Master In Technology
M Tech (Artificial Intelligence)

National Institute of Electronics and Information Technology

(An Autonomous Scientific Society of Ministry of Electronics and Information Technology, Government of India)
NIELIT Bhawan, Plot No. 3, PSP Pocket, Sector-8, Dwarka, New Delhi-110077,
Email: contact@nielit.gov.in

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Introduction

The horizon trembles with the dawn of a new era, an era where silicon hums with sentience and steel muscles with purpose – the era of Artificial Intelligence. From robotic surgeons wielding scalpels with a surgeon's precision to intelligent assistants anticipating your every need before you even whisper them, AI is no longer a futuristic fantasy, but an intricate thread woven into the fabric of our lives. It has transformed industries, redefined human-machine interaction, and stands poised to revolutionize the very way we experience the world. This is the threshold you stand upon, poised to step into the vanguard of this transformative surge.

The M.Tech in Artificial Intelligence program at NIELIT is your gateway to becoming a leader in this electrifying field. Meticulously crafted by industry titans and academic visionaries, our curriculum transcends mere learning to ignite a deep understanding of AI's core principles. It equips you not just with the tools, but with the power to unlock its boundless potential. You'll delve into the mathematical bedrock of machine learning, where equations become more than symbols, but pathways to understanding how intelligent systems learn and evolve from data. You'll master the art of supervised learning, wielding regression and classification algorithms like a sculptor shapes clay, unlocking the power to predict and automate. Unsupervised learning will become your microscope, revealing hidden patterns and insights within sprawling datasets, like a detective unearthing secrets in a tangled web of clues. This journey extends beyond algorithms and equations, delving into the ethical compass of AI development. You'll learn to navigate the intricate landscape of research methodology and intellectual property rights, ensuring your contributions to this powerful technology are responsible and impactful.

Program Education Objectives (PEO)

PEO1: To equip students with a comprehensive understanding of mathematical foundations, machine learning techniques, and optimization strategies, enabling them to apply this knowledge effectively in solving complex real-world problems.

PEO2: To foster a research-oriented mindset and encourage innovation in the field of machine learning. Graduates should be capable of conducting independent research, contributing to advancements in machine learning techniques, and developing novel solutions to emerging challenges.

PEO3: To promote ethical practices, intellectual property rights awareness, and holistic development. Graduates should possess strong communication skills, an understanding of societal implications, and a commitment to values such as sustainability, social responsibility, and continuous learning.

Program Outcomes (PO)

PO1: Graduates independently solve complex challenges in ML, showcasing research skills and proposing effective solutions.

PO2: Graduates exhibit proficient oral and written skills, empowering them to articulate technical concepts and collaborate effectively within interdisciplinary teams.

PO3: Graduates embrace lifelong learning, adapting to evolving ML trends, technologies, and methodologies for sustained professional development.

PO4: Graduates contribute innovatively to ML, applying advanced algorithms and AI, demonstrating research competence, and fostering technological advancements.

PO5: Graduates uphold ethical standards, respecting intellectual property, considering societal impacts, and responsibly contributing to social, environmental, and ethical considerations.

Course Category Wise Credit Distribution:

Category	Credits
Program Core	12
Core Labs	4
Electives	15
Electives Labs	4
Audit Course	2
Open Electives	3
Project / Dissertation	28

Course Structure

Semester-I						
S. No	Course Code	Course Name	L	T	P	C
1.	AIL601	Program Core-I Mathematical Foundations for Machine Learning	3	0	0	3
2.	AIL602	Program Core-II Machine Learning Techniques	3	0	0	3
3.	AIL***	Program Elective-I	3	0	0	3
4.	AIL***	Program Elective-II	3	0	0	3
5.	ACL601	Research Methodology and IPR	2	0	0	2
6.	ACL602	Audit course	2	0	0	0
7.	AIP601	Laboratory-I (Machine Learning Techniques Lab)	0	0	4	2
8.	AIP***	Laboratory-II (Based on Electives)	0	0	4	2
Total credits: 18						

Semester-II						
1.	AIL603	Program Core-III Optimisation Techniques	3	0	0	3
2.	AIL604	Program Core-IV Deep Learning Techniques	3	0	0	3
3.	AIL***	Program Elective-III	3	0	0	3
4.	AIL***	Program Elective-IV	3	0	0	3
5.	ACL***	Audit Course	2	0	0	0
6.	AIP604	Laboratory-III Deep Learning Techniques Lab	0	0	4	2
7.	AIP***	Laboratory-IV (Based on Electives)	0	0	4	2
8.	AID601	Mini project with Seminar	2	0	0	2
Total Credits: 18						

