Structures and algorithm analysis in C, Mark Allen Weiss, Pearson, 2nd Edition.
2. Fundamentals of data structures in C, Ellis Horowitz, Sartaj Sahni, Susan Anderson-Freed, Silicon Press, 2008.
3. "Expert Data Structures with C" by R.B. Patel, Khanna Book Publishing Company, New Delhi, 4th Edition.

Reference Books:

1. Algorithms and Data Structures: The Basic Toolbox by Kurt Mehlhorn and Peter Sanders
2. C Data Structures and Algorithms by Alfred V. Aho, Jeffrey D. Ullman, and John E. Hopcroft
3. Problem Solving with Algorithms and Data Structures" by Brad Miller and David Ranum
4. Introduction to Algorithms by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein
5. Algorithms in C, Parts 1-5 (Bundle): Fundamentals, Data Structures, Sorting, Searching, and Graph Algorithms" by Robert Sedgewick

<i>Prof</i>	<i>Online</i>	<i>Online</i>	<i>Online</i>	<i>Online</i>	<i>Prof</i>
Dr. N Ramakrishnaiah, Professor of CSE, UCEK, JNTUK Kakinada.	Dr. Jimson Mathew, Professor of CSE, IIT Patna.	Dr. Ch Sudhakar, Professor of CSE, NIT Warangal.	Mr. K Rambabu, Director, Monster India Pvt, Bangalore.	Dr. S Rao Chintalapudi, Professor and HoD, CSE(AIML) CMR Technical Campus, Hyderabad.	Dr. P. Subba Rao, Professor of CSE(AI&DS), BVCEC.

Professor
Department of CSE
University College of Engg.
JNTUK Kakinada.

Head of the
CAD, AIML & CSM
BVC Engineering College, Odalarevu
East Godavari, A.P. 533 210



I Year - II Semester	Code: 23 ^{CS} ML2L01	L	T	P	C
		0	0	3	1.5
DATA STRUCTURES LAB					
Course Objectives: The course aims to strengthen the ability of the students to identify and apply the suitable data structure for the given real-world problem. It enables them to gain knowledge in practical applications of data structures.					
Course Outcomes: At the end of the course, Student will be able to CO1: Explain the role of linear data structures in organizing and accessing data efficiently in algorithms. CO2: Design, implement, and apply linked lists for dynamic data storage, demonstrating understanding of memory allocation. CO3: Develop programs using stacks to handle recursive algorithms, manage program states, and solve related problems. CO4: Apply queue-based algorithms for efficient task scheduling and breadth-first traversal in graphs and distinguish between dequeues and priority queues and apply them appropriately to solve data management challenges. CO5: Recognize scenarios where hashing is advantageous, and design hash-based solutions for specific problems.					
List of Experiments: Exercise 1: Array Manipulation i) Write a program to reverse an array. ii) C Programs to implement the Searching Techniques – Linear & Binary Search iii) C Programs to implement Sorting Techniques – Bubble, Selection and Insertion Sort Exercise 2: Stack Operations i) Implement a stack using arrays and linked lists. ii) Write a program to evaluate a postfix expression using a stack. iii) Implement a program to check for balanced parentheses using a stack. Exercise 3: Queue Operations i) Implement a queue using arrays and linked lists. ii) Develop a program to simulate a simple printer queue system. iii) Solve problems involving circular queues. Exercise 4: Stack and Queue Applications i) Use a stack to evaluate an infix expression and convert it to postfix. ii) Create a program to determine whether a given string is a palindrome or not. iii) Implement a stack or queue to perform comparison and check for symmetry. iv) Implementing a BST using Linked List. v) Traversing of BST.					

