

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

[AFFILIATED TO BPUT, ODISHA]

www.coeb.ac.in

### DEPARTMENT OF CIVIL ENGINEERING ADD-ON COURSE

Course Titles: Water Economics And Governance

Branch: Civil Engineering

Programme: B.Tech

Year of Student: 4th Year

Course Objective:

1. To develop student knowledge on conservation of water, minimizing wastage and ensuring its more equitable distribution both across and within states of India through integrated water resource development and management.

2. To develop better understanding of water governance systems with the ultimate goal of delivering better

water policies for better lives.

3. To make the student understand about the effective, efficient and inclusive water governance seeks to enhance water security and ensure access to safe drinking water and sanitation for all, while responding to environmental, economic and social objectives

### **SYLLABUS**

**Total Lecture Hours: 40** 

Module –I 6 Hours

Introduction: General outline, Water availability and uses: national and international scenario; Challenges in water management. Water Rights in India: Need of water rights, Water and sanitation in international law.

Module –II 8 Hours

Water Sustainability: Concept of sustainable water uses; The Dublin statement; Sustainable water management; Stakeholders' participation. Valuing Water: The use and non-use values of water; Valuation methods; Non-revenue waters (NRW) and unaccounted for water (UFW); Metering water uses; Water management through economic instruments. Economics of Water Projects: Capital budgeting in water projects; Costs concepts of capital budgeting; Financial evaluation of water projects.

Module – III 10 Hours

Water Pricing - Approach and Models: Significance of water pricing; Average and marginal cost pricing; Shortrun marginal cost pricing; Water pricing models - flat rate, uniform rate, increasing block tariff and seasonal rate models. Conflicts in Water Pricing: Conflicts on subsidy verses sustainability, efficiency verses fairness in supply, development decisions verses capacity restrictions; Water pricing practices in India and abroad; relevant case studies.

Module –IV 8 Hours

Economics of Water Projects: Economics of sectoral water allocation; Capital budgeting in water projects; Costs concupied f capital budgeting; Financial evaluation of water projects. Economic Evaluation

Methods: Methods of project evaluation; Payback Period; Discounted Payback Period; Net Present Value; Internal Rate of Return; Average Rate of Return; Benefit-Cost Ratio.

Module –V 8 Hours

Water Governance: Elements and dimensions of water governance; Building blocks; Effective water governance schemes; Benchmarking water governance; Indicators of good governance. Water Governance in India: National water policies and water acts; Water regulatory authorities; Power and roles of central and state regulatory authorities; Legal and regulatory framework for hydro projects; Institutional arrangement and administrative controls of water service; Interstate water management initiatives; Stakeholders' participation; NGOs and social movements.

### **Course Outcomes:**

After completion of course the students will be able to:

CO1: Study of effectiveness of water governance relates to the contribution of governance to defining clear sustainable water policy goals and targets at different levels of government, to implement those policy goals, and to meet expected objectives or targets.

CO2: Growing population and high standards of living put increasing pressure on our water resources.

CO3: Study of water governance promotes responsible actions and measures to protect and ensure the sustainability of water resources and to optimize the services and benefits obtained from those resources.

CO4: Deals with the water resources related problems and challenges in an institutional structure.

### **Text Books:**

- 1. Colin H. Green, "Handbook of Water Economics: Principles and Practice" Willy publisher, 2003
- 2. Ariel Dinar and Kurt Schwabe, "Handbook of Water Economics" Edward Elgar publisher, 2015
- 3. Ramaswamy R. Iyer, "Water and the Laws in India" SAGE publisher, 2009
- 4. Chandrakanth M.G. "Water Resource Economics: Towards a Sustainable Use of Water for Irrigation in India", Springer publisher 2015

### Digital Learning Resources:

Course Name	Water Economics And Governance
Course Link	https://onlinecourses.nptel.ac.in/noc21_ce48/preview
Course Instructed	Dr. Manoj Kumar Tiwari, Department of Civil Engineering IIT Kanpur

### Evaluation Criteria

- Mandatory attendance of 75% for each student.
- Conduction of two internal assessments and students has to secure 50% marks in each assessment.
- Certificates will be awarded to each student fulfilling the above criteria.

