

GOVERNMENT OF WEST BENGAL
Govt. College of Engineering and Ceramic Technology
(Formerly College of Ceramic Technology)
73, Abinash Chandra Banerjee Lane, Kolkata-700010
Tele/Fax-23701264, E-Mail: gcectwb@gmail.com

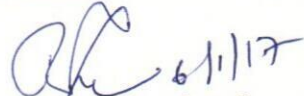
Date: Jan 6, 2017

NOTICE

A meeting of the Board of Studies of Ceramic Technology, Govt. College of Engg. and Ceramic Technology, Kolkata is scheduled to be held on 17th January (Tuesday) at 2.00 pm afternoon to discuss the following agenda:

- Agenda:
1. Finalisation of paper setters, moderators and examiners for the Forthcoming even semester examination.
 2. Miscellaneous if any.

All members are hereby requested to make it convenient to attend the meeting.


[Dr. Rituparna Sen]
Chairman, B.O.S.

Govt. College of Engg. & Ceramic Technology
Govt. of West Bengal

Copy forwarded for information and necessary information to:-

1. Dr. Srimantra Kumar Patra-Member
2. Dr. T. K. Bhattacharya-Member
3. Prof. Ranjan Ray-Member
4. Prof. R. C. Das-Member
5. Dr. Kaberi Das-Member
6. Dr. B. K. Sanfui_Member
7. Dr. Arup Ghosh-Member
8. Dr. Sankar Ghatak-Member
9. Dr. S. Mukherjee-Member
10. Dr. Srikrishna Manna-Member
11. Mr. Prasanta Datta-Member
12. Mr. Pappu Halder-Member
13. Ms. Sangita Ghosh-Member
14. Dr. K. Chakrabarty-Principal

Members present during Board of Studies meeting held on 17/01/2017

1. K. Chokul
2. PARTHA HALDAR - Haldar 17.01.17
3. ~~(P)~~ Ram chandra Das
4. KABERI DAS Kaberi Das 17/01/2017
5. BARUN K SANFUI Barun K Sanfui 17/01/17
6. RITUPARMO SEN Rituparmo Sen 17/1/17
7. Srimanta K. Patra Srimanta K. Patra 17/1/17
8. ~~S. P.~~ 17/1/2017
9. R. Ray R. Ray 17.1.17
10. Tachkundam Dutta
- 11.
- 12.
- 13.
- 14.
- 15.

Minutes of BOS meeting of Department of Ceramic Technology, held on
17.01.2017

1. Prof. Sen, Chairman of BOS, read out last meeting minutes and confirmed by the members.
2. List of paper setters (internal & external), moderators & internal & external examiners for sessional, final year project and lab papers for the forthcoming even semester examination have been finalised.

Meeting ended with thanks to all the members.

Confirmed

Chairman
19.6.2017

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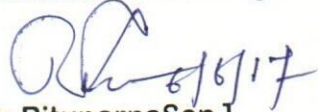
Date: June 6, 2017

NOTICE

A meeting of the Board of Studies of Ceramic Technology, Govt. College of Engg. and Ceramic Technology, Kolkata is scheduled to be held on 19th June (Monday) at 3.00 pm afternoon to discuss the following agenda:

- Agenda:
1. Finalisation of paper setters, moderators and examiners for the Forth coming odd semester examination.
 2. Miscellaneous if any.

All members are hereby requested to make it convenient to attend the meeting.


[Dr. Rituparna Sen]
Chairman, B.O.S.

Govt. College of Engg. & Ceramic Technology
Govt. of West Bengal

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8. Dr. Sankar Ghatak-Member
9. Dr. S. Mukherjee-Member
10. Dr. Srikrishna Manna-Member
11. Mr. Prasanta Datta-Member
12. Mr. Pappu Halder-Member
13. Ms. Sangita Ghosh-Member
14. Dr. K. Chakrabarty-Principal

Members present during Board of Studies meeting held on.....19/06/2017.....

1. K. Chokul
2. PARTHA HALDAR - ~~Haldar~~ 19.6.17
3. RITUPARNO SEN - ~~Sen~~ 19/6/17
4. Ram Chandra DAS ~~DAS~~
5. KABERI DAS Kaleerida
6. BARDUN KUMAR SAHAI ~~Sahai~~
7. Srimanta Kr. Patra ~~Patra~~
8. ~~Patra~~, 19/06/2017
9. ~~Patra~~ 19.6.17
10. Madhusudan Dutta.
- 11.
- 12.
- 13.
- 14.
- 15.

Minutes of BOS meeting of Department of Ceramic Technology, held on
19.06.2017

Prof. Sen, Chairman of BOS, has read out minutes of last meeting held on 17.01.2017 and confirmed by the members.

List of paper setters (internal & external), moderators & internal & external examiners for sessional, final year project and lab papers for the forthcoming semester examination have been finalised.

Meeting ended with vote of thanks by the chairman.

Confirmed
→
C. S. Sen
16.01.2018

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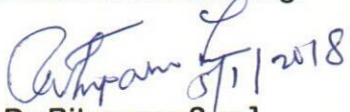
Date: Jan 5, 2018

NOTICE

A meeting of the Board of Studies of Ceramic Technology, Govt. College of Engg. and Ceramic Technology, Kolkata is scheduled to be held on 16th January (Tuesday) at 2.00 pm afternoon to discuss the following agenda:

- Agenda: 1. Finalisation of paper setters, moderators and examiners for the Forth coming even semester examination.
2. Miscellaneous if any.

All members are hereby requested to make it convenient to attend the meeting.


[Dr. Rituparna Sen]
Chairman, B.O.S.





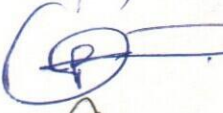




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7. Dr. Arup Ghosh-Member
8. Dr. Sankar Ghatak-Member
9. Dr. S. Mukherjee-Member
10. Dr. Srikrishna Manna-Member
11. Mr. Prasanta Datta-Member
12. Mr. Pappu Halder-Member
13. Ms. Sangita Ghosh-Member
14. Dr. K. Chakrabarty-Principal

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Members present at the Board of Studies Meeting of Department of
Ceramic Technology held on 16.01.2018


1. 
2. 
3. 
4. 
5. 
6. 
7. 
8. 
9. 
10. Madhusudan Dutta

Minutes of BOS meeting of Department of Ceramic Technology, held on 16.01.2018

1. Chairman of BOS, Prof. Sen, read out last meeting minutes and confirmed
2. List of paper setters (internal & external), moderators & internal & external examiners for sessional, final year project and lab papers for the forthcoming even semester examination have been finalised.

Meeting ended with thanks to all the members.

Confirmed


11.5.2018.

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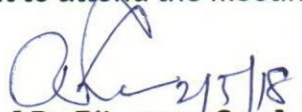
Date: May 2, 2018

NOTICE

A meeting of the Board of Studies of Ceramic Technology, Govt. College of Engg. and Ceramic Technology, Kolkata is scheduled to be held on 11th May (Friday) at 2.30 pm afternoon to discuss the following agenda:

- Agenda: 1. Finalisation of paper setters, moderators and examiners for the Forth coming odd semester examination.
2. Miscellaneous if any.

All members are hereby requested to make it convenient to attend the meeting.


[Dr. Rituparna Sen]
Chairman, B.O.S.

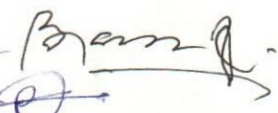
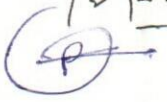




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4. Prof. R. C. Das-Member
5. Dr. Kaberi Das-Member
6. Dr. B. K. Sanfui_Member
7. Dr. Arup Ghosh-Member
8. Dr. Sankar Ghatak-Member
9. Dr. S. Mukherjee-Member
10. Dr. Srikrishna Manna-Member
11. Mr. Prasanta Datta-Member
12. Mr. Pappu Halder-Member
13. Ms. Sangita Ghosh-Member
14. Dr. K. Chakrabarty-Principal

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Members present at the Board of Studies Meeting of Department of
Ceramic Technology held on 11.05.2018

1. K. Chakrabarty
2. 
3. 
4. J. Patra
5. K. Das
6. 
7. 
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9. 
10. Madhusudan Patra

Minutes of BOS meeting of Department of Ceramic Technology, held on 11.05.2018

Prof. Sen, Chairman of BOS, has read out last meeting minutes and confirmed by the members.

List of paper setters (internal & external), moderators & internal & external examiners for sessional, final year project and lab papers for the forthcoming semester examination have been finalised.

Meeting ended with thanks to all the members.

Confirmed


18.1.19

GOVERNMENT OF WEST BENGAL

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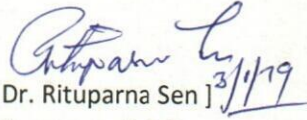
Date: January 3, 2019

NOTICE

A meeting of the Board of Studies of Ceramic Technology, Govt. College of Engg. And Ceramic Technology, Kolkata is scheduled to be held on 18th January (Thursday) at 12.00 noon to discuss the following agenda:

- Agenda: 1. Restructuring of B. Tech. CT curriculum.
 2. Miscellaneous if any.

All members are hereby requested to make it convenient to attend the meeting.


[Dr. Rituparna Sen] 3/1/19
Convenor, B.O.S.

Govt. College of Engg. & Ceramic Technology
Govt. of West Bengal

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5. Dr. Kaberi Das-Member
6. Dr. B. K. Sanfui_Member
7. Dr. Arup Ghosh-Member
8. Dr. Sankar Ghatak-Member
9. Dr. S. Mukherjee-Member
10. Dr. Srikrishna Manna-Member
11. Mr. Prasanta Datta-Member
12. Ms. Ruma Mullick-Member
13. Mr. Pappu Halder-Member
14. Ms. Sangita Ghosh-Member
15. Dr. K. Chakrabarty-Principal

Members Present in the Board of Studies Meeting of the
Department of Ceramic Technology

Date: 18.01.2019

Sl. No.	Name	Signature
1.	Dr. K. Chakrabarty, Principal	K. Chakrabarty 18-01-19
2.	Dr. Arup Ghosh	Arup Ghosh 18.01.2019
3.	Dr. Sankar Ghatak	
4.	Dr. Siddhartha Mukherjee	Siddhartha Mukherjee
5.	Mr. Prasanta Dutta	Prasanta Dutta 18/01/19.
6.	Shri Srikrishna Manna	Srikrishna Manna 18/01/19
7.	Dr. D. Khan	D. Khan 18/01/2019
8.	Prof. R. Ray	R. Ray 18/01/19
9.	Dr. S. K. Patra	S. K. Patra 18/01/19
10.	Prof. P. Guha	P. Guha
11.	Prof. R. C. Das	R. C. Das 18/01/19
12.	Dr. (Mrs.) Kaberi Das	Kaberi Das 18/01/19.
13.	Dr. T. K. Bhattacharyya	T. K. Bhattacharyya 18/01/19
14.	Dr. B. K. Sanfui	B. K. Sanfui 18/01/19
15.	Dr. Rituparno Sen	Rituparno Sen
16.	Reema Mallik	Reema Mallik
17.	Madhusudan Dutta	Madhusudan Dutta

Minutes of BOS meeting of Department of Ceramic Technology, held on 18.01.2019

1. Convener of BOS, Prof. Sen read out last meeting minutes and briefed the actions taken on the points of previous meeting was held on 15th June'2018 and finally confirmed by the members.
2. Draft structure of syllabi was presented on screen by Prof. Sen in front of all BOS members and discussed thoroughly for long about the structure. The following new courses are introduced;

3rd Semester

- a) Basic Mechanical Engineering
- b) Powder Preparation and chemical analysis of ceramic raw materials and products Lab
- c) Chemical and Engineering Thermodynamics

4th Semester

- a) Physical testing and instrumental methods of analysis of raw materials and products lab
3. List of paper setters, moderators and examiners for 3rd sem both new and old syllabus has been finalised.
 4. As 3rd sem of new syllabus is to commence from July' 2019, all the concerned teachers are advised to submit the detailed syllabi by June' 2019 positively.

Meeting ended with thanks to all the members.

Confirmed

Antyaru L
7.11.2019

Course Structure for UG Engineering Degree in Ceramic Technology

BOS approved
12/1/19

Semester – I

1 st Semester for Ceramic Technology							
Mandatory Induction Program- 3 weeks duration							
Sl. No.	Type of course	Course Code	Course Title	Hours per week			Credits
				Lecture	Tutorial	Practical	
Theory							
1	Basic Science course	BS(CT) 101	Mathematics – I	3	1	0	4
2	Basic Science course	BS(CT) 102	Chemistry	3	0	0	3
3	Basic Science course	ES(CT) 101	Programming for Problem solving	3	0	0	3
Sessional							
1	Basic Science course	BSL(CT) 103	Chemistry Lab	0	0	3	1.5
2	Engineering Science Course	ESL(CT) 102	Programming for Problem solving Lab	0	0	4	2
3	Engineering Science Course	ES(CT) 102	Engineering Graphics& Design	1	0	4	3
Practical							
1		CLA(CT) 1	Comprehensive Laboratory Assessment	-	-	-	1.0
			Total Credits	10	2	11	17.5



Course Structure for UG Engineering Degree in Ceramic Technology under Autonomy Semester – II

2 nd semester for CT							
Sl. No.	Type of course	Course Code	Course Title	Hours per week			Credits
				Lecture	Tutorial	Practical	
Theory							
1	Basic Science course	BS(CT) 204	Mathematics-II	3	0	0	3
2	Basic Science course	BS(CT) 205	Physics	3	1	0	4
3	Engineering Science Course	ES(CT) 204	Basic Electrical Engineering	3	1	0	4
4	Humanities & Social Sciences including Management	HS(CT/IT/CS) 201	English	2	0	0	2
Sessional							
1	Basic Science course	BSL(CT) 206	Physics Lab	0	0	3	1.5
2	Engineering Science Course	ESL(CT) 205	Basic Electrical Engineering Lab	0	0	2	1
3	Engineering Science Course	ESL(CT) 206	Workshop /Manufacturing Practices	1	0	4	3
4	Humanities & Social Sciences including Management	HSL(CT/IT/CS) 202	Language Lab	0	0	2	1
Practical							
1		CLA(CT) 2	Comprehensive Laboratory Assessment	-	-	-	1.0
			Total Credits	12	2	11	20.5

✓

(76)

Correct *18/12/19* *[Signature]*

Definition of Credit:

1 Hr. Lecture (L) per week	1 credit
1 Hr. Tutorial (T) per week	1 credit
1 Hr. Practical (P) per week	0.5 credits

MOOCs for B. Tech Honours:

The additional 20 credits (for obtaining B. Tech with Honours) are to be gained through MOOCs. The complete description of the MOOCs relevant for the first year course are given in *Annexure-I*. The courses for subsequent years of study will be posted subsequently.

