Careers Options
School of Basic & Applied Sciences

Vision and Mission of School of Basic & Applied Sciences

VISION

To be recognized globally as a center of excellence in imparting value-based education in Basic and Applied Sciences by creating innovation in fundamental and multidisciplinary research.

MISSION

1. To excel in imparting contemporary knowledge and skills by developing an educational ecosystem with diverse interests and talents.
2. To perform cutting edge research leading to innovation in sciences through national and international collaborations.
3. To develop solutions for the emerging challenges in Basic and Applied Science to cater the needs of society.
4. To attract best quality faculty to facilitate knowledge and develop confidence in our graduates to succeed in the world.

Program Educational objectives of SBAS

1: The graduates shall be successful professionals in Academia, Industry, Government and Entrepreneurship.

2: The graduates shall pursue higher education/research at institute of national and international repute.

3: The graduate shall effectively address the challenges of the society and undertake the projects for bridging the gap between industry and societal needs.

Why choosing courses in Basic and Applied Sciences

- The courses offered here are optimized to address future challenges from the very first day.
- The initiatives taken are meant to improve the employability and career options globally.
- SBAS at GU extensively works to prepare students well for competitive exams like NET/GATE.
- SBAS is broadening up their options for higher studies every year to meet the demand for professionals in various industries.
- Industrial visits and internship at reputed research organizations and corporates increases the chances of placements.

Specializations in School of Basic & Applied Sciences

Under-Graduate Program {B.Sc. (H)}

Chemistry
Physics
Mathematics
Botany
Zoology
Forensic Science
Environmental Science
Biological Science
Microbiology
Biomedical Engineering
Biochemistry
Biomedical Science
Nutrition & Dietetics
Medical Biotechnology

Post-Graduate Program {M.Sc.}

Chemistry
Mathematics
Forensic Science
Environmental Science
Healthcare & Clinical Research
Microbiology
Biochemistry
Medical Biotechnology
Nutrition & Dietetics

PROGRAM STRUCTURE

M.Sc. (Chemistry)
Subject Details- Core Subjects

- Stereochemistry & Reaction mechanisms
- Techniques in Analytical Chemistry
- Basic Concepts of Physical Chemistry
- Basic Analytical Chemistry
- Computer Applications for chemistry
- Organic Spectroscopy
- Reaction mechanism and Basics of group theory
- Basics of Instrumental Analysis
- Basic concepts and principles of Inorganic chemistry
- Different Labs

Organic Chemistry (Spl)
Inorganic Chemistry (Spl)
Physical Chemistry (Spl)
Labs according to Spl
Analytical Chemistry (Spl)

M.Sc. (Chemistry)
Subject Details

ELECTIVES

- Polymer Chemistry
- Industrial Chemistry
- Solid State Chemistry
- Environmental Analytical Chemistry
- Bio-Organic Chemistry
- Green Chemistry
- Carbon Nanomaterials
- Advance Metallurgical Sciences
- Industrial Biochemistry

SKILL ENHANCEMENT COURSES

- Soft skills
- Computer awareness
- Professional Communication
- IPR
- Dissertation (Two phases)

B.Sc. (H) Chemistry
Subject Details

Core Courses:

Physical Chemistry
(4 Theory+4 Labs)
Inorganic Chemistry
(4 Theory+4 Labs)
Organic Chemistry
(5 Theory+4 Labs)
Research Methodology

Displine specific Electives:

Nanoscience and Nanotechnology
Green Chemistry
Analytical Chemistry
Industrial Chemistry
Battery technology

Generic Electives:

Foundation Course in Mathematics
General Physics

B.Sc. (H) Chemistry
Subject Details

Ability Enhancement Courses:

Soft Skills

Environmental Science

Liberal Art

Professional Communication

Foreign Language

Skill Enhancement Courses:

Hands on Basic Techniques and Measurments

Programming Language such as Python, C++

AI and Machine learning

Campus to corporate

IPR

Six months project at Industries or R& D Labs

M.Sc. (Environmental Science)
Subject Details – Core Subjects

Ist Year
Semester-I

- Introduction to Environmental Studies
- Biodiversity and Conservation Biology
- Environmental Hazards and Pollution
- Environmental Geology
- Disaster Management
- Environmental Science Lab-I