Design and Developed by Dr. Thirumalai Raja and Ms. Sipra Mallick

Principal

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College of Engineering Bhubaneswar

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### DEPARTMENT OF CIVIL ENGINEERING COLLEGE OF ENGINEERING BHUBANESWAR

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### NOTICE

### Add On Certificate Courses 2020-2021

Ref No: COEB/CIVIL/2020/37

Date: 06/09/2020

It is for the information of all the students of 3<sup>rd</sup> /5<sup>th</sup> /7<sup>th</sup> semester B.Tech that the Department of Civil Engineering is going to start the following Add-on courses for Academic year 2020-2021 in ON\_LINE Mode. All the students are instructed to enroll their names for the following courses on or before 12/09/2020. The classes will be commenced from 14/09/2020. The students can contact their respective co-coordinators for enrollment and further detail.

Sl No.	Name of Add-on Course	Semester	Duration in Hrs	Name of Course Co- ordinators
1.	Earth Science for Civil Engineering	3 <sup>rd</sup>	36	Mrs. Nibedita Sahoo
2.	Introduction To Engineering Seismology	5 <sup>th</sup>	38	Mrs. Salini Patra
3.	Water Economics And Governance	7 <sup>th</sup>	40	Ms. Sipra Mallick

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

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Civil Engineering De

Copy to:

- 1. Office of the Registrar for kind Information.
- 2. Office of the Principal for kind information.
- 3. Departmental Notice Board.
- 4. Guard File

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### COLLEGE OF ENGINEERING BHUBANESWAR (COEB) ADD-ON COURSE

### STUDENT ENROLLMENT SHEET

Name of the Department: CIVIL ENGINEERING

Course Title: Water Economics And Governance

Semester: 7th Academic Year: 2020-2021 ONLINE MODE

### 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.	Registration No.	Name of the Student	Domanica by the Course Court
No.			Remarks by the Course Coordinator
1	1701219013	SWATY SOUMYA SETHY	
2	1701219030	CHIRANJIB PRADHAN	
3	1701219048	SHIVA SUNANI	
4	1701219054	FESAL MUSHARRAF	
5	1701219067	SUBHAKANTA ROUT	
6	1701219070	BHOLANATH MALLICK	
7	1701219146	AJAY KRUSHNA RAITA	
8	1701219148	AKASH LAKRA	
9	1701219149	DHIRAJ GAURAV KERKETTA	
10	1701219150	ELIAJAR TOPPO	
11	1701219151	GIRIDHARI RAITA	7
12	1701219153	MAUSAM KUMARI	-
13	1701219154	NIKHIL KUMAR	Certified that the Enrollment Sheet is
14	1701219155	RAHUL KUMAR SAMAL	prepared by taking the consents of the
15	1701219156	RAJDEEP KUMAR	students to enroll themselves in this
16	1701219157	RANJAN MAJHI	Certificate Course (Add-On) to be conducted
17	1701219158	RAVI KUMAR GUPTA	in Virtual Mode (ON-LINE) during the
18	1701219159	ROSHAN KUJUR	Pandemic COVID'19 through the link to be
19	1701219160	SAMBIT KHUNTIA	provided by the department.  They have also gone through the
20	1701219161	SANTOSH KUMAR SETHY	declaration/ undertaking to be strictly
21	1701219162	SASMITA SWAIN	abide by them during the course period.
22	1701219163	SOUMYA RANJAN SENAPATI	Course Coordinator
23	1701219164	SUCHARITA MOHANTY	(Signature with Seal)
24	1701219215	ASHISH KUMAR JENA	Condition
25	1701219216	SANTOSHI MISHRA	URSS
26	1701219217	KHAGENDRA MAHANTA	0 9 0
27	1701219218	PRIYANKA PRIYADARSHINI	
28	1701219219	PRIYANKA PRIYADARSHINI ROUT	
29	1701219220	LUCKY PRASAD BEHERA	
30	1701219222	DEBASIS PATRA	
31	1701219224	PRANAYA TANDI	
32	1701219225	LITU TAYSAM	
33	1701219228	MANAS BEHERA	
34	1701219229	SHUBHAKANTA BALIARSINGH	



