



ERASMUS MUNDUS



## **MASTER IN PHOTONICS – “PHOTONICS BCN” ERASMUS+ “EUROPHOTONICS-POESII”**

### **MASTER THESIS PROPOSAL**

**Dates: April - September 2018**

**Laboratory : OPTICAL COMMUNICATIONS**

**Institution: UPC-ETSETB-TSC-GCO**

**City, Country : BARCELONA**

**Title of the master thesis: WAVELENGTH MANAGEMENT IN UD-WDM-PON  
ACCESS NETWORKS**

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**Keywords : FIBER, WDM, PON, TRANSMISSION.**

**Summary of the subject (maximum 1 page) :**

Modern Fiber-to-the-Home networks use Wavelength Division Multiplexing to combine broadband signals to/from users. We extend this by ultra-dense WDM with coherent transmission, to implement the Wavelength-to-the User concept in an extended access network. This will enable to greatly increase the current communication capacity.

In the access network, every user transceiver generates its own wavelength and all wavelengths are combined in the passive optical network. To avoid crosstalk or collision between them and to increase the bandwidth efficiency, a monitor module in the headend has to manage the spectrum and control the laser sources.

In this work, first the tuning characteristics of the lasers will be studied and tested, the basic algorithm for wavelength distribution will be analysed and will be implemented by software controlling the network lasers. Thus, the optical spectrum will be managed, monitored and controlled via existing hardware interfaces and PC. The high bit-rate data transmission will be successfully checked. The access network testbed is available in the lab, along with the required instrumentation.

**Additional information :**

\* Required skills : Matlab or Labview.

\* Miscellaneous :