Semester-II

- Environmental Impact and Risk Assessment
- Environmental Toxicology and Health
- Resource Management
- Environmental Chemistry
- Environmental Science Lab-II
- Professional Communication
- Research Methodology
- IPR

IInd Year
Semester-III

- Summer Internship
- Dissertation
- Campus to Corporate

Semester -IV

- Environmental Biotechnology
- Green Technology
- Environmental Science Lab-III
- Dissertation
- Electives

M.Sc. (Environmental Science)
Subject Details - Electives

Pool I: Waste Management

- Solid and Hazardous Waste Management
- Waste Water Management
- Waste management Lab I - Practicals on Solid Waste
- Waste Management Lab II - Practicals on Waste Water Treatment

Pool II: Methodologies for Environmental Studies

- System Analysis and Modelling
- Remote Sensing and GIS
- Methodology Lab I - Practical on System Analysis and Modelling
- Methodology Lab II - Practical on Remote Sensing and GIS

Pool III: Environment and Society

- Rural Society and Development
- Urban Ecosystem
- E&S Lab I - Field Work on Rural Development
- E&S Lab II - Field Work on Urban Ecosystem

M.Sc. (Physics)
Courses with laboratories

Core courses

Mathematical Physics-I, II
Classical Mechanics
Quantum Mechanics-I , II
Solid State Electronics
Statistical Mechanics
Applied Numerical Methods
Nuclear Physics
Electrodynamics
Atomic and Molecular Physics
Research Methodology
Programming language Lab
Applied Numerical Methods Lab
Physics Laboratory

Elective courses

Digital Electronics
Microwaves and Antenna Propagation
Materials Science
Nanomaterials and Applications
Solid State Physics
Fiber Optics and optoelectronics
Nuclear and Particle Physics
Astrophysics and Cosmology

B.Sc. (H) Physics
Subject Details

Core courses

- Mathematical Physics
- Electricity and Magnetism
- Optics and instrumentation
- Solid state Physics
- Analog and digital Electronics
- Electromagnetic Theory
- Quantum Mechanics
- Statistical Mechanics
- Electromagnetics Theory
- Modern Physics
- Classical Mechanics

Elective courses

- Laser Physics
- Classical Dynamics
- Nuclear and Particle Physics
- Astronomy and Astrophysics
- Medical Physics
- Physics of Devices and Communication Systems
- Material Synthesis and Characterization Tech

M.Sc. (Mathematics)

Core courses offered

Semester I

- *Ordinary Differential Equations*
- *Linear Algebra*
- *Real Analysis*
- *Computer Programming in Python*
- *Computer Programming Lab in Python*

Semester II

- *Complex Analysis*
- *Partial Differential Equations*
- *General Topology*
- *Abstract Algebra*
- *Mathematical Statistics*
- *Mathematical Statistics Lab using R*
- *IPR*
- *Research Methodology*

Semester III

- *Functional Analysis*
- *Operations Research*
- *Differential Geometry*
- *Dissertation*
- *Summer Internship*
- *Campus to Corporate*

Semester IV

- *Applied Numerical Analysis*
- *Applied Numerical Analysis Lab*
- *Dissertation*

ELECTIVES OFFERED

- *Applied Numerical Analysis*
- *Advanced Optimization Techniques*
- *Advanced Statistical Techniques*
- *Integral Equations and Calculus of Variation*
- *Fluid Mechanics*
- *Mathematical aspects of Seismology*
- *Stochastic Processes*
- *Artificial Intelligence*
- *Fuzzy Mathematics*

B.Sc. (H) Mathematics
Core Courses offered

Semester-I

- Calculus- I
- Algebra and Number Theory
- Fundamentals of Computer and C-Programming
- C-programming Lab
- Probability and Statistics
- Probability and Statistics Lab in R
- Analytical Geometry

Semester-II

- Calculus –II
- Calculus- Lab using Scilab
- Statistical Methods and Design of Experiment
- Abstract Algebra
- Programming using Python
- Python Lab
- Ordinary Differential Equations

Semester-III

- Real Analysis & Complex Analysis
- Partial Differential Equations
- Linear Algebra
- Linear Algebra Lab using Python
- Discrete Structure
- Fundamentals of data science
- Numerical Methods
- Numerical Methods Lab