### COLLEGE OF ENGINEERING BHUBANESWAR (COEB) ADD-ON COURSE

### STUDENT ENROLLMENT SHEET

Name of the Department: CIVIL ENGINEERING

Course Title: Water Economics And Governance

Semester: 7th Academic Year: 2020-2021 ONLINE MODE

### 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
35	1701219230	ALISHA MISHRA	Temanis by the course coordinator
36	1701219231	AMRUTA BHANJA DEO	
37	1701219232	ANKIT DAS	-
38	1701219233	BARADA PRASANNA DAS	
39	1701219234	DUSMANT KUMAR BEHERA	
40	1701219235	HIMANSU SEKHAR DANDAPAT	_
41	1701219236	KASTURI RAY	
42	1701219237	NIBEDITA MOHANTY	_
43	1701219238	PRAVAT KUMAR SAHOO	_
44	1701219239	PUSPANJALI JENA	
45	1701219240	RUPARASHI BAIRIGANJAN	
46	1701219241	SARASWATI GUIN	
47	1701219242	SAROJ KUMAR MOHANTY	Contification of the state of t
48	1701219243	SATYAM SINGH	Certified that the Enrollment Sheet is prepared by taking the consents of the
49	1701219244	SUBHASISH BHADRA	students to enroll themselves in this
50	1701219245	SUKANYA NAIK	Certificate Course (Add-On) to be conducted
51	1701219246	SANTANU KUMAR SRICHANDAN	in Virtual Mode (ON-LINE) during the
52	1701219247	SAUBHAGYA RANJAN PRADHAN	Pandemic COVID'19 through the link to be
			provided by the department.  They have also gone through the
			declaration/ undertaking to be strictly abide by them during the course period.
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DEPARTMENT OF CIVIL ENGINEERING ADD ON/CERTIFICATE COURSE

STUDENT ATTENDANCE SHEET

Sheet No. O

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Prog	ramme: B.Tech i	Programme: B.Tech in Civil Engineering				Semester:	r: 7th			
Nan	Name of the Course:	Water Economics And Governance								
Dur	Duration: 40hrs	Academic Year: 2020-21		Date	& Signatu	re of	the Student	ent		Remarks
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5	1701219067	SUBHAKANTA ROUT	P	t	4	b	4	P	P	0
6	1701219070	BHOLANATH MALLICK	to	P	to	P	b	P	P	PRINCIPAL PRINCIPAL
7	1701219146	AJAY KRUSHNA RAITA	b	t	d'	A	6	Þ	D	College of Engineering
8	1701219148	AKASH LAKRA	b	b	to	P	to	b	+	
9	1701219149	DHIRAJ GAURAV KERKETTA	t	A	b	b	t	P	7	
10	1701219150	ELIAJAR TOPPO	Þ	b	T	to	P	D	7	Certified that this Certificate
	1701219151	GIRIDHARI RAITA	Þ	4	to	b	P	b	t	course is conducted in virtual
12	1701219153	MAUSAM KUMARI	7	4	A	0	b	P	P	mode (ON-LINE) because of the
13	1701219154	NIKHIL KUMAR	4	4	P	t	P	4	7	Pandemic COVID-19.
14	1701219155	RAHUL KUMAR SAMAL	P	A	O	Þ	b	P	P	The attendance is taken with the
15	1701219156	RAJDEEP KUMAR	4	A	b	4	b	b	J-C	remarks P-Present and A-Absent
16	1701219157	RANJAN MAJHI	to	P	P	P	B	B	7	for the students.
17	1701219158	RAVI KUMAR GUPTA	Þ	ठ	b	v	P	D	4	1: (6:
18	1701219159	ROSHAN KUJUR	b	6	b	P	4	P	7	Course Coordinator (Signiture
19	1701219160	SAMBIT KHUNTIA	b	b	P	4	4	P	7	WILL SEAL)
20	1701219161	SANTOSH KUMAR SETHY	A	B	P	t	6	4	t	Smorra
21	1701219162	SASMITA SWAIN	A	b	to	t	6	P	t	10000
22	1701219163	SOUMYA RANJAN SENAPATI	p	t	d	P	b	4	1	The state of the s
23	1701219164	SUCHARITA MOHANTY	t	b	A	v	6	6	P	IS
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26	1701219217	KHAGENDRA MAHANTA	p	4	T	*	6	8	P	
27	1701219218	PRIYANKA PRIYADARSHINI	A	5	. 6	+	7	7	) 6	
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# COLLEGE OF ENGINEERING BHUBANESWAK (CUED)

