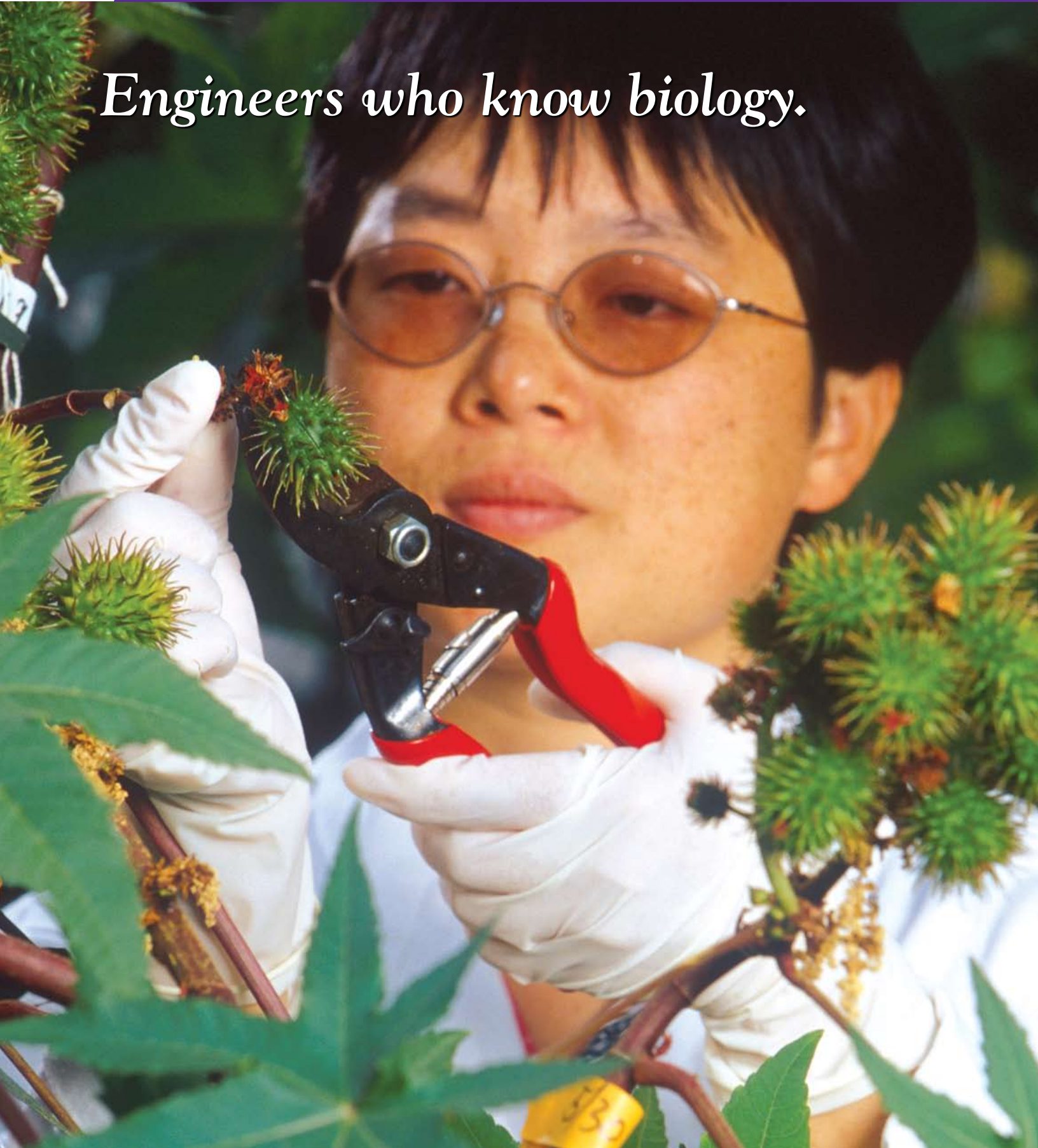


BIOLOGICAL ENGINEER

Engineers who know biology.



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Biological engineering is a new, rapidly developing discipline that uses scientific principles involving the life sciences to create products and processes to meet human needs in a profitable, effective manner. Due to the very intimate nature of biology and living organisms, this type of engineering has the potential to be very different than traditional engineering disciplines, which are primarily based on non-living materials and processes.

Areas that currently hire biological engineers include industries based on food and bioprocessing, plant and animal development, environmental sustainability, pharmaceutical production, and biomedical materials processing. Typical jobs include designing equipment to produce pharmaceuticals, pet food, or human foods; controlling tissue growth for new biological products; developing biological sensors to minimize stress or enhance productivity; controlling the environments in greenhouses and animal facilities; resolving waste management, water quality, and other environmental concerns; and developing biodegradable products. One important area in biological engineering is the development of renewable natural resources for use in energy applications (biofuels, lubricants, etc.) as petroleum availability declines in this century.

Biological engineers are hired by food and industrial processing companies, pharmaceutical and health equipment manufacturers; environmental consulting firms; biotechnological companies; federal, state, and local research, regulatory, and educational agencies; and greenhouse and animal housing manufacturers.

To be a biological engineer you need strong skills in mathematics combined with knowledge in the basic sciences: chemistry, physics, and biology. You may also have specific interests in areas such as: improving food, nutrition, and health for humans and animals; creating new foods; or addressing problems like waste management, water pollution, and waste reduction. In college you will take courses in mathematics, physics, chemistry, biology, communications, computer science, economics, and a wide variety of engineering sciences including heat flow, environmental engineering, water movement, fluid mechanics, instrumentation, controls, properties of agricultural materials, engineering analysis, and engineering design.

In high school, take [mathematics](#), [physics](#), [chemistry](#), [biology](#), [English](#), and [computer science](#). It also helps to get involved in activities that give you experience in communicating, leading groups, solving problems, analyzing situations, and resolving conflicting views. Additionally, due to the very intimate nature of this discipline, it would be very helpful to have a background in [ethics](#) and [philosophy](#), since many significant issues involving genetic engineering of living organisms will be part of this discipline.



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