Semester-IV

- Differential Geometry and Tensor
- Combinatorial Mathematics
- Transforms and their applications
- Econometrics
- Data Structures and Algorithms
- Discipline Elective-I

Semester-V

- Fuzzy Mathematics
- Operations Research
- Operations Research Lab
- Advanced Statistical Methods and tools
- Advanced Statistical Methods and tools Lab
- Discipline Elective- II
- Generic Elective-I
- Generic Elective-I Lab

Semester-VI

- Discipline Elective III
- Generic elective-II
- Generic elective-II Lab
- Project

B.Sc. (H) Mathematics
Electives offered

Discipline Elective

- Graph Theory
- Bio-Mathematics
- Ring Theory
- Formal Language and Automata Theory
- Dynamical Systems
- Financial Mathematics
- Mathematical Modelling & Simulation
- Optimization Techniques
- Cryptography and Network
- Security
- Applications of Algebra
- Actuarial Science

Generic Elective

- IOT
- IOT Lab
- Cloud computing
- Cloud computing Lab
- Computer Graphics
- Computer Graphics Lab
- Data Communication
- Data Communication Lab
- Artificial Intelligence
- Artificial Intelligence Lab
- Computer vision
- Computer vision Lab
- Neuro Computing
- Neuro Computing Lab

CAREER OPTIONS

CAREER OPTIONS
GOVERNMENT SECTOR

Top Recruiters

- Banking
- Defence
- Research organizations(IGIB, NICPR, NPL, CSIR labs, ICMR, NII
- Scientific Assistant in Pollution Control Board
- Intelligence Bureau
- ISRO, DRDO
- Faculty positions (DU, IIT and other govt colleges)

State Bank of India

INDIAN RAILWAYS

fssai

FOOD SAFETY AND STANDARDS AUTHORITY OF INDIA

Inspiring Trust, Assuring Safe & Nutritious Food

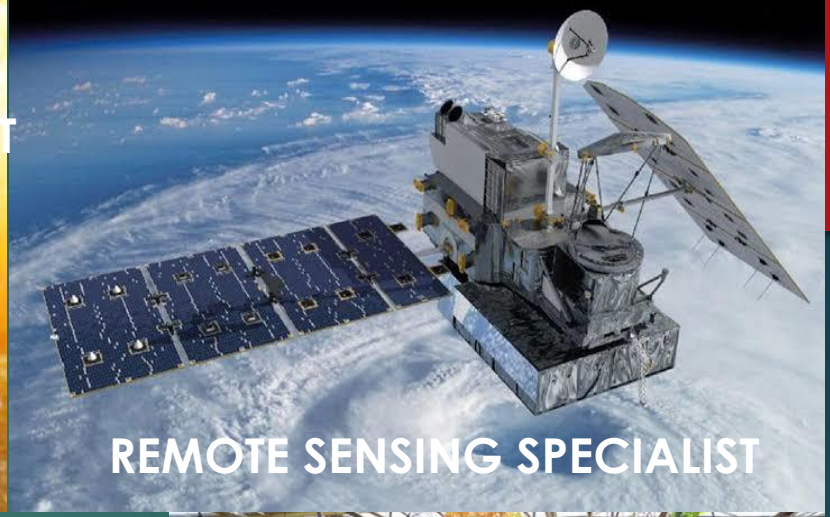
National Institute of Immunology

Career Option In Chemistry
Private sector

- Agricultural Research Services
- Biotechnology Firms
- Chemical Industry
- Pharmaceutical Companies
- Testing Laboratories
- Technical Journals
- Waste water Treatment Plants

Career Option In Chemistry

- Education sector (Government & Private Colleges & Universities)
- Engineering Firms (TATA, TCS, INFOSYS)
- Food Institutes (Dabur, Patanjali)
- Forensic Crime Research (CBI, Investigative Bureau)
- Health Care Providers (Dietician, Nutritionist)
- Industrial Laboratories (Ranbaxy, Jubilant Life Sciences, Sunpharma, Cipla)