DEPARTMENT OF CIVIL ENGINEERING ADD ON/CERTIFICATE COURSE

STUDENT ATTENDANCE SHEET

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Dura	Duration : 10 hzc	Academic Year: 2020-21		Date	80	Signature of the Student	the Stu	lent		Remarks
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28	1701219219	PRIYANKA PRIYADARSHINI ROUT	20	15/9/20	16/9/20	18/9/20	01/12/06/b	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2 1 1 1 1 1	
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29	1701219220	LUCKY PRASAD BEHERA	P	P	A	Þ	Þ	A	A	X 4 X
30	1701219222	DEBASIS PATRA	P	7	b	P	P	V	6	S James
31	1701219224	PRANAYA TANDI	A	t	b	ь	P	P	, 0	0
32	1701219225	LITU TAYSAM	<b>*</b>	>	Þ	P	P	7	A	PRINCIPAL PRINCIPAL
33	1701219228	MANAS BEHERA	P	7	b	b	b	7	b	College of Engineering
34	1701219229	SHUBHAKANTA BALIARSINGH	P	b	7	v	b	*	4	
35	1701219230	ALISHA MISHRA	P	P	b	A	b	P	P	
36	1701219231	AMRUTA BHANJA DEO	A	t	b	b	P	b	4	Certified that this Certificate
37	1701219232	ANKIT DAS	P	7	b	4	A	4	b	course is conducted in virtual
38	1701219233	BARADA PRASANNA DAS	P	v	<b>&gt;</b>	Þ	D	P	b	mode (ON-LINE) because or the
39	1701219234	DUSMANT KUMAR BEHERA	b	4	В	A	P	4	4	Pandemic COVID-19.
40	1701219235	HIMANSU SEKHAR DANDAPAT	>	V	P	0	P	t	7	Tile attendance is taken with the
41	1701219236	KASTURI RAY	A	V	P	6	7	<b>&gt;</b>	7	for the students
42	1701219237	NIBEDITA MOHANTY	0	<b>&gt;</b>	4	+	0	A	0	TOI LIV STUDENTS.
43	1701219238	PRAVAT KUMAR SAHOO	D	7	A	4	4	b	P	Course Coordinator (Siganture
44	1701219239	PUSPANJALI JENA	0	b	b	A	g,	p	P	with Seal)
45	1701219240	RUPARASHI BAIRIGANJAN	<b>*</b>	4	6	b	4	A	4	
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51)	1701219246	SANTANU KUMAR SRICHANDAN	P	4	A	Ð	Þ	A	A	
52	1701219247	SAUBHAGYA RANJAN PRADHAN	b	4	P	A	P	4	<b>&gt;</b>	100
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# COLLEGE OF ENGINEERING BHUBANESWAK (CUEB)

DEPARTMENT OF CIVIL ENGINEERING ADD ON/CERTIFICATE COURSE

STUDENT ATTENDANCE SHEET

Sheet No. 72

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DEPARTMENT OF CIVIL ENGINEERING ADD ON/CERTIFICATE COURSE

STUDENT ATTENDANCE SHEET

ONLINE MODE
Sheet No.

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Prog	ramme: B.Tech ii	Programme: B.Tech in Civil Engineering				Semester:	er: 7th			
Nam	Name of the Course:	Water Economics And Governance								
Dura	Duration: 40 has	Academic Year: 2020-21		Date	80	Signature of the Student	the Stu	dent		Remarks
SL.	REGISTRATION	ALINE GLAND GLAND GLOVET IN					Dete			
NO.	NO.	NAME OF THE STUDENT	Date: 24/9/20	Date: 25/9/20	Date: 28/9/20	Date: 24/9/20	Date: 30/9/20	Date: 5/10/20	6 /19/20	
28	1701219219	PRIYANKA PRIYADARSHINI ROUT	-0	1			<b>&gt;</b>	Þ ]	ס	of Brown
29	1701219220	LUCKY PRASAD BEHERA	Þ	P	T	Þ	A	P	P	0
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32	1701219225	LITU TAYSAM	<b>A</b>	<b>*</b>	P	A	*	<b>&gt;</b>	7	
33	1701219228	MANAS BEHERA	P	P	b	Þ	D	Þ	q	
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37	1701219232	ANKIT DAS	Þ	b	4	t	P	P	<del>d</del>	course is conducted in virtual
38	1701219233	BARADA PRASANNA DAS	t	b	P	þ	y	P	A	mode (ON- LINE) because of the
39	1701219234	DUSMANT KUMAR BEHERA	t	d	d	Þ	Þ	Þ	ס	Pandemic COVID-19.
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41	1701219236	KASTURI RAY	P	b	P	<i>d</i>	Þ	P	Þ	remarks P-Present and A-Absent
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DEPARTMENT OF CIVIL ENGINEERING ADD ON/CERTIFICATE COURSE

STUDENT ATTENDANCE SHEET

ONLINE MODE Sheet No. Or

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DEPARTMENT OF CIVIL ENGINEERING ADD ON/CERTIFICATE COURSE

STUDENT ATTENDANCE SHEET

Sheet No. D?

