TECHNICAL EDUCATION DEPARTMENT

GOVERNMENT OF GUJARAT

DR. S. & S. S. GHANDHY COLLEGE OF ENGG. & TECH., SURAT

Affiliated to

GUJARAT TECHNOLOGICAL UNIVERSITY

METALLURGYDEPARTMENT

(NBA ACCRIDITED)

BOOKLET

AS PER NEW GTU CURRICULUM 2021 ONWARDS





METALLURGY DEPARTMENT

ABOUT DEPARTMENT

In 1965, the Metallurgy Department was established at Dr. S. & S. S. Ghandhy College of Engineering and Technology, Surat, in South Gujarat. It stands as the sole institute offering a diploma program in metallurgy in Gujarat. The institute operates under the governance of the Department of Technical Education, Government of Gujarat. The Diploma Metallurgy program is duly approved by the All India Council for Technical Education (AICTE), New Delhi, and is affiliated with Gujarat Technological University, Ahmedabad.

The Metallurgy Department is dedicated to meeting the increasing global demand for skilled human resources in the field of metals. Metallurgy encompasses the production, properties, uses, shaping, and treatment of metals and their alloys. The faculty members of the department are highly educated, with one faculty member having completed her Ph.D., and most others are registered for Ph.D. programs. Since its establishment, the department has seen its alumni successfully placed in various industries and academic institutions.

In recognition of its excellence, the Metallurgy Department obtained accreditation from the National Board of Accreditation (NBA) in 2008. Subsequently, it also received NBA accreditation for the period spanning 21-22 to 23-24.

STUDENT INTAKE/YEAR:

Name of Department	Year	Student Intake
Metallurgy Department	1965	30
	2004	62

DURATION OF COURSE:

03 years, six semesters (including one full term industrial training in sixth semester as per old syllabus and Industrial internship in semester 3 and 5 as per new GTU curriculum).

ENTRY LEVEL:

1. 10th Standard Pass (1st Sem. Entry)
2. Certificate course of duration 2 years from ITI (3rd Sem. Entry)

ADMISSION:

Admission through Central Admission Committee for Professional Diploma Courses on the basis of state level merit List. **For More information visit www.acpdc.co.in**

VISION:

"To lead in diploma metallurgical engineering education with focus on innovation and sustainable development of industry and society".

MISSION:

- To impart and empower students with relevant knowledge, competence and creativity with special emphasis on metallurgical engineering.
- To promote conducive environment for all round development of students.
- To promote linkages with external agencies to meet changing needs of industry and society.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs):

- The metallurgy diploma graduate will be able to make successful career in metallurgical industry to meet ever changing needs of industry.
- To enable diploma graduate for lifelong learning and higher studies.
- Identifying and engage in innovation, become an entrepreneur for sustainable development of society.

PROGRAM SPECIFIC OUTCOMES (PSOs):

- Apply the fundamental knowledge of metallurgy for the benefit of society, industries and research organizations.
- Diploma holders will be able to select suitable techniques for testing of metals and alloys.

PROGRAM OUTCOMES (POs):

1. **Basic and Discipline specific knowledge:** Apply knowledge of basic mathematics, science and engineering fundamentals and engineering specialization to solve the engineering problems.
2. **Problem analysis:** Identify and analyse well-defined engineering problems using codified standard methods.
3. **Design/ development of solutions:** Design solutions for well-defined technical problems and assist with the design of systems components or processes to meet specified needs.
4. **Engineering Tools, Experimentation and Testing:** Apply modern engineering tools and appropriate technique to conduct standard tests and measurements.
5. **Engineering practices for society, sustainability and environment:** Apply appropriate technology in context of society, sustainability, environment and ethical practices.
6. **Project Management:** Use engineering management principles individually, as a team member or a leader to manage projects and effectively communicate about well-defined engineering activities.
7. **Life-long learning:** Ability to analyse individual needs and engage in updating in the context of technological changes.