Job Prospectus In Environmental Science

Career Options In Environmental Science
Private Sector

Project Manager in Environmental Organizations

- Environmental Consultant in Private Firms
- Sale Executive in Environmental Pollution Controlling Companies
- Environmental Journalist in newspaper, magazine or television station
- Refineries
- Distilleries
- Food Processing Industries
- Agriculture and Fertilizer Plants

Top Recruiters in the Private Sector

Career Options In Physics

Main Employment Areas:

- Research Insititutes
- Laboratories and Insititutes
- Educational Insititutes
- Agriculatural Research services
- Hospitals
- Power Generating Companies
- Aviation Industry
- Construction Firms
- Demolition Squads
- Protechnics Manufactures
- Mobile industries
- Auto-mobiles industries
- Electronic companies

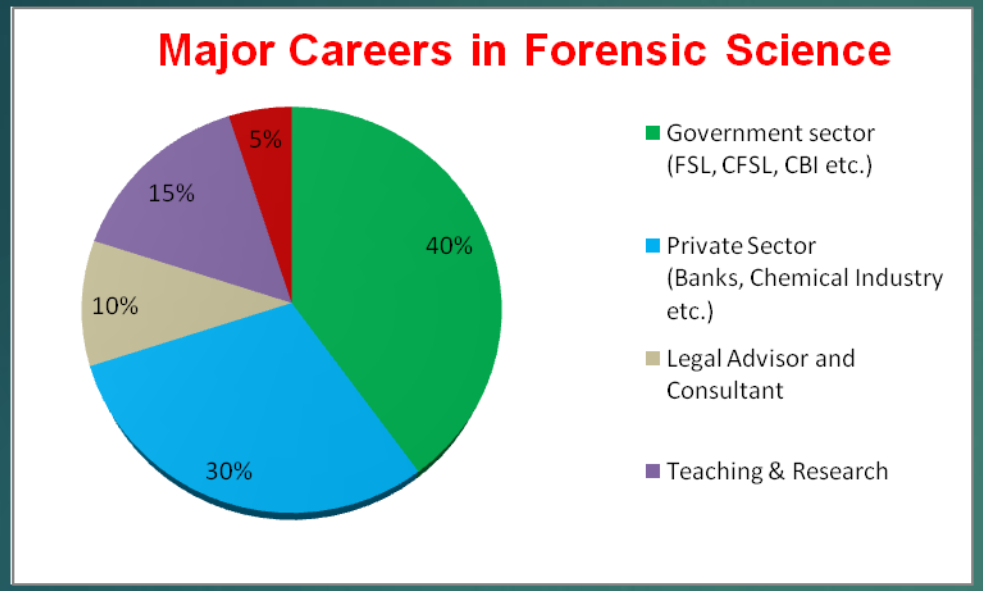
Top Recruiters

- Bhabha Atomic Research Centre (BARC)
- Oil and Natural Gas corporation (ONGC)
- Bharat heavy Electricals limited (BHEL)
- national Thermal Power corporation (NTPC)
- Indian Space Research Organisation (ISRO)

Job Opportunities in Mathematics

- Quantitative Risk Analyst
- Equity Quantitative Analyst
- Statistical Programmer
- Interest Rate Trading Strategist
- Quantitative Developer
- Treasury Management Specialist
- Data Analyst
- Accountant
- Demographer
- Operational Research
- MNCs
- IT(TCS, Infosys,WIPRO….)

Careers in Forensic Science



- ✓ Hospitals
- ✓ Forensic Science & Other Scientific Laboratories
- ✓ Law Enforcement
- ✓ Federal Agencies
- ✓ Chemical industry

Career Options

HIGHER EDUCATION

- UPSC examination
- Staff Selection Commission Examination
- Intelligence Bureau
- M.Phil.
- PhD

You can also apply for the most competitive exams conducted by Union Public Service Commision such as

IFS
IPS
IAS

Entrance Exams for higher education

Entrance Exams for PhD/M.Tech./Lectureship

If you have Master's degree in any subject and want to go for PhD degree, then you can apply for many Entrance Exams. Below, we have provided the list of national and international Entrance Exams through which you can get the admission in top universities and research Institutes of India and abroad.