Semester-III						
1.	AIL701	Program Elective-V	3	0	0	3
2.	OEL***	Open Elective	3	0	0	3
3.	AID701	Dissertation-I/ Industrial project	0	0	20	10
Total credit: 16						

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Semester-IV						
S. No	Course Code		L	T	P	C
1.	AID702	Dissertation-II	0	0	32	16
Total credit: 16						

Elective Courses						
S. No.	Course code	Course Name	L	T	P	C
1.	AIL702	Soft Computing	3	0	0	3
2.	AIL703	Advanced Algorithms and Analysis	3	0	0	3
3.	AIL704	Artificial Intelligence and Knowledge Representation	3	0	0	3
4.	AIL705	Data Warehousing and Pattern Mining	3	0	0	3
5.	AIL706	Natural Language Computing	3	0	0	3
6.	AIL707	Big Data Analytics	3	0	0	3
7.	AIL708	Information Retrieval	3	0	0	3
8.	AIL709	Pattern Recognition	3	0	0	3
9.	AIL710	Problem Solving Methods in Artificial Intelligence	3	0	0	3
10.	AIL711	Cognitive Systems	3	0	0	3
11.	AIL712	Introduction to High Performance Computing	3	0	0	3
12.	AIL713	Computer Vision	3	0	0	3
13.	AIL714	Social Media Analytics	3	0	0	3
14.	AIL715	Blockchain	3	0	0	3
15.	AIL716	Healthcare Data Analytics	3	0	0	3
16.	AIL717	Video Analytics using AI	3	0	0	3
17.	AIL718	Design Thinking	3	0	0	3

Audit Course						
S. No.	Course code	Course Name	L	T	P	C
1.	ACL701	English for Research Paper Writing	3	0	0	3
2.	ACL702	Disaster Management	3	0	0	3
3.	ACL703	Sanskrit for Technical Knowledge	3	0	0	3

4.	ACL704	Value Education	3	0	0	3
5.	ACL705	Constitution of India	3	0	0	3
6.	ACL706	Pedagogy Studies	3	0	0	3
7.	ACL707	Stress Management by Yoga	3	0	0	3
8.	ACL708	Personality Development through Life Enlightenment Skills.	3	0	0	3

Open Electives						
S. No.	Course code	Course Name	L	T	P	C
1.	OEL701	Business Analytics	3	0	0	3
2.	OEL702	Industrial Safety	3	0	0	3
3.	OEL703	Operations Research	3	0	0	3
4.	OEL704	Cost Management of Engineering Projects	3	0	0	3
5.	OEL705	Composite Materials	3	0	0	3
6.	OEL706	Waste to Energy	3	0	0	3

Job Roles

In the fields of Artificial Intelligence (AI) and Data Science, there are numerous job roles catering to various skill sets and expertise levels. Some of the common job roles in these fields:

- Data Scientist
- Machine Learning Engineer
- AI Research Scientist
- AI Engineer
- Data Engineer
- Business Intelligence (BI) Analyst
- Big Data Engineer
- Deep Learning Engineer
- Computer Vision Engineer
- NLP Engineer/Developer
- Conversational AI Developer
- Language Model Researcher
- Machine Translation Specialist
- Text Mining Specialist
- Speech Recognition Engineer
- Sentiment Analysis Specialist

Top Recruiters

The recruitment landscape in the fields of artificial intelligence (AI) and data science is dynamic and diverse, with numerous companies actively hiring talent in these domains. While it's challenging to definitively list the "top" recruiters, several companies consistently seek AI and data science professionals and have established themselves as prominent players in the industry. Some of the notable ones are:

- Google
- Microsoft
- Amazon
- Apple
- Facebook (Meta Platforms)
- IBM
- Netflix
- Tesla
- Uber
- Airbnb, etc

- Tata Consultancy Services (TCS)
- Infosys
- Wipro
- Accenture
- IBM India
- Amazon India
- Microsoft India
- Reliance Jio
- Paytm, etc

