

CORE LIFE SCIENCES (CLS)

CLS 600 Techniques in Biochemistry **3 Credits** Grade Mode: Standard Letter, Audit/Non Audit

This course is designed to train students in a range of standard biochemical and cellular biology techniques that are in routine use in a functioning biochemistry laboratory. The course combines lectures illustrating the scientific principles underlying a particular technique with hands-on experience of the methodology in the laboratory. Techniques include protein expression, purification, gel analysis, protein structure and cell culture.

CLS 625 Applied Biostatistics **3 Credits** Grade Mode: Standard Letter, Audit/Non Audit

The aim of this course is to introduce the fundamental biostatistical concepts to life science students. It aims to give an overview of the statistical and computational ideas required for analysis methods in biological sciences, and provide hands-on experience in analysis. This course does not assume that the student has a background in mathematics and computer science, but introduces all necessary background during the course. The course is appropriate for graduate students and researchers in health and life sciences.

CLS 661 Special Topics in Biosensors **3 Credits** Grade Mode: Standard Letter, Audit/Non Audit

Over the past 20 years, the field of bio-sensing technology has had a profound impact on both laboratory research as well as commercial activities. With the advance of semiconductor and nanofabrication technologies, bio-technological application-specific integrated circuits (ASICs) have become a major trend in research as well as industry. Examples include DNA sensing, microelectrode measurement array systems for in-vitro and in-vivo physiological research at the cellular level. Bio-sensing has had a major impact on different fields including, E-health systems, genome research and drug development.

CLS 706 Independent Studies **3 Credits** Grade Mode: Standard Letter

Independent Studies allow students to examine a variety of timely, cutting-edge research areas in life sciences. Taught by our faculty, research scientists from our research institutes or associated industries, this course allows students to keep up with novel trends and topics in the field.

CLS 711 Development and Diseases of The Nervous System **3 Credits** Grade Mode: Standard Letter, Audit/Non Audit

The aim of the course is to unfold the processes that underlie the formation and disorders the nervous system at the molecular, cellular and circuitry levels. The course will focus on genes/proteins and signaling pathways involved in neural induction, neural tube closure, patterning of the nervous system, neurogenesis, neuronal migration, axon pathfinding, as well as formation and refinement of synapses. Both physiological and pathological conditions will be addressed.

CLS 726 Proteomics in Precision Medicine **3 Credits** Grade Mode: Standard Letter, Audit/Non Audit

Personalized medicine has revolutionized the medical practice, and to achieve its goals today we are not only dependent on genomics but also on the proteomics for accurate diagnosis and efficient treatments. Thus, there is a growing demand for proteomics-based learning and applications in the field of basic and clinical research. The course 'Proteomics in precision medicine' will bridge this knowledge gap in the GPM program by teaching the students key concepts of proteomics and the overall applications and limitations.

CLS 751 Molecular Mechanisms of Cancer and Their Applications **3 Credits** Grade Mode: Standard Letter, Audit/Non Audit

This course will introduce students to the molecular mechanisms that lead to cancer development. It will describe the methods used to study these mechanisms and how they can be exploited in cancer diagnostics and therapy.