

TAPAS SHYAMAL

Metallurgical Engineering and materials Science

M.Tech

Indian Institute of Technology Bombay

Male

Specialization: Materials Science

DOB: 26/7/1994

Email: tapasshyamal2@gmail.com

Phone no. 7449431346/7908496350



Examination	University	Institute	Year	CPI %
Post-Graduation (M.Tech)	IIT Bombay	IIT Bombay	2020	8.38
Post-Graduation (M.Sc.)	University of Calcutta	Ramakrishna mission vidyamandira	2018	9.12
Under graduation (B.Sc)	University of Calcutta	Ramakrishna mission vidyamandira	2016	75.25

SCHOLASTIC ACHIEVEMENTS

- **GATE** - Secured 96.74 percentile in Gate Examination 2018 in Engineering Sciences (XE). **[2018]**
- **GRADUATION** – Bachelors Degree in Industrial Chemistry in year 2016 with First class. **[2016]**
- **POST-GRADUATION** – Masters Degree in Applied Chemistry with first class and a CGPA of 9.12 **[2019]**

ACADEMIC INTERESTS

Engineering Polymer & Composite, Advance Composites, Physics of Materials, Physical Metallurgy, Structural Characterization of Materials, Thermoelectric Materials, Mechanical characterization, Thermodynamics of Materials, Biomedical Microsystems, Statistics for Management Research, Foundation of Machine Learning, and advance ceramics, polymer blends and

KEY PROJECTS AND SEMINAR

1. Seminar project: Processing, Structure, and properties of polymer nanocomposites for Supercapacitor applications || Prof. Arup Ranjan Bhattacharyya [Spring 2020]

- Holistic literature survey on polymer nanocomposites for supercapacitor applications
- Surveyed on different type of supercapacitor and their applications based on the construct materials.
- Studied the classification and processing of polymer nanocomposites and the chemistry behind the electrical conductivity.
- Analyzed the properties of supercapacitors such as Cycling stability, mechanical robustness, electrical conductivity, specific capacitance, and fabrication scalability by different characterization techniques.

2. Seminar project: Transparent conducting polymer || prof. Sudhansu Mallick [Jan – May 2019]

- Holistic literature survey of transparent conductive polymers and its application
- performed polymerization techniques like spray method, solution based method, and doping method that improves the conductivity as well as transparency of the polymer
- Studied various characterization techniques such as IR, SEM, XRD, XPS, and RAMAN spectra analysis of the films ensuring good conductive and transparency

3. Master Thesis Project (M.Tech): DENTAL SHADES MATERIALS (Guide : Prof. SUDHANSU MALLICK, MEMS Dept., IIT Bombay Co-Guide: Prof. PARAG BHARGAVA) [May 2018 – Jul 2020]

- Synthesizing coloured venner glass-ceramic powder layers for PMF crown that match the aesthetic values of a natural tooth.
- Developed various shades of glass-ceramic powder by using spinel-based pigments; thus, ensuring high-temperature stability as well as good flexural strength
- Characterizing UV-Vis spectroscopy of lab-prepared and pre-existing standard samples to compare their CIELAB colour space values
- Conducted quantitative analysis such as ICP-AES, XRF to compare the results against the benchmark commercial product

4. Course Seminar: Crystal structure and thermoelectric properties of Sr – Mo substituted CaMnO₃ || Prof. Titas Dasgupta [Autumn 2018]

- Surveyed crystal structure of the materials, position of individual atom in periodic table, different method of sample preparation, and the importance of the material as a thermoelectric materials.
- Studied the phase diagram, electron microscopy, Seebeck coefficient, thermal conductivity, power factor and ZT parameter of the materials, that implies the importance of the materials

5. Master Thesis Project(MSc): Synthesis and characterization of Cu-Based semiconducting metal organic framework(MOF)Guide: Dr. Uttam Kumar Ghorai, RKMV, IC & APC [May 2015]

- Aimed at developing new promising class of materials for high performance super- capacitor electrode
- Developed metal organic framework using the chemicals such as p-benzenedicarboxylic (PTA), N,N dimethylformamide (DMF) and copper(II) chloride hydrate followed by Solvothermal process
- Conducted characterization techniques such as XRD, UV, IR, DSC and cyclic voltammetry to observe the crystal structure, absorbance, thermal stability, and energy efficiency of the Cu-PTA material
- Result observed that thermal stability of the material up to 450°C and 81.24% energy efficiency

INDUSTRIAL EXPERIENCE

Cement Corporation of India Ltd (A Government of India Enterprise) [September 2015]

- Monitor production Performance and recommend activities to maintain and increase rates of products
- Performed Quantity analysis of cement through chemical route and physical properties through compression test that ensured the composition of cement like CaO, MgO, Fe₂O₃, Al₂O₃ and compression strength of the cement.