The total of 20 credits that is required to be attained for B.Tech. Honours degree are distributed over four years in the following way: **For first year : 8 credits**

For second year : 4 credits

For third year : 4 credits

For fourth year : 4 credits

BOS approved
18/1/19

1 st Semester for Ceramic Technology							
Mandatory Induction Program- 3 weeks duration							
Sl. No.	Type of course	Course Code	Course Title	Hours per week			Credits
				Lecture	Tutorial	Practical	
Theory							
1	Basic Science course	BS(CT) 101	Mathematics – I	3	1	0	4
2	Basic Science course	BS(CT) 102	Chemistry	3	0	0	3
3	Basic Science course	ES(CT) 101	Programming for Problem solving	3	0	0	3
Sessional							
1	Basic Science course	BSL(CT) 103	Chemistry Lab	0	0	3	1.5
2	Engineering Science Course	ESL(CT) 102	Programming for Problem solving Lab	0	0	4	2
3	Engineering Science Course	ESL(CT) 103	Engineering Graphics & Design	1	0	4	3
Practical							
1		CLA(CT)1	Comprehensive Laboratory Assessment	-	-	-	1
Total credits							17.5

Correct
19/12/19

2 nd semester for CT							
Sl. No.	Type of course	Course Code	Course Title	Hours per week			Credits
				Lecture	Tutorial	Practical	
Theory							
1	Basic Science course	BS(CT) 204	Mathematics-II	3	0	0	3
2	Basic Science course	BS(CT) 205	Physics	3	1	0	4
3	Engineering Science Course	ES(CT) 204	Basic Electrical Engineering	3	1	0	4
4	Humanities & Social Sciences including Management	HS(CT/IT/CS) 201	English	2	0	0	2
Sessional							
1	Basic Science course	BSL(CT) 206	Physics Lab	0	0	3	1.5
2	Engineering Science Course	ESL(CT) 205	Basic Electrical Engineering Lab	0	0	2	1
3	Engineering Science Course	ESL(CT) 206	Workshop /Manufacturing Practices	1	0	4	3
4	Humanities & Social Sciences including Management	HSL(CT/IT/CS) 202	Language Lab	0	0	2	1
Practical							
1		CLA(CT) 2	Comprehensive Laboratory Assessment	-	-	-	1
						Total credits	20.5

Draft
Course Structure for UG Engineering Degree in Ceramic Technology under Autonomy
Semester III

3rd semester CT

Sl. No	Type of course	Course Code	Course Title	Hours per week				Credits
				Lecture	Tutorial	Practical	Total	
Theory								

1.	Basic Science Course	BS(CT) 306	⁷ <i>Engineering Mathematics</i> Numerical Methods for Engineers	3	1	0	4	4
2.	Engineering Science Course	ES(CT) 305	⁷ <i>Engg. Mechanics</i> <i>Basic Mech. Engineering</i>	3	0	0	3	3
3.	Professional Core Course	PC(CT) 301	Ceramic Raw Materials	3	1	0	4	4
4.	Professional Core Course	PC(CT) 302	Unit Operation I	3	1	0	4	4
5.	Professional Core Course	PC(CT) 303	Energy Resources & Furnaces	4	0	0	4	4
6.	Engineering Science Course	ES(CT) 306	⁸ <i>Chem & Eng</i> Thermodynamics	3	1	0	4	4

Sessional

1.	Professional Core Course	PCL(CT) 304	Powder Preparation & Chemical Analysis of Ceramic Raw Materials and Products Lab	0	0	3	3	1.5
2.	Professional Core Course	PCL(CT) 305	Fuels Testing Lab	0	0	3	3	1.5
3.	Basic Science Course	BS(CT) 307	Numerical Methods Lab	0	0	2	2	1

Practical

1.	Comprehensive Laboratory Assessment	CLA(CT) 3	All Labs	0	0	0	0	1
TOTAL				19	04	08	31	28
1.	MANDATORY COURSE	MC(CT) 301	Environmental Sciences	2	0	0	2	0

**Draft Course Structure for UG Engineering Degree in Ceramic Technology under Autonomy
Semester IV**

4th semester CT								
Sl. No.	Type of course	Course Code	Course Title	Hours per week				Credits
				Lecture	Tutorial	Practical	Total	
Theory								

1.	Basic Science Course	BS(CT) 408 ⁹	Biology	2	0	0	2	2
2.	Professional Core Course	PC(CT) 406	Unit Operation II	3	0	0	3	3
3.	Engineering Science Course	ES(CT) 407 ⁹	Engineering Materials Science	3	0	0	3	3
4.	Professional Core Course	PC(CT) 407	Processing of Ceramics	3	0	0	3	3
5.	Engineering Science Course	ES(CT) 408 ¹⁰	Fundamentals of Metallurgy	3	0	0	3	3
6.	Professional Elective Course	PE(CT) 401 Prof. Elective I	Reactor Design Process Calculations <i>Introduction to Industrial Ceramics</i>	2	0	0	2	2
7.	Humanities & Social Sciences including Management Courses	HS(CT) 403	Economics & Statistics	3	0	0	3	3

Sessional

1.	Professional Core Course	PCL(CT) 407 ⁸	Physical Testing & Instrumental Methods of Analysis of Raw Materials & Products Lab	0	0	⁴ 3	⁴ 3	² 1.5
2.	Professional Core Course	PCL(CT) 408 ⁹	Unit Operation Lab	0	0	² 3	² 3	1.5

Practical

1.	Comprehensive Laboratory Assessment	CLA(CT) 4	All Labs	0	0	0	0	1
TOTAL				19	0	6	25	23.0

19

**Draft Course Structure for UG Engineering Degree in Ceramic Technology under Autonomy
Semester V**

5th semester CT

Sl. No.	Type of course	Course Code	Course Title	Hours per week				Credits
				Lecture	Tutorial	Practical	Total	

Theory

1.	Professional Core Course	PC(CT) 509	Refractories	3	0	0	3	3
2.	Professional Core Course	PC(CT) 510	Glass Science & Technology	3	0	0	3	3
3.	Professional Core Course	PC(CT) 511	Whitewares	3	0	0	3	3
4.	Professional Elective Course	PE(CT) 502 Prof. Elective II	Nano Ceramics / Bio Ceramics	3	0	0	3	3
5.	Open Elective Course	OE(CT) 501 Open Elective I THEORY	DBMS / Object Oriented Programming / Operation Research	3	0	0	3	3

Sessional

1.	Professional Core Course	PCL(CT) 512	Refractories Lab	0	0	3	3	1.5
2.	Professional Core Course	PCL (CT) 513	Glass Lab	0	0	3	3	1.5
3.	Professional Core Course	PCL(CT) 514	Whitewares Lab	0	0	3	3	1.5
4.	Open Elective Course	OEL(CT) 502 Open Elective I LAB	DBMS Lab/ Object Oriented Programming Lab / OR Lab	0	0	2	2	1

Practical

1.	Comprehensive Laboratory Assessment	CLA(CT) 5	All Labs	0	0	0	0	1.0
			TOTAL	15	0	11	26	21.5
10.	Mandatory Course	MC(CT) 502	Indian Constitution/ Essence of Indian Traditional Knowledge/ Law for Engineers	3	0	0	3	0

**Draft Course Structure for UG Engineering Degree in Ceramic Technology under Autonomy
Semester VI**

6th semester CT								
Sl. No.	Type of course	Course Code	Course Title	Hours per week				Credits
				Lecture	Tutorial	Practical	Total	

Theory

1.	Professional Core Course	PC(CT) 615	Cement, Concrete & Monolithic Refractories	4	0	0	4	4
2.	Professional Core Course	PC(CT) 616	Physical Ceramics	3	0	0	3	3
3.	Professional Core Course	PC(CT) 617	Advanced Ceramics (To include Ceramic Membrane & Coatings & exclude Non Oxide Ceramics)	3	0	0	3	3
4.	Professional Elective Course	PE(CT) 603 Professional Elective III	Refractories for Ferrous Industries / Refractories for Non Ferrous & Other Industries	3	0	0	3	3
5.	Open Elective Course	OE(CT) 602 Open Elective II	Total Quality Management / Environment & Safety Management	3	0	0	3	3
6.	Professional Core Course	PC(CT) 617	Instrumentation & Process Control	4	0	0	4	4

Sessional

1.	Professional Core Course	PCL(CT) 618	Cement, Concrete & Monolithics Lab	0	0	3	3	1.5
2.	Humanities & Social Sciences including Management Courses	HSL(CT) 604	Group Discussions	0	0	2	2	1.0

Practical

1.	Comprehensive Laboratory Assessment	CLA(CT) 5	All Labs	0	0	0	0	1
TOTAL				20	0	5	25	23.5

Students would undergo 8-12 weeks' internship after 6th Semester

20

**Draft Course Structure for UG Engineering Degree in Ceramic Technology under Autonomy
Semester VII**

7th semester CT

Sl. No.	Type of course	Course Code	Course Title	Hours per week				Credits
				Lecture	Tutorial	Practical	Total	
Theory								

1.	Professional Core Course	PC(CT) 720	Computational Materials Science	2	0	0	2	2
2.	Professional Core Course	PC(CT) 721	Characterization of Materials	2	0	0	2	2
3.	Professional Elective Course	PE(CT) 704 Professional Elective IV	Non-oxide Ceramics / Composites	3	0	0	3	3
4.	Open Elective Course	OE(CT) 703 Open Elective III	Artificial Intelligence & Robotics/Internet of Things / Machine Learning	2	0	0	2	2
5.	Humanities & Social Sciences including Management Courses	HS(CT) 705	Fundamentals of Business Management	3	0	0	3	3

Sessional

1.	Humanities & Social Sciences including Management Courses	HSL(CT) 706	Seminar	0	0	2	2	1.0
2.	PROJECT	PROJECT (CT) 701	Project Work 1	0	0	10	10	5.0

			TOTAL	12	0	12	24	19.0
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**Draft Course Structure for UG Engineering Degree in Ceramic Technology under Autonomy
Semester VIII**

8th semester CT								
Sl. No.	Type of course	Course Code	Course Title	Hours per week				Credits
				Lecture	Tutorial	Practical	Total	
Sessional								

1.	Professional Elective Course	PE(CT) 805 Professional Elective V	Ceramic Plant & Equipment Design / Furnace & Kilns Design	0	0	3	3	1.5
2.	PROJECT	PROJ(CT) 801	Project Work 2	0	0	10	10	05
3.	Comprehensive Viva Voce	PC(CT) 821	Comprehensive Viva Voce	0	0	0	0	1.5

			TOTAL	0	0	13	13	8.0
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$$17.5 + 20.5 + 28.0 + 23.0 + 21.5 + 23.5 + 19.0 + 8.0 = 161 \text{ Credits}$$

**Annexure I
NPTEL Courses for 1st and 2nd Semesters**

(Two course totaling 8 credits are to be taken from the following courses)

Sl. No.	Course	Provider	Duration	Credits	Name of University/Institution
1	Communication Skills	NPTEL	12 Weeks	4	IIT Kanpur
2	Technical English for Engineers	NPTEL	8 Weeks	3	IIT Madras
3	Soft Skill Development	NPTEL	8 Weeks	3	IIT Kharagpur
4	Enhancing Soft Skills & Personality	NPTEL	8 Weeks	3	IIT Kanpur
5	Science Technology and Society	NPTEL	12 Weeks	4	IIT Guwahati
6	Corporate Social Responsibility	NPTEL	8 Weeks	3	IIT Kharagpur
7	Foundation of Optimisation	NPTEL	12 Weeks	4	IIT Kanpur



8	Mathematical Logic	NPTEL	12 Weeks	4	IIT Madras
9	Statistical Methods for Scientist and Engineers	NPTEL	12 Weeks	4	IIT Kharagpur
10	Introduction to R software	NPTEL	8 Weeks	3	IIT Kanpur
11	Principles of Programming Languages	NPTEL	12 Weeks	4	IIT Delhi
12	Introduction to Python: Absolute Beginner	EdX	5 Weeks	2	Microsoft
13	Introduction to Computer Science and Programming Using Python	EdX	12 Weeks	4	MIT, USA
14	Statistics and R	EdX	12 Weeks	4	Harvard University
15	Environmental Studies: A Global Perspective	EdX	12 Weeks	4	Curtin University
16	Speaking Effectively	NPTEL	8 Weeks	3	IIT Kharagpur
17	Developing Soft Skills and Personality	NPTEL	8 Weeks	3	IIT Kanpur
18	Introduction to Logic	Coursera	10 Weeks	3	Stanford University
19	Ethics	NPTEL	4 Weeks	2	IIT Kanpur
20	Intellectual Property	NPTEL	12 Weeks	4	IIT Madras

**NPTEL COURSES FROM 3RD SEMESTER ONWARDS:
For 3rd & 4th Semesters: (Any one of the following courses)**

103101111	Advanced Numerical Analysis	Prof. Sachin C. Patwardhan	IIT Bombay	49
103106074	Computational Techniques	Dr. NiketS.Kaisare	IIT Madras	40
103105061	Novel Separation Processes	Prof. S. De	IIT Kharagpur	40
103108100	Modern Instrumental Methods of Analysis	Dr. J.R. Mudakavi	IISc Bangalore	43
113104014	Structure of Materials	Prof. SandeepSangal, Dr. AnandhSubramaniam	IIT Kanpur	45
113105028	Science and Technology of Polymers	Prof. B. Adhikari	IIT Kharagpur	40
103106103	Particle Characterization (PG)	Dr. R. Nagarajan	IIT Madras	40
103106112	Statistics for Experimentalists	Dr. A. Kannan	IIT Madras	55

For 5th & 6th Semesters and 7th and 8th semesters (Any one of the following courses in 5th/6th and 7th/8th semesters respectively):

113105057	Advanced Materials and Processes	Prof. B.S. Murty	IIT Kharagpur	26
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113104006	Electroceramics	Dr. AshishGarg	IIT Kanpur	41
113104009	Introduction to Biomaterials	Dr. BirkamjitBasu,Dr. KanteshBalani	IIT Kanpur	39
113104012	Optoelectronic Materials and Devices	Prof. Monica Katiyar, Prof. Deepak Gupta	IIT Kanpur	42
113104013	Steel Making	Prof. DipakMazumdar,Prof. Satish Ch. Koria	IIT Kanpur	42
113104061	Environmental Degradation of Materials	Dr. KallolMondal	IIT Kanpur	41
113105015	Advanced ceramics for strategic applications	Prof. H.S. Maiti	IIT Kharagpur	47
113105021	Non-ferrous Extractive Metallurgy	Prof. H.S. Ray,Mr. L Pugazhenthay	IIT Kharagpur	43
113105024	Principles of Physical Metallurgy	Prof. R.N. Ghosh	IIT Kharagpur	42
113105025	Processing of Semiconducting Materials	Dr. PallabBanerji	IIT Kharagpur	40
113106039	Physics of Materials	Dr. PrathapHaridoss	IIT Madras	40
113106062	Electronic materials, devices, and fabrication	Parasuraman S	IIT Madras	40
113105020	Principles of Ceramic Fabrication and Processing	Prof. D. Bhattacharya	IIT Kharagpur	40
NOC	Fundamentals_of_optical_and_scanning_electron_microscopy	Prof. S.Sankaran	IIT Madras	20
NOC	Fundamentals_of_Electronic_Materials_and_Devies	Prof. ParasuramanSwaminathan	IIT Madras	20
NOC	Phase_Diagrams_in_Materials_Science_and_Engineering	Prof. KrishanuBiswas	IIT Kanpur	40

Paper Name: Engineering Mathematics

Paper Code:

Credits: 4

Lecture per week: 3 hours Tutorial per week: 1 hour

Year: 2nd year (CT). Semester: 3rd

Module 1: Integral Transform

Laplace Transforms: Laplace transform, properties of Laplace Transform, Laplace transform of periodic functions. Finding inverse Laplace transform by different methods, convolution theorem. Solution of ODE using L.T. [8L]

Fourier Transforms: Fourier transforms properties, Sine & Co-sine Fourier transforms, convolution, inverses and Parseval's Identity. [6L]

Module 2: Partial Differential Equation

Partial Differential Equation: Introduction to PDE, Formation of PDE.

First Order Partial differential equations, solutions of first order linear PDEs.

