



Gateway Skills 2008: Science, Technology, Engineering, & Mathematics Occupations

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Key Findings

- In 2006, there were 42,914 science-intensive jobs (annual mean wage \$101,349*), 69,453 technology-intensive jobs (annual mean wage \$68,824), 55,796 engineering-intensive jobs (\$67,556), and 24,394 mathematics-intensive jobs (annual mean wage \$64,083) in Missouri, which all paid much higher salaries than the state average wage of \$36,594.
- By 2016, science-intensive jobs will increase by more than 15.6%, technology-intensive jobs will increase by 13%, engineering-intensive jobs will increase by more than 12.7%, and mathematics-intensive jobs will increase by 19.9%.
- Science-intensive occupations accounted for 1.5% of all employment statewide in 2006. Technology-intensive jobs accounted for 2.4% of the statewide employment, engineering-intensive jobs accounted for 1.92%, and mathematics-intensive jobs accounted for 0.84% of the 2006 state employment.
- In general, mean average wages per job for most Gateway Skill occupations were below the national averages for Gateway Skill occupations. However, this is expected as Missouri's average wage is also below the national average wage for 2006. Mathematics-intensive jobs had the most occupations either similar to or above the national average.
- The proportion of graduates obtaining post-secondary degrees (associate's, bachelor's, master's, and doctorates) in mathematics, computer science, and physical science has been increasing steadily. Though the proportion of graduates gaining advanced degrees is growing over time, the state is not keeping up with the rate of advanced degrees overall.
- Just 30% of Missouri's 8th graders were proficient or advanced in mathematics in 2007 and only 33% of Missouri 8th graders were proficient or advanced in science in 2005. Missouri students did score better in science assessments, above the national average and with more consistency, between 4th and 8th grade.

*The average wage of science-intensive occupations is unusually high due to the large number of skilled medical professionals within this skill area along with their high numbers of employment.

Overview

At the turn of the millennium, it became evident to the nation that our economy was in the process of transitioning from an asset-based to an intangible asset-based system. In this new economy, copyrights, patents, branding, innovation, and knowledge are valued over more tangible assets such as stock or equipment. These intangible assets are critical in terms of making a company viably competitive on a national and even international scale. Many of these assets are products of industry innovation, spearheaded by human talent. Human innovation can provide industry with technical knowledge, help create new scientific discoveries and applications, and develop new ways in which to commercialize and position new products.

As such, it has been argued that both state and national economic growth are directly tied to innovation. The development of new technologies, products, and services creates progress in virtually all aspects of daily life. This development is key in meeting the upcoming challenges for Missouri such as rising health care costs for an aging population and the increased focus on new forms of energy, just to name a few. This accelerated rate of innovation will require more effective talent, especially in the areas of science, technology, engineering, and mathematics, also known as gateway skills.

“Increased global competition, lackluster performance in mathematics and science education, and a lack of national focus on renewing its science and technology infrastructure have created a new economic and technological vulnerability as serious as any military or terrorist threat.”

Rising Above the Gathering Storm (2006), National Academy of Sciences

In 2006, Missouri established a task force to investigate ways to increase student participation in gateway skills disciplines to better prepare Missourians for existing and future careers. Four strategic challenges have been identified that are central to improving gateway skills education in Missouri: Improve all students’ performance from pre-kindergarten through graduate education, expand the pool of students motivated to pursuing science, technology, engineering, and mathematical occupations, expand the pool of Missouri’s teachers who focus on these four gateway skills areas, and increase the public awareness of the importance of gateway skills industries and jobs in enhancing Missouri’s competitiveness and innovation. This analysis focuses on the gateway skills occupations—four areas that have, in the past, been linked to occupations with job security, advancement, and higher wages.

Methods

Occupations were classified as science, technology, engineering, or mathematics intensive if the combined importance and level of mathematics, technology, or science skills needed to perform a particular job were two or more standard deviations above the mean skill level for all occupations. Skills refer to the developed capacities that facilitate learning and/or performance within occupations. Occupational skills data was taken from a national database called the Occupational Information Network (O*NET) to be used in the analysis. Certain occupations on O*Net are subdivided into several more detailed occupations, such as Fire Inspectors and Investigators (33-2021) have been divided into Fire Inspectors (33-2021.01) and Fire Investigators (33-2021.02). The average of the importance (IM) for each occupation was calculated by totaling the IM scores for each of the new occupations and dividing by the number of new occupations that O*NET had created. This same process was used to create an average of the level (LV) for each occupation.

