



Learning at NPU
Global Open Courses Program

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(Second batch)

International College
Northwestern Polytechnical University



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1. Fiber Reinforced Polymer Composite: Mechanics and Manufacturing

Brief Intros: This course introduces theories and engineering technologies in manufacturing and machining of fiber reinforced polymer composite (FRP), focusing on the material properties and production, the experimental study of conventional drilling and milling process, quality control and process optimization, with relation to the mechanism of FRP machining, cutting force and damage modeling, mechanics of composite materials (such as stiffness, strength, and fracture mechanics), as well as finite element modeling, etc.

Through this subject, students are expected to master the mechanics and engineering knowledge in manufacturing and machining of FRP components, master the methods for conducting experimentation and theoretical modeling for the machining process, and help to solve process problems in industry.

Leading Scholar



Assoc. Prof. HE Yanli, mainly engaged in modern integrated manufacturing system, manufacturing system simulation and optimization, fiber composite material cutting and cutting process intelligent clamping research.



2. Theoretical and Applied Mechanics

Brief Intros: The course of theoretical and applied mechanics enables students to understand the mechanics principle of engineering problems and the analysis of engineering problems by learning the basic principles of mechanics and its application in engineering, cultivates students' ability to analyze and solve complex engineering problems, stimulates the spirit of exploration, and cultivates students' learning ability at the same time.

Leading Scholar



Prof. Zhang Juan, researches on Dynamics of Spacecraft: orbit transfer and orbit keeping, formation flight of small satellites, Dynamics of rigid-flexible coupling, Vibration theory and application, Optimization design of mechanics, etc. The first batch of the national excellent Massive Online Open Course "Theoretical Mechanics" course leader. She was awarded Baogang Excellent Teacher Award, the National Xu Zhilun Excellent Teacher award in Mechanics, the first prize of the fourth Teaching Innovation Competition of Shaanxi Province, the first prize of teacher teaching Innovation Competition of the universities of Excellence Alliance, etc



3. Bayesian Networks

Brief Intros: Bayesian Networks (BN) connect graph theory with probability theory in a magical way, allowing to model with great flexibility large collections of random variables, which interact in complex ways. With this approach, we build, within the computer, a model of the system that the model feels comfortable reasoning about. This model encodes our knowledge of how the system works in a computer-readable format. This representation can be manipulated by various algorithms that can respond questions based on the model and give prediction possibilities

Leading Scholar



Professor Josue Antonio Nescolarde Selva, a leading expert in the field of applied mathematics whose research focuses on the study of Complex Systems, with recent emphasis on human behavior. With expertise in Complex systems, Data Science, Mathematical Biology, Mathematical Epistemology, and Social systems modelling,

Professor Josue Antonio Nescolarde Selva has authored more than 100 peer-reviewed scientific publications in prestigious journals, with over 70 of them indexed in Science Citation Index.



4. Genome Analysis

Brief Intros: Bioinformatics is a new interdisciplinary subject in the 21st century. It is a science that uses computer as a tool to store, retrieve and analyze biological information in the research of life science. With the sequencing of human genome, the importance of bioinformatics has become more and more prominent. However, because it is a new interdisciplinary subject, which involves knowledge in mathematics, statistics, biology, physics and other disciplines, there is a lack of bioinformatics students in this field.

The course of genome analysis aims to teach students how to use bioinformatics tool to solve biological problems. Through the study of this course, students can have a comprehensive understanding of the basic concepts of bioinformatics, including next-generation sequencing, genome structure and annotation, differentially expressed genes and machine learning methods etc., improve students' ability to analyze biological data and have a frontier vision.

Leading Scholar



Associate Professor Wang Sufang, a renowned researcher in the field of genomics, transcriptomics, and human immune cells. Her expertise lies in next-generation sequencing technologies and genome-wide association studies in plants. Additionally, she has



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explored the effects of microgravity on human immune cells. Currently, Associate Professor Wang Sufang has secured two NSFC grants and two provincial grants, highlighting her exceptional achievements and contributions to the field. Her research findings have been published in 14 research papers, contributing to the advancement of scientific knowledge.

In recognition of her expertise, Associate Professor Wang Sufang was awarded first prize in the "Young Teachers Lecture Competition in the School of Life Sciences at Northwestern Polytechnical University" in December 2018. She also received third prize in the "National College Teaching Innovation Competition - Fifth Foreign Language Micro Course Competition" in the Shaanxi Division in October 2019.

5. Microbiology: Tool for Sustainable Development

Brief Intros: The course entitled "Microbiology: Tool for Sustainable Development" will provide students with an understanding of the fundamentals of microbiology and how they play an important role in environmental and economic stability. Students will learn how microorganisms serve as an important backbone for a variety of geological processes. This course is designed to develop students' critical thinking and ability to identify key environmental problems and sustainable, eco-friendly microbial-mediated solutions. In addition, the course will shed light on resource recovery for sustainable development and a circular economy, helping students think critically about how to effectively implement microbes for the development of sustainable technologies.



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Leading Scholar



Dr. Fiaz Ahmad is an Associate Professor at the School of Life Sciences, NPU. He received an “Outstanding Research Award, the Best Research Paper Award of the Year” and a cash prize of PKR 50,000 from the Higher Education Commission (HEC), Government of Pakistan in the year 2015. During his Ph.D., he has conferred the “Excellent International Doctoral Student Awards” for the year 2017-2018, 2018-2019, & “Outstanding Doctoral Graduate Student Award” (2020). His Ph.D. work was admired at the international forum & appreciated with the “Best Paper Award” at the 5th World Congress on New Technologies (NewTech’19), Held in Lisbon, Portugal (2019). To date, he holds 10 patents, 2 have been granted and the rest are accepted. His works have been published in internationally renowned peer-reviewed journals, such as Trends Microbiol - Cell Press, J Hazard Mat, Crit Rev Microbiol, Appl Microbiol Biotechnol, J Environ Manage, Cryst Growth Des, Mater Sci Eng -C, CrystEngComm, etc., cited more than 550 times.