TULSIRAMJI GAIKWAD-PATIL College of Engineering and Technology
Wardha Road, Nagpur - 441108
Accredited with NAAC **A+** Grade
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Department of Electronics and Communication Engineering

Date: 22/08/2024

Report

Aim: To perform hands on training for Web Application using NodeJS & PostgreSQL (IOT).

Introduction

The Department of Electronics & Communication Engineering, Tulsiramji Gaikwad Patil College of Engineering and Technology organized **"Backend API development for IOT, Embedded and Data Analytics using NodeJS and PostgreSQL"** from 08/08/2024 and 10/08/2024.

TechMentor IoT Solutions (OPC) Pvt. Ltd. Nagpur is Establishment in year 2018. It offers IT & Electronics Project Development & Consultancy, Technical Skill Based Training, Project Lab Setup and Import Export of Electronics Goods and also offers best & Reliable Product & Services customized as per client needs. This company will take three days workshop on Backend API development using NodeJS and PostgreSQL as Database for engineering students with these followed contents. NodeJS is an open-source framework which has been developed for developers to understand and build web applications with the help of JavaScript.Node.js and PostgreSQL are a powerful combination for IoT (Internet of Things) application development, they handling real-time data streams from IoT devices, non-blocking I/O model. Node.js allows developers to use JavaScript on both the client-side and server-side, simplifying development and reducing context switching. PostgreSQL provides a robust and reliable database management system for storing and managing large amounts of IoT data. PostgreSQL has built-in support for time-series data, making it suitable for storing and analyzing IoT sensor data. Who should do the course: Full Stack Developers & Those who are willing to learn and build their career in web development. All the students and faculties actively participated in this event to make it a grand success.

Workshop began with traditional lamp lightening and a prayer and Felicitation giving sapling of Guests Mr. Devishankar Mishra, Technical Lead, TechMentor IoT Solutions (OPC) Pvt. Ltd. Nagpur.Expert in API, Java, SQL with the consent of Hon. Management, Principal Dr Premanand Naktode , Vice Principal Dr. Pragati Patil, Dean Academics Prof Anup Gade, and Dean IQAC Prof Ritesh Banpurkar, the Workshop was inaugurated by Mr. Devishankar Mishra, Technical Lead

TechMentor IoT Solutions (OPC) Pvt. Ltd. Nagpur,Dr Sanjay Asutkar, Rohini Pochhi, Dr Bharati Sayankar, Dr Pravin Tajane Prof.Rahul Dhuture, Prof. Sandeep Thakre, Prof. Suraj Mahajan, Prof. Amol Dhenge, Prof. Mayuri Harde, Prof. Pallavi Rokade, Prof. Kalyani Sawarkar, Prof. Shrutika Wankhede, Students and supporting Staff. Total 56 Students from 3rd and 5th Semester ECE Department has been participated.

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The three days workshop has been conducted with following session.

Day 1 Session:

1. External Resource Person Mr. Devishankar Mishra introduced the Participants Introduction to Node.js,

2. Event-driven Programming, Event Loop, Blocking, the Event Loop Node.js Philosophy, Node.js Platform Setup Download and Install.

3. Node REPL, First Hello World Modules and npm, Anatomy of a module, Private code Accessing and using modules, npm commands, package.json.

4. The Callback Pattern, What are callbacks, Callback-last, Error-first..

5. At the end of Day -1 Session, Online Feedback from the Participants was collected.

Day 2 Session:

1. Node REPL, First Hello World Modules and npm, Anatomy of a module, Private code Accessing and using modules, npm commands, package.json.

