



Prof. Yeon Ho Chung is a Professor of Dept. of Information and Comm. Eng., Pukyong National University, Busan, Korea. He obtained an MSc. from Imperial College London, U.K., in 1992 and a Ph.D. from the University of Liverpool, U.K. in 1996. He

was a visiting research fellow at Plymouth University, visiting professor at Department of Electrical Engineering, University Park, Pennsylvania State University, USA and a visiting professor of Chiba University, Japan. He is a member of Editorial Board of Wireless Personal Communications, Springer and an associate editor of International Journal on Smart Sensing and Intelligent Systems. His research interests are VLC, OCC, optical MIMO, and advanced mobile transmission schemes.



Dr. Siddharth Deshmukh, is an Asst. Professor at National institute of Technology, Rourkela since 2007. His research interest includes communication system design, statistical signal processing, networked control systems and optimization theory.



Prof. Sarat Kumar Patra is a Professor at National institute of Technology, Rourkela since 2006. He obtained his PhD degree from University of Edinburgh, UK in 1998. His research interests include wireless and mobile communication, optical communication, cognitive radio, fuzzy systems.

About NIT Rourkela

NIT Rourkela is one of the premier national level institutions for technical education in the country and is funded by MHRD, Government of India. The institute established 1961 as Regional Engineering College Rourkela and was elevated to a deemed university under the name of National Institute of Technology, Rourkela in the year 2002. According to the Times Higher Education (THE) ranking of the World's best Universities 2017, it is ranked in top 800 institutes of world, and it is only NIT to feature in the list.

The main objective of the Institute is to produce quality Engineers and Scientists in Graduate and Post-Graduate levels in various branches of engineering and science. The institute with a lush green campus area of 650 acres has twenty departments, three academic centers and six service centers. The Institute has a very vibrant campus life with ten hall of residence for students, residential quarters for employees and two guest houses for visitors. The Institute has been consistently ranked among the best technical institutes in India. The Institute has been modernized by several foreign collaborative research projects. A very good number of sponsored research and consultancy projects are running at present.

For More Information

Visit: <http://www.gian.iitkgp.ac.in/>

Contact

Dr. Siddharth Deshmukh
Course Coordinator

Asst. Professor
Electronics and Communication Engineering
National Institute of Technology Rourkela
Odisha, India-769008
Phone: 0661-2462470/ 8280471030
E-mail: deshmukhs@nitrkl.ac.in

Prof. Sarat Kumar Patra
Course Co-Coordinator

Professor
Electronics and Communication Engineering
National Institute of Technology Rourkela
Odisha, India-769008.
Phone: 0661-2462457/9437221578
E-Mail: skpatra@nitrkl.ac.in



Optical Communication: A Front-runner for Future Wireless Networks

Aug. 16th – 26th, 2017



National Institute of Technology
Rourkela, Odisha, India

Under the aegis



Government of India

Ministry of Human Resources and Development

Course Overview

Optical wireless communication (OWC) is one of the most promising alternative communication scheme to address the limitations such as congested spectrum, a low data rate, expensive licensing, security issues, and a high cost of installation of radio frequency (RF) communication system. OWC technologies provide a flexible networking solution that delivers true broadband services. Specifically, visible light communication (VLC), a form of OWC exclusively uses visible light as a transmission medium and focuses on indoor and outdoor applications. VLC offers high efficiency because it employs existing lighting infrastructure that uses light emitting diodes (LEDs) as the transmitter, while a photodetector is used as the receiver. Moreover, VLC also offers 10,000 times wider bandwidth compared to broadband RF, since visible light spectrum is vast and license free. In addition to VLC, today's generation of smartphone equipped with cameras can also be used for optical camera communication (OCC), which is a form of OWC using camera as the receiver. Even though the data rate of OCC is relatively low at the current developments, the OCC offers an affordable data rate and versatility with its 2-dimension data capture.