Partial Differential Equation of second Order: Solution of Wave Equation, Heat Conduction equation and Laplace's equation by a) Laplace transform b) Fourier transforms and c) Method of separation of variables. [8L]

Module 3: Numerical Analysis

Approximation in numerical computation: Absolute error, Relative error, Percentage error, Truncation and rounding errors, Fixed and floating-point arithmetic, Propagation of errors. [2L]

Interpolation: Newton forward & backward interpolation, Lagrange's and Newton's divided difference Interpolation. [4L]

Numerical integration: Trapezoidal rule, Simpson's 1/3 rule, Weddle's rule, expression for corresponding error terms. [2L]

Numerical Solution of a system of linear equation: Gauss elimination method, Matrix inversion, Gauss Jordan, Gauss-seidel iterative method. [4L]

Numerical Solution of Algebraic equation: Bisection method, Regula-Falsi method, Newton Raphson method. [4L]

Numerical Solution of Ordinary Differential Equation: Euler's method, Modified Euler's & Runge-Kutta (4th Order) method. [4L]

Course Outcomes:

After completing the course the student will be able to

CO 1: apply the concept and techniques of integral transforms for spectral analysis and solutions of ODE and PDE relevant to the field of Ceramic science.

CO 2: apply the techniques of PDE for formulation and modeling of diffusion and heat conduction problems and its understanding.

CO 3: learn the tools of interpolation to estimate and predict for unknown functional value.

CO 4: understand and apply the techniques of numerical solutions of nonlinear equations and system of equations that arises from different real life engineering problems and where existing analytical methods are not sufficient for solutions.

CO 5: learn to choose proper numerical methods to deal with specific problems of definite integrals and ODE.

Learning resources

1. LokenathDebnath, DambaruBhatta, Integral Transform and their applications, CRC Press
2. Larry C. Andrews, Bhimsen K. Shivamoggi, Integral Transforms for Engineers, Macmillan.
3. Erwin Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons.
4. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers.
5. S. S. Sastry, Introductory Methods of Numerical Analysis, PHI
6. S. A. Mollah, Numerical Analysis and Computational Procedure, Books and Allied (P) Ltd.

Basic Mechanical Engineering

Pre-Requisite:

1. Class 12th standard physics knowledge
2. Class 12th standard knowledge in differential and integral calculus

Course objective:

The objective of this course is to provide a good foundation for taking up advanced courses of the subsequent semesters. A working knowledge of statics with emphasis on force equilibrium and free body diagrams is provided. This course provides an understanding of the kinds of stress and deformation and how to determine them in a wide range of simple, practical structural problems, and an understanding of the mechanical behavior of materials under various load conditions. This course also provides the basic understanding of different machine elements and joints like cam-follower, power screw, belt drives, gear drives, riveted and welded joints.

Detailed syllabus:

Module 1: Introduction to statics (9L)

Two dimensional force systems: Principle of transmissibility, Resolution of force into rectangular components, Moment, Varignon's theorem, Couple, Equivalent couples, Force couple systems. (5L)

Equilibrium of forces in two dimensions: Concept of free body diagram, Equilibrium conditions. (4L)

Module 2: Strength of materials (12L)

Concept of stress: Normal stress and shearing stress,

Tension and compression within the elastic limit: Definition of elasticity, plasticity, ductility, malleability, hardness, fatigue, creep, brittleness; Hooke's law, Stress-strain diagram for ductile and brittle material, working stress, factor of safety, stress and strain in composite bar, Thermal stress. (5L)

Torsion of circular shafts, angle of twist, torque and power developed in hollow and circular shafts. (2L)

Shear Force and Bending Moment: Relation between shear force and bending moment, Sign convention, Shear force and bending moment diagrams for simply supported beam, overhanging beam and cantilever subjected to point loads & uniformly distributed load, location of point of contraflexure. (5L)

Module-3: Theory of machine elements (18L)

Cams and followers: Classification of cams and followers, Different follower motions and their displacement diagrams like uniform velocity, SHM. Drawing of profile of radial cam with knife-edge follower without offset with reciprocating motion (graphical method only). (4L)

Power screws: Forms of threads, Terminology of power screw, Torque requirement while lifting and lowering load, self locking screw, efficiency of square threaded screw. (3L)

Belt drives: Types of belt and belt drives, action of belts on pulleys, velocity ratio. (2L)

Gear drives: Friction wheels, Advantages and disadvantages of gear drive, classification of gears, terminology used in gears, simple and compound gear train. (3L)

Riveted Joints: Types of riveted joints, Failure, strength and efficiency of a riveted joint. (3L)

Welded joints: Welding processes, butt joints, lap joints, strength of butt welds, stress relieving of welding joints. (3L)

Course outcome:

The students will be able to:

1. Use analytical techniques for analyzing two dimensional force systems
2. Confidently tackle equilibrium equations, moments and couple problems of engineering mechanics
3. Determine normal stress, shear stress, thermal stress of deformable body.
4. Define mechanical properties of materials and understand and analyze stress-strain diagram of engineering materials and realize the effect of deformable body under various loading conditions
5. Attain an introduction to basic machine elements and joints such as power screw, belt drives, riveted and welded joints, gear drives, cam-follower system.

Books recommended:

Engineering mechanics- Timoshenko and Young

Engineering mechanics- Mariam and Kraige

Strength of materials- Timoshenko and Young

Theory of machines- S S Rattan

Design of machine elements- V B Bhandari

Ceramic Raw Materials (PC(CT) 301)

Pre-Requisite:

1. Class 12th standard knowledge of chemistry
2. Class 12th standard knowledge in basic chemical calculation and Stoichiometric relations

Course Objective : The objective of the course is to acquire

- (a) knowledge on the structure, classification, properties and application of different natural ceramic raw materials.
- (b) knowledge on different processing technique of ultrapure synthetic ceramic materials and their properties / characterisation.
- (c) knowledge on the different properties, structure in relation with application field of ceramic raw materials.
- (d) knowledge on the different characteristics of different natural materials applicable in relation with application oriented ceramic product manufacturing.

Part-I : Natural Raw Materials

(a) Structure and properties of ceramic minerals 2L

- (i) Structure of ionic compound
- (ii) Structure of covalent ceramic minerals

(b) Identification of minerals 3L

- (i) Physico-chemical properties
- (ii) Optical mineralogical properties

(c) Silica and silicate minerals: 4L

Polymorphic forms of silica, their transformation, different applications in ceramic industries; different natural forms of silica of industrial importance, their properties, uses : e.g. quartzite, ganister, flint, silica sand. Other forms of silica and their applications: silica gel, vitreous silica.

(d) Plastic ceramic raw materials: clay minerals, classification of clays, structure, properties and application.

(i) Important properties of clay: plasticity, CEC, drying strength, shrinkage, vitrification, effect of heat on clay. 4L

(ii) Important clay minerals: china clay, ball clay, fireclay, bentonite, mica etc. 1L

(e) Fluxing agent: feldspar, nephelene syenite, bone ash, lepidolite and wollastonite- their composition, properties, availability and uses in relevant ceramic industries. 4L

(f) Refractory raw materials: bauxite, magnesite, dolomite, chromite, graphite, sillimanite group of minerals, limestone---their composition, properties, effect of heat, occurrence and applications.

4L

(g) Other important raw materials: Laterite, rutile, gypsum, garnet, fluorspar, borax. 2L

Part-II : Synthetic Ceramic raw Materials:

1. Scope, Application & Basic background of Synthetic Ceramic Powder: 3L

Purpose /Advantage of synthetic Ceramic Raw Materials, Ultra pure Synthetic ceramic raw materials, Industrially used synthetic ceramic raw materials, Idea about crystal, crystallite, grain, particle, Particle size and shape, Agglomerated & Mono dispersed particle, Application areas of synthetic ceramic powder in different Engineering field.

2. Methods of Ceramic Powder preparation: 6L

Sol-Gel process (SGP), Sol-Gel-Auto combustion & Low temperature Solution Combustion process (LCS) , Precipitation and co-precipitation technique, Hydrothermal synthesis, Solvent vaporization technique

2. Characterization of Synthetic Ceramic powder: 3L

Particle size distribution of nano and micron range particles, Decomposition and crystallization study by DTA, TGA and DTGA, Phase analysis by XRD, Debye Scherer equation for crystallite size determination. SEM and TEM.

3. Alumina : 4L

Phases of Alumina and its structure, Bayer alumina and its purification, Calcined Alumina, Tabular alumina, Fused alumina, Synthesis of oxide and hydroxide Powder from solution/combustion routes & powder Characterization

4. Zirconia: 4L

Polymorphic transformation of ZrO_2 , Partially stabilized and fully stabilized zirconia (PSZ & FSZ), Synthesis of stabilized ZrO_2 powder (with Y_2O_3 , CeO_2 etc.) from solution routes & powder Characterization , Monodisperse spherical ZrO_2 powder spinel

5. Mullite, Silica Gel and Precipitated Silica: 4L

Synthesis from different precursors in solution routes & their Characterization

6. Barium Titanate and Ferrite: 4L

Temperature dependent structural stability of $BaTiO_3$, Synthesis of $BaTiO_3$ by Pechini and modified Pechini process, Normal and inverse spinel ferrites, Synthesis of Ni, Zn and Mn ferrite powder by sol-gel-auto combustion , co-precipitation techniques & powder Characterization.

Course Outcome :

After successful completion of the course the student should be able to understand

(a) The importance of natural as well as synthetic ceramic raw materials for practical application in different field of application in ceramic industries.

(b) Different methods of synthesis of synthetic ceramic materials & their characterisation.

(c) The structure-properties relationship of different ceramic raw materials.

Recommended Books

1. Clays and Ceramic Raw materials: W.E. Worrall Applied Sc publishers
2. Properties of Ceramic Raw materials: W. Ryan, Pergamon Press
3. The Chemistry and Physics of Clays and other Ceramic Materials: R. W. Grimshaw, Ernest Benn Ltd
4. Ceramic Raw Materials (2nd Revised Edition) – W. E. Worrall (1982). Pergamon Press, Oxford. 111p.
5. Ceramic Raw Materials of India: A Directory – S.K Guha (Editor) (1982). Indian Institute of Ceramics, Kolkata. 202p.
6. Ceramic Powder preparation : A Hand Book, Dibyendu Gangully & Minati Chatterjee, Kluwer Academic Publishers
7. Sol-Gel Processing of Advanced Ceramics, Editor by F. D. Gnanam, Oxford & IBH Publishing Co. Pvt. Ltd. New Delhi

Unit Operations I (ES: 306)**Pre-Requisite:**

1. Class 12th standard knowledge of physics
2. Class 12th standard knowledge in differential & integral calculus

Course Objective:

The objective of the course is to provide an exposure to the engineering application of the physical principles involved in various unit operations related to processing of ceramic materials. Familiarising the students with the major physical features and the working principles of the equipment for handling various kinds of fluid and transport of heat through conduction, convection and radiation is also a part of the objective. This course also provides an understanding of practical problem solving techniques for the processes as described in section 1,2,3 & 4.

Section 1: Fluid Mechanics

Introduction to unit operations for ceramic processes, Units and dimensions, dimensional analysis, Hydrostatic Equilibrium, Manometer, Newtonian & non-Newtonian fluid, Laminar & turbulent flow, Reynold's stress, Boundary layers, Momentum balance and Bernoulli equation, Friction factor and friction factor charts, Pipe, Fittings and Valves, Pumps, Fans and Compressors, Flowmeters, Drag and Friction in flow.

Section 2: Heat Transfer by Conduction

Steady State Heat Transfer by conduction, Fourier's law, Compound resistance in series, Heat transfer through hollow cylinder and spheres, Unsteady state heat conduction, Semi infinite solid, Penetration distance

Section 3: Heat Transfer by convection

Principles of heat flow in fluids, Countercurrent and parallel flows and related temperature profiles, Overall heat transfer co-efficient, Logarithmic mean temperature difference, Individual heat transfer coefficients, Calculation of overall co-efficients, Heat transfer by forced convection, Application of Empirical Equations, Heat exchanger equipments

Section 4: Heat Transfer by Radiation

Fundamental concepts of radiation, Emissivity, Blackbody radiation, Planck's law, Wein's displacement law, Stefan-Boltzman Law, Kirchoff's law, Gray body, Angle of vision, Radiation intensity of blackbody, View factor, Radiation between two black surfaces, Heat exchange between parallel gray surfaces

Course outcome:

After successful completion of the course the student should be able to

- 1) Distinguish the basic features of moving fluids at low and high velocities through pipes in order to determine the frictional losses and propose suitable materials of construction for a pipeline.
- 2) Propose machineries for transportation of fluids with special emphasis on ceramic processes.
- 3) Propose a pipeline layout complete with fittings, valves and flow meters for a flow of fluid with certain flow rate.
- 4) Apply the laws of heat conduction for calculation of heat flow through successive layers of furnace wall.
- 5) Apply the principles of heat flow in fluids to calculate the heat transfer area for a heat exchanger and eventually propose a suitable heat exchanger.
- 6) Apply rudimentary concepts of radiation to determine the amount of heat transfer by radiation in furnaces.

Books recommended:

1. Unit Operations of Chemical Engineering – W. M. McCabe., J. C. Smith., P. Harriot., McGraw Hill
2. Chemical Engineering – Coulson, Richardson, Backhurst and Harker, Pergamon Press
3. Heat Transfer – B. K. Datta., Prentice Hall of India, New Delhi

BOS meeting on 7th November' 2019

6 messages

Rituparno Sen <rsen63@gmail.com>

23 October 2019 at 15:31

To: Ramchandra Das <rohin9591@rediffmail.com>, srimantapatra <srimantapatra@yahoo.co.in>, Ranjan Ray <rnjn_ray@yahoo.co.uk>, Kaberi Das <kabdkd@yahoo.co.in>, "mailme.drbks" <mailme.drbks@gmail.com>, Tapas Kumar Bhattacharya <tkb_ceramics@yahoo.co.in>, guhap7 <guhap7@gmail.com>, Dr Arup Ghosh <arup@cgcri.res.in>, Sankar Ghatak <sankarcsir@gmail.com>, Srikrishna Manna <srikrishna@cgcri.res.in>, smukherjee03@gmail.com, Prasanta Dutta <prasanta1.dutta@trlkrosaki.com>, Prasanta Dutta <prasantadutta@hotmail.com>, debdarpan <debdarpan@gmail.com>, Debdarpan Khan <debdarpan@rediffmail.com>, "Dr. Rituparno Sen" <rsen63@gmail.com>
Cc: Krishnendu Chakrabarty <chakrabarty40@rediffmail.com>, guhap7 <guhap7@gmail.com>

Respected members,

23.10.2019

On my personal behalf I convey my best regards to you all and wish you a very happy Diwali in advance.

I would like to invite you as a member of the Board of Studies (Ceramic Technology) to a meeting of BOS (CT) to be held on the 7th November' 2019 (Thursday) at 2.00 pm at the Conference Room of the College.

I am attaching herewith the detailed syllabus of 3rd semester CT, prepared by our respected subject teachers, (the structure of syllabi of all 8 semesters has already been approved in the meeting of BOS on the 18th January' 2019) for favour of your perusal and observation. I would request you have a prior look into it and help us finalizing it and finally approving it in the BOS meeting to be held on 7th Nov' 2019.

The courses are running and the faculties are following the syllabi as per framed ones following regulations already shared with you before the last meeting was held.