					
Dr. N Ramakrishnaiah, Professor of CSE, UCEK, JNTUK Kakinada.	Dr. Jimson Mathew, Professor of CSE, IIT Patna.	Dr. Ch Sudhakar, Professor of CSE, NIT Warangal.	Mr. K Rambabu, Director, Monster India Pvt, Bangalore.	Dr. S Rao Chintalapudi, Professor and HoD, CSE(AIML) CMR Technical Campus, Hyderabad.	Dr. P. Subba Rao, Professor of CSE(AI&DS), BVCEC.
Professor Department of CSE University College of Engg. JNTUK Kakinada.					Head of the CAD, AIML & CSM BVC Engineering College, Odalarevu East Godavari, A.P. 533 210



Exercise 5: Linked List Implementation

- i) Implement a singly linked list and perform insertion and deletion operations.
- ii) Develop a program to reverse a linked list iteratively and recursively.
- iii) Solve problems involving linked list traversal and manipulation.

Exercise 6: Linked List Applications

- i) Create a program to detect and remove duplicates from a linked list.
- ii) Implement a linked list to represent polynomials and perform addition.
- iii) Implement a double-ended queue (deque) with essential operations.

Exercise 7: Double Linked List Implementation

- i) Implement a doubly linked list and perform various operations to understand its properties and applications.

Exercise 8: Binary Search Tree

- i) Implementing a BST using Linked List.
- ii) Traversing of BST.

Exercise 9: Hashing**Implement a hash table with collision resolution techniques.**

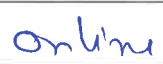
- i) Write a program to implement a simple cache using hashing.
- ii) Write a program to implement BFS.
- iii) Write a program to implement DFS.

Text Books:

1. Data Structures and algorithm analysis in C, Mark Allen Weiss, Pearson, 2nd Edition.
2. Fundamentals of data structures in C, Ellis Horowitz, Sartaj Sahni, Susan Anderson-Freed, Silicon Press, 2008

Reference Books:

1. Algorithms and Data Structures: The Basic Toolbox by Kurt Mehlhorn and Peter Sanders
2. C Data Structures and Algorithms by Alfred V. Aho, Jeffrey D. Ullman, and John E. Hopcroft
3. Problem Solving with Algorithms and Data Structures" by Brad Miller and David Ranum
4. Introduction to Algorithms by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein
5. Algorithms in C, Parts 1-5 (Bundle): Fundamentals, Data Structures, Sorting, Searching, and Graph Algorithms by Robert Sedgewick.

					
Dr. N Ramakrishnaiah, Professor of CSE. UCEK, JNTUK Kakinada.	Dr. Jimson Mathew, Professor of CSE, IIT Patna.	Dr. Ch Sudhakar, Professor of CSE, NIT Warangal.	Mr. K Rambabu, Director, Monster India Pvt, Bangalore.	Dr. S Rao Chintalapudi, Professor and HoD, CSE(AIML) CMR Technical Campus, Hyderabad.	Dr. P. Subba Rao, Professor of CSE(AI&DS), BVCEC.

Professor
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JNTUK Kakinada.



Head of the
CAD, AIML & CSM
BVC Engineering College, Odalarevu
East Godavari, A.P. 533 210
Page 2 of 2



BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE
(AUTONOMOUS), ODALAREVU
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
(ARTIFICIAL INTELLIGENCE & DATA SCIENCE)
ACADEMIC REGULATIONS FOR COURSE EVALUATION

a) Theory Courses:

Assessment Method	Marks
Continuous Internal Assessment	30
Semester End Examination	70
Total	100

b) Practical Courses:

Practical Courses

Assessment Method	Marks
Continuous Internal Assessment	30
Semester End Examination	70
Total	100

c) Evaluation of Skill Oriented Courses:

The course shall carry 100 marks and shall be evaluated through continuous assessments during the semester for 30 sessional marks and end examination shall be for 70 marks. Day-to-day work in the class / laboratory shall be evaluated for 30 marks by the concerned teacher based on the regularity/assignments/viva/mid semester test. The end examination similar to practical examination pattern shall be conducted by the concerned teacher and an expert in the subject nominated by the principal.

d) Evaluation of Summer Internships:

- ➔ Total External Marks: 50
- ➔ A student shall secure minimum 40% of marks for successful completion
- ➔ Weightage of 50% each for Report and Oral Presentation
- ➔ Departmental Committee is responsible for Evaluation



e) Full Semester Internship and Project work:

