



Missouri Target Industry Brief BIO-SCIENCE

Bio-Science Target Industry

The **Bio-Science** Target Industry Group encompasses three niches: Plant and Agricultural Technology, Companion and Feed Animal Sciences, and Biomedical. Missouri has a robust network of public and private entities supporting research and economic growth within this target industry.

Missouri is home to a Bio-Science Industry that employs 49,729 workers. Leading employment in the Bio-Science Industry is *Other Professional and Technical Services* employing 11,739 with *Scientific and Research and Development Services* following with an employment of 7,184.

Location quotient (LQ) compares the regional share of an industry to the national share. An LQ over 1 indicates sectors of employment concentration larger than the nation. Missouri's leading Bio-Science Industries are *Animal Food Manufacturing* with an LQ of 3.71 and *Hog and Pig Farming* with a LQ of 2.93.

2014 Employment and Establishment Data for the Bio-Science Target Industry Group

| Total Private Sector Industries | | 175,198 | 2,250,914 | \$44,698 | |
|---------------------------------|--|---------|-----------|----------|------|
| 1111 | Oilseed and Grain Farming | 532 | 2,434 | \$34,913 | 2.32 |
| 1122 | Hog and Pig Farming | 78 | 1,779 | \$33,196 | 2.93 |
| 1152 | Support Activities for Animal Production | 79 | 599 | \$27,789 | 1.1 |
| 3111 | Animal Food Manufacturing | 83 | 3,956 | \$77,178 | 3.71 |
| 3112 | Grain and Oilseed Milling | 38 | 2,247 | \$52,260 | 1.95 |
| 3251 | Basic Chemical Manufacturing | 60 | 3,270 | \$68,895 | 1.16 |
| 3253 | Agricultural Chemical Manufacturing | 51 | 1,716 | \$71,838 | 2.39 |
| 3254 | Pharmaceutical and Medicine Manufacturing | 76 | 5,292 | \$88,690 | 0.97 |
| 3391 | Medical Equipment and Supplies Manufacturing | 218 | 3,463 | \$47,097 | 0.58 |
| 4245 | Farm Product Raw Material Merch. Whls. | 179 | 2,248 | \$44,801 | 1.55 |
| 5417 | Scientific Research and Development Services | 357 | 7,184 | \$85,829 | 0.58 |
| 5419 | Other Professional and Technical Services | 1,533 | 11,739 | \$38,193 | 0.95 |
| 6215 | Medical and Diagnostic Laboratories | 309 | 3,802 | \$52,855 | 0.78 |
| Total Bio-Science Industries | | 8,593 | 49,729 | \$55,656 | 0.98 |

Source: 2014 Quarterly Census of Employment and Wages, Bureau of Labor Statistics

Bio-Science Employment Trends

Bio-Science Five-Year Employment Trends

Employment trends for the **Bio-Science** Target Industry Group from 2010 to 2014 shows a decrease of 699 total jobs. Nine industries had employment growth during the time period, but the majority of the job losses came from *Scientific Research and Development Services and Medical Equipment and Supplies Manufacturing*.

Industries with the largest job growth during the five-year period were *Other Professional and Technical Services* with an increase of 882 jobs, *Pharmaceutical and Medicine Manufacturing* employment increased by 719 jobs, and *Oilseed and Grain Farming* increased employment by 612 jobs.

Industries with the largest employment loss were *Scientific Research and Development Services* with a loss of 3,109 jobs, and *Medical Equipment and Supplies Manufacturing* with a loss of 437 jobs, and *Farm Product Raw Material Merchandise Wholesalers* with a loss of 210 jobs.