The meeting would be held on the Single Point agenda of "Approving the detailed syllabi of 3rd semester Ceramic Technology"

Thanking you,

With best regards, and soliciting your presence and active participation in the above process,

Dr. Rituparno Sen
Professor & HOD (CT)
Ex-Officio Chairman - BOS (CT)

Attachments: 1. Draft detailed syllabi of 3rd semester Ceramic Technology

 **THIRD SEM DETAILED SYLLABUS NEW.docx**
45K

Srikrishna Manna <srikrishna@cgcri.res.in>
To: Rituparno Sen <rsen63@gmail.com>

23 October 2019 at 17:54

Dear Sir,

Thank you sir for wishing a very happy Diwali in advance and wish you a prosperous happy Diwali. Invited me to attend at meeting of BOS (CT) as a member to be held on the 7th November 2019 (Thursday) at 2.00 pm . I shall be busy for India International Science Festival (IISF) 2019 to be held on 5th Nov. to 8th Nov.2019 at kolkata. Therefore, I shall not able to attend in this meeting of BOS (CT) on your scheduled date. Kindly accept my mail intimation.

With best regards
Srikrishna Manna

On 10/23/19 03:31 PM, **Rituparno Sen** <rsen63@gmail.com> wrote:

Respected members,

23.10.2019


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[Quoted text hidden]

--
Srikrishna Manna
Sr. Technical officer (2)
CSIR - Central Glass & Ceramic Research Institute
Division : Speciality Glass Technology Division
196, Raja S.C. Mullick Road, Kolkata -32
Mob. No. 9593174560 / 8902750691
Office Email : srikrishna@cgcri.res.in
Email : manna.srikrishna@gmail.com

 **srikrishna.vcf**
1K

debdarpan khan <debdarpan@gmail.com>
To: CER RITUPARNA SEN <rsen63@gmail.com>

23 October 2019 at 18:07

Thank you Sir, and Happy Diwali to you.
I will attend the meeting.
Debdarpan Khan
[Quoted text hidden]

debdarpan khan <debdarpan@gmail.com>
To: CER RITUPARNA SEN <rsen63@gmail.com>

23 October 2019 at 18:15

Sir,
I have gone through the detailed syllabus of " ENVIRONMENTAL SCIENCES [MC (CT) 301]".
I had provided names of 3 books and now would like to add another book which I find will help the students.

Can this be done?

Debdarpan Khan.
[Quoted text hidden]

Rituparno Sen <rsen63@gmail.com>
To: debdarpan <debdarpan@gmail.com>

24 October 2019 at 08:58

Yes, of course you can.
[Quoted text hidden]

Rituparno Sen <rsen63@gmail.com>

7 November 2019 at 10:01

To: Partha Haldar <partha.jumech@gmail.com>, Krishnendu Dutta <krish_dutt@yahoo.co.in>, Debdulal Maity <deb.dulal@yahoo.co.in>

Dear colleagues,


The subjects being taught by you in 3rd Sem are to be discussed and approved in today's meeting of the BOS of CT.

I would personally request you to join the meeting as invitee and have lunch at 1.45 pm before the meeting starts.

Excuse me for the delay in informing.

With regards,

R. Sen
Chairman, BOS (CT)
[Quoted text hidden]

 **THIRD SEM DETAILED SYLLABUS NEW.docx**
45K

BOS meeting on 7th November' 2019

6 messages

Rituparno Sen <rsen63@gmail.com>

23 October 2019 at 15:31

To: Ramchandra Das <rohin9591@rediffmail.com>, srimantapatra <srimantapatra@yahoo.co.in>, Ranjan Ray <rnjn_ray@yahoo.co.uk>, Kaberi Das <kabd kd@yahoo.co.in>, "mailme.drbks" <mailme.drbks@gmail.com>, Tapas Kumar Bhattacharya <tkb_ceramics@yahoo.co.in>, guhap7 <guhap7@gmail.com>, Dr Arup Ghosh <arup@cgcri.res.in>, Sankar Ghatak <sankarcsir@gmail.com>, Srikrishna Manna <srikrishna@cgcri.res.in>, smukherjee03@gmail.com, Prasanta Dutta <prasanta1.dutta@trlkrosaki.com>, Prasanta Dutta <prasantadutta@hotmail.com>, debdarpan <debdarpan@gmail.com>, Debdarpan Khan <debdarpan@rediffmail.com>, "Dr. Rituparno Sen" <rsen63@gmail.com>

Cc: Krishnendu Chakrabarty <chakrabarty40@rediffmail.com>, guhap7 <guhap7@gmail.com>

Respected members,

23.10.2019

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I am attaching herewith the detailed syllabus of 3rd semester CT, prepared by our respected subject teachers, (the structure of syllabi of all 8 semesters has already been approved in the meeting of BOS on the 18th January' 2019) for favour of your perusal and observation. I would request you have a prior look into it and help us finalizing it and finally approving it in the BOS meeting to be held on 7th Nov' 2019.

The courses are running and the faculties are following the syllabi as per framed ones following regulations already shared with you before the last meeting was held.


The meeting would be held on the Single Point agenda of "Approving the detailed syllabi of 3rd semester Ceramic Technology"

Thanking you,

With best regards, and soliciting your presence and active participation in the above process,

Dr. Rituparno Sen
Professor & HOD (CT)
Ex-Officio Chairman - BOS (CT)

Attachments: 1. Draft detailed syllabi of 3rd semester Ceramic Technology

 **THIRD SEM DETAILED SYLLABUS NEW.docx**
45K

Srikrishna Manna <srikrishna@cgcri.res.in>
To: Rituparno Sen <rsen63@gmail.com>

23 October 2019 at 17:54

Dear Sir,

Thank you sir for wishing a very happy Diwali in advance and wish you a prosperous happy Diwali. Invited me to attend at meeting of BOS (CT) as a member to be held on the 7th November 2019 (Thursday) at 2.00 pm . I shall be busy for India International Science Festival (IISF) 2019 to be held on 5th Nov. to 8th Nov.2019 at kolkata. Therefore, I shall not able to attend in this meeting of BOS (CT) on your scheduled date. Kindly accept my mail intimation.

With best regards
Srikrishna Manna

On 10/23/19 03:31 PM, **Rituparno Sen** <rsen63@gmail.com> wrote:

Respected members,

23.10.2019

On my personal behalf I convey my best regards to you all and wish you a very happy Diwali in advance.

I would like to invite you as a member of the Board of Studies (Ceramic Technology) to a meeting of BOS (CT) to be held on the 7th November' 2019 (Thursday) at 2.00 pm at the Conference Room of the College.

I am attaching herewith the detailed syllabus of 3rd semester CT, prepared by our respected subject teachers, (the structure of syllabi of all 8 semesters has already been approved in the meeting of BOS on the 18th January' 2019) for favour of your perusal and observation. I would request you have a prior look into it and help us finalizing it and finally approving it in the BOS meeting to be held on 7th Nov' 2019.

[Quoted text hidden]

Srikrishna Manna
Sr.Technical officer (2)
CSIR - Central Glass & Ceramic Research Institute
Division : Speciality Glass Technology Division
196, Raja S.C.Mullick Road, Kolkata -32
Mob. No.9593174560 / 8902750691
Office Email : srikrishna@cgcri.res.in
Email : manna.srikrishna@gmail.com

 **srikrishna.vcf**
1K

debdarpan khan <debdarpan@gmail.com>
To: CER RITUPARNA SEN <rsen63@gmail.com>

23 October 2019 at 18:07

Thank you Sir, and Happy Diwali to you.
I will attend the meeting.
Debdarpan Khan
[Quoted text hidden]

debdarpan khan <debdarpan@gmail.com>
To: CER RITUPARNA SEN <rsen63@gmail.com>

23 October 2019 at 18:15

Sir,
I have gone through the detailed syllabus of " ENVIRONMENTAL SCIENCES [MC (CT) 301]".
I had provided names of 3 books and now would like to add another book which I find will help the students.

Can this be done?

Debdarpan Khan.
[Quoted text hidden]

Rituparno Sen <rsen63@gmail.com>
To: debdarpan <debdarpan@gmail.com>

24 October 2019 at 08:58

Yes, of course you can.
[Quoted text hidden]

Rituparno Sen <rsen63@gmail.com> 7 November 2019 at 10:01
To: Partha Haldar <partha.jumech@gmail.com>, Krishnendu Dutta <krish_dutt@yahoo.co.in>, Debdulal Maity <deb.dulal@yahoo.co.in>

Dear colleagues,

The subjects being taught by you in 3rd Sem are to be discussed and approved in today's meeting of the BOS of CT.

I would personally request you to join the meeting as invitee and have lunch at 1.45 pm before the meeting starts.

Excuse me for the delay in informing.

With regards,

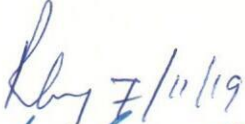

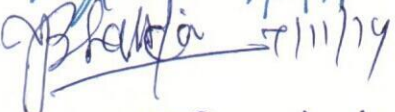
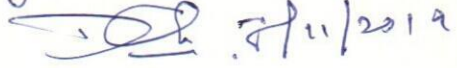



R. Sen
Chairman, BOS (CT)
[Quoted text hidden]



THIRD SEM DETAILED SYLLABUS NEW.docx
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MEMBERS PRESENT AT THE MEETING OF BOS on 7th NOV' 2019 at 2.30 pm

1.  7/11/19
2.  7/11/19
3.  7/11/19
4.  7/11/2019
- 5.
6. Deb dulal Maitty .
7. Kalevi Sen, 07/11/19 .
8. Partha Haldar 7/11/19
9. Poitknigir Saha
10.  7/11/19
11. Prosamita Datta 7/11/19 .
12.  7/11/19
13.  7/11/19
14. Ruma Maitty .
15. M-dhusadan Dutta .
- 16.
- 17.
- 18.

The meeting started with the Chairman welcoming all the members. The chairman himself through powerpoint presentation discussed the draft syllabi details pertaining to 3rd sem ~~C.T.~~ B.Tech C.T. ~~SoE~~ Members suggested inclusion of solid state processes in Synthetic Ceramic Raw Material and non-oxide Ceramic material (nitrides, silicides, borides etc). Light Pollution was ^{also} included in Environmental Science. ~~It should~~ The course papers must be written ~~below~~ covering the following components-

- ① Pre requisite
- ② Course objective
- ③ Course material - main content -
- ④ Recommended books
- ⑤ Course Outcome.

Confirmed
Rajpaul Singh
10/11/2020

List of Paper Setters, Examiners and Moderators for the 7th Semester Examinations of B. Tech, Ceramic Technology, December' 2019

Sl No.	Paper Name and Code	Type of Activity	Name	Organization	Ph No. & E-Mail ID
THEORY					
1.	Advanced Ceramics (CT 712)	Internal Paper setter	Dr. S. K. Patra & Dr. Sankar Ghatak	GCECT	9831130882 mairasakat@rediffmail.com 9830026182
		External Paper Setter	Dr. P. K. Maity	Sc. College	srimantapatra@yahoo.co.in 9432889369 prabir.maity@gmail.com
2.	Physical Ceramics (CT 713)	Internal Paper setter	Dr. R. Sen	GCECT	9831509654 rsen63@gmail.com
		External Paper Setter	Dr. S. Ghatak	Emeritus Scientist, CGCRI	8697229214 sankarsir@gmail.com
3.	Steel Plant Refractories (CT 714A) Elective Paper	Internal Paper setter	Dr. B. K. Sanfui	GCECT	9163493361 mailme.drbsks@gmail.com
		External Paper Setter	Dr. H. S. Maiti	Ex-Director, CSIR-CGCRI	
4.	Bio Ceramics (CT 714B) Elective Paper	Internal Paper Setter	Ms. Pameji Pal	GCECT	
		External Paper Setter	Dr. Biswanath Kundu	CSIR-CGCRI	biswa.kundun@gmail.com 9831772081
		Internal Paper setter	Dr. T. K. Bhattacharyya	GCECT	9831758067
4..	Nano Technology (CT 715A) Elective Paper	Internal Paper setter	Dr. Debjyoti Roy	Sc. College	tkb_ceramics@yahoo.co.in 6290013199
		External Paper Setter	Ms. Runa Mallik	GCECT	debucer@rediffmail.com 9748174604
		Internal Paper setter	Dr. Sankar Ghatak	Former Scientist, CGCRI	rumamallik.1234@gmail.com 8697229214
5.	Composites (CT 715B) Elective Paper	External Paper Setter	Dr. Sankar Ghatak	CGCRI	sankarsir@gmail.com
		Internal Paper setter	Prof. R. C. Das	GCECT	9883156865 rohin9591@rediffmail.com
		External Paper Setter	Dr. S. K. Banerjee	Visiting Prof., GCECT	9830513009 santosh.ceramics@gmail.com

PRACTICALS					
1.	Group Discussion (HS 715)	Internal Examiner	R Sen / P Guha	GCECT	9330903728 guhap7@gmail.com
		External Examiner for Viva voce	Mr. P. Dutta	TRL Krosaki Refractories Pvt. Ltd.	9831075034 prasantaadutta@hotmail.com
2.	Plant Design (CT 720)	Internal Examiner	Ms. Rumma Mallik & Prof. P. Guha	GCECT	9748174604 rumamallik.1234@gmail.com 9330903727 guhap7@gmail.com
		External Examiner for Viva Voce	Mr. Dilip De	Industrial Associates	dkde@industrialassociates.co.in 9433018157
3.	Industrial Training (CT 721)	Internal Examiner	R. Sen / P. Guha	GCECT	9831509654 / 9330903728
		External Examiner for Viva Voce	Dr. A. K. Chhoppadhyay	MD, National Refractories	09937267890 akc@bmaindia.com
4.	Project Part I (CT 722)	Internal Examiner	All Faculties	GCECT	As stated earlier
		External Examiner for Viva Voce	Dr. S. Ghatak	Emeritus Scientist, CGCRI	8697229214 sankarsir@gmail.com

List of Paper Setters, Examiners and Moderators for the 1st Semester Examinations of M. Tech, Ceramic Technology, December' 2019

Serial No.	Paper Name and Code	Type of Activity	Name	Organization	Ph No. & E-Mail ID
THEORY					
1.	Applied Mathematics M(CT) 101	Internal Paper setter	Dr. Krishnendu Dutta	GCECT	9477501460 krish_dutta@yahoo.co.in
2.	Structure, Properties & Characterization of Engineering Materials M(CT) 102	Internal Paper setter	Dr. Rituparna Sen	GCECT	9831509654 rsen63@gmail.com
3.	Phase Equilibrium & Transformation in Ceramic Systems M(CT) 103	Internal Paper setter	Ms. Rumma Mallik	GCECT	9748174604 rumamallik.1234@gmail.com
4.	Advanced Process Technology of Ceramics M(CT) 104	Internal Paper setter	Dr. (Mrs.) Kaberi Das	GCECT	9433052304 kbbkd@yahoo.co.in

5.	Environmental Engg. & Occ. Health & Safety M(CT) 105A Elective Paper	Internal Paper setter	Prof. Ranjan Ray	GCECT	9830598068 rnjn_ray@yahoo.co.uk
PRACTICALS					
1.	Characterization of Ceramic Raw Materials Lab M(CT) 191	Internal Examiner	Dr. R. Sen / Dr. S. K. Patra / Prof. R. C. Das	GCECT	As stated earlier
		External Examiner for Viva Voce	Dr. P. K. Gangopadhyay / Prof. P. Guha	Former Professor, GCECT/GCECT	9433614250
2.	Powder Processing & Characterization Lab M(CT) 192	Internal Examiner	Dr. T. K. Bhattacharyya	GCECT	9831758067 tkb_ceramics@yahoo.co.in
		External Examiner for Viva Voce	Dr. Debyoti Roy	Sc. College	
SESSIONAL					
1.	Seminar M(CT) 183	Internal Examiner	All Faculties	GCECT	As stated earlier
		External Examiner for Viva Voce	Dr. Sankar Ghatak	Emeritus Scientist, CGCRI	8697229214 sankarsir@gmail.com

List of Paper Setters, Examiners and Moderators for the 3rd Semester Examinations of M. Tech, Ceramic Technology, December' 2019 (Old Regulation)