IM and LV scores were then summed and standardized. The scores were standardized based on a 13 point scale, which is the result of summing both the 5 point importance scale and the 7 point level scale. This inherently weights the level of a skill over the importance in the standardized score. This process generated a skills proficiency score that ranged from 0.0 (lowest skill proficiency) to 100.0 (highest skill proficiency).

$$\text{SKILL-PROFICIENCY occupations} = (((\text{SumIMLV}-1) / (13-1)) * 100)$$

Where:

$$\text{SumIMLV} = \text{AvgIM} + \text{AvgLV}$$

$$\text{AvgIM} = \text{Average Skill Importance Score}$$

$$\text{AvgLV} = \text{Average Skill Level (Frequency of Use) Score}$$

The data for this analysis comes from three principal sources. Information on occupational skill requirements was taken from O*NET, maintained by the U.S. Department of Labor. Occupational wage data for Missouri was taken from Occupational Employment Statistics (OES), maintained by the Missouri Department of Economic Development and the U.S. Department of Labor. Occupational employment data for Missouri was taken from Employment Projections, maintained by the Missouri Department of Economic Development and the U.S. Department of Labor.

Occupational Information Network (O*NET)

O*NET is a comprehensive database of worker attributes and job characteristics. The database contains information on knowledge, skills and ability requirements for 812 occupations. Although it is sometimes difficult to differentiate among knowledge, skill and ability in practice, they are distinct concepts in theory. Knowledge refers to information that has been acquired through formal education or training experiences. Skills refer to developed capacities that facilitate learning or performance. Abilities are defined as underlying characteristics of individuals, which are related to effective or superior performance in a job.

The knowledge and skills measures are used in this analysis. It is important to remember that knowledge and skills in this study do not measure an individual worker's knowledge and skills. Instead, the knowledge and skills are measures of the average level required by the performance of certain functions in that occupation.

Occupational Employment Statistics (OES)

The Occupational Employment Statistics (OES) program conducts a yearly mail survey designed to produce estimates of employment and wages for specific occupations. The OES program collects data on wage and salary workers in non-farm establishments in order to produce employment and wage estimates for over 700 occupations. Data from self-employed persons are not collected and are not included in the estimates. Estimates based on geographic areas are available at the national, state and metropolitan area levels. Occupational employment and wage estimates for over 400 industry classifications are also available. The Missouri Department of Economic Development conducts the OES survey for the State of Missouri. Each year more than 10,000 employers will be surveyed through random selection based on their industrial classification, size and geographic location. In addition to the statewide data, there are tabulations for each of the state's six metropolitan statistical areas and thirteen Local Workforce Investment Areas.

Occupational Employment Projections

Occupational employment projections are developed using data from Missouri's occupational employment and wage survey along with unemployment insurance information provided by the State of Missouri and the U.S. Bureau of Labor Statistics. OES and Quarterly Census of Employment and Wages (QCEW) data are the basis for the occupational data used in the projections. The data collected reflect the Standard Occupational Classification (SOC). Many occupations are not identified separately in the SOC and are included in aggregate categories. Employment may not be sufficient to warrant the development of occupational projections in every occupation in each state, or the data may be confidential. The U.S. Employment and Training Administration provides funding for the employment projections program.

Science-Intensive Occupations Summary

According to 2006 estimates, there were 42,914 science-intensive jobs in Missouri earning an annual mean wage of \$101,349 per job, which is much higher than the state average wage of \$36,594. The projected number of science-intensive jobs for 2016 is expected to increase by more than 15.6% to a total of 49,589 jobs. The average level of educational attainment for individuals employed in science-intensive occupation in 2006 was a bachelor's degree or higher, plus work experience. In addition, workers in science-intensive occupations accounted for 1.5% of all employment statewide.

Most science-intensive jobs were in Education & Health Services, Self-Employed Workers, Government, and Professional & Business Services. The projected net change of science-intensive occupations from 2006-2016 is over 6,600 jobs.