- In the final semester, the student should mandatorily register and undergo internship (onsite/virtual) and in parallel he/she should work on a project with well-defined objectives. At the end of the semester the candidate shall submit an internship completion certificate and a project report. A student shall also be permitted to submit project report on the work carried out during the internship.
- The project report shall be evaluated with an external examiner. The total marks for project work 200 marks and distribution shall be 60 marks for internal and 140 marks for external evaluation. The supervisor assesses the student for 30 marks (Report: 15 marks, Seminar: 15 marks). At the end of the semester, all projects shall be showcased at the department for the benefit of all students and staff and the same is to be evaluated by the departmental Project Review Committee consisting of supervisor, a senior faculty and HOD for 30 marks. The external evaluation of Project Work is a Viva-Voce Examination conducted in the presence of internal examiner and external examiner appointed by the Chief Controller of Examinations and is evaluated for 140 marks.

	online	online	online	online	
Dr. N Ramakrishnaiah, Professor of CSE. UCEK, JNTUK Kakinada.	Dr. Jimson Mathew, Professor of CSE, IIT Patna.	Dr. Ch Sudhakar, Professor of CSE, NIT Warangal.	Mr. K Rambabu, Director, Monster India Pvt, Bangalore.	Dr. S Rao Chintalapudi, Professor and HoD, CSE(AIML) CMR Technical Campus, Hyderabad.	Dr. P. Subba Rao, Professor of CSE(AI&DS), BVCEC.

Professor
Department of CSE
University College of Engg.
JNTUK Kakinada.



Head of the
CAD, AIML & CSM
BVC Engineering College, Odalarevu
East Godavari, A.P. 533 210



**BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE
(AUTONOMOUS), ODALAREVU
Department of Computer Science and
Engineering(AI&ML)/AI&ML**

Date: 05/10/2023

From

Head of the Department,
Department of Computer Science and Engineering (AI&ML)/AI&ML.

To

The Principal,
Bonam Venkata Chalamayya Engineering College (Autonomous),
Odalarevu.

Respected Sir,

Sub: Sanctioning the remuneration to BOS members.

The department of CSE(AI&ML)/AI&ML conducted the 5th BOS meeting on 04/10/2023 successfully and got ratification for the Regulation of BR23, First Year B.Tech course structure and syllabus. The members of BOS presented in the meeting from JNTUK, IIT, NIT, Industry and alumni. For the above meeting purpose, we have to give the remuneration. So, kindly give the approval to sanction the amount of remuneration for the above said.

Members Present in the Meeting and their remuneration:

Sl. No.	Name & Details of Expert	Account Detail	Amount
1	Dr. N RAMAKRISHNAIAH Professor of CSE, UCEK, JNTUK Kakinada	N. Ramakrishnaiah Acc.No: 30096214622 SBI, JNTUK, Kakinada IFSC: SBIN0001358	15,000/-
2	Dr. JIMSON MATHEW, Professor of CSE, IIT Patna	Jimson Mathew Acc. No. Acc.No: 6244101000042 Canara Bank, Patna, Bihar, IFSC: CNRB0006244	20,000/-
3	Dr CH. SUDHAKAR Professor in Dept of CSE NIT Warangal, Telangana	Ch. Sudhakar, Acc. No: 52109421443 IFSC Code: SBIN0020149 SBI, NIT, Warangal	20,000/-
4	KANUGULA RAMBABU Director, Monster India Pvt.Ltd, Bengaluru	Kanugula Rambabu Acc.No:36552397943, IFSC: SBIN0014889, SBI Bank, VISHRANTWADI AIRPORT ROAD, VISHRANTWADI, PUNE	10,000/-
5	Dr. S RAO CHINTALAPUDI Professor of CSE & HoD CSE(AI&ML) CMT Technical Campus, Hyderabad.	S Rao Chintalapudi Acc.No: 33590138666 SBI, JNTUK, Kakinada IFSC: SBIN0001358	5,000/-
6	Transportation allowances for getting signatures from experts		--
Total			70,000/-

Thank you.