Kellton	Persistent Systems	Saksoft
Tata Elxsi	Bosch	Zensar Technologies
Haptik	Lily AI	Oracle Financial Services ...
Cyient Ltd	Happiest Minds Technolo...	Infosys
Gradient AI	Maruti Techlabs Private Li...	Affle (India) Limited
DataToBiz	Fx is Ai	Fractal Analytics
HCL Technologies	Nvidia	TCS
Tech Mahindra	Webtunix AI	Wipro

Walkthrough of Artificial Intelligence Lab

The Artificial Intelligence(AI) Lab is state of the art lab with all high- end machines and AI development kits. The lab is designed to give students hands-on experience in everyday Artificial Intelligence Applications like Predictive Analysis, Image Detection and Analysis, Natural Language Processing tools and applications.

AI lab prepares the students for the future by running various short term skill oriented courses like

- Six weeks in Programming Fundamentals, Data Science, Machine Learning and Deep Learning
- Six months Industrial training in Artificial Intelligence and Machine Learning in collaboration with IIT Ropar.
- Short term workshops in OpenAI, Deep Learning, TensorRT, PyTorch, Artificial Intelligence of Things (AIoT) to boost the interest of students, corporates and professionals in the AI ecosystem.
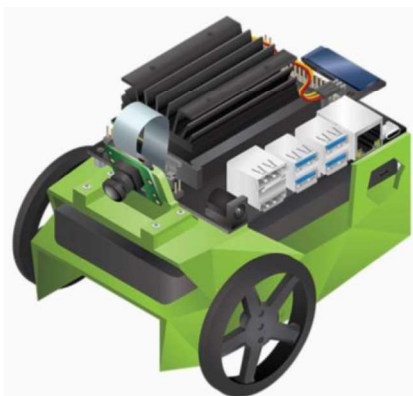
Our modular design ensures that students learn a variety of skills, stay enthusiastic about learning, and develop their creative interest and also enable research and development of Artificial Intelligent applications.

Students undergo various mini projects throughout the course and develop major live projects in Computer Vision, Natural Language Processing and Predictive Analysis

The Artificial Intelligence Lab has trained more than 1500 participants under short term, long term and other technology awareness workshops in last three years.

The alumni of Artificial Intelligence Lab have been placed in top notch companies like Nvidia, Quickheal, etc.

Some of the hardware facilities available in AI lab are :
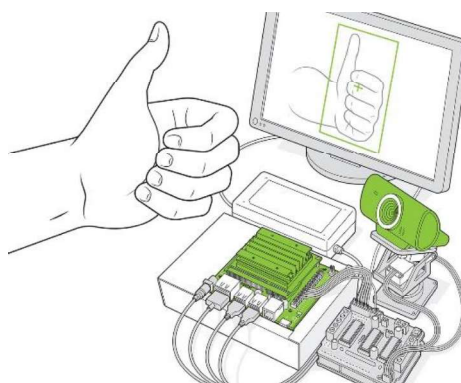
1	Rack Mounted Sever	HP ProLiant DL160 G8 Server, 2 Intel Xeon E5-2670 v2 CPUs, 128GB DDR3, 2TB SSD
2	15 Desktop PCs	Intel i5, 32 GB RAM, NVidia GeForce GTX 1050 TI Intel (R) UHD graphics 630 (Dell)Graphics Card
3	30 Desktop PCs	Intel i7, 32 GB, Graphics Card
4	5 Laptops	Intel i5, 16 GB RAM, 512 SSD windows 10 professional

| 5 | Jetson Nano kits | Quad-core ARM Cortex-A57 MPCore processor ; Memory, 4 GB 64-bit LPDDR4, 1600MHz 25.6 GB/s ; Storage, 16 GB eMMC 5.1, camera |