Entrance Exam for admission in India

National Eligibility Test (NET): CSIR and UGC

Graduate Aptitude Test in Engineering (GATE)

State Level Eligibility Test (SLET)

Joint Entrance Screening test (JEST)

Entrance Exam for admission Abroad

Graduate Record Examination (GRE)

Test of English as a Foreign Language (TOEFL)

CAREER OPTIONS FOR A GRADUATE AFTER B.Sc. (Hons)

- COMPETITIVE EXAMS(Higher Education)

- IIT JAM
- CAT
- CMAT
- JEST
- NEST
- IISER
- BARC

- GRE
- TOEFEL
- IELTS

Institutes for Higher Education in India

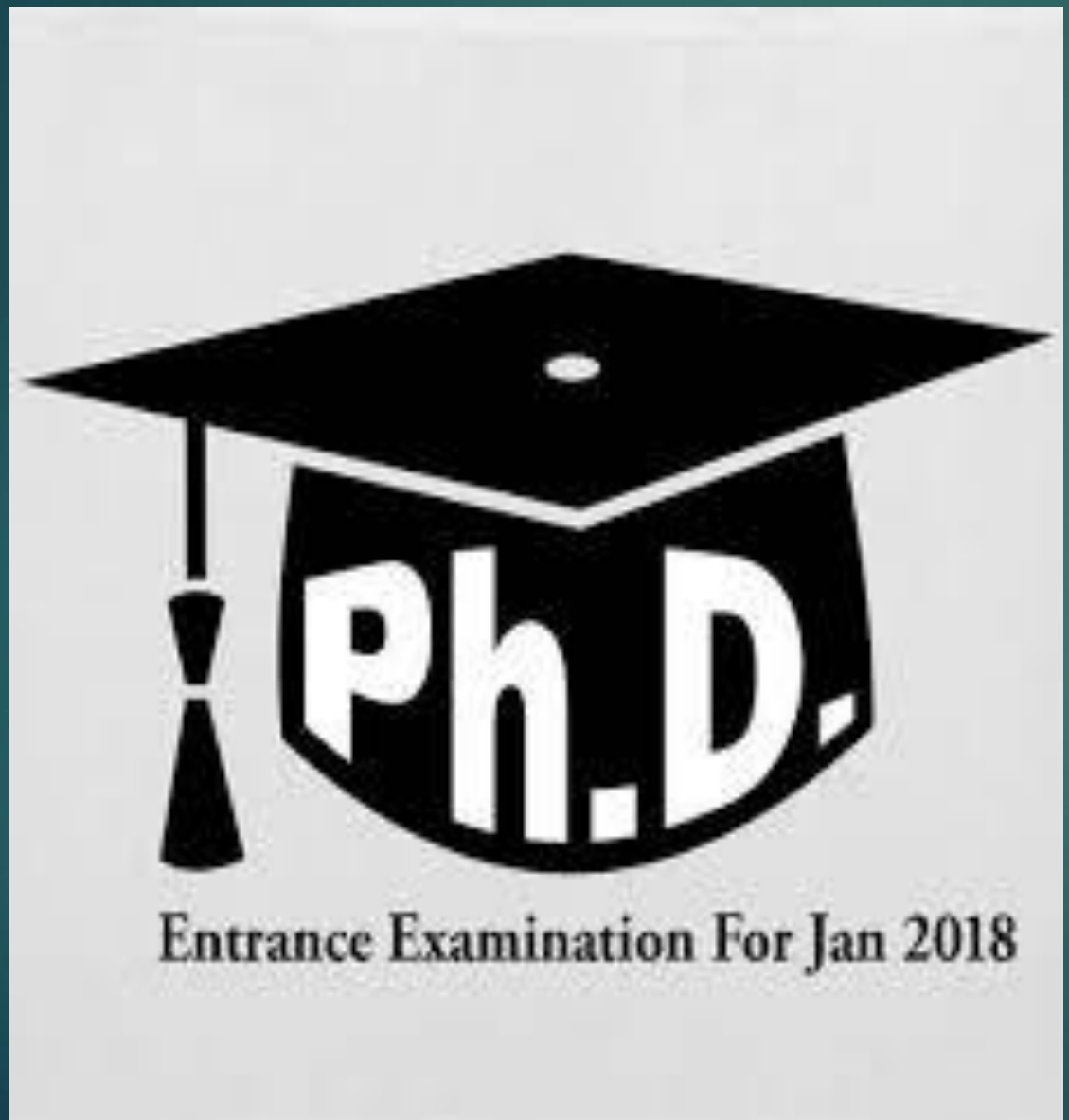
- Qualify NET (CSIR/UGC)
- Qualify GATE
- Purse **M.Phil**
- Purse Ph.D
- Pursue Research

Top Institutes

•IISC Bangalore
•IITs/NITs
•IISERs
•NISERS
•IICT, Hyderabad
•ICT Mumbai
•TIFR
•CSIR Labs
•AIIMS
•BHU
•Research Institutes affiliated to Universities

Countries that offers Ph.D. Courses after M.Sc.

