**Associate of Science Degree: Associate of Science Degree in Biostatistics.**

The AS Degree in Biostatistics is a program designed to train students in the methods and techniques used in biotechnology, with emphasis on statistical applications used in manufacturing and research settings. Students in the degree program complete the biotechnology science core courses and electives listed below. In addition to the core courses listed below, students must complete Ohlone College General Education Plan A. Fifty percent of the core courses must be completed at Ohlone. Additionally, MATH 159, BIOT 112, and BIOT 133 must be completed at Ohlone. Courses in this program train students in DNA and protein laboratory techniques and assays, laboratory record keeping, sterile techniques, statistical methodology, and computer applications. The program prepares students for entry-level positions in biomanufacturing and pharmomanufacturing positions requiring skills biostatistics.

Students will be awarded the AS Degree in Biostatistics upon completion of all Biotechnology core and elective courses and Ohlone College GE Plan A, for a total of 60 units.

**Biotechnology Core Courses**

| | |
|---|---|
| CHEM 109 Biochemistry for Health Science and Biotechnology | 4 |
| CAOT 148 Computer Applications in Biotechnology | 0.5 |
| BIOT 105 Introduction to Cell & Molecular Biology | 4 |
| BIOT 106M Math Applications in Biotechnology | 2 |
| BIOT 110A1 Introduction to DNA Techniques | 1 |
| BIOT 110A2 PCR I and DNA Sequencing | 1 |
| BIOT 110A3 Protein Isolation and Assays | 1 |
| BIOT 112 Introduction to Bioinformatics | 2 |
| BIOT 113 GMP/GLP | 0.5 |
| BIOT 115A Animal Cell Culture Techniques | 2 |
| BIOT 115B Bioreactor Cell Culture Techniques | 2 |
| BIOT 121 Biotechnology Careers | 1 |
| BIOT 131D Review of Biotechnology Concepts | 1 |
| MATH 159 Elements of Statistics and Probability | 5 |
| **Units = 27** | |

**Electives**

**Students complete 5-8 units from the list of electives**

| | |
|---|---|
| BIOL 101A Principles of Biology--Molecular & Cellular Biology | 5 |
| BIOL 105 Heredity, Evolution & Society | 3 |
| BIOL 106 Microbiology | 5 |
| BIOT 111A Genomic and cDNA Library Construction and Analysis | 1.5 |
| BIOT 111B PCR Primer Design and Optimization and Reverse Transcription PCR | 1.5 |
| BIOT 117 Immunology | 1 |
| BIOT 119 Clean Room Operations | 0.5 |
| BIOT 123 Writing SOPs | 0.5 |
| CHEM 101A General Chemistry | 5 |
| ENGL 156 Introduction to Report & Technical Writing | 3 |
| SPCH 101 Introduction to Public Speaking | 3 |
| **Total Units:** | **32-35** |

**Associate of Science Degree in Biotechnology--Cell Production/Fermentation**

The AS Degree in Biotechnology--Cell Production/Fermentation is a program designed to train students in the methods and techniques used in biotechnology, with emphasis on cell production used in manufacturing settings. Students in this degree program complete the biotechnology science core courses and electives listed below. In addition to the core courses listed below, students must complete Ohlone College General Education Plan A. Fifty percent of the core courses must be completed at Ohlone. Additionally, BIOT 115A, BIOT 115B, BIOT 117 and BIOT 119 must be completed at Ohlone. Courses in this program train students in DNA and protein laboratory techniques and assays, laboratory record keeping, sterile techniques, and cell-culturing techniques. The program prepares students for entry-level positions in biomanufacturing and pharmomanufacturing positions requiring skills in cell culturing and fermentation.

Students will be awarded the AS Degree in Biotechnology--Cell Production/Fermentation upon completing the required core courses and electives and Ohlone College General Education Plan A for a total of 60 units.

**Biotechnology Core Courses**

| | |
|---|---|
| CHEM 109 Biochemistry for Health Science and Biotechnology | 4 |
| CAOT 148 Computer Applications in Biotechnology | 0.5 |
| BIOT 105 Introduction to Cell & Molecular Biology | 4 |
| BIOT 106M Math Applications in Biotechnology | 2 |
| BIOT 110A1 Introduction to DNA Techniques | 1 |
| BIOT 110A2 PCR I and DNA Sequencing | 1 |
| BIOT 110A3 Protein Isolation and Assays | 1 |
| BIOT 113 GMP/GLP | 0.5 |
| BIOT 115A Animal Cell Culture Techniques | 2 |
| BIOT 115B Bioreactor Cell Culture Techniques | 2 |
| BIOT 117 Immunology | 1 |
| BIOT 121 Biotechnology Careers | 1 |
| BIOT 131D Review of Biotechnology Concepts | 1 |
| ENGL 156 Introduction to Report & Technical Writing | 3 |
| BIOT 119 Clean Room Operations | 0.5 |
| **Units = 24.5** | |

