COLLEGE OF ENGINEERING BHUBANESWAR

Plot No.1 (A), CNI Complex, Patia, Bhubaneswar – 751024, Odisha, India.

[AFFILIATED TO BPUT, ODISHA]

www.coeb.ac.in

PG DEPARTMENT OF MASTER OF COMPUTER APPLICATION

ADD-ON COURSE : Streaming Data: Concepts, Applications, and Technologies

[Programme: MCA]

Course Objectives:

1. Streaming data is data that continuously flows from sources such as IoT devices, sensors, GPS devices, server and security logs, and click streams from mobile apps and websites; typically high-volume data moving at high speed.
2. The business and technical drivers for streaming data adoption and Data pipeline processing patterns and the advanced patterns that are possible with streaming
3. How micro services and edge computing work with IoT data streams, Use case patterns and a variety of use cases for streaming data
4. Five kinds of Change Data Capture (CDC) and the strengths and weaknesses of each and the roles and functions of Kafka broker, data producers, and data consumers.

SYLLABUS

Total Lecture Hours : 36

MODULE I: THE NEED FOR SPEED   **[06 periods]**

Batch Vs. Real Time, The Speed of Business, The Speed of Data Parts 1-3, Fast Data Drives the Consumer World, Fast Data Drives the Business World, Fast Data Drives the Analytic World, The Business Case for Fast Data

MODULE II: MOVING DATA THROUGH PIPELINES   **[04 periods]**

Data Pipeline Processing, Data Stream Processing, IoT and Edge Computing

MODULE III: CHANGE DATA CAPTURE   **[08 periods]**

Data Management – A New Streaming Use Case, What is CDC?, Date Stamps for Change Detection, Diff Comparisons for Change Detection, Database Triggers for Change Detection, In-Database Change Data Capture, Log Based Change Data Capture, Log Based CDC for Data Warehousing and Data Lakes.

MODULE IV: DATA STREAMING WITH APACHE KAFKA   **[04 periods]**

Introduction to Apache Kafka, Kafka Predecessors

MODULE V: KAFKA ARCHITECTURE   **[07 periods]**

Apache Kafka Architecture, Essential Components Part 1-2, Data and Process Flow Part 1-2, Kafka Record – Key Components, Kafka Broker Overview, Cluster Management with Apache

PRINCIPAL

College of Engineering Bhubaneswar

MODULEVI: DATA STREAM ECOSYSTEMS AND USE CASES [07 periods]

Data Streaming Use Cases, Streaming Integration with Data Ecosystems, Kafka Alternatives from Cloud Service Providers, Amazon Kinesis, Azure Event Hub, Google Cloud PUB/SUB

Course Outcomes:

CO1: The concept and applications of streaming architecture

CO2: Kafka architecture, essential components and Kafka data and process flow

CO3: Cluster management, data connections, and APIs with Kafka

CO4: Integrating streaming into the data ecosystem

Evaluation Process:

1. Attendance for the course is 75%, which is mandatory.
2. Minimum qualifying marks percentage for the course is 50.
3. Certificate will be issued after successful completion of course and assessment processes.
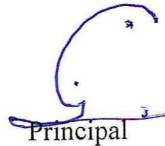
Learning resources:

Suggested Books:
Streaming Data: Understanding the real-time pipeline by Andrew Psaltis ((Author).

Other Sources:
e-learning resources:

https://www.confluent.io/learn/data-streaming/
https://www.qlik.com/us/streaming-data

Design and Developed by: Prof. Ranjeep Kumar Pradhan &, Prof. B.B. Biswal

Principal

H.O.D, MCA

HOD MCA
COLLEGE OF ENGINEERING BHUBANESWAR

PRINCIPAL
College of Engineering Bhubaneswar
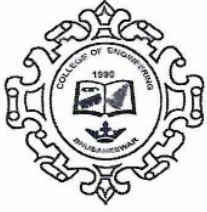
DEPARTMENT OF MCA

COLLEGE OF ENGINEERING BHUBANESWAR

Plot No.1 (A), CNI Complex, Patia, Bhubaneswar – 751024, Odisha, India.