2. The Callback Pattern, What are callbacks, Callback-last, Error-first.

3. All 56 Participants contributed their 100 % performance with full enthusiasm

4. Hands On Training Session will be devoted to Creating API using NodeJS and PostgreSQL

5. At the end of Day - 2 Session, Online Feedback from the Participants were collected.

Day 3 Session:

1. Events, when to use Event Emitters, Binding Functions to Events, Event Requests and Listening, **Error Handling**.

2. Participants were trained to write Codes, uploading of Codes with respect **Callbacks: Error-first, Errors in Event Emitters, Uncaught Exceptions, Using Domains, Buffers, Why Buffers exist, Creating Buffers, Reading and Writing Buffers, Manipulating Buffers.**

3. The session ended by validatory function with distribution of Certificate to participated students.

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Dr. Mohan Gaikwad –Patil Chairman GPG, Mr.Akash Gaikwad-Patil Vice Chairman, Dr. Sandeep Gaikwad Treasurer GPG, Dr.Pragati Patil, Vice Principal, motivated us to organize this event. Dr.Sanjay Asutkar, HoD ECE Department, and Prof. Rahul Dhuture, workshop coordinator congratulated participants for enhancement in their knowledge and promised for more such workshops. News has also been shared to Hitvada, Loksatta and Tarun Bharat, Community Newspaper to be published.

Objective of Workshop:

1. To Provide participants with new knowledge, insights, or skills related to a specific course such as Internet of Things (IOT), Artificial Intelligence (AI).
2. To Offer hands-on practice or interactive sessions that enable participants to develop or enhance specific skills.
3. To Facilitate group activities or discussions that promote teamwork, idea sharing, and collaboration among participants.
4. To Create an environment that encourages creative thinking and innovative approaches to problem-solving or task completion.
5. To Address specific challenges or issues by working through them collectively, often with the goal of finding actionable solutions.

Mapping of Workshop with POs:

PO1: Engineering Knowledge

PO2: Problem Analysis

PO3: Design/ development of solutions

PO4: Conduct investigations of complex problems

PO5: Modern tool usage

PO8: Ethics

PO9: Individual and team work

PO10: Communication

PO11: Project Management and Finance

PO12: Life-long learning

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Outcomes of Workshop:

1. At the end of the workshop course contents is mapped with   PO1, PO2, PO3, PO4, PO5, PO8, PO9, PO10, PO11, PO12 of IOT and AI course.

2. Student will be able to learned advanced topics of IOT and AI.

3. Students will be able to understand the concept NodeJS and PostgreSQL a is an open-source framework for build web applications.

4. Students will get knowledge about the Node.js allows developers to use JavaScript on both the client-side and server-side, simplifying development and reducing context switching.

5. Student will get knowledge about the PostgreSQL provides a robust and reliable database management system for storing and managing large amounts of IoT data.

Conclusion:

Participants were learned advanced topics of IOT and AI and trained to create API using NodeJS and PostgreSQL. Node.js Students allows developers to use JavaScript on both the client-side and server-side, simplifying development and reducing context switching.

Acknowledgement:

1. The three days session conducted was very interactive.

2. Practical knowledge was enhanced.

3. Usage and industry scope was discussed

4. PO1, PO2, PO3, PO4, PO5, PO8, PO9, PO10, PO11, PO12 were attained.

5. Student's feedback was good and satisfactory.

Action Taken Report:

- Advanced Workshop are planned using the hardware of embedded and IOT.

- Mini and Major projects will be assigned using same software like Java and C+

- Prepare Project for Competition under IETE, IEI, ISTE Student Chapter.

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<u>Glimpses of Three Days Workshop on Mobile Robotics</u>

Inauguration of Three Days Workshop on "Backend API development for IOT, Embedded and Data Analytics using NodeJS and PostgreSQL" from 8th to 10th August 2024. Organized by ECE Department in association with TechMentor IoT Solutions (OPC) Pvt. Ltd. Nagpur

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Hands on training session on Three Days workshop on"Backend API development for IOT, Embedded and Data Analytics using NodeJS and PostgreSQL" from 8th to 10th August 2024 is given by Mr. Devishankar Mishra, Technical Lead, TechMentor IoT Solutions (OPC) Pvt. Ltd. Nagpur.

Certificate Distribution of Three Days workshop on "Backend API development for IOT, Embedded and Data Analytics using NodeJS and PostgreSQL" from 8th to 10th August 2024 is given by Mr. Devishankar Mishra, Technical Lead, TechMentor IoT Solutions (OPC) Pvt. Ltd. Nagpur.