Serial No.	Paper Name and Code	Type of Activity	Name	Organization	Ph No. & E-Mail ID
THEORY					
1.	Technology Management M(CT) 301	Internal Paper setter	Dr. S. K. Banerjee	GCECT	9830513009 santosh.ceramics@gmail.com

2.	Research Methodology M(CT) 301	Internal Paper setter	Dr. Sankar Ghatak	Emeritus Scientist, CGCRI	8697229214 sankarsir@gmail.com
SESSIONAL					
1.	Dissertation - I M(CT) 381	Internal Examiners	All Faculties	GCECT	As stated earlier
		External Examiner for Viva Voce	Dr. S. Ghatak	Former CSIR-CGCRI	8697229214 sankarsir@gmail.com

Board of Moderators for B. Tech 5th Semester, 7th Semester of Ceramic Technology & M. Tech 3rd Semester (Old Regulation)' 2019

Dr. Swapan Kumar Das, Retd. Scientist, CGCRI

Dr. Arup Ghosh, Retd. Scientist, CGCRI

Prof. (Dr.) R. N. Majumder, Retd. Prof., Calcutta University

Dr. Probal Das, Retd. Scientist, CGCRI

Dr. Indrajit Bhattacharyya, Associate Prof., KGEC

Prof. (Dr.) T. K. Paryya, Science College

Dr. Sangeeta Agarwal

Prof. Anindya Sengupta

Dr. (Mrs.) Dipa Biswas, Sc. College

Dr. Swathi Mitra, Barasat Govt. College

Dr. Bidyut Pal, Associate Professor, Maulana Azad College

Prof. Manoj Mitra, Former Prof. & Dean, FET, JU

Prof. P. K. Das Poddar, Former Prof., Sc. College

Dr. P. K. Gangopadhyay, Former OIC, GCECT, Kolkata - 10

Prof. Dr.) P. G. Pal, Former OIC, GCECT, Kolkata - 10

Draft

**Detailed Syllabus for UG Engineering Degree in Ceramic Technology under Autonomy
Semester III**

Paper Name: Engineering Mathematics

Paper Code:

Credits: 4

Lecture per week: 3 hours Tutorial per week: 1 hour

Year: 2nd year (CT). Semester: 3rd

Module 1: Integral Transform

Laplace Transforms: Laplace transform, properties of Laplace Transform, Laplace transform of periodic functions. Finding inverse Laplace transform by different methods, convolution theorem. Solution of ODE using L.T. [8L]

Fourier Transforms: Fourier transforms properties, Sine & Co-sine Fourier transforms, convolution, inverses and Parseval's Identity. [6L]

Module 2: Partial Differential Equation

Partial Differential Equation: Introduction to PDE, Formation of PDE.

First Order Partial differential equations, solutions of first order linear PDEs.

Partial Differential Equation of second Order: Solution of Wave Equation, Heat Conduction equation and Laplace's equation by a) Laplace transform b) Fourier transforms and c) Method of separation of variables. [8L]

Module 3: Numerical Analysis

Approximation in numerical computation: Absolute error, Relative error, Percentage error, Truncation and rounding errors, Fixed and floating-point arithmetic, Propagation of errors. [2L]

Interpolation: Newton forward & backward interpolation, Lagrange's and Newton's divided difference Interpolation. [4L]

Numerical integration: Trapezoidal rule, Simpson's 1/3 rule, Weddle's rule, expression for corresponding error terms. [2L]

Numerical Solution of a system of linear equation: Gauss elimination method, Matrix inversion, Gauss Jordan, Gauss-seidel iterative method. [4L]

Numerical Solution of Algebraic equation: Bisection method, Regula-Falsi method, Newton Raphson method. [4L]

Numerical Solution of Ordinary Differential Equation: Euler's method, Modified Euler's & Runge-Kutta (4th Order) method. [4L]

Course Outcomes:

After completing the course the student will be able to

CO 1: apply the concept and techniques of integral transforms for spectral analysis and solutions of ODE and PDE relevant to the field of Ceramic science.

CO 2: apply the techniques of PDE for formulation and modeling of diffusion and heat conduction problems and its understanding.

CO 3: learn the tools of interpolation to estimate and predict for unknown functional value.

CO 4: understand and apply the techniques of numerical solutions of nonlinear equations and system of equations that arises from different real life engineering problems and where existing analytical methods are not sufficient for solutions.

CO 5: learn to choose proper numerical methods to deal with specific problems of definite integrals and ODE.

Learning resources

1. LokenathDebnath, DambaruBhatta, Integral Transform and their applications, CRC Press
2. Larry C. Andrews, Bhimsen K. Shivamoggi, Integral Transforms for Engineers, Macmillan.
3. Erwin Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons.
4. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers.
5. S. S. Sastry, Introductory Methods of Numerical Analysis, PHI
6. S. A. Mollah, Numerical Analysis and Computational Procedure, Books and Allied (P) Ltd.

Basic Mechanical Engineering

Pre-Requisite:

1. Class 12th standard physics knowledge
2. Class 12th standard knowledge in differential and integral calculus

Course objective:

The objective of this course is to provide a good foundation for taking up advanced courses of the subsequent semesters. A working knowledge of statics with emphasis on force equilibrium and free body diagrams is provided. This course provides an understanding of the kinds of stress and deformation and how to determine them in a wide range of simple, practical structural problems, and an understanding of the mechanical behavior of materials under various load conditions. This course also provides the basic understanding of different machine elements and joints like cam-follower, power screw, belt drives, gear drives, riveted and welded joints.



Detailed syllabus:

Module 1: Introduction to statics (9L)

Two dimensional force systems: Principle of transmissibility, Resolution of force into rectangular components, Moment, Varignon's theorem, Couple, Equivalent couples, Force couple systems. (5L)

Equilibrium of forces in two dimensions: Concept of free body diagram, Equilibrium conditions. (4L)

Module 2: Strength of materials (12L)

Concept of stress: Normal stress and shearing stress,

Tension and compression within the elastic limit: Definition of elasticity, plasticity, ductility, malleability, hardness, fatigue, creep, brittleness; Hooke's law, Stress-strain diagram for ductile and brittle material, working stress, factor of safety, stress and strain in composite bar, Thermal stress. (5L)

Torsion of circular shafts, angle of twist, torque and power developed in hollow and circular shafts. (2L)

Shear Force and Bending Moment: Relation between shear force and bending moment, Sign convention, Shear force and bending moment diagrams for simply supported beam, overhanging beam and cantilever subjected to point loads & uniformly distributed load, location of point of contraflexure. (5L)

Module-3: Theory of machine elements (18L)

Cams and followers: Classification of cams and followers, Different follower motions and their displacement diagrams like uniform velocity, SHM. Drawing of profile of radial cam with knife-edge follower without offset with reciprocating motion (graphical method only). (4L)

Power screws: Forms of threads, Terminology of power screw, Torque requirement while lifting and lowering load, self locking screw, efficiency of square threaded screw. (3L)

Belt drives: Types of belt and belt drives, action of belts on pulleys, velocity ratio. (2L)

Gear drives: Friction wheels, Advantages and disadvantages of gear drive, classification of gears, terminology used in gears, simple and compound gear train. (3L)

Riveted Joints: Types of riveted joints, Failure, strength and efficiency of a riveted joint. (3L)

Welded joints: Welding processes, butt joints, lap joints, strength of butt welds, stress relieving of welding joints. (3L)

Course outcome:

The students will be able to:

1. Use analytical techniques for analyzing two dimensional force systems
2. Confidently tackle equilibrium equations, moments and couple problems of engineering mechanics
3. Determine normal stress, shear stress, thermal stress of deformable body.
4. Define mechanical properties of materials and understand and analyze stress-strain diagram of engineering materials and realize the effect of deformable body under various loading conditions
5. Attain an introduction to basic machine elements and joints such as power screw, belt drives, riveted and welded joints, gear drives, cam-follower system.

Books recommended:

Engineering mechanics- Timoshenko and Young

Engineering mechanics- Mariam and Kraige

Strength of materials- Timoshenko and Young

Theory of machines- S S Rattan

Design of machine elements- V B Bhandari

Ceramic Raw Materials (PC(CT) 301)

Pre-Requisite:

1. Class 12th standard knowledge of chemistry
2. Class 12th standard knowledge in basic chemical calculation and Stoichiometric relations

Course Objective : The objective of the course is to acquire

- (a) knowledge on the structure, classification, properties and application of different natural ceramic raw materials.
- (b) knowledge on different processing technique of ultrapure synthetic ceramic materials and their properties / characterisation.
- (c) knowledge on the different properties, structure in relation with application field of ceramic raw materials.
- (d) knowledge on the different characteristics of different natural materials applicable in relation with application oriented ceramic product manufacturing.

Part-I : Natural Raw Materials

- (a) Structure and properties of ceramic minerals 2L
 - (i) Structure of ionic compound
 - (ii) Structure of covalent ceramic minerals
- (b) Identification of minerals 3L
 - (i) Physico-chemical properties
 - (ii) Optical mineralogical properties
- (c) Silica and silicate minerals: 4L

Polymorphic forms of silica, their transformation, different applications in ceramic industries; different natural forms of silica of industrial importance, their properties, uses : e.g. quartzite, ganister, flint, silica sand. Other forms of silica and their applications: silica gel, vitreous silica.

- (d) Plastic ceramic raw materials: clay minerals, classification of clays, structure, properties and application.
 - (i) Important properties of clay: plasticity, CEC, drying strength, shrinkage, vitrification, effect of heat on clay. 4L
 - (ii) Important clay minerals: china clay, ball clay, fireclay, bentonite, mica etc. 1L
- (e) Fluxing agent: feldspar, nephelene syenite, bone ash, lepidolite and wollastonite- their composition, properties, availability and uses in relevant ceramic industries. 4L
- (f) Refractory raw materials: bauxite, magnesite, dolomite, chromite, graphite, sillimanite group of minerals, limestone--- their composition, properties, effect of heat, occurrence and applications. 4L
- (g) Other important raw materials: Laterite, rutile, gypsum, garnet, fluorspar, borax. 2L

Part-II : Synthetic Ceramic raw Materials:

- 1. Scope, Application & Basic background of Synthetic Ceramic Powder: 3L

Purpose /Advantage of synthetic Ceramic Raw Materials, Ultra pure Synthetic ceramic raw materials, Industrially used synthetic ceramic raw materials, Idea about crystal, crystallite, grain, particle, Particle size and shape, Agglomerated & Mono dispersed particle, Application areas of synthetic ceramic powder in different Engineering field.

2. Methods of Ceramic Powder preparation:

6L

Sol-Gel process (SGP), Sol-Gel-Auto combustion & Low temperature Solution Combustion process (LCS) , Precipitation and co-precipitation technique, Hydrothermal synthesis, Solvent vaporization technique

2. Characterization of Synthetic Ceramic powder:

3L

Particle size distribution of nano and micron range particles, Decomposition and crystallization study by DTA, TGA and DTGA, Phase analysis by XRD, Debye Scherer equation for crystallite size determination. SEM and TEM.

3. Alumina :

4L

Phases of Alumina and its structure, Bayer alumina and its purification, Calcined Alumina, Tabular alumina, Fused alumina, Synthesis of oxide and hydroxide Powder from solution/combustion routes & powder Characterization

4. Zirconia:

4L

Polymorphic transformation of ZrO_2 , Partially stabilized and fully stabilized zirconia (PSZ & FSZ), Synthesis of stabilized ZrO_2 powder (with Y_2O_3 , CeO_2 etc.) from solution routes & powder Characterization , Monodisperse spherical ZrO_2 powder spinel

5. Mullite, Silica Gel and Precipitated Silica:

4L

Synthesis from different precursors in solution routes & their Characterization

6. Barium Titanate and Ferrite:

4L

Temperature dependent structural stability of $BaTiO_3$, Synthesis of $BaTiO_3$ by Pechini and modified Pechini process, Normal and inverse spinel ferrites, Synthesis of Ni, Zn and Mn ferrite powder by sol-gel-auto combustion , co-precipitation techniques & powder Characterization.

Course Outcome :

After successful completion of the course the student should be able to understand

- (a) The importance of natural as well as synthetic ceramic raw materials for practical application in different field of application in ceramic industries.
- (b) Different methods of synthesis of synthetic ceramic materials & their characterisation.
- (c) The structure-properties relationship of different ceramic raw materials.

Recommended Books

1. Clays and Ceramic Raw materials: W.E. Worrall Applied Sc publishers
2. Properties of Ceramic Raw materials: W. Ryan, Pergamon Press
3. The Chemistry and Physics of Clays and other Ceramic Materials: R. W. Grimshaw, Ernest Benn Ltd
4. Ceramic Raw Materials (2nd Revised Edition) – W. E. Worrall (1982). Pergamon Press, Oxford. 111p.
5. Ceramic Raw Materials of India: A Directory – S.K Guha (Editor) (1982). Indian Institute of Ceramics, Kolkata. 202p.
6. Ceramic Powder preparation : A Hand Book, Dibyendu Gangully & Minati Chatterjee, Kluwer Academic Publishers

7. Sol-Gel Processing of Advanced Ceramics, Editor by F. D. Gnamam, Oxford & IBH Publishing Co. Pvt. Ltd. New Delhi

Unit Operations I (ES: 306)

Pre-Requisite:

1. Class 12th standard knowledge of physics
2. Class 12th standard knowledge in differential & integral calculus

Course Objective:

The objective of the course is to provide an exposure to the engineering application of the physical principles involved in various unit operations related to processing of ceramic materials. Familiarising the students with the major physical features and the working principles of the equipment for handling various kinds of fluid and transport of heat through conduction, convection and radiation is also a part of the objective. This course also provides an understanding of practical problem solving techniques for the processes as described in section 1,2,3 & 4.

Section 1: Fluid Mechanics

Introduction to unit operations for ceramic processes, Units and dimensions, dimensional analysis, Hydrostatic Equilibrium, Manometer, Newtonian & non-Newtonian fluid, Laminar & turbulent flow, Reynold's stress, Boundary layers, Momentum balance and Bernoulli equation, Friction factor and friction factor charts, Pipe, Fittings and Valves, Pumps, Fans and Compressors, Flowmeters, Drag and Friction in flow.

Section 2: Heat Transfer by Conduction

Steady State Heat Transfer by conduction, Fourier's law, Compound resistance in series, Heat transfer through hollow cylinder and spheres, Unsteady state heat conduction, Semi infinite solid, Penetration distance

Section 3: Heat Transfer by convection

Principles of heat flow in fluids, Countercurrent and parallel flows and related temperature profiles, Overall heat transfer co-efficient, Logarithmic mean temperature difference, Individual heat transfer coefficients, Calculation of overall co-efficients, Heat transfer by forced convection, Application of Empirical Equations, Heat exchanger equipments

Section 4: Heat Transfer by Radiation

Fundamental concepts of radiation, Emissivity, Blackbody radiation, Planck's law, Wein's displacement law, Stefan-Boltzman Law, Kirchoff's law, Gray body, Angle of vision, Radiation intensity of blackbody, View factor, Radiation between two black surfaces, Heat exchange between parallel gray surfaces

Course outcome:

After successful completion of the course the student should be able to

- 1) Distinguish the basic features of moving fluids at low and high velocities through pipes in order to determine the frictional losses and propose suitable materials of construction for a pipeline.
- 2) Propose machineries for transportation of fluids with special emphasis on ceramic processes.
- 3) Propose a pipeline layout complete with fittings, valves and flow meters for a flow of fluid with certain flow rate.
- 4) Apply the laws of heat conduction for calculation of heat flow through successive layers of furnace wall.
- 5) Apply the principles of heat flow in fluids to calculate the heat transfer area for a heat exchanger and eventually propose a suitable heat exchanger.