**Electives**

**Students complete 10.5-14.0 units from the list of electives**

| | |
|---|---|
| BIOT 111A Genomic and cDNA Library Construction and Analysis | 1.5 |
| BIOT 111B PCR Primer Design and Optimization and Reverse Transcription PCR | 1.5 |
| BIOT 112 Introduction to Bioinformatics | 2 |
| BIOT 120 Introduction to Scanning Electron Microscopy (SEM) | 1 |
| BIOT 122 Introduction to Nanotechnology | 3 |
| BIOT 123 Writing SOPs | 0.5 |
| BIOT 131 Computing in Biotechnology | 4 |
| BIOT 132 DNA Computing | 2 |
| BIOT 133 SAS Programming | 3 |
| BIOL 101A Principles of Biology--Molecular & Cellular Biology | 5 |
| BIOL 105 Heredity, Evolution & Society | 3 |
| BIOL 106 Microbiology | 5 |
| CHEM 101A General Chemistry | 5 |
| MATH 159 Elements of Statistics and Probability | 5 |
| SPCH 101 Introduction to Public Speaking | 3 |
| **Total Units = 35-38.5** | |

**Associate of Science Degree in Biotechnology Quality Control/Research**

The Associate of Science Degree in Biotechnology Quality Control/Research is a program designed to train students in the methods and techniques used in biotechnology, with emphasis on quality control and research technician settings. Students in the program complete the biotechnology science core courses and electives listed below. In addition to the core courses listed below, students must complete Ohlone College General Education Plan A. Fifty percent of the core courses must be completed at Ohlone. Additionally, BIOT 111A and BIOT 111B must be completed at Ohlone. Courses in this program train students in DNA and protein laboratory techniques and assays, laboratory record keeping, sterile techniques, genomic and cDNA library construction and analysis, and rt-PCR. The program prepares students for entry-level positions in biomanufacturing and pharmomanufacturing quality control and research technician positions.

Students will be awarded the Associate of Science Degree in Biotechnology Quality Control/Research upon completing all required core and elective courses plus Ohlone College General Education Plan A, for a total of 60 units.

**Biotechnology Core Courses.**

| | |
|---|---|
| CHEM 109 Biochemistry for Health Science and Biotechnology | 4 |
| CAOT 148 Computer Applications in Biotechnology | 0.5 |
| BIOT 105 Introduction to Cell & Molecular Biology | 4 |
| BIOT 106M Math Applications in Biotechnology | 2 |
| BIOT 110A1 Introduction to DNA Techniques | 1 |
| BIOT 110A2 PCR I and DNA Sequencing | 1 |
| BIOT 110A3 Protein Isolation and Assays | 1 |
| BIOT 111A Genomic and cDNA Library Construction and Analysis | 1.5 |
| BIOT 111B PCR Primer Design and Optimization and Reverse Transcription PCR | 1.5 |
| BIOT 113 GMP/GLP | 0.5 |
| BIOT 115A Animal Cell Culture Techniques | 2 |
| BIOT 115B Bioreactor Cell Culture Techniques | 2 |
| BIOT 121 Biotechnology Careers | 1 |
| BIOT 123 Writing SOPs | 0.5 |
| BIOT 131D Review of Biotechnology Concepts | 1 |
| ENGL 156 Introduction to Report & Technical Writing | 3 |
| | **Units = 26.5** |

**Electives**
**Students complete 8.5-12.0 units from the list of electives**

| | |
|---|---|
| BIOT 117 Immunology | 1 |
| BIOT 120 Introduction to Scanning Electron Microscopy (SEM) | 1 |
| BIOT 122 Introduction to Nanotechnology | 3 |
| BIOT 131 Computing in Biotechnology | 4 |
| BIOT 133 SAS Programming | 3 |
| BIOL 101A Principles of Biology--Molecular & Cellular Biology | 5 |
| BIOL 105 Heredity, Evolution & Society | 3 |
| BIOL 106 Microbiology | 5 |
| CHEM 101A General Chemistry | 5 |
| MATH 159 Elements of Statistics and Probability | 5 |
| SPCH 101 Introduction to Public Speaking | 3 |
| | **Total Units = 35-38.5** |

**Certificate of Achievement: Certificate of Achievement in Cell Production/Fermentation**

The Certificate of Achievement in cell Production/Fermentation is a 21.5 unit program designed to train students in methods and techniques used in biotechnology, with emphasis on cell production used in manufacturing settings. Courses in this program train students in DNA and protein laboratory techniques and assays, laboratory record keeping, sterile techniques, and cell-culturing techniques. The program prepares students for entry-level positions in biomanufacturing and pharmomanufacturing positions requiring skills in cell culturing and fermentation.