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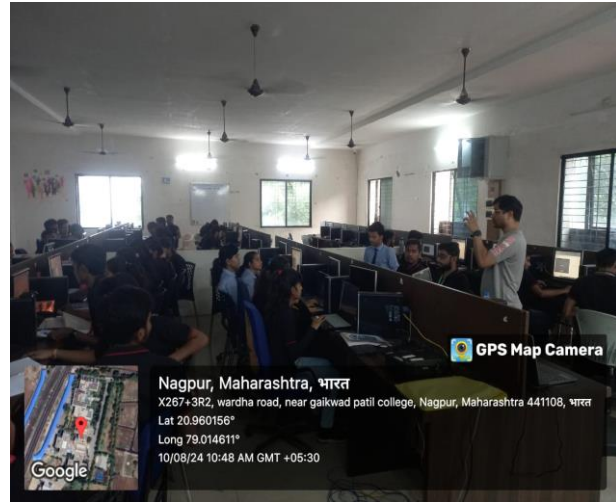Accredited with NAAC **A+** Grade
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News Media

Three Days Workshop on "Backend API development for IOT, Embedded and Data Analytics using NodeJS and PostgreSQL" organized at TGPCET

With the desire to enhance knowledge and to provide for industry readiness, the department of Electronics and Communication, Tulsiramji Gaikwad Patil College of Engineering and Technology (TGPCET), Nagpur, organized three days hands on workshop on **Backend API development for IOT, Embedded and Data Analytics using NodeJS and PostgreSQL** from 8th to 10th August 2024. Workshop began with traditional lamp lightening and a prayer and felicitation giving sapling of guest Mr. Devishankar Mishra, Technical Lead, TechMentor IoT Solutions (OPC) Pvt. Ltd. Nagpur. He guided on 1st Day the students about the recent technologies associated with AI, ML, Data Science and stressed upon the simultaneous practical exposure to the students in concurrence with the theory. He motivated students to improve upon employability skills related to industry demand. On 2nd Day he guided the students on Application Peripheral Interface, Java Sript, Shortcuts in technology, VS Code, Apps, and Development. On 3rd Day Creating API using NodeJS and PostgreSQL. Total 61 Students of BTech 3rd semester and 5th semester actively participated in the workshop.

All Teaching staff with guest of Mr. Devishankar Mishra, Technical Lead, TechMentor IoT Solutions (OPC) Pvt. Ltd. Nagpur

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Participants were provided with hands-on learning opportunities, with Application Peripheral Interface, Java Sript, Shortcuts in technology, VS Code, Apps, and Development. The event demonstrated the potential of technology in various applications, fostering meaningful discussions and knowledge exchange. It marked a significant stride toward innovation in this critical sector the hands on workshop included introduction to Internet on Things, exposure to various sub fields and technology stacks of IoT, embedded systems, and Data analytics.

Three days session were very interactive with students trying out a diverse set of applications in API. The session ended with distribution of Certificate to participated students. Dr.Mohan Gaikwad –Patil Chairman GPG, Mr. Akash Gaikwad-Patil Vice Chairman, Dr. Sandeep Gaikwad Treasurer GPG, Dr. P.L.Naktode, Principal, Dr. Pragati Patil, Vice Principal, motivated us to organize this event. Dr. Sanjay Asutkar, HoD ECE Department, Prof. Rahul Dhuture, Coordinator and All teaching and non teaching staff members congratulated participants for enhancement in their knowledge and promised for more such workshops. Program was anchored by Ms. Twinkle Karpe and MD Kaif Ebadulla Molla.