2010 - 2014 Employment Data - Bio-Science Target Industry Group

| | | | | | | | |
|------|--|---------------|---------------|---------------|---------------|---------------|-------------|
| 1111 | Oilseed and Grain Farming | 2,434 | 2,381 | 2,206 | 1,966 | 1,822 | 612 |
| 1122 | Hog and Pig Farming | 1,779 | 1,834 | 1,761 | 1,724 | 1,711 | 68 |
| 1152 | Support Activities for Animal Production | 599 | 576 | 575 | 566 | 556 | 43 |
| 3111 | Animal Food Manufacturing | 3,956 | 3,934 | 3,837 | 3,713 | 3,544 | 412 |
| 3112 | Grain and Oilseed Milling | 2,247 | 2,240 | 2,564 | 2,135 | 2,160 | 87 |
| 3251 | Basic Chemical Manufacturing | 3,270 | 2,959 | 3,149 | 3,164 | 3,095 | 175 |
| 3253 | Agricultural Chemical Manufacturing | 1,716 | 1,708 | 1,693 | 1,676 | 1,649 | 67 |
| 3254 | Pharmaceutical and Medicine Manufacturing | 5,292 | 5,472 | 5,052 | 4,637 | 4,573 | 719 |
| 3391 | Medical Equipment and Supplies Manufacturing | 3,463 | 3,391 | 3,434 | 4,004 | 3,900 | -437 |
| 4245 | Farm Product Raw Material Merch. Whls. | 2,248 | 2,147 | 2,201 | 2,400 | 2,458 | -210 |
| 5417 | Scientific Research and Development Services | 7,184 | 6,742 | 10,031 | 10,018 | 10,293 | -3,109 |
| 5419 | Other Professional and Technical Services | 11,739 | 11,162 | 10,735 | 10,706 | 10,857 | 882 |
| 6215 | Medical and Diagnostic Laboratories | 3,802 | 3,850 | 3,963 | 3,856 | 3,810 | -8 |
| | Total | 49,729 | 48,326 | 51,201 | 50,368 | 50,428 | -699 |

Source: Quarterly Census of Employment and Wages, Bureau of Labor Statistics

Bio-Science Occupations

Bio-Science Occupations

Top long-term training occupations in **Bio-Science** industry include *Pharmacists, Chemists* and *Environmental Scientists*. Top moderate training occupations include *Medical and Clinical Laboratory Technicians, Radiologic Technologists* and *Health Technologists, and Technicians*. Leading short-term training occupations include *Veterinary Assistants* and *Laboratory Animal Caretakers and Farm Workers* and *Crop, Nursery and Greenhouse Laborers*.

2014 Top Biosciences Occupational Employment

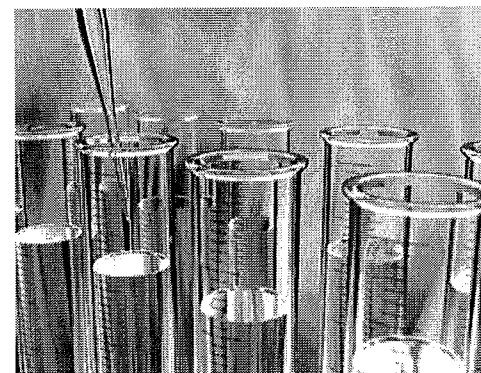
| Occupation Code | Title | 2014 Employment | 2014 Average Wage | 2014 Occupation Location Quotient |
|-------------------------------|--|------------------|-------------------|-----------------------------------|
| Total, All Occupations | | 2,673,640 | \$42,790 | |
| 29-1051 | Pharmacists | 6,010 | \$122,530 | 1.05 |
| 19-2031 | Chemists | 2,180 | \$69,530 | 1.28 |
| 19-2041 | Environmental Scientists and Specialists, Including Health | 1,220 | \$48,060 | 0.69 |
| 29-1131 | Veterinarians | 1,170 | \$77,980 | 0.95 |
| 19-1021 | Biochemists and Biophysicists | 1,160 | \$85,820 | 1.87 |
| 29-2012 | Medical and Clinical Laboratory Technicians | 4,060 | \$39,080 | 1.28 |
| 29-2034 | Radiologic Technologists | 3,850 | \$51,310 | 1.01 |
| 29-2099 | Health Technologists and Technicians, All Other | 2,250 | \$41,380 | 1.18 |
| 49-9062 | Medical Equipment Repairers | 1,340 | \$43,900 | 1.64 |
| 29-2056 | Veterinary Technologists and Technicians | 1,190 | \$32,670 | 0.65 |
| 43-9061 | Office Clerks, General | 58,710 | \$29,910 | 1.03 |
| 43-4051 | Customer Service Representatives | 50,480 | \$32,720 | 1.02 |
| 29-2052 | Pharmacy Technicians | 9,500 | \$28,560 | 1.30 |
| 31-9096 | Veterinary Assistants and Laboratory Animal Caretakers | 2,130 | \$22,190 | 1.52 |
| 45-2093 | Farmworkers, Farm, Ranch, and Aquacultural Animals | 1,760 | \$23,890 | 2.82 |