Students awarded this certificate will have completed all required core courses described for the program with a C grade or better.
**BIOT 115A, BIOT 115B, BIOT 117, and BIOT 119 must be taken at Ohlone.**

| | |
|---|---|
| CHEM 109 Biochemistry for Health Science and Biotechnology | 4 |
| CAOT 148 Computer Applications in Biotechnology | 0.5 |
| BIOT 105 Introduction to Cell & Molecular Biology | 4 |
| BIOT 106M Math Applications in Biotechnology | 2 |
| BIOT 113 GMP/GLP | 0.5 |
| BIOT 121 Biotechnology Careers | 1 |
| BIOT 131D Review of Biotechnology Concepts | 1 |
| BIOT 110A1 Introduction to DNA Techniques | 1 |
| BIOT 110A2 PCR I and DNA Sequencing | 1 |
| BIOT 110A3 Protein Isolation and Assays | 1 |
| BIOT 115A Animal Cell Culture Techniques | 2 |
| BIOT 115B Bioreactor Cell Culture Techniques | 2 |
| BIOT 117 Immunology | 1 |
| BIOT 119 Clean Room Operations | 0.5 |
| **Total Units =** | **21.5** |

**Certificate of Achievement : Certificate of Achievement in Biostatistics**

The Certificate of Achievement in Biostatistics is a 28 unit program designed to train students in methods and techniques used in biotechnology statistical analysis. Courses in this program train students in DNA and protein laboratory techniques and assays, laboratory record keeping, sterile techniques, and mathematical analysis of laboratory outcomes. The program prepares students for entry-level positions in biomanufacturing and research assistant positions requiring skills in statistics.

The student will be awarded this certificate after completion of all required core courses with a C grade or better.
**BIOT-113, MATH-159 must be completed at Ohlone College**

| | |
|---|---|
| CAOT 148 Computer Applications in Biotechnology | 0.5 |
| CHEM 109 Biochemistry for Health Science and Biotechnology | 4 |
| BIOT 105 Introduction to Cell & Molecular Biology | 4 |
| BIOT 106M Math Applications in Biotechnology | 2 |
| BIOT 113 GMP/GLP | 0.5 |
| BIOT 121 Biotechnology Careers | 1 |
| BIOT 131D Review of Biotechnology Concepts | 1 |
| BIOT 110A1 Introduction to DNA Techniques | 1 |
| BIOT 110A2 PCR I and DNA Sequencing | 1 |
| BIOT 110A3 Protein Isolation and Assays | 1 |
| BIOT 115A Animal Cell Culture Techniques | 2 |
| BIOT 115B Bioreactor Cell Culture Techniques | 2 |
| BIOT 133 SAS Programming | 3 |
| MATH 159 Elements of Statistics and Probability | 5 |
| **Total Units =** | **28** |

**Certificate of Achievement: Certificate of Achievement in Biotech QC/Research**

The Certificate of Achievement in Biotech Quality Control/Research is a 23 unit program designed to train students in methods and techniques used in biotechnology quality control and research settings. Courses in this program train students in DNA and protein laboratory techniques and assays, laboratory record keeping, sterile techniques, advanced PCR procedures, and genomic/cDNA library construction and analytical skills. The program prepares students for entry-level positions in as research assistants and/or quality control technicians in biotechnology.

Students awarded this certificate will have completed all required core courses described for the program with a C grade or better.
**Biot 111A and Biot 111B must be taken at Ohlone**

| | |
|---|---|
| CAOT 148 Computer Applications in Biotechnology | 0.5 |
| CHEM 109 Biochemistry for Health Science and Biotechnology | 4 |
| BIOT 105 Introduction to Cell & Molecular Biology | 4 |
| BIOT 106M Math Applications in Biotechnology | 2 |
| BIOT 113 GMP/GLP | 0.5 |
| BIOT 121 Biotechnology Careers | 1 |
| BIOT 131D Review of Biotechnology Concepts | 1 |
| BIOT 110A1 Introduction to DNA Techniques | 1 |
| BIOT 110A2 PCR I and DNA Sequencing | 1 |
| BIOT 110A3 Protein Isolation and Assays | 1 |
| BIOT 111A Genomic and cDNA Library Construction and Analysis | 1.5 |
| BIOT 111B Genomic and cDNA Library Construction and Analysis | 1.5 |
| BIOT 115A Animal Cell Culture Techniques | 2 |
| BIOT 115B Bioreactor Cell Culture Techniques | 2 |
| **Total Units =** | **23** |