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Feedback Report of Day 1 Session
Backend API development for IOT, Embedded and Data Analytics using NodeJS and PostgreSQL (Date-08/08/2024)

Feedback Report of Day 1 Session					
Batch Size : 56					
Question Number	**Total Count of Student**	**Total Count of Correct Answer**	**Total Count of Incorrect Answer**	**% of Correct Answer**	**% of Incorrect Answer**
1	56	45	11	80.36%	19.64%
2	56	51	05	91.07%	08.93%
3	56	52	04	92.86%	07.14%
4	56	34	22	60.71%	39.29%
5	56	39	17	69.64%	30.36%
6	56	40	16	71.43%	28.57%
7	56	50	06	89.29%	10.71%
8	56	47	09	83.93%	16.07%
9	56	40	16	71.43%	28.57%
10	56	50	06	89.29%	10.71%

Feedback Report of Day 1 Session (Date-08/08/2024)

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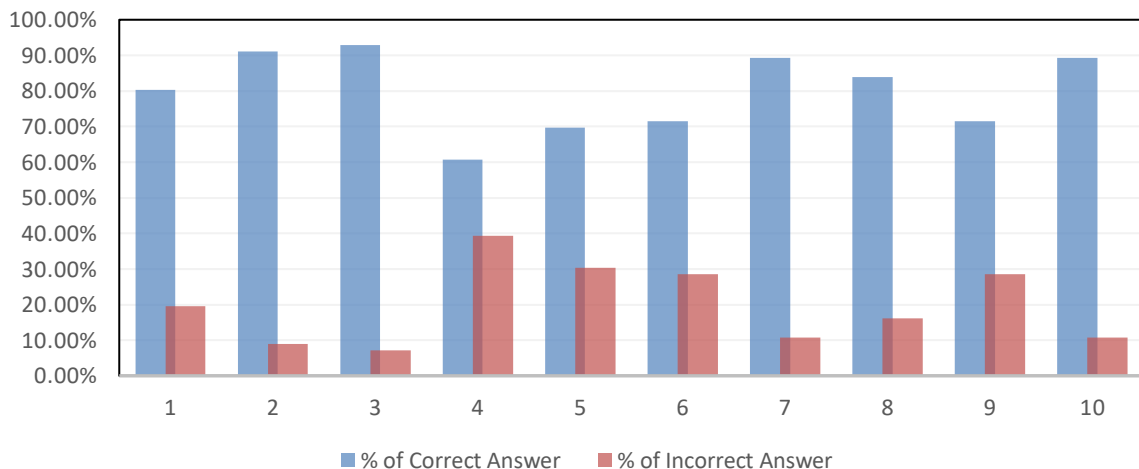**(An Autonomous Institution Affiliated to RTM Nagpur University)**

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Feedback Report of Day 2 Session
Backend API development for IOT, Embedded and Data Analytics using NodeJS and PostgreSQL (Date-09/08/2024)

Feedback Report of Day 2 Session					
Batch Size : 56					
Question Number	Total Count of Student	Total Count of Correct Answer	Total Count of Incorrect Answer	% of Correct Answer	% of Incorrect Answer
1	56	51	05	91.07%	17.75%
2	56	49	07	88.70%	11.30%
3	56	47	09	82.25%	17.75%
4	56	49	07	79.03%	20.97%
5	56	51	05	85.48%	14.52%
6	56	46	10	95.16%	4.84%
7	56	42	14	90.32%	9.68%
8	56	48	06	91.93%	8.07%
9	56	44	12	83.87%	16.13%
10	56	43	13	88.70%	11.30%

Feedback Report of Day 2 Session (Date-09/08/2024)