AA

- 6) Apply rudimentary concepts of radiation to determine the amount of heat transfer by radiation in furnaces.

Books recommended:

1. Unit Operations of Chemical Engineering – W. M. McCabe., J. C. Smith., P. Harriot., McGraw Hill
2. Chemical Engineering – Coulson, Richardson, Backhurst and Harker, Pergamon Press
3. Heat Transfer – B. K. Datta., Prentice Hall of India, New Delhi

Energy Resource & Furnaces (CT – 302)

Pre-Requisite:

1. Class 12th standard knowledge of physics and chemistry
2. Class 10th standard knowledge of basic mathematics

Course Objective:

The objective of the course is to provide the knowledge on basic characteristics and the sources of the energy resources being used for processing ceramic materials at high temperature furnaces. Familiarising the students with the major physical features and the working principles of those furnaces as well as the accessories forms a major part of the objective. This course also provides some important clues for solving practical numerical problems related to fuel combustion and furnace efficiency.

A) Energy Resources

Section 1: Basic Definitions

Calorific value, Primary and Secondary Air, Inflammability limits, Flame temperature etc.

Section 2: Solid Fuel

Origin of Coal, Proximate & Ultimate Analysis, Stages of Coal, Coal Petrography, Storage of Coal & Spontaneous combustion; Carbonisation of coal, Low Temperature & High Temperature Carbonization, Coke Making & By-product Recovery, Salient features of LTC & HTC

Section 3: Liquid Fuel

Origin of Petroleum, Classification of Petroleum, Products from Petroleum Distillation, General Scheme of Petroleum Distillation, Cracking, Visbreaking, reforming, sweetening, viscosity index, flash point & fire point, Cloud Point & Pour point, Carbon Residue, Aniline Point & Diesel Index, Octane & Cetane no., Coal-Tar Fuel

Section 4: Gaseous Fuel

Natural gas, Liquefied Petroleum Gas, Producer Gas & water gas

B) Furnaces

Section 1: General Features of Industrial Furnaces

Introduction, Classification of Industrial Furnaces, Components of total Furnace System, Furnaces/Kiln Construction materials.

Section 2: Efficient Utilization of Energy

Heat/Fuel Economy, Energy Audit and its Necessity, Sources of Heat Losses, Factors affecting Fuel Economy, Thermal Efficiency in operation of Furnace, Techniques of waste heat recovery, Recuperators & Regenerators, Operation of different type of Recuperators & Regenerators

Section 3: Dynamics of Flue Gas Movement in a furnace

Definition of Draught; its necessity, Classification of Draught, Deduction of Equations for Calculation of Natural Draught & Chimney Height

Section 4: Study of Typical Furnaces/Kilns and useful Heating Elements

Down Draft Kiln, Tunnel Kiln, Shuttle kiln, Bell type kiln, Glass Tank Furnace, Blast Furnace, BOF, EAF, Roller Hearth Kiln, Rotary Kiln, Induction Furnaces, Electrical Furnaces, SiC, MoSi₂ & Lanthanum Chromate heating Element

Course outcome:

After successful completion of the course the student should be able to

- 7) Apply the knowledge of basic definitions and properties of solid, liquid and gaseous fuels to specify right kind and quantity of fuel for use in industrial and other furnaces.
- 8) Apply the knowledge of carbonization of coal for using it for metallurgical and domestic purpose.
- 9) Assess the properties of various petroleum fractions and coal tar fuels for their suitable use as automobile fuel/furnace fuel or as lubricants
- 10) Propose solutions for problems based on various parameters and basic features of common furnaces
- 11) Apply the concept of dynamics of gas movement, fuel economy, techniques of heat recovery, operations of heat exchangers used in ceramic industry.
- 12) Select suitable furnaces & kilns for different ceramic & glass making processes.

Books recommended:

1. Elements of Fuels, Furnaces & Refractories – O.P. Gupta.
2. Fuels & combustions – Samir Sarkar
3. Industrial Furnaces Vol. I & II – Trincs W.
4. The science of Flames and Furnaces – M.W. Thring.
5. Principles of Blast Furnaces for iron making- A.K. Biswas.

Chemical & Engineering Thermodynamics PC(CT) 303

Pre-Requisite:

1. Class 12th standard knowledge of physics, physical Chemistry & basic chemical thermodynamics
2. Class 12th standard knowledge in differential & integral calculus
3. Basic concepts of thermodynamics as contained in the syllabus of 1st year of 4-year degree course

Course objective:

A) Chemical Thermodynamics

The objective of the course is to provide the knowledge on thermodynamic and kinetic parameters of solid state reactions including third Law of thermodynamics and its application in crystalline solids. Imparting knowledge on stability of domain in different oxides, configurational entropy of crystalline solid oxides, phase equilibria and phase diagram of binary oxide system, congruent and incongruent melting of oxide ceramics also constitute a major part of the objective.

B) Engineering Thermodynamics

The objective of the course is to provide an exposure to the engineering application of the basic concepts of thermodynamics. Providing major clues as to how the energy balance equation, concept of second law, entropy change and availability can be applied for solving practical problems is also a part of the objective. This course also provides an understanding of practical problem solving techniques for Carnot vapour cycle, Rankine cycle, Diesel cycle and auto cycle by applying the knowledge on properties of pure substance in all three phases and their behaviour in power cycles

AS

Course content

A) Chemical Thermodynamics

Section-1: Thermodynamics of Solid metallic oxide:

Thermodynamically controlled and Kinetically controlled product, Free energy diagram of polymorphic transformation of solid metallic oxide, Chemical potential and Electrode potential of solid oxides, Gibbs-Duhem relation and its application, Gibbs Helmholtz equation and its applicability in ceramic system.

Section-II: Thermodynamics of Solid State reactions:

Free energy diagram for solid state reactions like calcination, dehydroxylation etc. Stability of domain in different oxides phases, Ellingham Diagram, Chemical equilibrium and equilibrium constant, Reaction isotherm, Temperature dependence of equilibrium constant, Van't Hoff equation and its application

Section-III: Statistical Thermodynamics: Thermodynamics probability and Configurational entropy of crystalline solid, Third Law of thermodynamics and its application in ceramic compounds, Specific entropy of solid metallic oxides, Boltzman distribution Law, Partition function and its application

Section-IV: Phase Equilibrium: Phase, Component, Degree's of Freedom, Gibb's phase rule, Phase diagram of one and two component oxide system, Construction of different types of phase diagram, Eutectic and Peritectic reactions with examples. Congruent melting and incongruent melting of solid metallic oxides

B) Engineering Thermodynamics

Section 1:

Concept of energy and various forms of energy, first law applied to elementary processes, Control volume, steady flow process, mass and energy balance in simple steady flow process, application of steady flow process to nozzle, throttling device and turbine/compressor, variable flow processes.

Section 2:

Carnot cycle, efficiency of reversible heat engine, inequality of Clausius, entropy change in irreversible process, principle of increase of entropy, applications of entropy principle, available and unavailable energy, decrease in unavailable energy when heat is transferred through finite temperature difference, available energy from finite energy source, quality of energy, law of degradation of energy, maximum work in a reversible process

Section 3:

Thermodynamic properties of pure substance, P-V-T behaviour of simple compressible substance, ideal and real gas,

Section 4:

Carnot vapour cycle, Ideal Rankine cycle, Reheat Rankine cycle, Air-standard Otto and Diesel cycle.

Course outcome:

After successful completion of the course the student should be able to

- (a) Apply thermodynamic concepts to predict the stability of metal and metallic oxides and the possibility of solid state reactions
- (b) Apply the concept of configurational entropy and third Law of thermodynamics to detect imperfections in crystalline solids
- (c) Utilise the features of phase diagram in eutectic and peritectic system
- (d) Apply mass and energy balances to closed and open systems including various thermal devices such as nozzles, diffusers, turbines and compressors, for solving representative numerical problems.
- (e) Evaluate the performance of energy conversion devices using the concept of second law, entropy change and availability.
- (f) Solve problems involving different practical power cycles using the knowledge on the properties of pure substances like water and changes in properties of substances in various processes.

Books recommended:

1. Introduction to Ceramics— W. D. Kingery, H. K. Bowen & D. R. Uhlmann
2. Solid State Phase Transformation— V. Raghavan
3. Fundamentals of Ceramics—M. W. Barsoum
4. Physical Chemistry—P. C. Rakshit
5. Engineering Thermodynamics – P.K.Nag
6. Thermodynamics: An engineering approach- Yunus A Cengel; Michael A Boles

SCIENCES

ENVIRONMENTAL STUDIES [MC(CT)301]**PRE-REQUISITE:**

Class 12 standard knowledge of physics, chemistry, biology, mathematics

COURSE OBJECTIVE:

The objective of the course is to provide the students the knowledge as to why the study of environment is of great importance.

They will learn about problems of various types of pollution (anthropogenic and natural), loss of forest, degradation of land, waste disposal, global warming, depletion of ozone layer and loss of biodiversity i.e. degradation of Mother Earth made by the humans.

They will get to know about “Sustainable development”, i.e. meeting human goals along with sustaining the ability of natural systems to provide resources and services for mankind to survive.

Disaster management will help them to learn how to manage environmental hazards in the events of natural and anthropogenic calamities.

A6

Knowledge of Environmental Impact Assessment (EIA), which is mandatory for setting up new industries, and various Acts related to environmental protection will help the students in their professional life.

SYLLABUS OF ENVIRONMENTAL STUDIES [MC(CT)301]

27 LECTURES

MODULE 1: The Multidisciplinary nature of environmental studies

2 LECTURES

Definition, scope and importance, Need for public awareness.

MODULE 2: The Natural Resources

5 LECTURES

Renewable and non renewable resources:

a) Natural resources and associated problems

Forest resources: Use and over-exploitation, deforestation, mining, dams and their effects on forests and tribal people.

Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dam's benefits and problems.

Mineral Resources: Use and exploitation, environmental effects of extracting and using mineral resources.

Food Resources: World food problems, changes caused by agriculture and over grazing, effects of modern agriculture, fertilizers- pesticides problems, water logging, salinity.

Energy Resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources.

Land Resources: Land as a resource, land degradation, man induced landslides, soil erosion, and desertification.

b) Role of individual in conservation of natural resources.

c) Equitable use of resources for sustainable life styles.

MODULE 3: Eco Systems

5 LECTURES

a) Concept of an eco system: Understanding ecosystems, Ecosystem degradation, Resource utilisation

b) Structure and function of an eco system.

c) Producers, consumers, decomposers.

- d) Energy flow in the eco systems: Water cycle, Carbon cycle, Oxygen cycle, Nitrogen cycle, Energy cycle, Integration of cycles in nature
- e) Ecological succession.
- f) Food chains, food webs and ecological pyramids.
- g) Introduction, types, characteristic features, structure and function of (1) Forest ecosystem (ii) Grass land ecosystem (iii) Desert ecosystem (iv) Aquatic eco systems (ponds, streams, lakes, rivers, oceans, estuaries)

MODULE 4: Biodiversity and its Conservation

5 LECTURES

- (a) Introduction, Definition: genetic diversity, species diversity and ecosystem diversity.
- (b) Biogeographically classification of India.
- (c) Value of biodiversity: consumptive, productive, social, ethical
- (d) Biodiversity at global, national and local level.
- (e) India as a mega diversity nation.
- (f) Hot-spots of biodiversity.
- (g) Threats to biodiversity: habitats loss, poaching of wild life, man wildlife conflicts.
- (h) Endangered and endemic species of India.
- (i) Conservation of biodiversity: in-situ and ex-situ conservation of biodiversity.

MODULE 5: Environmental Pollution

6 LECTURES

- (a) Definition,
- (b) Causes, effects and control measures of: (1) Air pollution, (2) Water pollution, (3) Soil pollution, (4) Marine pollution, (5) Noise pollution, (6) Thermal pollution, (7) Nuclear hazards
- (c) Solid waste Management: Causes, effects and control measures of urban and industrial wastes.
- (d) Role of an individual in prevention of pollution.
- (e) Disaster management: Floods, earth quake, cyclone and landslides, industrial safety.

MODULE 6: Social issues and the Environment

4 LECTURES

- (a) Urban problems related to energy
- (b) Water conservation, rain water harvesting, water shed management



- (c) Resettlement and rehabilitation of people; its problems and concerns,
- (d) Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust
- (e) Wasteland reclamation
- (f) Consumerism and waste products
- (g) Environment protection Act
- (h) Air (prevention and control of pollution) Act
- (i) Water (prevention and control of pollution) Act
- (j) Wildlife protection act
- (k) Forest conservation act
- (l) Issues involved in enforcement of environmental legislations
- (m) Public awareness

Recommended Books:

1. Textbook of Environmental studies, Erach Bharucha, UGC
2. Fundamental concepts in Environmental Studies, D D Mishra, S Chand & Co Ltd

Powder Preparation & Chemical Analysis of Ceramic Raw Materials and Products Lab.: PCL (CT) 304

Pre-Requisite:

1. Class 12th standard knowledge of Inorganic Chemistry
2. Class 12th standard knowledge in basic Analytical Chemistry

Course Objective: The objective of the course is to acquire

- (a) Knowledge on synthesis of ultrapure ceramic powder by Sol-Gel process & process variable for gelation.
- (b) Knowledge on synthesis of ultrapure ceramic powder by Precipitation and co-precipitation techniques in relation with particle size.
- (c) Knowledge on synthesis of nano-crystalline ceramic powder by solution combustion techniques.
- (d) Knowledge of the different constituents present in different ceramic raw materials by analysing in complex metric method.
- (e) Knowledge of the different constituents present in fired ceramic products through different analysing methods.

List of Experiments of Powder Preparation Lab.

- 1 Synthesis of ultrapure Silica powder by Sol-Gel Method and effect of Catalyst on Gelation.
- 2 Synthesis of Alumino hydrogel by precipitation techniques and effect of precursor concentration on particle size.
- 3 Synthesis and characterisation of Alumina from Alumino hydrogel.
- 4 Synthesis of MAH gel & MgAl₂O₄ spinel by co-precipitation techniques
- 5 Synthesis of Nano crystalline ZnFe₂O₄ & Zn/Mg (Fe₂O₄) by solution combustion techniques.

List of Experiments of Chemical analysis Lab.

1. Estimation of SiO₂, Fe₂O₃, Al₂O₃, CaO and MgO in Lime stone/ Marble Dust
2. Estimation of SiO₂, Fe₂O₃, Al₂O₃, CaO and MgO in Dolomite.
3. Complete Analysis of Water Glass.



4. Quantitative analysis of Bauxite.
5. Determination of insoluble portion in Portland cement.
6. Determination of Free Lime content in Portland cement.
7. Complete analysis of Portland cement.
8. Quantitative analysis of Bauxite.
9. Complete Analysis of Soda-lime – silica glass.
10. Quantitative analysis of Blast Furnace Slag.
11. Quantitative analysis of Fly Ash.
12. Rapid estimation of silica in glass sand and glass.

Course Outcome:

After successful completion of the course the student should be able to understand

- (a) The importance of different techniques to synthesis of ultrapure ceramic powder
- (b) The importance of different processing parameter in relation with particle size.
- (c) The importance of synthesis of nano-crystalline ceramic powder
- (d) The chemical composition of various ceramic raw materials & products used in refractory and glass industry.
- (e) The complete analysis of Portland cement, free lime in Cement and insoluble materials content in OPC and Slag cement.
- (f) The composition of water glass and soda-lime-silica glass, blast furnace slag.
- (g) The percentage of silica in silica glass and glass sand.