TEACHING SCHEME FOR DIPLOMA IN METALLURGY ENGINEERING

SEMESTER – I										
COURSE CODE	COURSE TITLE	TEACHING SCHEME/WEEK			CREDITS (L+T+P)	EXAMINATION SCHEME				
						THEORY		PRACTICAL		TOTAL
		L	T	P		E	M	I	V	
4300001	MATHEMATICS	3	1	0	4	70	30	0	0	100
4300002	COMMUMICATIOM SKILLS IN ENGLISH	2	0	2	3	70	30	25	25	150
4300009	APPLIDE CHEMISTRY	3	0	2	4	70	30	25	25	150
4300013	BASIC ENGINEERING DRAWING AND GRAPHICS	2	0	4	4	70	30	25	25	150

4300015	SPORTS AND YOGA	0	0	2	0	0	0	50	0	50
4301901	ENGINEERING WORKSHOP PRACTICE	0	0	4	2	0	0	25	25	50
4312101	INTRODUCTION TO ENGINEERING MATERIALS	3	1	0	4	70	30	0	0	100
TOTAL					**21**	**350**	**150**	**150**	**100**	**750**

SEMESTER – II										
COURSE CODE	**COURSE TITLE**	**TEACHING SCHEME/WEEK**			**CREDITS (L+T+P)**	**EXAMINATION SCHEME**				
						THEORY		**PRACTICAL**		**TOTAL**
		L	**T**	**P**		**E**	**M**	**I**	**V**	
4300003	ENVIRONMENT AND SUSTAINABILITY	3	0	0	3	70	30	0	0	100
4300004	APPLIED PHYSICS	3	0	2	4	70	30	25	25	150
4300008	ENGINERING MECHANICS	3	**0**	2	4	70	30	25	25	150
4300010	BASICS OF INFORMATION AND COMMUNICATION TECHNOLOGY	0	0	4	2	0	0	25	25	50
4300014	BASICS OF ELECTRICAL AND ELECTRONIC ENGINEERING	0	2	2	3	0	0	25	25	50
4300016	INDIAN CONSTITUTION	2	0	0	0	0	0	50	0	50
4300017	BASICS OF MECHANICAL ENGINEERING	0	2	2	3	0	0	25	25	50
4322101	PHYSICAL METALLURGY-1	3	0	0	3	70	30	0	0	100
TOTAL					22	280	120	175	125	700

SEMESTER – III										
COURSE CODE	**COURSE TITLE**	**TEACHING SCHEME/WEEK**			**CREDITS (L+T+P)**	**EXAMINATION SCHEME**				
						THEORY		**PRACTICAL**		**TOTAL**
		L	**T**	**P**		**E**	**M**	**I**	**V**	
4330001	SUMMER INTERNSHIP-I	0	0	2	1	0	0	25	25	50

4332101	MINERAL PROCESSING	3	0	2	4	70	30	25	25	150
4332102	PHYSICAL METALLURGY-II	3	0	4	5	70	30	50	50	200
4332103	JOINING OF METAL	4	0	4	6	70	30	50	50	200
4332104	FUEL FURNACES AND REFRACTORIES	3	0	0	3	70	30	0	0	100
4332105	METAL FORMING PROCESS	3	1	0	4	70	30	0	0	100
TOTAL		**16**	**1**	**12**	**23**	**350**	**150**	**200**	**200**	**800**

SEMESTER – IV										
COURSE CODE	**COURSE TITLE**	**TEACHING SCHEME/WEEK**			**CREDITS (L+T+P)**	**EXAMINATION SCHEME**				
						THEORY		**PRACTICAL**		**TOTAL**
		L	**T**	**P**		**E**	**M**	**I**	**V**	
4340001	ESSENCE OF INDIAN KNOWLEDGE AND TRADITION(ELECTIVE -1)	2	0	0	2	70	30	25	25	150
4340002	CONTRIBUTOR PERSONALITY DEVELPOMENT(ELECTIVE-2)	2	0	0	2	70	30	25	25	150
4340003	INTEGRATED PERSONALITY DEVELPOMENT COURSE(ELECTIVE-3)	2	0	0	2	70	30	25	25	150
4342101	FOUNDRY TECHNOLOGY	3	0	4	5	70	30	50	50	200
4342102	DESTRUCTIVE TESTING	2	0	4	4	70	30	50	50	200
4342103	HEAT TREATMENTS	3	0	4	5	70	30	50	50	200
4342104	IRON MAKING	3	0	0	3	70	30	0	0	100
4342105	NON FERROUS EXTRACTIVE METALLURGY	2	0	0	2	70	30	0	0	100
TOTAL		**19**	**0**	**12**	**25**	**560**	**240**	**225**	**225**	**1250**