[AFFILIATED TO BPUT, ODISHA]

www.coeb.ac.in

NOTICE

ADD-ON/CERTIFICATE COURSE

Ref No: COEB/MCA/2020/21   Date: 05/09/2020

It is for the information of all the students of **1st/ 3rd** semester that the classes for the Add-On/Certificate Courses for the **Academic Year 2020-21** will commence as per the time table given below in **ONLINE** Mode. The registration process for the course will start from **06/09/2020**. The interested students to enroll themselves for the course are advised to contact the concerned Course Coordinators for the details.

Semester	Course Title	Course Coordinator	Date of Commencement
1st	Streaming Data: Concepts, Applications, and Technologies	Dr. Parimal Girl	14/09/2020
3rd	Cloud Deployment	Dr. Sanjay Kumar Sarangi	14/09/2020

The class timing will be from **5.30 pm to 7.30 pm**.

Head of the Department
HOD MCA
COLLEGE OF ENGINEERING BHUB...

Copy to:

1. Office of the Chairman/ Vice-Chairman for kind information.
2. Office of the Executive Director for kind Information.
3. Office of the Registrar for kind Information.
3. Office of the Principal for kind information.
4. Departmental Notice Board
5. Guard File

PRINCIPAL
College of Engineering Bhubaneswar

Head of the Department
HOD MCA
COLLEGE OF ENGINEERING BHUB.

COLLEGE OF ENGINEERING BHUBANESWAR (COEB)
ADD-ON COURSE ENROLLMENT SHEET
ON-LINE MODE

Name of the Department: MCA

Course Title: Streaming Data : Concepts,Applications & Technologies

Semester : 1st	Academic Year: 2020-21

Duration: 14/09/2020 to 16/10/2020

Student's Declaration/Undertaking

1. I do hereby undertake to participate in the above mentioned add on course.

2. I do hereby, promise to abide by the admissible rules and regulations, concerning discipline, attendance, etc. of the department, and also to follow the Code of Conduct prescribed for the students of the Institute, as in force from time to time.

Sl. No.	Registration No.	Name of the Student	Remarks by the Course Coordinator
1	2005219001	ARADHANA PANDA	Certified that the Enrollment Sheet is prepared by taking the consents of the students to enroll themselves in this Certificate Course (Add-On) to be conducted in Virtual Mode (ON-LINE) during the Pandemic COVID'19 through the link provided by the Department. They have also gone through the declaration/ undertaking to be strictly abided by them during the course period.
2	2005219002	ITISHREE PRIYADARSHINI SWAIN	
3	2005219003	KHAGESWAR NAYAK	
4	2005219004	KHETRABASI BEHERA	
5	2005219005	PRASANJIT KHUNTIA	
6	2005219006	AJAY KUMAR SARKAR	
7	2005219007	CHOUDHURY SATYAPRAKSH	
8	2005219008	DIPTIMAYEE BISWAL	
9	2005219009	ELINA BANARJEE	
10	2005219011	JITENDRA KUMAR NAYAK	
11	2005219012	JOGESWAR SINGH	
12	2005219013	KAMAL KUMAR BEHERA	
13	2005219014	MITRA RANI PANDA	
14	2005219015	MONALISHA SWAIN	
15	2005219016	MUSKAN BEHERA	
16	2005219017	NAMRATA MOHAPATRA	
17	2005219018	PRATAP CHANDRA DEO	
18	2005219019	PUSPALATA BEHERA	
19	2005219020	RATNAKAR POLLAI	
20	2005219021	RUPAS RANJAN DEHURY	
21	2005219022	SAMBIT KUMAR BEHERA	
22	2005219023	SANKHO SUBHRO NAG	
23	2005219024	SANTANU RANA	
24	2005219026	SATYAPRAKASH SAMAL	
25	2005219027	SAUMYAKANTA DAS	
26	2005219028	SAUMYARANJAN DUTTA	
27	2005219029	SIBANGI MISHRA	
28	2005219030	SILVA SAMAL	
29	2005219031	SITESH KUMAR SWAIN	
30	2005219032	SOUMYASHREE PANDA	
31	2005219033	SUBHAKANTA SAHU	
32	2005219034	SUMAN KUMAR DASH	
33	2005219035	SUMANTA KUMAR ACHARYA	
34	2005219036	SUSHREE SUBHASMITA PANDA	
35	2005219037	SUVAM KUMAR PARIDA	
36	2005219038	SWABHIMAN MISHRA	
37	2005219039	SWAGATIKA BARIK	
38	2005219040	SWETAPADMA ROUT	
39	2005219041	TAPAS KUMAR BHOI	
40	2005219042	TUSHAR RANJAN ROUT	