Fuel Testing Lab(CT: 411)

Pre-Requisite:

1. Class 12th standard knowledge of physics and chemistry
2. Class 10th standard knowledge of basic mathematics

Course Objective:

The objective of the course is to provide the scope of doing experiments to determine some important basic characteristics of common fuels and lubricants being used for processing ceramic materials at high temperature

furnaces. Familiarising the students through printed manual (for each experiment) with the techniques and the major physical features along with the working principles of the instruments with which the said properties are determined is also a part of the objective.

List of Experiments:

1. Proximate Analysis of coal: Determination of Moisture, Volatile Matter, Ash and Fixed Carbon content of coal
2. Determination of Calorific Value of Coal/Oil
3. Studying the nature of change in Viscosity of lube oil at different temperatures
4. Determination of Flash Point and Fire Point of Fuel oils
5. Determination of Carbon Residue of Fuel Oil/Lube Oil
6. Performing Distillation Test for Petroleum Products

Course Outcome:

After successful completion of the course the student should be able to

- 1) Determine basic industrially important properties like calorific value and proximate analysis of solid fuel.
- 2) Determine basic industrially important properties of liquid fuel like Calorific value, flash point & fire point, boiling range etc.
- 3) Determine basic industrially important properties of lubricants like Carbon Residue, Viscosity and Temperature Relationship etc.

Books Recommended:

Respective IS manuals and the manuals provided in the fuel testing laboratory

Numerical Methods Lab

1. Assignments on Newton forward ,backward and Lagrange's interpolation.
2. Assignments on numerical integration using Trapezoidal rule,simpson's 1/3 rule ,weddle's rule.
3. Assignments on numerical solution of a system of linear equations using Gauss elimination and Gauss – seidel iterations.
4. Assignments on numerical solution of Algebraic Equation by Regular-Falsi and Newton Raphson methods.
5. Assignment on ordinary differential equation : Euler's and Runge- Kutta methods.
6. Introduction to software packages: C/Matlab/Labveiw/Mathematica.

Meeting of BOS of Ceramic Technology

8 messages

Rituparno Sen <rsen63@gmail.com>

31 December 2019 at 19:27

To: Krishnendu Chakrabarty <chakrabarty40@rediffmail.com>, RANJAN RAY <ranjanray1958@gmail.com>, srimantapatra <srimantapatra@yahoo.co.in>, Ram Chandra Das <rcdas1963@gmail.com>, Kaberi Das <kabdkd@yahoo.co.in>, Tapas Kumar Bhattacharya <tkb_ceramics@yahoo.co.in>, "mailme.drbsks" <mailme.drbsks@gmail.com>, guhap7 <guhap7@gmail.com>, indrani111 <indrani111@rediffmail.com>, Prasanta Dutta <prasanta1.dutta@trlkrosaki.com>, Siddhartha Mukherjee <smukherjee03ju@gmail.com>, ARUP GHOSH <arupcgcri1@gmail.com>, Srikrishna Manna <srikrishna@cgcri.res.in>, Sankar Ghatak <sankarcsir@gmail.com>, Krishnendu Dutta <krish_dutt@yahoo.co.in>

Respected Members,

Wish you Merry Christmas and a very happy and prospective New Year 2020..

I would like to intimate you all that Prof. Dr. D. Kumar of IIT, BHU has very kindly expressed his willingness to be associated with GCECT and as per advice from our Principal, Prof. Dr. Krishnendu Chakrabarty, I am happy to induct him in our Board of Studies of Ceramic Technology from now onward. Prof. Kumar would make himself available during such meetings and even some other times interact with students and faculties as well. This would strengthen the departmental activities, I believe.

As it is time to go in for detailing the 4th Sem syllabus, whose structure has been finalized in a meeting of BOS on 18.01.19, I would request faculties entrusted with teaching of the following subjects as detailed in the attachment to prepare draft syllabus of the subjects being taught by them and submit to me both hard and soft copies on or before 7th January' 2020 for compilation and placing before the **BOS meeting to be held on the 10th January' 2020 at 12.00 noon at the Conference room of the College.**

Unit Operation II - Prof. Ranjan Ray

Engg. Mat. Sc. - Prof. R. Sen

Processing of Ceramics - Dr. Kaberi Das and Dr. B. K. Sanfui

Metallurgy - Dr. T. K. Bhattacharyya and Dr. B. K. Sanfui

Process Calculations / Reactor Design - Prof. Ranjan Ray

Biology - Prof. R. Sen

Economics & Statistics - Prof. Indrani and Dr. Krishnendu Dutta


Unit Operation Lab - Prof. Ranjan Ray

Physical Testing and Instrumental Analysis - Prof. R. Sen, Prof R. C. Das and Dr. S. K. Patra

Kindly make it convenient to attend the meeting on 10th January and kindly send me the respective detailed syllabus by 7th January' 2020.

With best regards,

Rituparno Sen

 **Fourth Sem Syllabus.docx**
17K

Prithwijit Guha <guhap7@gmail.com>

31 December 2019 at 19:39

To: Rituparno Sen <rsen63@gmail.com>

Cc: Krishnendu Chakrabarty <chakrabarty40@rediffmail.com>, RANJAN RAY <ranjanray1958@gmail.com>, srimantapatra <srimantapatra@yahoo.co.in>, Ram Chandra Das <rcdas1963@gmail.com>, Kaberi Das <kabdkd@yahoo.co.in>, Tapas Kumar Bhattacharya <tkb_ceramics@yahoo.co.in>, "mailme.drbks" <mailme.drbks@gmail.com>, indrani111 <indrani111@rediffmail.com>, Prasanta Dutta <prasanta1.dutta@trlkrosaki.com>, Siddhartha Mukherjee <smukherjee03ju@gmail.com>, ARUP GHOSH <arupcgcri1@gmail.com>, Srikrishna Manna <srikrishna@cgcri.res.in>, Sankar Ghatak <sankarcsir@gmail.com>, Krishnendu Dutta <krish_dutt@yahoo.co.in>

If possible, share the current syllabus of those papers for upgradation for the benefit of all.

P.Guha

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Rituparno Sen <rsen63@gmail.com>

31 December 2019 at 19:40

To: Krishnendu Chakrabarty <chakrabarty40@rediffmail.com>, RANJAN RAY <ranjanray1958@gmail.com>, srimantapatra <srimantapatra@yahoo.co.in>, Ram Chandra Das <rcdas1963@gmail.com>, Kaberi Das <kabdkd@yahoo.co.in>, Tapas Kumar Bhattacharya <tkb_ceramics@yahoo.co.in>, "mailme.drbks" <mailme.drbks@gmail.com>, guhap7 <guhap7@gmail.com>, indrani111 <indrani111@rediffmail.com>, Prasanta Dutta <prasanta1.dutta@trlkrosaki.com>, Siddhartha Mukherjee <smukherjee03ju@gmail.com>, ARUP GHOSH <arupcgcri1@gmail.com>, Srikrishna Manna <srikrishna@cgcri.res.in>, Sankar Ghatak <sankarcsir@gmail.com>, Krishnendu Dutta <krish_dutt@yahoo.co.in>

I am sorry, mistakenly I have written PROSPECTIVE NEW YEAR.

Wish you all HAPPY AND PROSPEROUS NEW YEAR.

Excuse me for the mistake in haste.

Regards,

[Quoted text hidden]

Rituparno Sen <rsen63@gmail.com>

31 December 2019 at 19:41

To: Prithwijit Guha <guhap7@gmail.com>

Cc: Krishnendu Chakrabarty <chakrabarty40@rediffmail.com>, RANJAN RAY <ranjanray1958@gmail.com>, srimantapatra <srimantapatra@yahoo.co.in>, Ram Chandra Das <rcdas1963@gmail.com>, Kaberi Das <kabdkd@yahoo.co.in>, Tapas Kumar Bhattacharya <tkb_ceramics@yahoo.co.in>, "mailme.drbks" <mailme.drbks@gmail.com>, indrani111 <indrani111@rediffmail.com>, Prasanta Dutta <prasanta1.dutta@trlkrosaki.com>, Siddhartha Mukherjee <smukherjee03ju@gmail.com>, ARUP GHOSH <arupcgcri1@gmail.com>, Srikrishna Manna <srikrishna@cgcri.res.in>, Sankar Ghatak <sankarcsir@gmail.com>, Krishnendu Dutta <krish_dutt@yahoo.co.in>

Sure, will do that.

[Quoted text hidden]

Rituparno Sen <rsen63@gmail.com>

31 December 2019 at 19:42

To: Prithwijit Guha <guhap7@gmail.com>

Cc: Krishnendu Chakrabarty <chakrabarty40@rediffmail.com>, RANJAN RAY <ranjanray1958@gmail.com>, srimantapatra <srimantapatra@yahoo.co.in>, Ram Chandra Das <rcdas1963@gmail.com>, Kaberi Das

<kabdkd@yahoo.co.in>, Tapas Kumar Bhattacharya <tkb_ceramics@yahoo.co.in>, "mailme.drbs" <mailme.drbs@gmail.com>, indrani111 <indrani111@rediffmail.com>, Prasanta Dutta <prasanta1.dutta@trlkrosaki.com>, Siddhartha Mukherjee <smukherjee03ju@gmail.com>, ARUP GHOSH <arupcgcri1@gmail.com>, Srikrishna Manna <srikrishna@cgcri.res.in>, Sankar Ghatak <sankarcsir@gmail.com>, Krishnendu Dutta <krish_dutt@yahoo.co.in>

It is already available in the College website, Sir.

☺

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Prasanta Dutta <prasanta1.dutta@trlkrosaki.com>
To: Rituparno Sen <rsen63@gmail.com>

1 January 2020 at 11:51

Dear Dr. Sen,
Thanks for the communication.
To inform you that on 10th Jan'20 I will not be able to attend the BOS meeting due to some pre occupation.

With best regards,

Prasanta

Get Outlook for Android

From: Rituparno Sen <rsen63@gmail.com>
Sent: Tuesday, December 31, 2019 7:27:26 PM
To: Krishnendu Chakrabarty <chakrabarty40@rediffmail.com>; RANJAN RAY <ranjanray1958@gmail.com>; srimantapatra <srimantapatra@yahoo.co.in>; Ram Chandra Das <rcdas1963@gmail.com>; Kaberi Das <kabdkd@yahoo.co.in>; Tapas Kumar Bhattacharya <tkb_ceramics@yahoo.co.in>; mailme.drbs <mailme.drbs@gmail.com>; guhap7 <guhap7@gmail.com>; indrani111 <indrani111@rediffmail.com>; Prasanta Dutta <prasanta1.dutta@trlkrosaki.com>; Siddhartha Mukherjee <smukherjee03ju@gmail.com>; ARUP GHOSH <arupcgcri1@gmail.com>; Srikrishna Manna <srikrishna@cgcri.res.in>; Sankar Ghatak <sankarcsir@gmail.com>; Krishnendu Dutta <krish_dutt@yahoo.co.in>
Subject: Meeting of BOS of Ceramic Technology

[Quoted text hidden]


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Rituparno Sen <rsen63@gmail.com>
To: Partha Haldar <partha.jumech@gmail.com>

2 January 2020 at 12:26

----- Forwarded message -----
From: **Rituparno Sen** <rsen63@gmail.com>
Date: Tue, Dec 31, 2019, 7:27 PM
Subject: Meeting of BOS of Ceramic Technology
[Quoted text hidden]
[Quoted text hidden]

 **Fourth Sem Syllabus.docx**
17K

Rituparno Sen <rsen63@gmail.com>

9 January 2020 at 19:58

To: RANJAN RAY <ranjanray1958@gmail.com>

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

From: **Rituparno Sen** <rsen63@gmail.com>

Date: Tue, Dec 31, 2019, 7:27 PM

Subject: Meeting of BOS of Ceramic Technology

To: Krishnendu Chakrabarty <chakrabarty40@rediffmail.com>, RANJAN RAY <ranjanray1958@gmail.com>, srimantapatra <srimantapatra@yahoo.co.in>, Ram Chandra Das <rcdas1963@gmail.com>, Kaberi Das <kabdkd@yahoo.co.in>, Tapas Kumar Bhattacharya <tkb_ceramics@yahoo.co.in>, mailme.drbks <mailme.drbks@gmail.com>, guhap7 <guhap7@gmail.com>, indrani111 <indrani111@rediffmail.com>, Prasanta Dutta <prasanta1.dutta@trlkrosaki.com>, Siddhartha Mukherjee <smukherjee03ju@gmail.com>, ARUP GHOSH <arupcgcri1@gmail.com>, Srikrishna Manna <srikrishna@cgcri.res.in>, Sankar Ghatak <sankarcsir@gmail.com>, Krishnendu Dutta <krish_dutt@yahoo.co.in>

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Fourth Sem Syllabus.docx

17K

MEMBERS PRESENT AT THE MEETING OF BOS on 10th January' 2020 at 12.00 O'clock

2.

3. Srimanta Kr. Patra ~~Patra~~ 10/01/2020
4. Ram Chandra Das 10/01/2020

5. B.K. Samal ~~Samal~~ 10/01/2020
6. Arup Ghosh ~~Arup Ghosh~~ 10/01/2020

7. Raju by Raju 10/01/2020
8. T.K. Bhattacharya ~~Bhattacharya~~ 10/01/2020

9. Sangita Choudhury ~~Choudhury~~ 10/01/2020
10. Kaleri Das ~~Kaleri~~ 10/01/2020

11. PRITHWIJIT GUHA ~~Guha~~ 10/01/2020
12. Pappu Halder ~~Halder~~ 10/01/2020

13. Dewendra Kumar ~~Dewendra~~ 10/01/2020
14. Madhusudan Dutta

15.
16.
17.
18.

Prof. Debendra Kumar has kindly consented to become an inducted member of BOS. He will attend subsequent meetings of BOS according to his convenience.

The Chairman of BOS, Prof. R. Sen discussed the salient features of the ~~a~~ new syllabus ~~of~~ which was ~~is~~ partially completed. 4th semester syllabus preparation is underway.

So far the ~~as the~~ courses to be chosen by the students for additional credits to get honours, Prof. Kumar suggested that a student be allowed to choose randomly from the courses offered and make a list and submit it to the Dept. well in advance. The Dept. will approve finally the courses ~~to be taken~~ from the list. The students should be asked to submit the.

The ~~a~~ details syllabus of Biology, as prepared by the teachers of Biology was also discussed. A rough ~~draft~~ draft was prepared. The Biology teacher was asked to prepare the draft freshly because it was felt many components would not be suitable for ceramic engineers and the total contents appears to be very heavy which was very difficult to cover ~~in~~ within 24-28 classes (it is a 2 credit paper).

Prof. Kumar also suggested possibility of introduction of experiment based small projects so that the students would be able to prepare material using experimental techniques. This is for imparting practical skill. It may be a non-credit paper.

Some papers for which draft syllabus have been prepared were also discussed.

No decision could be arrived at regarding course content of reactor design. It has to be decided whether we could think of an alternative.

Prof T.K.B suggested introduction of Industrial Ceramics and it was unanimously accepted. In place of Reactor design, Introduction to Industrial Ceramics. Prof. Kumar suggested requisition of service from industry for taking part in teaching this paper.

Confirmed


7/4/70

(55)

GOVERNMENT OF WEST BENGAL
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Date: April 3, 2020

NOTICE

A meeting of the Board of Studies of Ceramic Technology, Govt. College of Engineering & Ceramic Technology, Kolkata is scheduled to be held on 7th April, 2020 (Tuesday) at 04.00 p.m. through online mode to discuss the following agenda. The link for joining the meeting will be shared in due course of time.

- Agenda :
- (1) Finalization and approval of 4th Semester and 5th Semester C. T. detailed syllabi of Ceramic Technology (B. Tech)
 - (2) Miscellaneous.