This course will cover following modules: Introduction to advance wireless technologies like, LTE, millimeter-wave, small cell, V2X, D2D and smart homes; LED/LASER Photo-detector characteristics; indoor/outdoor visible light communication (VLC) modeling; VLC modulation schemes and standards; indoor multi-user schemes and applications; cooperative VLC; RF/VLC HetNets; VLCC applications and challenges; Optical Camera Communication (OCC); OCC standards; Image sensors; OCC modulation; OCC applications and challenges. In addition, the course will cover current research applications, further directions and useful resources with simulations.

Course Objectives

- To provide an overview of next generation high-speed wireless communication.
- To exposes the participants about current research and developments of OWC and its derivatives.
- To outline major OWC technologies that are being developed and investigated.
- To highlight the pros and cons of OWC that are considered disseminative in high speed, high-rate wireless access networks.

Grading and Certification

On completion of course and final assessment, grade certificate will be provided to participating students for a two credit course work.

You Should Attend If...

- You are a Signal Processing/Communication engineer or research scientist interested in recent development and application of optical communication.
- You are a researcher in the field of optical communication.
- You are a student or faculty from academic institution interested in learning/ to take up research in the field of optical communication. (UG final year, M.Tech. and PhD scholar are encouraged to attend the course).

Registration/Course Fee (Non-refundable)

The participation fee for taking the course is as follows:

- Participants from abroad: US \$200
- Industry/ Research Organizations: Rs. 5000/-
- Academic Institutions: Rs.2000/-
- Students (India): Rs.1000/- (Only registration)
- Students(India): Rs.2500/- (Inclusive of lodging and boarding in Institute hostel)

The above fee includes all instructional materials, computer use for tutorials and assignments. The registration/course fee is to be paid through a Demand Draft which should be drawn in favor of '**Continuing Education, NIT Rourkela**' payable at **SBI, NIT Rourkela Branch (Code:2109)** or by NEFT/RTGS to A/C No.: **10138951784, State Bank of India, NIT Rourkela Branch IFSC Code: SBIN0002109.**

In addition to the above fee, one-time online fee of Rs.500/- is to be paid for registration in the GIAN web portal. (See registration process step 1 in next column)

Accommodation

Out station participants can be provided accommodation and boarding in the Institute Guest Houses (limited accommodation on first-cum-first serve basis) inside the campus on direct payment as the Registration fee does not include lodging and boarding. The lodging (twin sharing) may range from Rs.3500/- to Rs.4500/- (food extra) for the entire duration of the course. Students desiring for lodging and boarding at institute hostel can pay Rs.2500 which will be inclusive of course registration fees.

Important Dates

- **Last date for receiving applications:** 4th Aug. 2017
- **Last date for Intimation to Participants:** 7th Aug. 2017
- **Course Dates:** 16th Aug. – 26th Aug. 2017

Registration Process

Registration for any GIAN course is a two-step process.

Step 1:

One Time Registration with the GIAN web portal of IIT Kharagpur using the following steps:

- Create login and password at: <http://www.gian.iitkgp.ac.in/GREGN/index>
- Complete the personal details and pay Rs. 500/- (non-refundable) through the online payment gateway.
- Select the Course(s) you are interested in.
- Confirm your application.

(Individuals who have already registered to GIAN earlier do not need to repeat)

Step 2:

Course registration with the course coordinator.

- Institute registration process is an offline process. The participants are required to take print out of Registration Form. **The registration form is available at:**
- He/she then may proceed for the course registration by filling out the registration form and paying the registration course fee.

Documents to be sent online

- Scanned copy of filled in "Registration Form".
- Scanned copy of "Demand Draft/ receipt of NEFT".

Above documents must be sent to course coordinator via email: deshmukhs@nitrrkl.ac.in.

Documents to be sent by post

- Original registration form.
- Demand Draft/ receipt of NEFT.

The above documents must be sent by post to:

**Dr. Siddharth Deshmukh,
Electronics and Communication Engineering,
National Institute of Technology Rourkela,
Odisha, India-769008.**

The DD/Receipt of NEFT and the original registration form must reach to the coordinator on or before **4th Aug. 2017**.

Note:

Maximum number of students: 50.
(Participants will be selected on first-cum-first serve basis)