Course Coordinator
(Signature with Seal)

PRINCIPAL
College of Engineering Bhubaneswar

COLLEGE OF ENGINEERING BHUBANESWAR (COEB)
DEPARTMENT OF MCA
ADD ON/CERTIFICATE COURSE

STUDENT ATTENDANCE SHEET

ON-LINE MODE

Programme: **MCA**

Name of the Course: **Streaming Data** Course Code :PG-2

Semester: **1st** Academic Year: 2020-21

Duration : 36 hrs -

Remarks by the Course Coordinator (**P**-Present, **A**-Absent)

SL. NO.	Reg. No./ Enrollment No.	NAME OF THE STUDENT	Date 14/9/20	Date 15/9/20	Date 16/9/20	Date 18/9/20	Date 21/9/20	Date 22/9/20	Date 23/9/20	Date 24/9/20	Date 25/9/20	Remarks
1	2005219001	ARADHANA PANDA	P	P	P	P	P	P	A	P	P	Certified that this Certificate course is conducted in virtual mode (ON-LINE) because of the Pandemic COVID-19. The attendance is taken with the remarks P-Present and A-Absent for the students.
2	2005219002	ITISHREE PRIYADARSHINI	P	P	A	P	P	P	P	P	P	
3	2005219003	KHAGESWAR NAYAK	P	P	P	P	P	P	P	P	A	
4	2005219004	KHETRABASI BEHERA	P	P	P	P	P	P	P	P	P	
5	2005219005	PRASANJIT KHUNTIA	P	P	A	P	P	P	P	P	P	
6	2005219006	AJAY KUMAR SARKAR	P	A	P	P	P	P	P	P	P	
7	2005219007	CHOUDHURY SATYAPRAKSH	P	P	A	P	P	P	P	P	P	
8	2005219008	DIPTIMAYEE BISWAL	P	A	P	A	P	A	P	A	P	
9	2005219009	ELINA BANARJEE	P	P	P	P	P	P	P	P	P	
10	2005219011	JITENDRA KUMAR NAYAK	P	P	P	P	A	P	P	P	P	
11	2005219012	JOGESWAR SINGH	P	P	P	A	P	P	P	P	P	
12	2005219013	KAMAL KUMAR BEHERA	P	P	P	P	P	A	P	P	P	
13	2005219014	MITRA RANI PANDA	P	P	P	P	P	P	P	P	P	
14	2005219015	MONALISHA SWAIN	P	P	P	P	P	P	P	P	P	
15	2005219016	MUSKAN BEHERA	P	P	P	P	P	P	P	P	P	
16	2005219017	NAMRATA MOHAPATRA	P	P	P	A	P	P	P	P	P	
17	2005219018	PRATAP CHANDRA DEO	P	P	P	P	P	P	P	P	P	
18	2005219019	PUSPALATA BEHERA	P	P	P	P	P	P	A	P	P	
19	2005219020	RATNAKAR POLLAI	P	P	P	P	P	P	P	P	A	
20	2005219021	RUPAS RANJAN DEHURY	P	P	P	P	P	P	P	P	P	
21	2005219022	SAMBIT KUMAR BEHERA	P	P	P	P	P	P	P	P	P	
22	2005219023	SANKHO SUBHRO NAG	P	P	P	A	P	P	P	P	P	
23	2005219024	SANTANU RANA	P	P	P	P	P	P	P	A	P	