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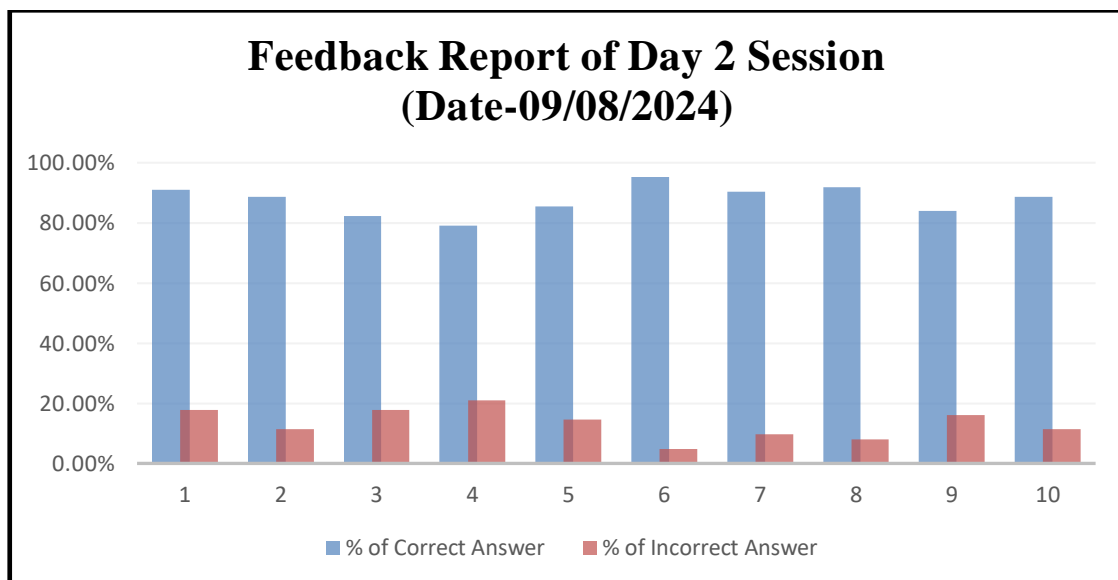**(An Autonomous Institution Affiliated to RTM Nagpur University)**

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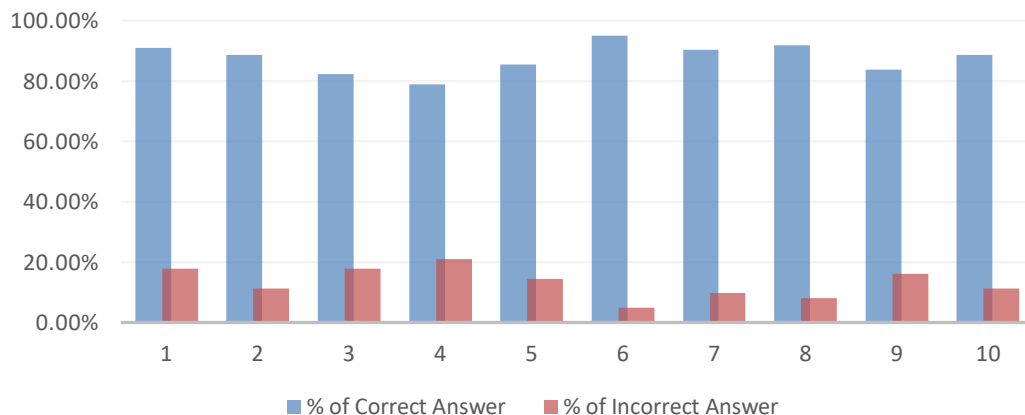
Feedback Report of Day 2 Session
Backend API development for IOT, Embedded and Data Analytics using NodeJS and PostgreSQL (Date-10/08/2024)

Feedback Report of Day 3 Session.					
Batch Size : 56					
Question Number	Total Count of Student	Total Count of Correct Answer	Total Count of Incorrect Answer	% of Correct Answer	% of Incorrect Answer
1	56	46	10	82.15%	17.85%
2	56	50	06	89.29%	10.71%
3	56	44	12	78.57%	21.43%
4	56	49	07	87.50%	12.50%
5	56	51	05	91.07%	8.93%
6	56	48	06	85.71%	10.71%
7	56	41	15	73.21%	26.79%
8	56	44	12	78.57%	21.43%
9	56	40	16	71.43%	28.57%
10	56	43	13	76.79%	23.21%

Feedback Report of Day 3 Session (Date-10/08/2024)
■ % of Correct Answer ■ % of Incorrect Answer

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Correct answer in % range 80-100 (3), 60-80 (2) and below 60(1)

Day-1 Backend API development for IOT, Embedded and Data Analytics using NodeJS and PostgreSQL (Date-08/08/2024)

