



All about Wireless Power Transfer- Antenna, Circuit, Device, and Applications

Overview

A Wireless Power Transfer (WPT) is the 4th application of radio waves/fields after wireless communication, remote sensing, and heating. The WPT is roughly classified with a coupled (near field) WPT and a radiative (far field) WPT. The radiative WPT via microwaves can be applied for battery-free IoT (Internet-of-Things) sensors, wireless charger for mobiles, wireless powered flying drone, and Solar Power Satellite (SPS)/Space Based Solar Power (SBSP). The WPT is recently considered as a game changing technology. We can realize the new world “electricity like the air” with the WPT, in which the electricity is most important for our life, but we cannot mind where they are like the air. The WPT can contribute to the decrease of CO₂, especially in the SPS/SBSP, but also in battery-free sensors with new power management systems. The radiative WPT is based on conventional radio wave theory/technology from the different viewpoint as “energy”. In the proposed GIAN Course, the audience can learn all about WPT, which involves antenna, circuit, device, and applications.

This GIAN Course is both for working professionals and young engineers including students, who want to learn the WPT, and for senior engineers, who want to consider new applications of the WPT including commercial applications. After attending the GIAN Course, they can start the WPT research and development in each technology, antenna, circuit, device, and applications, which they are interested in.

Course Objectives

The GIAN Course is both for working professionals and young engineers including students, who want to learn the WPT, and for senior engineers, who want to consider new applications of the WPT including commercial applications. After attending the GIAN Course, they can start the WPT research and development in each technology, antenna, circuit, device, and applications, which they are interested in.

Course Information	<p>Duration: 25-29 August 2025</p> <p>Place: Department of ECE, NIT Silchar, Assam, India</p> <p>Total Contact Hours: 13 Lecture Sessions and 02 Sessions (Tutorial + Hands on) in 5 days</p> <p>GIAN Course Examination: 29 August 2025</p>
Course Outlines	<p>Review and Recent R&D of Radiative Wireless Power Transfer, Review and Recent R&D of Solar Power Satellite SPS, Theory and Technology of Antenna and Propagation for WPT, Microwave Power Transfer Applications in Bioelectromagnetic, Target Detecting Technologies, Power Combiner and Power Splitter for WPT Applications, Theory and Technology of Amplifier Design for WPT, Energy Storage for WPT Applications, Theory and Technology of Rectenna – Rectifying Antenna for WPT. Problem Solving Session with Examples and Hands-On Session</p>
Teaching Faculty	<p>Prof. Naoki Shinohara: 11 Lecture Sessions + 1 Tutorial Session</p> <p>Dr. Taimoor Khan: 2 Lecture Sessions + 1 Tutorial Session</p>



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Who can attend....	<ul style="list-style-type: none">● Electronics engineers or research scientists from R&D organizations/ laboratories, interested in working in the area of wireless power transfer (WPT) system, microwave, antennas and allied domains.● Faculty members from academic institutions/universities interested in learning how to do research on WPT systems or subsystems.● Engineer and researcher from manufacturing, service and government organizations including R&D laboratories.● Student (B.Tech./M.Tech./MSc./Ph.D.), researchers and faculty members in all areas of engineering working on wireless power transfer, microwave, antennas and allied domains.
Fee Details	<p>The participation fees for taking the course is as follows:</p> <p>a. Participants from abroad: USD 250</p> <p>b. Participants from Industry/Research Organizations: Rs. 5000/-</p> <p>c. Participants from Academic Institutions:</p> <ul style="list-style-type: none"><i>i. Faculty member: Rs. 2000/-</i><i>ii. External Students: Rs. 500/-</i><i>iii. Internal PG and Ph.D. Students: Rs. 500/-</i><i>iv. Internal UG Students: Nil</i> <p>Note:</p> <ul style="list-style-type: none">● The above fee includes all instructional materials, computer use for tutorials and assignments, laboratory equipment, 24 hr free internet facility.● The participants may be provided with accommodation (single/sharing) on payment basis.● Valid Identity card/bonafide letter is mandatory from the students.



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Registration Guidelines

1. Pay the requisite course fee (see above) through SBI Collect. You may use the adjacent QR Code. Select: **GIAN COURSE NIT SILCHAR_2412366_Taimoor Khan**. Note down the payment reference number. You will need this in the next step.
2. Fill out the registration form using the link: <https://forms.gle/eosh2mw9Wo69LGtQ6> and await the Course Coordinator's confirmation within the next couple of days.
3. The deadline for registration is 24 August 2025. Seats will be filled on a first-come-first-get basis.

N.B: Please retain original receipt/one photocopy of the payment confirmation for on-spot submission.