Source: 2014 Occupational Employment Survey, Bureau of Labor Statistics

MISSOURI ECONOMIC RESEARCH AND INFORMATION CENTER

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Agriculture, Food and Natural Resources: Plant Systems Career Pathway Plan of Study for Learners Parents Counselors Teachers/Faculty

This Career Pathway Plan of Study (based on the Plant Systems Pathway of the Agriculture, Food and Natural Resources Career Cluster) can serve as a guide, along with other career planning materials, as learners continue on a career path. Courses listed within this plan are only recommended coursework and should be individualized to meet each learner's educational and career goals. *This Plan of Study, used for learners at an educational institution, should be customized with course titles and appropriate high school graduation requirements as well as college entrance requirements.

| EDUCATION LEVELS | GRADE | English/ Language Arts | Math | Science | Social Studies/ Sciences | Other Required Courses Other Electives Recommended Electives Learner Activities | *Career and Technical Courses and/or Degree Major Courses for Plant Systems Pathway | SAMPLE Occupations Relating to This Pathway |
|---|---|----------------------------------|-----------------------------------|--------------------------------------|-----------------------------|--|--|---|
| <i>Interest Inventory Administered and Plan of Study Initiated for all Learners</i> | | | | | | | | |
| SECONDARY | 9 | English/ Language Arts I | Algebra I | Earth or Environmental Science | State History Civics | All plans of study should meet local and state high school graduation requirements and college entrance requirements. Supervised Agricultural Experience (SAE) and participation in appropriate FFA activities support and reinforce classroom and laboratory learning and should be a requirement for all students. | <ul style="list-style-type: none"> Introduction to Agriculture, Food and Natural Resources Introduction to Plant and Soil Science Advanced Plant and Soil Science focusing on agronomy, forestry and range science or horticulture Biotechnology and Agricultural Science Research Choose one of the following: <ul style="list-style-type: none"> Agronomy Forestry and Range Science Horticulture | Occupations Requiring Postsecondary Education <ul style="list-style-type: none"> ▶ Agricultural Journalist ▶ Biotechnology Lab Technician ▶ Commodity Marketing Specialist ▶ Custom Hay/Silage Operator ▶ Farmer ▶ Golf Course Manager ▶ Grain Operation Superintendent ▶ Green House Manager ▶ Rancher ▶ Tree Surgeon |
| | 10 | English/ Language Arts II | Geometry | Biology | U.S. History | | | |
| | 11 | English/ Language Arts III | Algebra II or other math course | Chemistry or other science course | World History | | | |
| <i>College Placement Assessments-Academic/Career Advisement Provided</i> | | | | | | | | |
| POSTSECONDARY | 12 | English/ Language Arts IV | Trigonometry or other math course | Botany or other science course | | All plans of study need to meet learners' career goals with regard to required degrees, licenses, certifications or journey worker status. Certain local student organization activities may also be important to include. | <ul style="list-style-type: none"> Principles of Plant Systems Fundamentals of Plant Production and Management Students choose area of specialization and take related courses such as Horticulture, Forestry or Agronomy Continue Courses in Area of Specialization Complete Plant Systems Major (4-Year Degree Program) | Occupations Requiring Baccalaureate Degree <ul style="list-style-type: none"> ▶ Agricultural Educator ▶ Bioinformatics Specialist ▶ Botanist ▶ Plant Breeder and Geneticist ▶ Plant Pathologist ▶ Soil and Water Specialist |
| | Year 13 | English Composition | Algebra | Chemistry | American Government | | | |
| | Year 14 | Speech/ Oral Communication | | Biological Science Botany | American History Geography | | | |
| | Year 15 | Technical Writing | Statistics | Organic Chemistry Microbiology | Political Science | | | |
| Year 16 | Continue courses in the area of specialization. | | | | | | | |

Articulation/Dual Credit Transcribed-Postsecondary courses may be taken/moved to the secondary level for articulation/dual credit purposes.



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