

# **PART II**

## **OPTICAL COMPONENTS**

Legacy optical communications systems—systems that transmit data over a single wavelength—depend heavily on four components: the optical transmitter, the optical receiver, the optical fiber, and the optical amplifier. Although the bandwidth (bit rate) of the transmitted optical signal keeps increasing, it is predicted that bandwidth exhaust is inevitable. To respond to bandwidth exhaust and to also allow for service diversification (over the same fiber), more wavelengths are “squeezed” into the same fiber. In dense wavelength division multiplexing (DWDM) systems, in addition to the four devices above, more specialized optical devices are required to offer an all-optical connectivity between two points. Such devices are optical filters, add-drop multiplexers, tunable transmitters and receivers (that can selectively tune in a wavelength), optical switches, and so on.

In Part II, we describe the optical components that are needed in optical DWDM systems. This technology is still evolving, and thus one would expect better performing and more compact devices to emerge. Nevertheless, the underlining principles remain the same.