Signature of the Course Coordinator
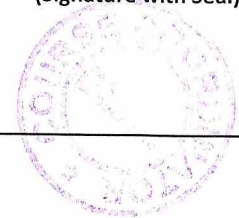
PRINCIPAL
College of Engineering Bhubaneswar

Course Coordinator
(Signature with Seal)

SL. NO.	Reg. No./ Enrollment No.	NAME OF THE STUDENT	Date 14/9/20	Date 15/9/20	Date 16/9/20	Date 18/9/20	Date 21/9/20	Date 22/9/20	Date 23/9/20	Date 24/9/20	Date 25/9/20	Remarks
24	2005219026	SATYAPRAKASH SAMAL	P	P	A	P	P	P	P	P	P	Certified that this Certificate course is conducted in virtual mode (ON-LINE) because of the Pandemic COVID-19. The attendance is taken with the remarks P-Present and A-Absent for the students.
25	2005219027	SAUMYAKANTA DAS	P	P	P	P	P	P	P	P	P	
26	2005219028	SAUMYARANJAN DUTTA	P	P	P	P	P	P	P	A	P	
27	2005219029	SIBANGI MISHRA	P	P	P	P	P	P	P	P	P	
28	2005219030	SILVA SAMAL	P	P	P	P	P	P	P	P	P	
29	2005219031	SITESH KUMAR SWAIN	P	P	P	P	P	A	A	P	P	
30	2005219032	SOUMYASHREE PANDA	P	P	P	P	P	P	P	P	A	
31	2005219033	SUBHAKANTA SAHU	P	P	P	P	P	P	P	P	P	
32	2005219034	SUMAN KUMAR DASH	P	P	P	P	A	P	P	P	P	
33	2005219035	SUMANTA KUMAR ACHARYA	P	P	P	P	P	P	P	P	P	
34	2005219036	SUSHREE SUBHASMITA	P	P	P	P	P	P	P	P	P	
35	2005219037	SUVAM KUMAR PARIDA	P	P	P	P	P	P	P	A	P	
36	2005219038	SWABHIMAN MISHRA	P	P	P	P	P	P	P	P	P	
37	2005219039	SWAGATIKA BARIK	P	P	A	P	P	P	P	P	P	
38	2005219040	SWETAPADMA ROUT	P	P	P	P	P	P	P	P	P	
39	2005219041	TAPAS KUMAR BHOI	P	P	P	P	P	A	P	P	P	
40	2005219042	TUSHAR RANJAN ROUT	P	P	P	P	P	P	P	P	P	
		Signature of the Course Coordinator										

Course Coordinator
(Signature with Seal)

PRINCIPAL
College of Engineering Bhubaneswar

COLLEGE OF ENGINEERING BHUBANESWAR (COEB)
DEPARTMENT OF MCA
ADD ON/CERTIFICATE COURSE

STUDENT ATTENDANCE SHEET

PRINCIPAL
College of Engineering Bhubaneswar

ON-LINE MODE

Programme: **MCA**

Name of the Course: **Streaming Data**   Course Code :PG-2

Semester: **1st**   Academic Year: 2020-21
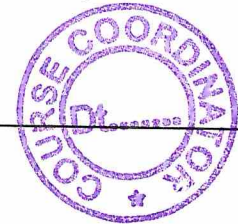
Duration : **36 hrs**

Remarks by the Course Coordinator (**P**-Present, **A**-Absent)