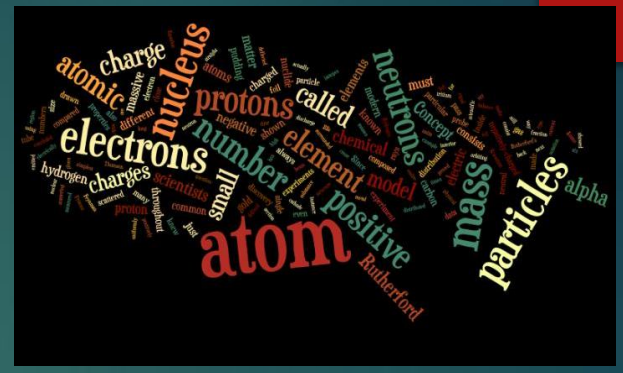
Career Options In Chemistry



Research Areas

- Analytical Chemistry
- Applied Chemistry
- Chemistry
- Geoengineering
- Ph.D. In Electro-Chemistry
- Ph.D. In Industrial Chemistry
- Ph.D. In Inorganic Chemistry (Nuclear & Radiochemistry)
- Organic Chemistry
- Physical Chemistry
- Computational Chemistry

Career Option in Physics



Research Areas:

- Applied Physics
- Biophysics
- Chemical Thermodynamics
- Nuclear Physics
- Kinematics
- Physics
- Thin Films

And many other fields….

SOME SUCCESS STORIES OF ALUMNI IN SBAS

Deepak Kumar Pursuing Ph.D. (Chem) CDRI, Lucknow	Sudhanshu Sharma Pursuing Ph.D. (BioChem) Delhi Technical University	Ashu Pursuing Ph.D. (Chem) University College Dublin, Ireland
Adil Khan Assistant Chemist NTPC	Ali A. Sani Research Officer Nigerian Institute for Trypanosomiasis Research	Rupali Tiwari Pursuing Ph.D. (Physics) Slovakia Technical University, Slovakia
Sunny Panchal Senior Associate Innodat Pvt ltd	Shubhi Agarwal Forensic Science CFSL, Bhopal	Soumya Tomar Forensic Science GENPACT NOIDA
Sandip Panda Chemistry Mankind Pvt. Ltd.	Amisha Saxena Chemistry Tech Sci Research	Diksha Pal Biochemistry Sai Communications

SOME SUCCESS STORIES (NET/GATE)

Varnika Mehta
NET

Nupur Joshi
NET

Garima Jindal
NET

Prachi Tyagi
GATE

Chanchal Chandela
NET

Mohit Yadav
NET

SOME SUCCESS STORIES (ENTREPRENEUR)

MADHAV GOYAL
ORMAP FORENSIC MART PVT. Ltd.
https://www.forensicmart.com

NITIN PANDEY
FORENSIC.INDIA PVT. LTD.
https://www.forensicindia.org/

ATUL KUMAR DUBEY
FORENSIC.INDIA PVT. LTD.
https://www.forensicindia.org/

SCOPE FOR THOSE WHO WANTS TO BE AN ENTREPRENEUR

- Like minded people can come together for team building
- Opportunities to meet right people.
- Sharpen the skills and gain valuable knowledge.
- Individual develops an aptitude which start up he/she would prefer.
- It is useful in a wide array of industries from health care to retail.
- Entrepreneurs are prepared to solve complex problems with innovative and insightful solutions.
- Accounts and finance will provide critical knowledge for protecting a venture's financial future.
- Eco-Entrepreneurs have the skills and knowledge necessary to identify problems with existing products, services and systems related to ecosystem.



Thank You!!