Yours truly,

AO
5/10/23



Head of the Department / CSE(AI&ML)/AI&ML
(Dr. P. Subba Rao)

BVC Engineering College, Odalarevu
East Godavari, A.P. 533 210



**BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE
(AUTONOMOUS), ODALAREVU
Department of Computer Science and Engineering(AI&DS)**

Date: 30/09/2023

From

Head of the Department,
Department of Computer Science and Engineering (AI&DS)

To

The Principal,
Bonam Venkata Chalamayya Engineering College (Autonomous),
Odalarevu.

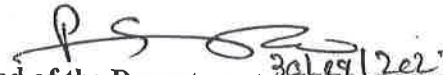
Respected Sir,

Sub: Permission seeking to conduct the department BOS meeting

We are going to conduct the 5th BOS meeting on 04/10/2023 for ratifying the Regulation of BR23, First Year B.Tech course structure and syllabus of the department of Computer Science and Engineering (AI&DS) through online mode. So, kindly give the approval to conduct the above and to be given your presence on the meeting will be successful.

Thank you.

Yours truly,


Head of the Department / CSE(AI&DS)

Head of the
PVC Engineering College, Odalarevu
East Godavari, A.P. 533 210

Permitted

30/09/23



**BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE
(AUTONOMOUS), ODALAREVU
Department of Computer Science and Engineering(AI&DS)**

Date: 30/09/2023

From

Head of the Department,
Department of Computer Science and Engineering (AI&DS)

To

The Principal,
Bonam Venkata Chalamayya Engineering College (Autonomous),
Odalarevu.

Respected Sir,

Sub: Permission seeking to conduct the department BOS meeting

We are going to conduct the 5th BOS meeting on 04/10/2023 for ratifying the Regulation of BR23, First Year B.Tech course structure and syllabus of the department of Computer Science and Engineering (AI&DS) through online mode. So, kindly give the approval to conduct the above and to be given your presence on the meeting will be successful.

Thank you.

Yours truly,


Head of the Department / CSE(AI&DS)

(Dr P. SUBBA RAO)
Head of the
CAD, AIML & CSM
BVC Engineering College, Odalarevu
East Godavari, A.P. 533 210

Permitted

30/09/23

Invitation Link to attend 5th BoS meeting of the Department of CSE (AI&DS)/CSE (AI & ML)/ Artificial Intelligence and Machine Learning. BVCEC, Odalarevu – Reg.

1 message

Wed, Oct 4, 2023 at 9:01 AM

HoD CAD <hodcad.bvce@bvcgroup.in>
To: Jimson Mathew <jimson@iitp.ac.in>, chapram@nitw.ac.in, babu K <dkanugula@gmail.com>, srao.chintalapudi@gmail.com, bdsahu@nitrrl.ac.in, vamsivihar@jntucek.ac.in, "N. Ramakrishnaiah" <nkrishna27@gmail.com>

Dear Sir,
We are requesting you to attend the meeting below at the Id.
BoS Meeting-CSE/CSE (AI&DS)/CSE (AI & ML)/ Artificial Intelligence and Machine Learning. BVCEC, Odalarevu
Wednesday, October 4 · 10:45 – 14:45
Time zone: Asia/Kolkata
Google Meet joining info
Video call link: <https://meet.google.com/sgc-nayf-nwq>
Or dial: (US) +1 334-472-8164 PIN: 484 361 007#

Thank you Sir,

Dr P. Subba Rao
Chairperson-BOS

[Handwritten signature]

2/20/24, 3:23 PM

BVC Group Mail - Request to attend 5th BoS meeting of the Department of Computer Science and Engineering (Artificial Intelligen...