WORK EXPERIENCE

Applied Materials || Prof. Parag Bhargava (IIT Bombay) Visharad Jalan || Mayur Kulkarni, Suresh Seth and Akshay Dhanakshirur (Applied Materials) ||

Topic: Development of inspection method for ceramic to reduce failures under process conditions

Objectives:

- Identify cause for failure of the ceramic parts
- Propose or design NDE methodology to segregate parts which might fail prematurely
- Develop Non Destructive Evaluation (NDE) fixture to screen ceramic parts
- Examine the nature of flaws in the parts segregated with the help of NDE and recommend processing improvements if any

Approach:

- We prepared ceramic bars from ANTS ceramics that are almost the same specification as AMTS provided ceramic ring and data in terms of purity, surface Roughness, etc.
- We characterized the sample by the SEM for surface Morphology determination, a Three-point flexure fixture for flexural strength measurement.
- We developed the NDE prototype for flexural Strength and modulus of elasticity determination.
- We try light transmission for flaw visualization and try to implement the concept of proof testing.

TECHNICAL SKILLS

Languages	C	C++	Python	MATLAB
Software tools	CATIA	Origin	Xpert Highscore	AutoCad
Instrumentation	SEM, TEM, XRD, Optical Microscope, Raman spectroscopy, Screen Printing, RTP, TGA, UTM, FTIR <i>Hands on experience: DC Sputtering, RF Sputtering, Thermal Evaporation, Electron Beam evaporation, Autoclave, centrifugation, Palletization</i>			

POSITION OF RESPONSIBILITY

1) Teaching Assistant || TEM sample preparation lab || IIT Bombay (Autumn Semester 2018-19)

- TEM samples (planer and cross- sectional) of different kinds like thin films, metal oxide, metals have been prepared for users of IIT Bombay, R&Ds and various educational institutions in India
- The samples are precisely prepared from bulk size to micron size by using different instrument like disc punch, diamond cutter, ultrasonic cutter, dimple grinder and precision ion polishing system

2) Teaching Assistant || Kinetics of processes || IIT Bombay (Autumn Semester 2018-19)

- Part of 4 member assisted the professor in conducting help session for students and solving student's queries regarding material taught and in assessment of mid and

End-term answer sheets

- Designed assignments to give comprehensive knowledge about specific course topic
- **Volunteer on 150th Birth Anniversary celebration of Swami Vivekananda at Belur Math**
[12th Jan 2014]

- Served incoming devotees in maintaining discipline and assisted the injured ones

3) Convocation Volunteer || PCSA || IIT Bombay [10th August 2019]

- Part of a team of 96 members responsible for organizing the 57th annual convocation 2019
- Worked in a team of 2 members & helped in organizing 1 day convocation orientation

4) NATIONAL SERVICE SCHEME (NSS) [2013 – 2014]

- Heading a 2-tier team of 9 Activity Associates and 150+ volunteers to orchestrate 12000+ hours of social service catering to the education and up-growth of the underprivileged
- One year volunteer for social work with relieve fund for Indian army and orphaned children

EXTRA/ CO-CURRICULAR ACTIVITIES

Courses and certificates	<ul style="list-style-type: none"> ▪ ‘Information Technology Application’ of six month duration from Youth Computer Training Centre with grade “A” [January to June 2013] ▪ Successfully completed python programming course offered by Careercell in IIT Bombay [2019] ▪ Successfully completed Machine Learning course offered by Careercell in IIT Bombay [2019] ▪ Scored 100% in Python Programming offered by Udemy [2019] ▪ Scored 100 % in Machine Learning offered by Udemy [2019]
Participation	<ul style="list-style-type: none"> ▪ Motivational Lecture Organized by the equal opportunity cell in college [Aug14] ▪ one day National seminar on Patent Awareness organized by Internal quality Assurance cell & Swami Vivekananda Research Centre [Sept 2016] ▪ the National level seminar emitted “Recent Advances in Materials Science” organized by Ramakrishna Mission Vidyamandira and School of Materials science and Nanotechnology [2016]
Activities	<ul style="list-style-type: none"> ▪ Blood donate at state Government hospital blood bank organized by SBTC ▪ Attended a course of first Aid in emergency organized by Indian academy of health & hygiene [2017]
Sports Achievement	<ul style="list-style-type: none"> ▪ Winners group Pele XI the college football tournament [2017] ▪ Runners group Kolkata Titans Six the college volleyball tournament [2017]
Spiritual Course	<ul style="list-style-type: none"> ▪ Successfully undergone the three months add-on certificate courses on “Shrimad Bhagavad Gita: Effective life Management” [February – April 2016]
Hobbies	Swimming, Playing: Table Tennis, football, and volleyball