SL. NO.	Reg. No./ Enrollment No.	NAME OF THE STUDENT	Date 28/9/20	Date 29/9/20	Date 30/9/20	Date 5/10/20	Date 6/10/20	Date 7/10/20	Date 8/10/20	Date 9/10/20	Date 12/10/20	Remarks
1	2005219001	ARADHANA PANDA	P	P	P	P	P	P	P	P	P	Certified that this Certificate course is conducted in virtual mode (ON-LINE) because of the Pandemic COVID-19. The attendance is taken with the remarks P-Present and A-Absent for the students.
2	2005219002	ITISHREE PRIYADARSHINI	P	P	P	P	P	P	P	P	P	
3	2005219003	KHAGESWAR NAYAK	P	A	P	P	P	P	P	P	P	
4	2005219004	KHETRABASI BEHERA	P	P	P	P	P	P	P	P	P	
5	2005219005	PRASANJIT KHUNTIA	P	P	P	P	P	P	P	P	P	
6	2005219006	AJAY KUMAR SARKAR	P	P	P	P	P	P	P	P	P	
7	2005219007	CHOUDHURY SATYAPRAKSH	P	P	P	P	P	P	P	P	P	
8	2005219008	DIPTIMAYEE BISWAL	A	P	A	P	A	P	A	P	A	
9	2005219009	ELINA BANARJEE	P	P	P	P	P	A	P	P	P	
10	2005219011	JITENDRA KUMAR NAYAK	P	P	P	P	P	P	P	P	P	
11	2005219012	JOGESWAR SINGH	P	P	P	P	P	P	P	P	P	
12	2005219013	KAMAL KUMAR BEHERA	P	P	P	P	P	A	P	P	P	
13	2005219014	MITRA RANI PANDA	P	P	P	P	P	P	P	P	P	
14	2005219015	MONALISHA SWAIN	P	P	P	A	P	P	P	P	P	
15	2005219016	MUSKAN BEHERA	P	P	P	P	P	P	P	A	P	
16	2005219017	NAMRATA MOHAPATRA	P	P	P	P	P	P	P	P	P	
17	2005219018	PRATAP CHANDRA DEO	P	A	P	P	P	P	P	P	P	
18	2005219019	PUSPALATA BEHERA	P	P	P	P	P	P	P	P	P	
19	2005219020	RATNAKAR POLLAI	P	P	P	P	P	P	P	P	P	
20	2005219021	RUPAS RANJAN DEHURY	P	P	P	P	P	P	P	P	P	
21	2005219022	SAMBIT KUMAR BEHERA	P	P	A	P	P	P	P	P	P	
22	2005219023	SANKHO SUBHRO NAG	P	P	P	P	P	P	P	P	P	
23	2005219024	SANTANU RANA	P	P	P	P	P	P	P	P	P	

Signature of the Course Coordinator

Course Coordinator
(Signature with Seal)

SL. NO.	Reg. No./ Enrollment No.	NAME OF THE STUDENT	Date 28/9/20	Date 29/9/20	Date 30/9/20	Date 5/10/20	Date 6/10/20	Date 7/10/20	Date 8/10/20	Date 9/10/20	Date 12/10/20	Remarks
24	2005219026	SATYAPRAKASH SAMAL	P	P	P	P	P	P	P	P	P	Certified that this Certificate course is conducted in virtual mode (ON-LINE) because of the Pandemic COVID-19. The attendance is taken with the remarks P-Present and A-Absent for the students.
25	2005219027	SAUMYAKANTA DAS	P	P	P	P	A	P	P	P	P	
26	2005219028	SAUMYARANJAN DUTTA	P	P	P	P	P	P	P	P	P	
27	2005219029	SIBANGI MISHRA	P	P	P	P	P	P	P	A	P	
28	2005219030	SILVA SAMAL	P	P	A	P	P	P	P	P	A	
29	2005219031	SITESH KUMAR SWAIN	P	A	P	A	P	A	A	P	P	
30	2005219032	SOUMYASHREE PANDA	A	P	P	P	P	P	P	P	P	
31	2005219033	SUBHAKANTA SAHU	P	P	P	P	P	P	P	P	P	
32	2005219034	SUMAN KUMAR DASH	P	P	P	P	P	P	P	P	P	
33	2005219035	SUMANTA KUMAR ACHARYA	P	P	P	P	P	P	P	P	P	
34	2005219036	SUSHREE SUBHASMITA	P	P	P	P	P	P	P	P	P	
35	2005219037	SUVAM KUMAR PARIDA	P	P	P	P	P	P	P	P	P	
36	2005219038	SWABHIMAN MISHRA	P	P	P	P	P	P	P	P	P	
37	2005219039	SWAGATIKA BARIK	P	P	P	P	P	P	P	P	P	
38	2005219040	SWETAPADMA ROUT	P	P	P	P	P	P	P	P	P	
39	2005219041	TAPAS KUMAR BHOI	P	P	P	P	P	P	P	P	P	
40	2005219042	TUSHAR RANJAN ROUT	P	P	P	P	P	P	P	P	P	
		Signature of the Course Coordinator										