-  **6. Data Structures.docx**
23K
-  **1.BR23_I Year Course Structure.docx**
88K
-  **2. Introduction to Programming.docx**
31K
-  **3 a Computer Programming Lab.docx**
34K
-  **8.B.Tech BR-2023 Academic Regulations.pdf**
9368K
-  **3. Computer Programming Lab.docx**
31K
-  **4. IT Workshop-CSE&Allied.docx**
20K
-  **Dr. N Ramakrishnaiah.pdf**
642K

Sun, Oct 1, 2023 at 5:12 PM

N. Ramakrishnaiah <nkrishna27@gmail.com>
To: HoD CAD <hodcad.bvce@bvcgroup.in>

Ok...Sir

[Quoted text hidden]

Sun, Oct 1, 2023 at 7:16 PM

HoD CAD <hodcad.bvce@bvcgroup.in>
To: "dkangula@gmail.com" <dkangula@gmail.com>

[Quoted text hidden]

11 attachments

-  **Agenda.docx**
34K
-  **CSE(AI&DS) BOS MEMBERS.doc**
37K
-  **7 Data Structures lab.docx**
20K
-  **6. Data Structures.docx**
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34K
-  **8.B.Tech BR-2023 Academic Regulations.pdf**
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-  **3. Computer Programming Lab.docx**
31K
-  **4. IT Workshop-CSE&Allied.docx**
20K

Request to attend 5th BoS meeting of the Department of Computer Science and Engineering (Artificial Intelligence and Data Science), BVCEC, Odalarevu – Reg.

1 message

HoD CAD <hodcad.bvce@bvcgroup.in>
To: jimson@iitp.ac.in

Sun, Oct 1, 2023 at 4:09 PM

Dear Sir,

Sub: Request to attend 5th BoS meeting of the Department of Computer Science and Engineering (Artificial Intelligence and Data Science), BVCEC, Odalarevu – Reg.

We thank you for your kind acceptance of our invitation to act as a BoS member for the Department of Computer Science and Engineering (Artificial Intelligence and Data Science), Bonam Venkata Chalamayya Engineering College (Autonomous), Odalarevu.

In this regard, we are glad to convey for your kind information that the 5th BoS meeting will be conducted on 4th October, 2023 (Wednesday) at 11.00 AM through online mode.

The agenda of BoS meeting

Ratification of First Year B.Tech., course structure and the appropriate subjects in the first year on the regulation of BR-23

You are requested to give your kind consent and information for the 5th BoS meeting of the Department of Computer Science and Engineering (Artificial Intelligence and Data Science) through EMail.

Thank You Sir,

Yours sincerely,

Chairperson-BoS

Dr. P. Subba Rao

11 attachments **CSE(AI&DS) BOS MEMBERS.doc**
37K **6. Data Structures.docx**
23K **Agenda.docx**
34K

Request to attend 5th BoS meeting of the Department of Computer Science and Engineering (Artificial Intelligence and Data Science), BVCEC, Odalarevu – Reg.

2 messages

HoD CAD <hodcad.bvce@bvcgroup.in>
To: chapram@nitw.ac.in

Sun, Oct 1, 2023 at 4:11 PM

Dear Sir,

Sub: Request to attend 5th BoS meeting of the Department of Computer Science and Engineering (Artificial Intelligence and Data Science), BVCEC, Odalarevu – Reg.

We thank you for your kind acceptance of our invitation to act as a BoS member for the Department of Computer Science and Engineering (Artificial Intelligence and Data Science), Bonam Venkata Chalamayya Engineering College (Autonomous), Odalarevu.

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Thank You Sir,



Yours sincerely,

Chairperson-BoS

Dr. P. Subba Rao

11 attachments

 **7 Data Structures lab.docx**
20K

 **6. Data Structures.docx**
23K

 **4. IT Workshop-CSE&Allied.docx**
20K



Updated affiliation for Request to attend 5th BoS meeting of the Department of Computer Science and Engineering (Artificial Intelligence and Data Science), BVCEC, Odalarevu – Reg

1 message

Tue, Oct 3, 2023 at 11:40 AM

HoD CAD <hodcad.bvce@bvcgroup.in>
To: chapram@nitw.ac.in

Dear Sir,

Sub: Request to attend 5th BoS meeting of the Department of Computer Science and Engineering (Artificial Intelligence and Data Science), BVCEC, Odalarevu – Reg.