SEMESTER – V										
COURSE CODE	COURSE TITLE	TEACHING SCHEME/WEEK			CREDITS (L+T+P)	EXAMINATION SCHEME				
						THEORY		PRACTICAL		TOTAL
		L	T	P		E	M	I	V	
4300021	INTERNSHIP AND START - UPS	3	0	0	3	70	30	0	0	100
4352101	STEEL MAKING	3	0	0	3	70	30	0	0	100
4352102	CORROSIO0N OF METAL	3	0	4	5	70	30	50	50	200
4352103	NON DESTRUCTIVE TESTING	2	0	2	3	70	30	25	25	150
4352104	SUMMER INTERNSHIP-II	0	0	6	3	0	0	50	50	100
4352105	ADVANCE HEAT TREATMENT (Elective 1)	2	0	2	3	70	30	25	25	150
4352106	ADVANCE FOUNDRY (Elective 2)	2	0	2	3	70	30	25	25	150
4352407	MATERIAL CHARACTERIZATION (Elective 3)	2	0	2	3	70	30	25	25	150
TOTAL		**17**	**0**	**18**	**26**	**350**	**120**	**200**	**200**	**1100**

SEMESTER – VI										
COURSE CODE	COURSE TITLE	TEACHING SCHEME/WEEK			CREDITS (L+T+P)	EXAMINATION SCHEME				
						THEORY		PRACTICAL		TOTAL
		L	T	P		E	M	I	V	
4362101	ALLOY STEEL	3	0	2	4	70	30	25	25	150
4362102	INTRODUCTION TO FAILURE ANALYSIS	2	0	2	3	70	30	25	25	150
4362103	POWDER METALLURGY	2	0	2	3	70	30	25	25	150
4362104	METALLURGICAL ENGINEERING PROJECT	0	0	8	4	0	0	100	100	200
4362105	COMPOSITE MATERIAL (Elective 1)	2	0	0	2	70	30	0	0	100

4362106	SURFACE ENGINEERING (Elective 2)	2	0	0	2	70	30	0	0	100
4362107	METALLURGY THERMODYNAMICS (Elective 3)	2	0	0	2	70	30	0	0	100
TOTAL		**13**	**0**	**14**	**20**	**350**	**180**	**175**	**175**	**950**

BRIDGE COURSE FOR C2D STUDENTS

SEMESTER – I										
COURSE CODE	**COURSE TITLE**	**TEACHING SCHEME/WEEK**			**CREDITS (L+T+P)**	**EXAMINATION SCHEME**				
						THEORY		**PRACTICAL**		**GRAND TOTAL**
		L	**T**	**P**		**E**	**M**	**I**	**V**	
C400001	MATHEMATICS	3	1	0	4	70	30	0	0	100
C400002	COMMUMICATION SKILLS IN ENGLISH	2	0	2	3	70	30	25	25	150
C400009	APPLIDE CHEMISTRY	3	0	2	4	70	30	25	25	150
C400013	BASIC ENGINEERING DRAWING AND GRAPHICS	2	0	4	4	70	30	25	25	150
C400015	SPORTS AND YOGA	0	0	2	0	0	0	50	0	50
C4301901	ENGINEERING WORKSHOP PRACTICE	0	0	4	2	0	0	25	25	50
C4312101	INTRODUCTION TO ENGINEERING MATERIALS	3	1	0	4	70	30	0	0	100
TOTAL		**13**	**2**	**14**	**21**	**350**	**150**	**150**	**100**	**750**

SEMESTER – II										
COURSE CODE	**COURSE TITLE**	**TEACHING SCHEME/WEEK**			**CREDITS (L+T+P)**	**EXAMINATION SCHEME**				
						THEORY		**PRACTICAL**		**GRAND TOTAL**
		L	**T**	**P**		**E**	**M**	**I**	**V**	
C4300003	ENVIRONMENT AND SUSTAINABILITY	3	0	0	3	70	30	0	0	100
C4300004	APPLIED PHYSICS	3	0	2	4	70	30	25	25	150