Question number	POs Mapped									
	PO1	PO2	PO3	PO4	PO5	PO8	PO9	PO10	PO11	PO12
1	3	3	3	3	3	3	3	3	3	3
2	3	3	3	3	3	3	3	3	3	3
3	3	3	3	3	3	3	3	3	3	3
4	2	2	2	2	2	2	2	2	2	2
5	2	2	2	2	2	2	2	2	2	2
6	2	2	2	2	2	2	2	2	2	2
7	3	3	3	3	3	3	3	3	3	3
8	3	3	3	3	3	3	3	3	3	3
9	2	2	2	2	2	2	2	2	2	2
10	3	3	3	3	3	3	3	3	3	3
Average	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3

Pie chart analysis for POs attainment

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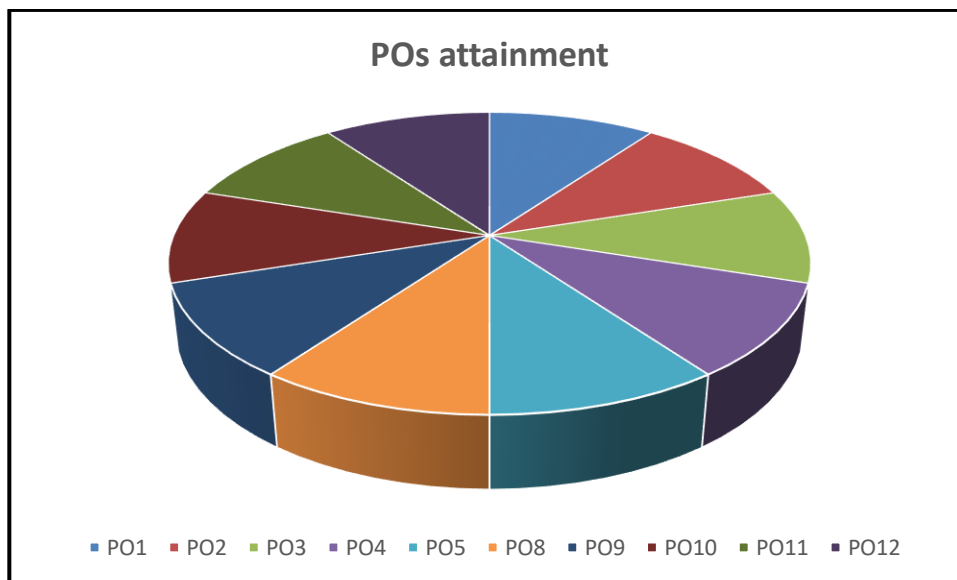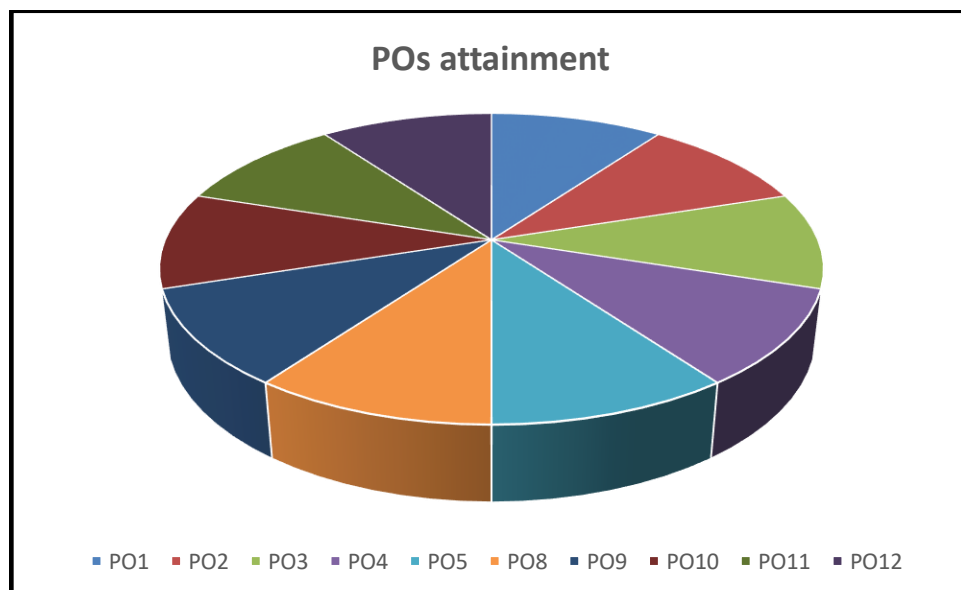**(An Autonomous Institution Affiliated to RTM Nagpur University)**