Prog	ramme: B.Tech i	Programme: B.Tech in Civil Engineering				Semester:	r: 7th			
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28	1701219219	PRIYANKA PRIYADARSHINI ROUT	4			7	4	4:		R Bonn
29	1701219220	LUCKY PRASAD BEHERA	t	P	t	P	b	Þ		3
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31	1701219224	PRANAYA TANDI	Þ	t	P	P	ם	b		College of Engineering Bhubaneswar
(32)	1701219225	LITU TAYSAM	*	7	<b>&gt;</b>	Þ	*	>		Conego
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34	1701219229	SHUBHAKANTA BALIARSINGH	t	to	>	B	b	4		
35	1701219230	ALISHA MISHRA	ď	7	t	t	D	4		
36	1701219231	AMRUTA BHANJA DEO	B	d	A	t	P	4		Certified that this Certificate
37	1701219232	ANKIT DAS	D'	P	b	Þ	P	4		course is conducted in virtual
38	1701219233	BARADA PRASANNA DAS	P	to	4	4	7	t		mode (ON- LINE) because of the
39	1701219234	DUSMANT KUMAR BEHERA	B	D	b	P	ט	6		Pandemic COVID-19.
40	1701219235	HIMANSU SEKHAR DANDAPAT	d	đ	b	>	ט	t		I he attendance is taken with the
41	1701219236	KASTURI RAY	D.	d	4	4	7	to		remarks r-rresem and A-Ausem
42	1701219237	NIBEDITA MOHANTY	2	t	P	A	t	Þ		ioi the studellis.
43	1701219238	PRAVAT KUMAR SAHOO	ם	T	T	4	t	Þ		Course Coordinator (Siganture
44	1701219239	PUSPANJALI JENA	4	b	U	U	A	t		with Seal)
45	1701219240	RUPARASHI BAIRIGANJAN	t	7	b	4	4	D		
46	1701219241	SARASWATI GUIN	8	ט	t	7	b	৳		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
47	1701219242	SAROJ KUMAR MOHANTY	Ö	t	P	b	t	6		100
48	1701219243	SATYAM SINGH	t	U	8	<b>P</b>	6	7		(r)
49	1701219244	SUBHASISH BHADRA	t	q	Þ	7	to	Þ		The state of the s
50	1701219245	SUKANYA NAIK	d	ט	to	P	6	b		(20)
51	1701219246	SANTANU KUMAR SRICHANDAN	A	7	P	Þ	7	7		0
52	1701219247	SAUBHAGYA RANJAN PRADHAN	U	4	t	2	B	7		
Sign	Signature of the Course Coordinator	rse Coordinator	2	185	Ling	150	1/2	12/2		



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## Certificate of Completion

This is to certify that Mr./Ms. SAROJ KUMAR MOHANTY , student of the Department	Civil Engg. semester Seventh bearing registration number 1701219242	has successfully completed the ADD-ON Course titled Water Economics And Governance
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conducted at College of Engineering Bhubaneswar in the academic year 2020-21

Course-Coordinator

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Principal

PRINCIPAL PRINCIPAL College of Engineering Bhubane



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## Octificate of Ocmpletion

has successfully completed the ADD-ON Course titled	ofCivil Enggsem	This is to certify that Mr./Ms. SATYAM SINGH
Water Economics And Governance	semester Seventh bearing registration number 1701219243	, student of the Department

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conducted at College of Engineering Bhubaneswar in the academic year 2020-21

Course-Coordina

Course-Coordinator

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Principal

PRINCIPAL PRINCIPAL College of Engineering Bhubaneswar



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### Ocrtificate of Ocmpletion

Course titled Water Economics And Governance	has successfully completed the ADD-ON Course titled
semester Seventh bearing registration number1701219244	of Civil Engg.
SUBHASISH BHADRA , student of the Department	This is to certify that Mr./Ms. $\_\_SUB$

conducted at College of Engineering Bhubaneswar in the academic year 2020-21

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Course-Coordinator

Principal

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## Optificate of Oompletion

has successfully completed the ADD-ON Course titled	of Civil Engg.	This is to certify that Mr./Ms. SUKANYA NAIK
	semester	SUKANYA NAIK
Water Economics And Governance	semester Seventh bearing registration number	, stuc
	1701219245	, student of the Department

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conducted at College of Engineering Bhubaneswar in the academic year 2020-21

Course-Coordinator

Principal



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## Oertificate of Oempletion

f Civil Engg semester Seventh bearing registration number 1701219247	This is to certify that Mr./MsSAUBHAGYA RANJAN PRADHAN, student of the Department
has successfully completed the ADD-ON Course titledWater Economics And Governance	semester Seventh bearing registration number  Water Economics And Governance
	semester Seventh bearing registration number

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Course-Coordinator

Principal