C4300008	ENGINERING MECHANICS	3	0	2	4	70	30	25	25	150
C4300010	BASICS OF INFORMATION AND COMMUNICATION TECHNOLOGY	0	0	4	2	0	0	25	25	50
C4300014	BASICS OF ELECTRICAL AND ELECTRONIC ENGINEERING	0	2	2	3	0	0	25	25	50
C4300016	INDIAN CONSTITUTION	2	0	0	0	0	0	50	0	50
C4300017	BASICS OF MECHANICAL ENGINEERING	0	2	2	3	0	0	25	25	50
C4322101	PHYSICAL METALLURGY-1	3	0	0	3	70	30	0	0	100
TOTAL		**14**	**4**	**12**	22	280	120	175	125	700

For more details regarding syllabus, examination scheme etc., kindly visit **www.gtu.ac.in**

INFRASTRUCTURE

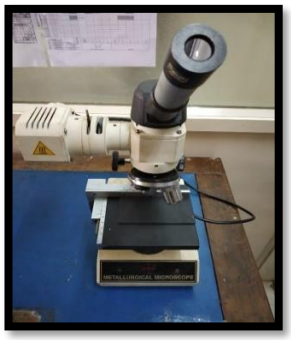
Metallurgy Department is equipped with well-ventilated classrooms with adequate flexible furniture. Department is equipped with five laboratories. Details of various labs are given below.

1. PHYSICAL METALLURGY LABORATORY

This laboratory is equiped with various instruments like Belt Grinding Machine with Sanding Belt, Double Disc Polishing Machine, Metallurgical Microscopes and various metals and alloys specimen set.

Belt Grinding Machine with Sanding Belt

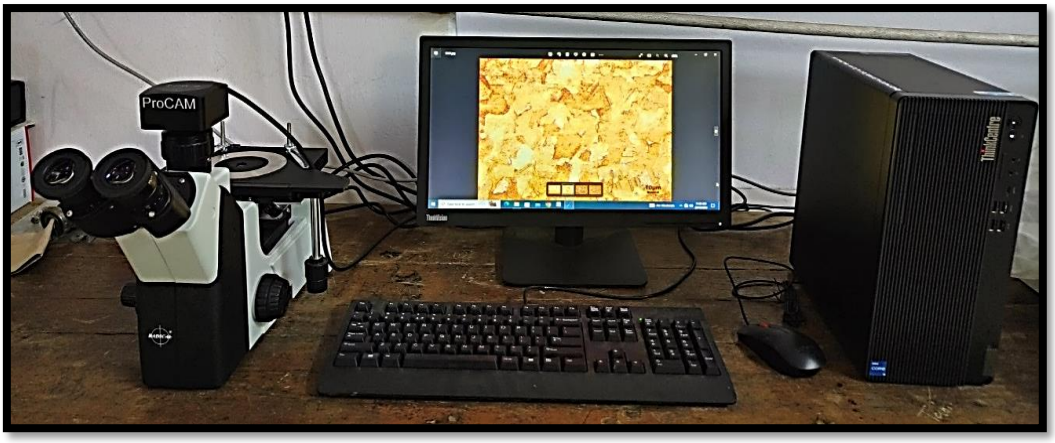
Double Disc Polishing Machine



Metallurgical Microscopes

BINOCULAR METALLURGICAL MICROSCOPE

DIGITAL ROCKWELL HARDNESS TESTINGMACHINE



ADVANCE POLARIZATION MICROSCOPE

2. FOUNDRY LABORATORY

This laboratory is equipped with Crucible Furnace, Digital Electronic Balance and models of Cupola furnace, Electric-Arc furnace, gating system, sieve shaker and disc pelletizer.

Crucible Furnace

Digital Electronic Balance (600 gm)

3. MATERIAL TESTING LABORATORY

Material testing laboratory is equipped with Ultrasonic Digital Flaw Detector, Liquid Penetrant Test kit and model of fatigue testing machine.

Ultrasonic Digital Flaw Detector

4. HEAT TREATMENT LABORATORY

This laboratory is mainly used for heat treatment of metals and alloys. It is equiped with muffle furnace and other instruments which is used in physical metallurgy laboratory.

Muffle Furnace

5. METAL WORKING LABORATORY

Metal working laboratory is equipped with rolling mill. Models of extrusion and rolling mills are also available for demonstration.