Course Coordinator
(Signature with Seal)

PRINCIPAL
College of Engineering Bhubaneswar

COLLEGE OF ENGINEERING BHUBANESWAR

PLOT NO-1(A), CNI COMPLEX, PATIA, BHUBANESWAR, KHORDHA, ODISHA-751024

Certificate of Completion

This is to certify that Mr./Ms. __ARADHANA PANDA__, student of the Department

of __MCA__ semester __First__ bearing registration number __2005219001__

has successfully completed the ADD-ON Course titled __Concepts, Applications, and Technologies__
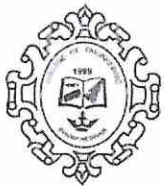
conducted at College of Engineering Bhubaneswar in the academic year __2020-21__

TRUE COPY

PRINCIPAL
College of Engineering Bhubaneswar

Course-Coordinator   Principal

COLLEGE OF ENGINEERING BHUBANESWAR

PLOT NO-1(A), CNI COMPLEX, PATIA, BHUBANESWAR, KHORDHA, ODISHA-751024

Certificate of Completion

This is to certify that Mr./Ms. __ITISHREE PRIYADARSHINI SWAIN__, student of the Department

of __MCA__ semester __First__ bearing registration number __2005219002__

has successfully completed the ADD-ON Course titled __Concepts, Applications, and Technologies__

conducted at College of Engineering Bhubaneswar in the academic year __2020-21__

TRUE COPY

Course-Coordinator

Principal

PRINCIPAL
College of Engineering Bhubaneswar

COLLEGE OF ENGINEERING BHUBANESWAR

PLOT NO-1(A), CNI COMPLEX, PATIA, BHUBANESWAR, KHORDHA, ODISHA-751024

Certificate of Completion

This is to certify that Mr./Ms. __KHAGESWAR NAYAK__, student of the Department

of __MCA__ semester __First__ bearing registration number __2005219003__

has successfully completed the ADD-ON Course titled __Concepts, Applications, and Technologies__
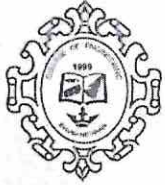
conducted at College of Engineering Bhubaneswar in the academic year __2020-21__

TRUE COPY

Course-Coordinator

Principal

PRINCIPAL
College of Engineering Bhubaneswar

COLLEGE OF ENGINEERING BHUBANESWAR

PLOT NO-1(A), CNI COMPLEX, PATIA, BHUBANESWAR, KHORDHA, ODISHA-751024

Certificate of Completion

This is to certify that Mr./Ms. __KHETRABASI BEHERA__, student of the Department

of __MCA__ semester __First__ bearing registration number __2005219004__

has successfully completed the ADD-ON Course titled __Concepts, Applications, and Technologies__

conducted at College of Engineering Bhubaneswar in the academic year __2020-21__

TRUE COPY

Course-Coordinator

Principal

PRINCIPAL
College of Engineering Bhubaneswar

COLLEGE OF ENGINEERING BHUBANESWAR

PLOT NO-1(A), CNI COMPLEX, PATIA, BHUBANESWAR, KHORDHA, ODISHA-751024

Certificate of Completion

This is to certify that Mr./Ms. __PRASANJIT KHUNTIA__, student of the Department

of __MCA__ semester __First__ bearing registration number __2005219005__

has successfully completed the ADD-ON Course titled __Concepts, Applications, and Technologies__

conducted at College of Engineering Bhubaneswar in the academic year __2020-21__.

TRUE COPY

Course-Coordinator

Principal

PRINCIPAL
College of Engineering Bhubaneswar