Course Coordinator

Dr. Taimoor Khan
Associate Professor
Dept of Electronics and Communication Engg.
National Institute of Technology Silchar
Silchar, Assam, India, E-mail: ktaimoor@ece.nits.ac.in

The Faculty (Experts)



Naoki Shinohara is a Professor with Kyoto University Japan. He has been engaged in research on solar power station/satellite and microwave power transmission systems. He was IEEE MTT-S Distinguish Microwave Lecturer (2016–2018), and is IEEE MTT-S Technical Committee 25 (Wireless Power Transfer and Conversion) former Chair, IEEE MTT-S Kansai Chapter TPC member, IEEE Wireless Power Transfer Conference founder and Advisory Committee member, URSI commission D Vice Chair, International Journal of Wireless Power Transfer (Cambridge Press) Executive Editor, the first Chair and Technical Committee member on IEICE Wireless Power Transfer, Japan Society of Electromagnetic Wave Energy Applications adviser, Space Solar Power Systems Society Vice Chair, Wireless Power Transfer Consortium for Practical Applications (WiPoT) Chair, and Wireless Power Management Consortium (WPMc) Chair. His books are *Wireless Power Transfer via Radiowaves* (ISTE Ltd./Wiley), *Recent Wireless Power Transfer Technologies Via Radio Waves* (ed.) (River Publishers), and *Wireless Power Transfer: Theory, Technology, and Applications* (ed.) (IET), and some Japanese textbooks of WPT.



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Taimoor Khan is an Associate Professor in Electronics and Communication Engineering Department at NIT Silchar. He has been a Visiting Researcher at Queen's University, Canada, and a Visiting Assistant Professor at AIT, Bangkok. His research interests include RF energy harvesting, wireless power transfer, AI/ML in electromagnetics, and advanced antenna technologies. Dr. Khan has received prestigious awards such as the ISTE Syed Sajid Ali National Award (2022) for Renewable Energy research and the IETE SVC Aiya Memorial Award (2020) for excellence in microwave engineering. He has guided eight Ph.D. students and published 86 journal articles, 68 conference papers, 03 patents, and 06 books. He has completed one SERB-funded and two MHRD/AICTE-funded projects and currently leads two international collaborative projects under SPARC and VAJRA initiatives. A Fellow of IEI, IETE, and ATMS, and a Senior Member of IEEE, Dr. Khan also serves as an Associate Editor for *IET Electronics Letters* and *International Journal of RF and Microwave CAE* and Section Editor for *IEEE Open Journal of Antennas and Propagation*. He is the founder of several IEEE entities at NIT Silchar, including the IEEE MTT Society Student Branch Chapter, IEEE Silchar Subsection, and IEEE Kolkata Section APS Chapter-Silchar. He has also chaired and organized notable conferences, such as SILCON-2022 and SILCON-2023.

About Silchar

Silchar is the second largest town in the state of Assam. It was the kingdom of the Kachhari Kings from 1755 to 1830. It was annexed to the British East India Company in 1833. The city has now attained a cosmopolitan status with inhabitants from all over India although Bengali speaking people constitute the majority. It is an educational and business hub in North East India next to Guwahati. Aesthetically the campus is very beautiful with greenery and wetlands.

About NIT Silchar

In the late fifties, the Government of India decided to establish Regional Engineering Colleges (RECs) under the Quality Technical Education Policy – one each in every major state – with the prime objective of imparting quality technical education throughout the country and to foster national integration. These Regional Engineering Colleges were established as joint ventures of the Government of India and the respective State Governments. Assam is considered as the flag bearer of Northeast India and so in the year 1967 the 15th REC was officially established in Silchar. The first batch of students were admitted in 1977 in the BE program in 3 branches of engineering namely, Civil Engineering, Mechanical Engineering, and Electrical Engineering with a total intake of 60 students in each branch. The REC Silchar was upgraded to National Institute of Technology, Silchar with the status of Deemed University on 28th June 2002. The institute has been taken over by the Government of India and subsequently made into a fully funded Central Government Autonomous Institution. The institute has remodeled its curriculum and academic activities in line with that of the IITs. With its Deemed University status, the institute started awarding degrees from the year 2002 and the first convocation of the institute was held on 16 February 2004. The Government of India declared the Institute as an Institute of National Importance by enacting the National Institutes of Technology Act 2007.



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How to reach NIT Silchar

The city is well connected by Road, Train and Air. There are direct flights from Kolkata and Guwahati and trains from New Delhi, Kolkata, Guwahati, and Agartala. Daily bus services are available from Agartala, Guwahati, Aizawl, and Imphal. The Institute is located around 35 kms from the Silchar airport, 10 kms from the Silchar railway station, 14 kms from ISBT Silchar, and 8 kms from the heart of the Silchar town. Prepaid taxi and auto services are available from Silchar.