All Members are hereby requested to make it convenient to attend the meeting.

All concerned are being informed accordingly.

Sd/-

[Dr. Rituparna Sen]
Convener, B.O.S.

Govt. College of Engineering & Ceramic Technology
Govt. of West Bengal

Copy forwarded for information and necessary information to:-

1. Dr. Srimanta Kumar Patra - Member
2. Dr. T. K. Bhattacharya - Member
3. Prof. Ranjan Ray - Member
4. Prof. R. C. Das - Member
5. Dr. Kaberi Das - Member
6. Dr. B. K. Sanfui - Member
7. Dr. Arup Ghosh - Member
8. Dr. Shankar Ghatak - Member
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10. Dr. Srikrishna Manna - Member
11. Mr. Prasanta Dutta - Member
12. Ms. Ruma Mullick - Member
13. Mr. Pappu Halder - Member
14. Ms. Sangita Ghosh - Member
15. Dr. K. Chakrabarty - Principal

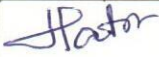
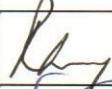

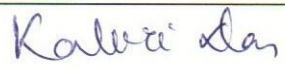









[Dr. Rituparna Sen]
Convener, B.O.S.

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**Members of Board of Studies present during the meeting held on 7th April,
2020 through online mode**

Sl. No.	N a m e	Position	Signature
1.	Dr. Srimanta Kumar Patra	Member	
2.	Dr. T. K. Bhattacharya	Member	
3.	Prof. Ranjan Ray	Member	
4.	Prof. R. C. Das	Member	
5.	Dr. Kaberi Das	Member	
6.	Dr. B. K. Sanfui	Member	
7.	Dr. Arup Ghosh	Member	
8.	Dr. Shankar Ghatak	Member	
9.	Dr. S. Mukherjee	Member	
10.	Dr. Srikrishna Manna	Member	
11.	Mr. Prasanta Dutta	Member	
12.	Ms. Ruma Mullick	Member	
13.	Mr. Pappu Halder	Member	
14.	Ms. Sangita Ghosh	Member	
15.	Dr. K. Chakrabarty	Principal	
16.	Dr. Rituparna Sen	Convener	

17. Dr. Madhusudan Dutta



Minutes of the BOS meeting held online on ~~29th September 20~~ 7th April 2020

Members attended:

1. Dr. Rituparno L - Chairman BOS
2. Dr. Kaberi Das
3. Prof R. C. Das
4. Prof. Ranjan Ray
5. Dr. S. K. Patra
6. Dr. B. K. Sanfui
7. Dr. T. K. Bhattacharya
8. Dr. Arup Ghosh
9. Mr. Parasanta Dutta.

The Chairman, BOS narrated the minutes of the meeting held on the 10th January, 2020 and subsequently it was confirmed.

During the meeting of 10th Jan'20, the task of preparation of B.Tech (New) 4th Sem syllabus was underway and few modifications were suggested. Keeping that in mind the final detailed syllabus of CT 4th Sem has been placed for approval by BOS and subsequently been approved.

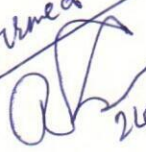
BOS advised faculty members to prepare the detailed syllabi of B.Tech 5th Sem CT, which would run from July '20 - Dec'20. Members of faculty intimated that the detailing of subjects of CT 5th Sem is underway and would be produced in the next meeting of BOS. ~~list of paper pattern (int & ext) and moderators have been approved.~~

~~The meeting ended with vote of thanks to the Chair.~~

Due to outbreak of Covid-19 pandemic, method of teaching has to be ⁱⁿ online mode. Google classroom has been ~~planned~~ ^{planned} by the institute for taking classes.

Examinations for the semesters have been planned to be taken in online mode and SOP for taking online examinations would be prepared.

~~Confirmed~~


24.11.20

②

Date: November 20, 2020

NOTICE

A meeting of the Board of Studies of Ceramic Technology, Govt. College of Engineering & Ceramic Technology, Kolkata is scheduled to be held on 24th November, 2020 (Tuesday) at 04.00 p.m. through online mode to discuss the following agenda. The link for joining the meeting will be shared in due course of time.

- Agenda :
- (1) Finalization and approval of 6th Semester C. T. detailed syllabus of Ceramic Technology (B. Tech)
 - (2) Miscellaneous.

All Members are hereby requested to make it convenient to attend the meeting.

All concerned are being informed accordingly.

Sd/-

[Dr. Rituparna Sen]

Convener, B.O.S.

Govt. College of Engineering & Ceramic Technology
Govt. of West Bengal

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11. Mr. Prasanta Dutta - Member
12. Ms. Ruma Mullick - Member
13. Mr. Pappu Halder - Member
14. Ms. Sangita Ghosh - Member
15. Dr. K. Chakrabarty - Principal







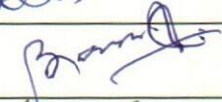
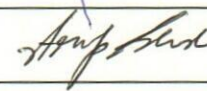
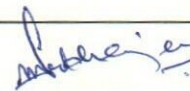
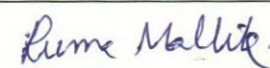
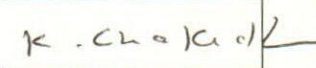

[Dr. Rituparna Sen]

Convener, B.O.S.

Govt. College of Engineering & Ceramic Technology
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**Members of Board of Studies present during the meeting held on 24th
November, 2020 through online mode**

Sl. No.	Name	Position	Signature
1.	Dr. Srimanta Kumar Patra	Member	
2.	Dr. T. K. Bhattacharya	Member	
3.	Prof. Ranjan Ray	Member	
4.	Prof. R. C. Das	Member	
5.	Dr. Kaberi Das	Member	
6.	Dr. B. K. Sanfui	Member	
7.	Dr. Arup Ghosh	Member	
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13.	Mr. Pappu Halder	Member	
14.	Ms. Sangita Ghosh	Member	
15.	Dr. K. Chakrabarty	Principal	
16.	Dr. Rituparna Sen	Convener	

17. Dr. Dr. Mochhusudan Dutta

Mochhusudan Dutta.

Minutes of BOS meeting of Department of Ceramic Technology, held on 24.11.2020

Dr. R. Sen, as chairman BOS narrated the minutes of the previous online meeting held on 7th April' 2020 in which B. Tech. 4th& 5thsem detailed syllabi are confirmed.

Due to outbreak of COVID 19 pandemic and nationwide lock down, institute had to be shut and academic activities were being continued in Google classroom through official license of GSuite of the college.


Examinations of intermediate and final semesters are to be taken in online method, approved officially by the academic council of the institute.

Dr.Senhas presented the detailed syllabi of 6thSem CT including following new courses;

- a) Refractories for non-ferrous and allied industries as elective
- b) Environment Engg and Management
- c) Indian Constitution
- d) Instrumentation & process control
- e) Cement, concrete & monolithic
- f) Cement, concrete & monolithic lab

After few nominal corrections and typographical errors and codes of subjects, it is accepted and approved by the BOS members.

The meeting ended with vote of thanks to the Chairman.

Confirmed

4/5/21

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Date: April 30, 2021

NOTICE

A meeting of the Board of Studies of Ceramic Technology, Govt. College of Engineering & Ceramic Technology, Kolkata is scheduled to be held on 4th May, 2021 (Tuesday) at 04.00 p.m. through online mode to discuss the following agenda. The link for joining the meeting will be shared in due course of time.

- Agenda :
- (1) Finalization and approval of 7th Semester C. T. detailed syllabus of Ceramic Technology (B. Tech)
 - (2) Miscellaneous.


All Members are hereby requested to make it convenient to attend the meeting.

All concerned are being informed accordingly.

Sd/-
[Dr. Rituparna Sen]
Convener, B.O.S.
Govt. College of Engineering & Ceramic Technology
Govt. of West Bengal

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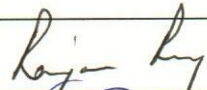

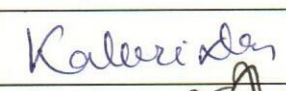
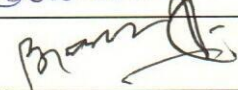
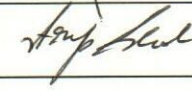
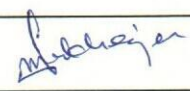
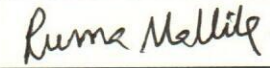

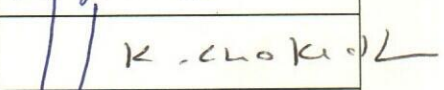

1. Dr. Srimanta Kumar Patra - Member
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11. Mr. Prasanta Dutta - Member
12. Ms. Ruma Mullick - Member
13. Mr. Pappu Halder - Member
14. Ms. Sangita Ghosh - Member
15. Dr. K. Chakrabarty - Principal


[Dr. Rituparna Sen]
Convener, B.O.S.

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**Members of Board of Studies present during the meeting held on 4th May,
2021 through online mode**

Sl. No.	N a m e	Position	Signature
1.	Dr. Srimanta Kumar Patra	Member	
2.	Dr. T. K. Bhattacharya	Member	
3.	Prof. Ranjan Ray	Member	
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12.	Ms. Ruma Mullick	Member	
13.	Mr. Pappu Halder	Member	
14.	Ms. Sangita Ghosh	Member	
15.	Dr. K. Chakrabarty	Principal	
16.	Dr. Rituparna Sen	Convener	

17. Dr. Madhusudan Dutta

Madhusudan Dutta,

Minutes of BOS meeting of Department of Ceramic Technology, held on 04.05.2021

Prof. Sen, Chairman BOS, read out minutes of previous meeting which was held on 24th November'2020 and confirmed.

Detailed syllabus of 7th semester has been presented by the chairman, discussed in details and finally accepted with minor changes.

The following new courses have been introduced;

- a) Computational Material Science
- b) Characterisation of Materials
- c) Internet of things
- d) Machine learning
- e) Fundamental of Business management

Meeting ended with thanks to all the members.

Confirmed
Chairman L
17.11.2021

Date: November 12, 2021

NOTICE

A meeting of the Board of Studies of Ceramic Technology, Govt. College of Engineering & Ceramic Technology, Kolkata is scheduled to be held on 17th November, 2021 (Wednesday) at 04.00 p.m. through online mode to discuss the following agenda. The link for joining the meeting will be shared in due course of time.

- Agenda :
- (1) Finalization and approval of 8th Semester C. T. detailed syllabus of Ceramic Technology (B. Tech)
 - (2) Miscellaneous.

All Members are hereby requested to make it convenient to attend the meeting.

All concerned are being informed accordingly.

Sd/-

[Dr. Rituparna Sen]
Convener, B.O.S.

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14. Ms. Sangita Ghosh - Member
15. Dr. K. Chakrabarty - Principal

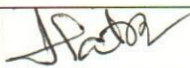


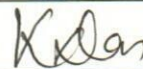
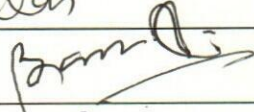
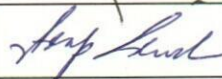

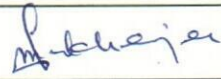


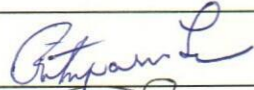


[Dr. Rituparna Sen]
Convener, B.O.S.

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**Members of Board of Studies present during the meeting held on 17th
 November, 2021 through online mode**

Sl. No.	Name	Position	Signature
1.	Dr. Srimanta Kumar Patra	Member	
2.	Dr. T. K. Bhattacharya	Member	
3.	Prof. Ranjan Ray	Member	
4.	Prof. R. C. Das	Member	
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13.	Mr. Pappu Halder	Member	
14.	Ms. Sangita Ghosh	Member	
15.	Dr. K. Chakrabarty	Principal	
16.	Dr. Rituparna Sen	Convener	

17. Dr. Debdarpan Khan Member

18. Dr. Madhusudan Dutta


 Madhusudan Dutta

Minutes of BOS meeting of Department of Ceramic Technology, held on 17.11.2021

1. Chairman of BOS, Prof. Sen read out last meeting minutes, held on 4th May'2021 and confirmed.
2. Dr.Senhas presented detailed syllabi of 8th semester for the following newly introduced courses;
 - a) Ceramic plant and equipment design
 - b) Furnace and kiln design
3. A flexible academic programme has been finalized in the 8th semester syllabus as provisions have been made for internship in industries during 8th semester with a view to promoting enhanced Industry-Institute interaction.

After detailed discussion, syllabi have been approved by the members.

Meeting ended with thanks to all the members.

Confirmed

Chairman
8/3/22

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Date: March 4, 2022

NOTICE

A meeting of the Board of Studies of Ceramic Technology, Govt. College of Engineering & Ceramic Technology, Kolkata is scheduled to be held on 8th March, 2022 (Tuesday) at 04.00 p.m. through online mode to discuss the following agenda. The link for joining the meeting will be shared in due course of time.

- Agenda :
- (1) Finalizing the course outcomes of individual courses of B. Tech., Ceramic Technology
 - (2) Miscellaneous.

All Members are hereby requested to make it convenient to attend the meeting.

All concerned are being informed accordingly.

Sd/-

[Dr. Rituparna Sen]
Convener, B.O.S.

Govt. College of Engineering & Ceramic Technology
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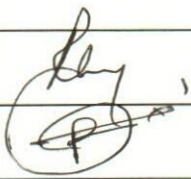
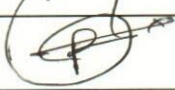
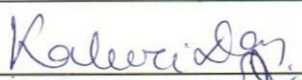
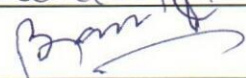

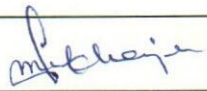
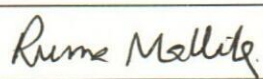
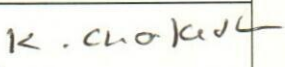

 4.3.22

[Dr. Rituparna Sen]
Convener, B.O.S.

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Govt. of West Bengal

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**Members of Board of Studies present during the meeting held on 8th
March, 2022 through online mode**

Sl. No.	Name	Position	Signature
1.	Dr. Srimanta Kumar Patra	Member	
2.	Dr. T. K. Bhattacharya	Member	
3.	Prof. Ranjan Ray	Member	
4.	Prof. R. C. Das	Member	
5.	Dr. Kaberi Das	Member	
6.	Dr. B. K. Sanfui	Member	
7.	Dr. Arup Ghosh	Member	
8.	Dr. Shankar Ghatak	Member	
9.	Dr. S. Mukherjee	Member	
10.	Dr. Srikrishna Manna	Member	
11.	Mr. Prasanta Dutta	Member	
12.	Ms. Ruma Mullick	Member	
13.	Mr. Pappu Halder	Member	
14.	Ms. Sangita Ghosh	Member	
15.	Dr. K. Chakrabarty	Principal	
16.	Dr. Rituparna Sen	Convener	

17. Dr. Madhusudan Dutta.

Madhusudan Dutta.

Minutes of BOS meeting of Department of Ceramic Technology, held on 08.03.2022

1. Chairman of BOS, Prof. Senhas read out last meeting minutes, held on 17th November'2021 and confirmed by the members.
2. Principal Sirhas briefed how to write course objectives as well as course outcomes.
3. Prof. Sen, HOD-Ceramic Dept. has presented draft course objectives and course outcomes for the papers, taught by him.
4. After long discussion, prerequisite, course objectives and course outcomes of all the papers of B.Tech-Ceramic Technology are discussed and finalised in presence of principal Sir.

Meeting ended with thanks to all the members.

Confirmed

Prof. Senhas
16/5/2023