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Correct answer in % range 80-100 (3), 60-80 (2) and below 60(1)

Day-2 Backend API development for IOT, Embedded and Data Analytics using NodeJS and PostgreSQL (Date-09/08/2024)

Question number	POs Mapped										
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12
1	3	3	3	3	3	3	3	3	3	3	3
2	3	3	3	3	3	3	3	3	3	3	3
3	3	3	3	3	3	3	3	3	3	3	3
4	2	2	2	2	2	2	2	2	2	2	2
5	3	3	3	3	3	3	3	3	3	3	3
6	3	3	3	3	3	3	3	3	3	3	3
7	3	3	3	3	3	3	3	3	3	3	3
8	3	3	3	3	3	3	3	3	3	3	3
9	3	3	3	3	3	3	3	3	3	3	3
10	3	3	3	3	3	3	3	3	3	3	3
Average	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9

POs attainment

PO1 ■ PO2 ■ PO3 ■ PO4 ■ PO5 ■ PO8 ■ PO9 ■ PO10 ■ PO11 ■ PO12

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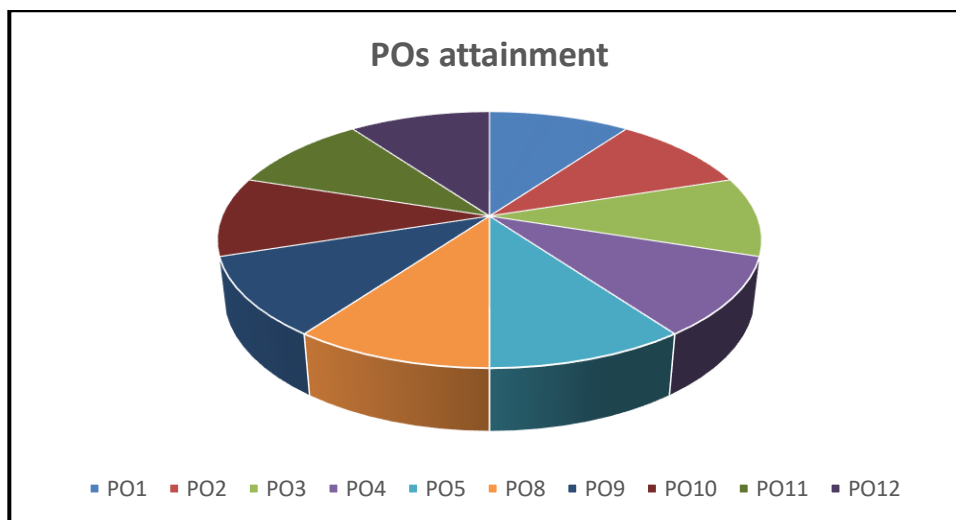**(An Autonomous Institution Affiliated to RTM Nagpur University)**

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Correct answer in % range 80-100 (3), 60-80 (2) and below 60(1)

Day-3 Backend API development for IOT, Embedded and Data Analytics using NodeJS and PostgreSQL (Date-10/08/2024)

Question number	POs Mapped										
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12
1	3	3	3	3	3	3	3	3	3	3	3
2	3	3	3	3	3	3	3	3	3	3	3
3	2	2	2	2	2	2	2	2	2	2	2
4	3	3	3	3	3	3	3	3	3	3	3
5	3	3	3	3	3	3	3	3	3	3	3
6	3	3	3	3	3	3	3	3	3	3	3
7	2	2	2	2	2	2	2	2	2	2	2
8	2	2	2	2	2	2	2	2	2	2	2
9	2	2	2	2	2	2	2	2	2	2	2
10	2	2	2	2	2	2	2	2	2	2	2
Average	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9

HoD (ECE)

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