Projects in the areas of Predictive Machine Learning, Computer Vision, NLP
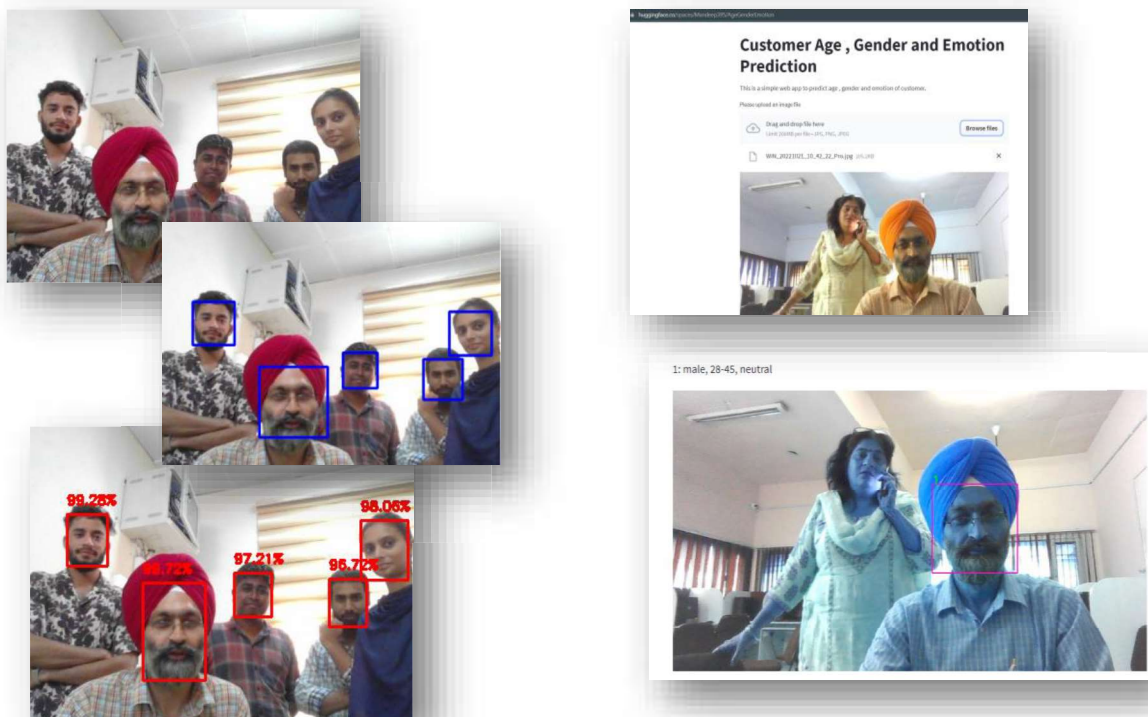
sThe Artificial Intelligence at NIELIT looks to work in various aspects of AI ecosystem and focus on various verticals. Some of the future endeavors are as under :

Seeking Sponsored Projects and Industrial Collaborations: The lab actively pursues sponsored projects funded by government bodies such as the Govt. of India. Additionally, it seeks partnerships with industrial entities to conduct collaborative research projects in the expansive field of Artificial Intelligence (AI). By combining resources and expertise, these collaborations aim to drive innovation and address pressing challenges in AI research and application.

Establishment of Advanced GPU Computing Facility: A key initiative on the lab's agenda is the establishment of an advanced GPU computing facility. This facility will be instrumental in facilitating cutting-edge research across various domains of AI. With enhanced computational capabilities, researchers will be empowered to tackle complex AI problems more efficiently, leading to breakthroughs in areas such as machine learning, computer vision, and natural language processing.

Conducting Workshops and Training Sessions: In line with the goal of nurturing a skilled workforce in AI, the lab organizes workshops and training sessions. These initiatives serve to disseminate knowledge, share best practices, and equip

participants with the requisite skills and expertise in AI technologies. By fostering a culture of continuous learning and professional development, the lab contributes to building a talent pool capable of driving AI innovation in India and beyond.

Emphasis on Societal Impact Projects: Looking ahead, the lab prioritizes AI projects with a focus on societal impact. These projects aim to address pressing societal challenges by leveraging AI technologies to provide innovative solutions. By exploring new approaches to AI problems and emphasizing real-world applicability, the lab endeavors to make meaningful contributions to areas such as healthcare, education, environmental sustainability, and social welfare.

These future aspects underscore the lab's commitment to advancing AI research, fostering collaborations, empowering talent, and leveraging AI for positive societal change. By aligning its efforts with these strategic priorities, the lab aims to position itself as a catalyst for transformative innovation in the field of Artificial Intelligence.

Fees of the Course and Number of Seats

Fee-Structure for the Academic year (2024-25)

S. No.	Particulars	Sem 1	Sem 2	Sem3	Sem 4
1	Tuition and Lab Fees	65,000/-	65,000/-	65,000/-	65,000/-
2	Caution Money	6,500/-	Nil	Nil	Nil
	Sub Total	71,500/-	65,000/-	65,000/-	65,000/-

Number of Seats: **18**

Eligibility Criteria:

Admission to M.Tech. (Artificial Intelligence) shall be made on the basis of merit of GATE Score in respective discipline. The candidates seeking admission in M.Tech. course must have passed B.E./B.Tech. in any branch of engineering with 50% (45% for SC/ST & Disabled Persons Categories) marks.