Rolling Mill

6. MINERAL PROCESSING LABORATORY

The Bench Top Ball Mill serves a crucial role in mineral processing by grinding various minerals into fine powders. This milling process is fundamental in breaking down ore samples, enabling the liberation of valuable minerals from the ore matrix. The ball mill utilizes grinding media such as balls to reduce the particle size of the minerals, allowing for subsequent mineral separation and recovery processes.

Ball Mill

The Semi-Automatic Sieve Shaker is an essential tool for performing sieve analysis on various minerals. Sieve analysis involves separating particles based on size through the use of a series of stacked sieves with progressively finer mesh sizes. The Semi-Automatic Sieve Shaker automates the process, ensuring accuracy and repeatability in determining the particle size distribution of mineral samples. This information is critical in understanding the characteristics of minerals and aids in the design and optimization of mineral processing operations.

Sieve Shaker

7. WELDING LABORATORY

The Rocker Arm Spot Welding Machine is employed for spot welding applications. This machine features a rocker arm mechanism that applies pressure to the work pieces, while an electric current is passed through the spot welding electrodes, creating localized heat and forming a weld at the contact points. Spot welding is particularly useful in joining thin sheets of metal and is commonly used in automotive and sheet metal fabrication industries. The Rocker Arm Spot Welding Machine in the laboratory allows for hands-on experience in spot welding, facilitating experimentation with different materials.

Rocker Arm Spot Welding Machine

8. CORROSIONLABORATORY

The corrosion laboratory is equipped with a Salt Spray Test Chamber, a specialized apparatus designed for assessing the corrosion behavior of various metals and alloys under simulated environmental conditions. The Salt Spray Test, also known as the salt fog test, is a widely used accelerated corrosion testing method that subjects materials to a highly corrosive environment, replicating the effects of salt-laden atmospheres encountered in real-world conditions.

Salt Spray Chamber

COMPUTING FACILITIES

Department is equipped with ICT tools like Laptop, projector, speakers which are frequently used in classrooms to enhance the teaching learning process. Free Access NaMo Wifi facility is also available at department.

DEPARTMENT LIBRARY

Many reference books of metallurgical and basic subjects are available in departmental library. Students can access the books as per their will and convenience.

FACULTY DETAILS

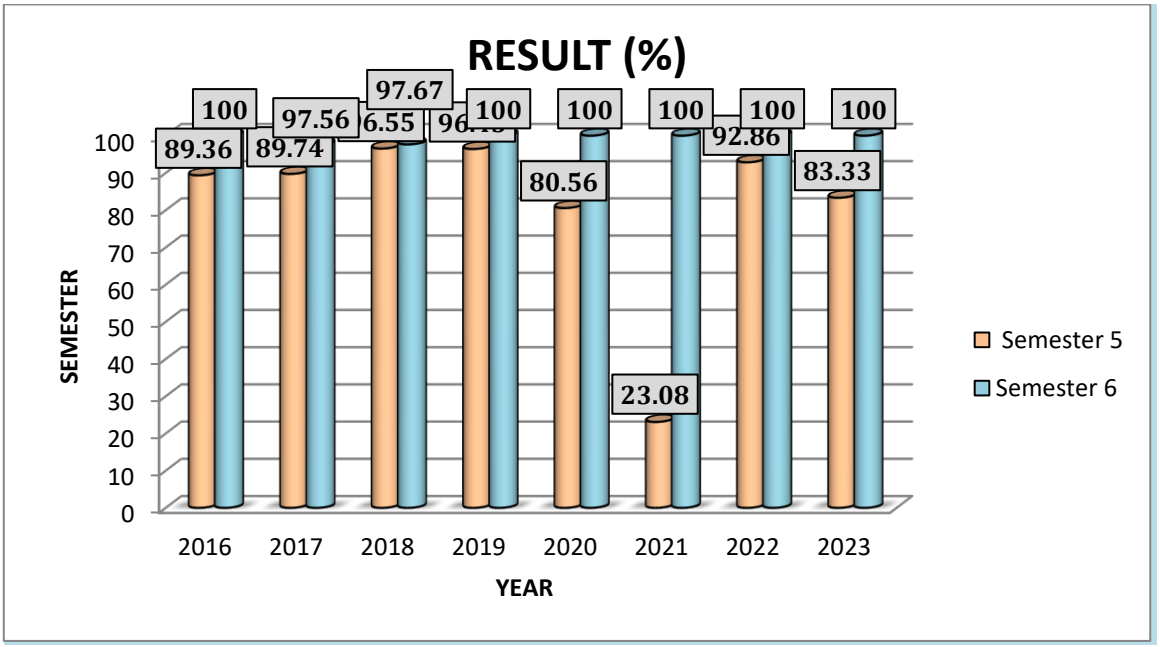
SR. NO.	NAME	DESIGNATION	QUALIFICATION	TEACHING EXPERIENCE
1	Mrs. B. H. Goyal	H.O.D	M.E.	29
2	Mr. S. F. Parmar	Lecturer	M.E.	20
3	Dr. S. M. Patel	Lecturer	P.H.D	11
4	Mr. M. J. Joshi	Lecturer	M.E.	12
5	Mr. T. K. Kyada	Lecturer	M.E.	06
6	Mr. R. D. Dave	Lecturer	M.E.	06
7	Mr. N. G. Patel	Lecturer	M.E.	06
8	Mr. A. M. Gautam	Lecturer	M.E.	12

