

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE PLAN – PART I			
Course Title	Optical Communication systems		
Course Code	EC 606	No. of Credits	03
Course Code of Pre-requisite subject(s)	ECPC28		
Session	Jan. 2021	Section (if, applicable)	
Name of Faculty	Dr.D.Sriram Kumar	Department	Electronics and Communication
Email	srk@nitt.edu	Telephone No.	9443494495
Name of Course Coordinator(s) (if, applicable)			
E-mail		Telephone No.	
Course Type	<input checked="" type="checkbox"/> Core course		
Syllabus (approved in BoS)			
Fundamentals of coherent systems: Basic concepts. Modulation and demodulation schemes. System performance. Semiconductor optical amplifiers. EDFA and Raman amplifiers – modeling and analysis. Analysis and digital transmission with high power fiber amplifiers. Multichannel systems: WDM light wave systems. TDM and code division multiplexing. Advances in wavelength division multiplexing / demultiplexing technologies. SONET/SDH, ATM, IP, storage area networks. Wavelength routed networks. Next generation optical Internets. Soliton systems: Nonlinear effects. Soliton – based communication. High speed and WDM soliton systems			
COURSE OBJECTIVES			
1. To prepare the students understand the various process and subsystems involved in the optical communication. 2. To enable the students appreciate the different multiplexing technologies in the fiber optic communication. 3. To design optical communication systems to serve a defined purpose			
COURSE OUTCOMES (CO)			
Course Outcomes	Aligned Programme Outcomes (PO)		
1. Understand the modulation and demodulation schemes in the coherent optical systems	1,2		
2. Understand the various types of the optical amplifiers	1,5,6		
3. Analyze various multiplexing techniques used and evaluate the recent advances in this field	2,5		
4. Compare the merits and demerits, potential applications of microwave semiconductor devices	1,5		
5. Analyze the operating principle of WDM solutions systems	2,6		

COURSE PLAN – PART II

COURSE OVERVIEW

Students get exposure to the fundamental of Optical Communication. Students will be taught about the principle of operation and application of several optical devices and circuits. Students will understand the SOA, EDFA, WDM, SONET, SOLITON concepts. Further they will be exposed to multiplexing & Demultiplexing of Optical Communication, circuits & applications.

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	3 rd Week of January 3 Contact Hours	Fundamentals of coherent systems: Basic concepts.	PPT/ On-line
2	4 th Week of January 3 Contact Hours	Modulation and demodulation schemes	
3	1 st Week of February 3 Contact Hours	System performance.	
4	2 nd Week of February 3 Contact Hours	Semiconductor optical amplifiers. EDFA Amplifier	
5	3 rd Week of February 3 Contact Hours	Raman amplifiers & Modeling and analysis	
6	4 th Week of February 3 Contact Hours	Analysis and digital transmission with high power fiber amplifiers Assessment -1	
7	1 st Week of March 3 Contact Hours	Multichannel systems: WDM light wave systems	
8	2 nd Week of March 3 Contact Hours	TDM & code division multiplexing	
9	3 rd Week of March 3 Contact Hours	Advances in wavelength division multiplexing / demultiplexing	
10	4 th Week of March 3 Contact Hours	SONET/SDH, ATM Assessment-2	
11	1 st Week of April 3 Contact Hours	IP, storage area networks	
11	2 nd Week of April 3 Contact Hours	Wavelength routed networks and Next generation optical Internets	
12	3 rd Week of April 3 Contact Hours	Soliton systems: Nonlinear effects, Soliton – based communication	
14	4 th Week of April 3 Contact Hours	High speed soliton systems	
15	1 st Week of May 3 Contact Hours	WDM soliton systems Compensation Assessment (CPA)	

COURSE ASSESSMENT METHODS (shall range from 4 to 6)

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Assessment - 1	4 th Week of February	60 Minutes	25
2	Assessment - 2	4 th Week of March	60 Minutes	25