For Gate Passed Candidates: For admission to M. Tech.in Artificial Intelligence candidate must have passed GATE paper. in CS/IT/ECE/EE.

For Non-Gate Candidates: For admission to M. Tech.in Artificial Intelligence candidate must have passed B.E./B.Tech. in Computer Science/Information Technology/ Electronics and Communication Engineering/ Electronics and Instrumentation Engineering/ Information Communication Technology /Electronics and Computer Engineering/ Electrical and Electronics Engineering/ Electrical Engineering/Mechanical Engineering or equivalent degree in Engineering with 50% (45% for SC/ST & Disabled Persons Categories) marks.

Reservation Policy

1. Seats are reserved as per Govt. of India Rules, AICTE and/or University Approval.

2. A quota of 15 % is reserved for the SC candidates, 7.5% for ST candidates, 27% for Other Backward Classes and 10% for Economic Weaker Section (EWS):
3. Candidates selected against the quota for persons with disabilities (5%) as per PWD Act 1995 are placed in the appropriate category viz.SC/ST/OBC/General candidates depending upon the category to which they belong in the roster meant for reservation of SCs/STs/OBCs.

Hostel Facilities

NIELIT Ropar provides in-campus hostel accommodation for both boys and girls separately with a total capacity of 160 seats in each hostel, with modern amenities. The hostels are secured by round-the-clock security guards at the entry gates.

Other Facilities

- NKN Connectivity
- 24x 7 Wi-Fi Campus
- IEEE Online Access
- Shodh Ganga Access
- ACM Online Access

Our Location and How to reach to us?
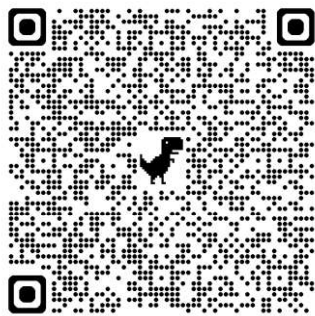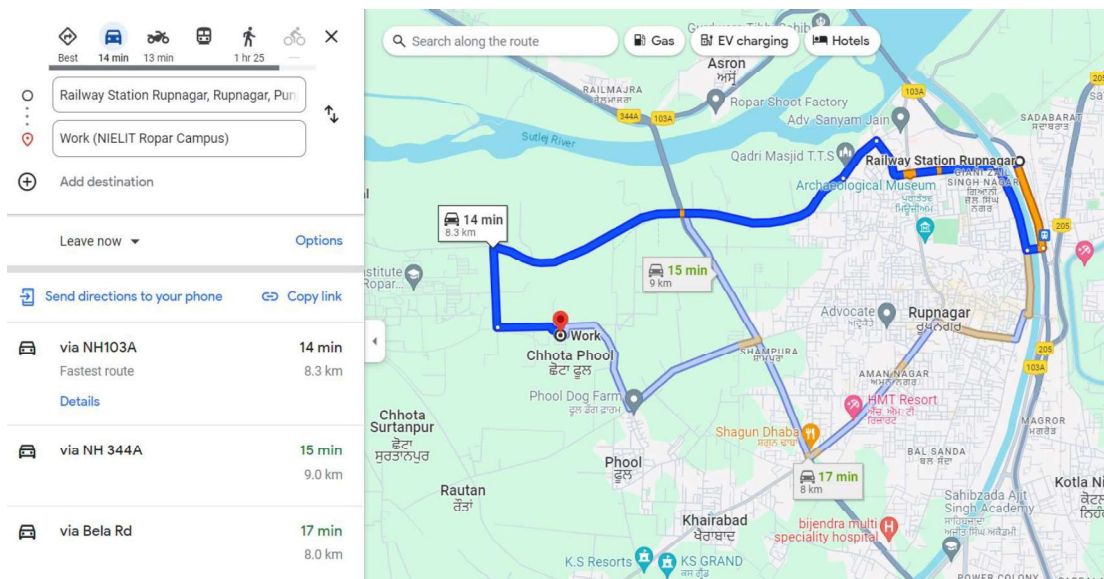