We thank you for your kind acceptance of our invitation to act as a BoS member for the Department of Computer Science and Engineering (Artificial Intelligence and Data Science), Bonam Venkata Chalamayya Engineering College (Autonomous), Odalarevu.

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Thank You Sir,

Yours sincerely,

Chairperson-BoS

Dr. P. Subba Rao

 Dr Ch. Sudhakar_AI&DS.pdf
611K

2/20/24, 3:15 PM

BVC Group Mail - Request to attend 5th BoS meeting of the Department of Computer Science and Engineering (Artificial Intelligen...

-  **7 Data Structures lab.docx**
20K
-  **2. Introduction to Programming.docx**
31K
-  **1.BR23_I Year Course Structure.docx**
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9368K
-  **Mr. K Rambabu.pdf**
628K
-  **4. IT Workshop-CSE&Allied.docx**
20K
-  **3. Computer Programming Lab.docx**
31K

HoD CAD <hodcad.bvce@bvcgroup.in>
To: babu K <dkanugula@gmail.com>

Sun, Oct 1, 2023 at 7:20 PM

----- Forwarded message -----

From: **HoD CAD** <hodcad.bvce@bvcgroup.in>

Date: Sun, Oct 1, 2023 at 4:14 PM

Subject: Request to attend 5th BoS meeting of the Department of Computer Science and Engineering (Artificial Intelligence and Data Science), BVCEC, Odalarevu – Reg.

To: <kanugula.rambabu@monsterindia.com>

Dear Sir,

Sub: Request to attend 5th BoS meeting of the Department of Computer Science and Engineering (Artificial Intelligence and Data Science), BVCEC, Odalarevu – Reg.

We thank you for your kind acceptance of our invitation to act as a BoS member for the Department of Computer Science and Engineering (Artificial Intelligence and Data Science), Bonam Venkata Chalamayya Engineering College (Autonomous), Odalarevu.

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Thank You Sir,

Yours sincerely,

Chairperson-BoS

Dr. P. Subba Rao

11 attachments

-  **6. Data Structures.docx**
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37K
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20K
-  **3. Computer Programming Lab.docx**
31K



Request to attend 5th BoS meeting of the Department of Computer Science and Engineering (Artificial Intelligence and Data Science), BVCEC, Odalarevu – Reg.

1 message

HoD CAD <hodcad.bvce@bvcgroup.in>
To: srao.chintalapudi@gmail.com

Sun, Oct 1, 2023 at 4:16 PM

Dear Sir,

Sub: Request to attend 5th BoS meeting of the Department of Computer Science and Engineering (Artificial Intelligence and Data Science), BVCEC, Odalarevu – Reg.

We thank you for your kind acceptance of our invitation to act as a BoS member for the Department of Computer Science and Engineering (Artificial Intelligence and Data Science), Bonam Venkata Chalamayya Engineering College (Autonomous), Odalarevu.

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Thank You Sir,



Yours sincerely,

Chairperson-BoS

Dr. P. Subba Rao

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23K **3 a Computer Programming Lab.docx**
34K **4. IT Workshop-CSE&Allied.docx**
20K



BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE

(AUTONOMOUS)

(Approved by AICTE, New Delhi with PIO/ Foreign National Status, Permanently Affiliated to JNTUK, Kakinada)

(Graded 'A' by NAAC, Bangalore, Recognised by UGC under Sections 2(f)& 12(B))

(Sponsored by BONAM VENKATA CHALAMAYYA EDUCATIONAL SOCIETY, Edarapally, Amalapuram)

ODALAREVU - 533 210, Allavaram Mandal, East Godavari District, Andhra Pradesh, INDIA

Phone : 08856-250045, 250145, 250245, 250345, 250825, Fax : 250881 | E-mail : bvce@bvccgroup.in | www.bvcec.org

Dr. P Subba Rao
(Chairman- BoS)

To

30/09/2023

Dr. N Ramakrishnaiah,

Professor of CSE, UCEK, JNTUK Kakinada.