For more information kindly visit www.ssgc.cteguj.in

TECHNICAL & SUPPORTING STAFF

SR. NO.	NAME	DESIGNATION	QUALIFICATION	EXPERIENCE
1	Ms. J. B. Lad	Lab. Assistant	Diploma Mechanical Engineering	11

RESULT ANALYSIS



TRAINING & PLACEMENTS OPPORTUNITIES

Every year all the students of semester 6 are placed for full term (14 weeks) industrial training as a part of curriculum. List of industry where students undergone Industrial training is given below.

Sr. No.	Company name	Sr. No.	Company name
EW A1	C .M. Smith Sons. Ltd., Ahmedabad	10	NSVP Induction Casting, Surat
2	Crown Metal, Surat	11	Radiance Techno Metal, Surat
3	Arcelor Mittal Nippon Steel India Ltd, Surat	12	Shiva Engineering, Surat
4	JMT India Inc., Surat	13	Slok Ndt & Inspection Services, Surat
5	Krishna Copper, Valsad	14	Theis Precision India Pvt Ltd, Navsari
6	Larsen & Toubro Ltd, Surat	15	Technoforge, Ankleshwar
7	Miranda Tools, Ankleshwar	16	Vittoria Designs Pvt. Ltd., Rajkot
8	NHB Ball & Roller Ltd., Amalsad	17	Welspun Corp Pipes And Plates, Vadodara
9	Nivic Technocast, Rajkot	18	M.H.T.E. Metal Heat Treatment, V. V. nagar

Every year campus drives are held at Institute by various metallurgical companies. Many students are placed through on/off campus drive. Many diploma Graduates of this program are recruited by Arcelor Mittal Nippon Steel India Limited, Surat. Most of the pass outs either get placement or go for further studies.

List of industries/companies hired our graduates in past few years is given below.

Arcelor Mittal Nippon Steel India Ltd, Hazira
Larsen & Toubro Ltd, Surat
Hindalco Industries Ltd (Birla copper), Bharuch
Uttamgalva, Vardha
Theis Precision India Pvt Ltd, Navsari
Schaeffler India Limited, Vadodara
Royal Arc Electrodes Ltd., Bhilad
Miranda Tools, Ankleshwar
China Steel Corporation India Pvt. Ltd., Bharuch
Godrej & Boyche, Bharuch
Arcelor Mittal Design, Hazira
Welspun, Dahej

CO-CURRICULAR & EXTRA CURRICULAR ACTIVITIES

Even though, knowledge and academics are important for every student, it is necessary to develop skills and talents throughextra-Curricular and Co-Curricular Activities, for the overall personality development of student. Activities like Food Festival, Important Day Celebration, Tree plantation, Cleanliness drive, Yoga celebrations, Sports week, Group Discussions, Mock Interview, Finishing School, NCC and NSS activities are planned and organised in department and institute level for an overall development of students. In every term expert lectures, seminar/workshop/webinar and industrial visits are arranged by metallurgy department. For first year students Thalassemia Test is conducted at institute level. Every year institute is organizing blood donation camp students and faculty supports and contributes in it.

CONTACT US

Metallurgy Department,
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Department E mail: metssg21@gmail.com