3	Seminars / Assignments	1 st Week of April – 4 th week of April		10
4	Project / Paper writing	1 st Week of April – 4 th week of April		10
CPA	Compensation Assessment*	1 st Week of May	60 Minutes	
5	Final Assessment *	3 rd Week of May	120 Minutes	30

*mandatory; refer to guidelines on page 4

ESSENTIAL READINGS : Textbooks, reference books Website addresses, journals, etc

Reference books

1. G.P.Agrawal, Fiber Optic Communication Systems (3/e), Wiley, 2002
2. B.P.Pal , Guided Wave Optical Components and Devices, Elsevier , 2006
3. K – P. Ho Phase-modulated Optical Communication Systems, 2005
4. C.S.Murthy & M.Gurusamy, WDM Optical Networks, PHI, 2002

Websites

1. [http:// www.ofcnfoec.org](http://www.ofcnfoec.org)
2. [http:// www.occfiber.com/](http://www.occfiber.com/)
3. [http:// www.rp-photonics.com/optical_fiber_communications.html](http://www.rp-photonics.com/optical_fiber_communications.html)
4. en.wikipedia.org/wiki/Optical_fiber

Suggested Video Lectures

1. National Programme on Technology Enhanced Learning (NPTEL)
2. Massive Open Online courses (MOOC)
3. Mc Graw Hill Access Engineering Library (<http://www.accessengineeringlibrary.com>)

COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)

1. Feedback from the students during class committee meetings
2. Anonymous feedback through questionnaire

COURSE POLICY (preferred mode of correspondence with students, policy on attendance, compensation assessment, , academic honesty and plagiarism etc.)

MODE OF CORRESPONDENCE (email/ phone etc)

1. All the students are advised to check their NITT WEBMAIL regularly. All the correspondence (schedule of classes/ schedule of assessment/ course material/ any other information regarding this course) will be done through their webmail only.
2. Queries (if required) to the course teacher shall only be emailed to the email id specified by the teacher.

ATTENDANCE

1. Attendance will be taken by the faculty in all the contact hours. Every student should maintain minimum 75 % physical attendance in these contact hours along with assessment criteria to attend the end semester examination.

COMPENSATION ASSESSMENT

1. Any student, who fails to maintain 75% attendance need to appear for the compensation assessment (CPA). Student who scores more than 60 % marks in the CPA along with assessment criteria will be eligible for attending the end semester examination.
2. Those students who have attendance lag and also missed any of the continuous assessments (CAs) can appear for CPA to get eligibility for writing the end semester examination as quoted in Pt. 2. Their scores in the CPA WILL NOT be taken into account for computing marks for CA.
3. Students not having 75% minimum attendance at the end of the semester and also fail in CPA (scoring less than 60%) will have to RE DO the course.

ACADEMIC HONESTY & PLAGIARISM

1. All the students are expected to be genuine during the course work. Taking of information by means of copying simulations, assignments, looking or attempting to look at another student's paper or bringing and using study material in any form for copying during any assessments are considered dishonest.
2. Tendering of information such as giving one's program, simulation work, assignments to another student to use or copy is also considered dishonest.
3. Preventing or hampering other students from pursuing their academic activities is also considered as academic dishonesty.
4. Any evidence of such academic dishonesty will result in the loss of marks on that assessment. Additionally, the names of those students so penalized will be reported to the class committee chairperson and HoD of the concerned department.
5. Students who honestly producing ORIGINAL and OUTSTANDING WORK will be REWARDED.

ADDITIONAL INFORMATION

FOR APPROVAL

Course Faculty  _____ CC-Chairperson  _____ HOD  _____

Guidelines:

- a) The number of assessments for a course shall range from 4 to 6.
- b) **Every course shall have a final assessment on the entire syllabus with at least 30% weightage.**
- c) **One compensation assessment for absentees in assessments (other than final assessment) is mandatory. This is not applicable for project work/industrial lectures/internship.**
- d) The policy for attendance for the course should be clearly specified.
- e) Necessary care shall be taken to ensure that the course plan is reasonable and is objective.