Sub: Request to attend 5th BOS meeting of the Department of Computer Science and Engineering, BVCEC, Odalarevu – Reg.

Dear Sir,

We thank for your kind acceptance of our invitation to act as a BOS member for the Department of Computer Science and Engineering (AI&DS), Bonam Venkata Chalamayya Engineering College (Autonomous), Odalarevu.

In this regard, we glad to convey for your kind information that the 5th BOS meeting will be conducted on 4th October, 2023 (Wednesday) at 11.00 AM through online mode.

The agenda of BOS meeting

Ratification of First Year B.Tech., course structure and the appropriate subjects in the first year on the regulation of BR-23

You are requested to give your kind consent and information for the 5th BOS meeting of the Department of Computer Science and Engineering (AI&DS) through E-Mail.

Thank You.



Yours sincerely,

PS
30/09/2023

Dr. P Subba Rao
(Chairman- BoS)

Head of the
CAD, AIML & CSM
BVCE Engineering College, Odalarevu
East Godavari, A.P. 533 210



BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE

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ODALAREVU - 533 210, Allavaram Mandal, East Godavari District, Andhra Pradesh, INDIA

Phone : 08856-250045, 250145, 250245, 250345, 250825, Fax : 250881 | E-mail : bvce@bvcgroup.in | www.bvcec.org

To

30/09/2023

Dr. Jimson Mathew,
Professor of CSE,
IIT Patna.

Sub: Request to attend 5th BOS meeting of the Department of Computer Science and Engineering, BVCEC, Odalarevu – Reg.

Dear Sir,

We thank for your kind acceptance of our invitation to act as a BOS member for the Department of Computer Science and Engineering (AI&DS), Bonam Venkata Chalamayya Engineering College (Autonomous), Odalarevu.

In this regard, we glad to convey for your kind information that the 5th BOS meeting will be conducted on 4th October, 2023 (Wednesday) at 11.00 AM through online mode.

The agenda of BOS meeting

Ratification of First Year B.Tech., course structure and the appropriate subjects in the first year on the regulation of BR-23

You are requested to give your kind consent and information for the 5th BOS meeting of the Department of Computer Science and Engineering (AI&DS) through E-Mail.

Thank You.



Yours sincerely,


30/09/2023

Dr. P Subba Rao
(Chairman- BoS)

Head of the
CAD, AIML & CSM
BVC Engineering College, Odalarevu
East Godavari, A.P. 533 210



BONAM VENKATA CHALAMAYYA ENGINEERING COLLEGE

(AUTONOMOUS)

(Approved by AICTE, New Delhi with PIO/ Foreign National Status, Permanently Affiliated to JNTUK, Kakinada)

(Graded 'A' by NAAC, Bangalore, Recognised by UGC under Sections 2(f)&12(b))

(Sponsored by BONAM VENKATA CHALAMAYYA EDUCATIONAL SOCIETY, Edarapally, Amalapuram)

ODALAREVU - 533 210, Allavaram Mandal, East Godavari District, Andhra Pradesh, INDIA

Phone : 08856-250045, 250145, 250245, 250345, 250825, Fax : 250881 | E-mail : bvce@bvcegroup.in | www.bvcec.org

To

30/09/2023

Dr. Ch Sudhakar,

Professor of CSE,

NIT Warangal,

Mail : chapram@nitw.ac.in

Mobile No. : 9440647945

Sub: Request to attend 5th BOS meeting of the Department of Computer Science and Engineering, BVCEC, Odalarevu – Reg.

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To

30/09/2023

Mr. K Rambabu,

Director,

Monster India Pvt. Ltd,

Bengaluru.

Mail : kanugula.rambabu@monsterindia.com

Mobile No. : 93475 82939

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To

30/09/2023

Dr. S.Rao Chintalapudi, M.Tech., Ph.D.,
Associate Professor PEC (Autonomous),
ADB Road, Surampalem,
9949379392,
Srao.chintalapudi@gmail.com

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