Scan or click to Locate Campus
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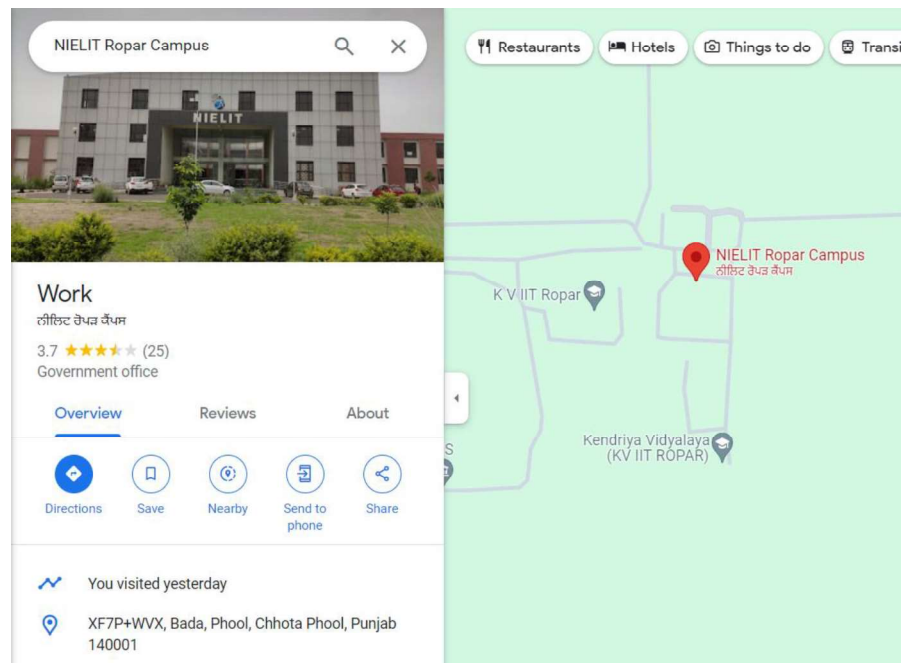
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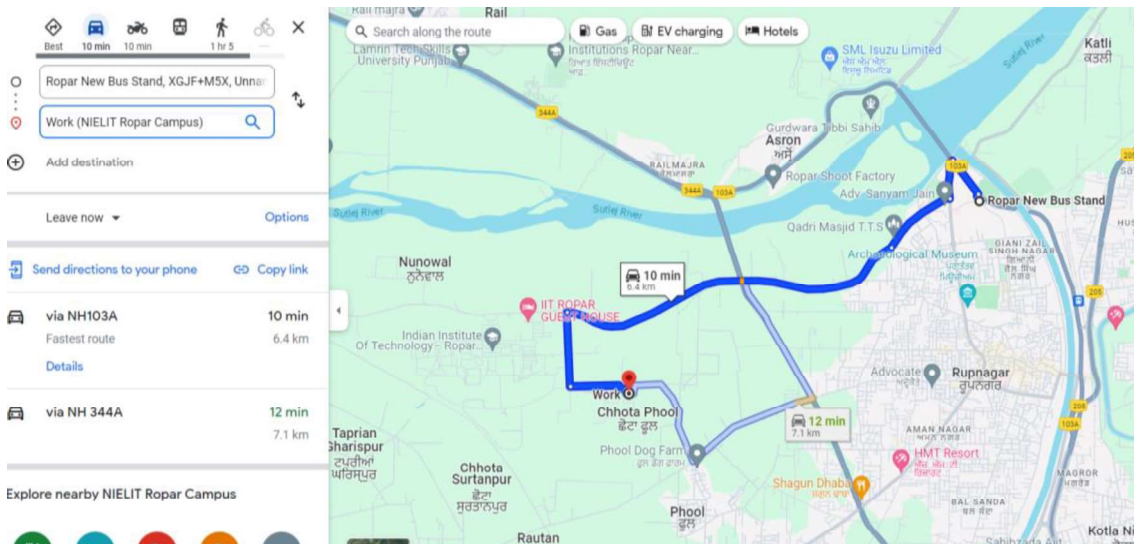
By Auto / Taxi from Ropar Railway Station

From Chandigarh Airport

Important contacts / Faculty

Anita Budhiraja
Scientist – E
9815988717

Dr. Sarwan Singh
Scientist – D
9815621657