Science-Intensive Occupations - Employment by Industry in Missouri			
Industry	2006 Employment	2016 Employment	Net Change
Construction	22,132	26,503	4,371
Education & Health Services	44,404	51,480	7,076
Financial Activities	14,812	18,828	4,016
Government	36,721	42,707	5,986
Information	23,215	27,616	4,401
Manufacturing	29,788	35,142	5,354
Natural Resources & Mining	12,210	13,302	1,092
Other Services (Except Government)	23,108	28,207	5,099
Professional & Business Services	33,855	39,753	5,898
Self-Employed Workers	43,891	50,938	7,047
Trade, Transportation, & Utilities	32,776	38,601	5,825
Missouri Total	42,914	49,589	6,675

Estimated annual average employment and wages for 2006.

Source: Analysis of Occupational Employment Statistics and O*Net by MERIC

In Missouri, science-intensive occupations with the highest employment base were Health Specialties Teachers, Higher Education (4,630 jobs at \$103,990), Mechanical Engineers (3,250 jobs at \$66,110), Family and General Practitioners (2,950 jobs at \$160,730), Dentists, General (2,210 jobs at \$150,070), and Chemists (1,990 jobs at \$61,910).

Occupations with the largest percentage of national mean wages were Health Specialties Teachers, Higher Education (128.9% of national mean wages), Dentists, General (109.1% of national mean wages), Family and General Practitioners (104.6% of national mean wages), Medical Scientists, except Epidemiologists (103.5%), and Surgeons (103.1%).

From 2006 to 2016, science-intensive occupations with the largest projected percent increases in employment are:

- Biochemists and Biophysicists (30 jobs at 38% change)
- Medical Scientists, except Epidemiologists (490 jobs at 33% change)
- Veterinarians (370 jobs at 25% change)
- Forensic Science Technicians (50 jobs at 25% change)
- Anthropology and Archeology Teachers, Higher Education (20 jobs at 22% change)

Science-Intensive Occupations- Employment and Wages in Missouri

Occupation Title	Employment 2006	Employment 2016	Entry Wage	Average Wage	Expert Wage	Mean Wage
Health Specialties Teachers, Higher Ed.	4,630	5,280	\$52,330	\$103,990	\$129,820	\$80,700
Mechanical Engineers	3,250	3,400	\$47,120	\$66,110	\$75,600	\$72,300
Family and General Practitioners	2,950	3,080	\$100,920	\$160,730	\$190,640	\$153,640
Dentists, General	2,210	2,080	\$73,480	\$150,170	\$188,510	\$137,630
Chemists	1,990	2,110	\$38,760	\$61,910	\$73,480	\$63,490
Aerospace Engineers	ND	ND	\$63,220	\$80,850	\$89,670	\$90,930
Biological Technicians	1,780	2,140	\$24,870	\$34,290	\$38,990	\$37,810
Medical Scientists, Except Epidemiologists	1,490	1,980	\$42,380	\$66,420	\$78,440	\$64,200
Veterinarians	1,480	1,850	\$40,860	\$74,440	\$91,220	\$84,090
Anesthesiologists	1,260	1,410	ND	\$183,480	ND	\$192,780
Nursing Instructors and Teachers, Higher Ed.	1,120	1,350	\$42,830	\$61,030	\$70,130	\$57,500
Surgeons	1,120	1,150	\$67,496	\$197,360	\$174,242	\$191,410
Biological Science Teachers, Higher Ed.	910	1,050	\$40,580	\$66,910	\$80,080	\$71,780
Obstetricians and Gynecologists	740	830	ND	\$181,200	ND	\$183,600
Internists, General	730	750	ND	\$168,590	ND	\$167,270
Pediatricians, General	630	650	\$67,490	\$138,660	\$174,240	\$145,210
Chemical Engineers	620	660	\$41,940	\$80,290	\$99,460	\$81,500
Engineering Teachers, Higher Ed.	560	650	\$50,410	\$81,540	\$97,100	\$79,510
Natural Sciences Managers	530	580	\$62,250	\$96,180	\$113,150	\$104,040
Zoologists and Wildlife Biologists	410	450	35,210	\$46,740	52,500	\$55,100

Estimated annual average employment and wages for 2006. Projected annual average employment for 2016.

Source: Analysis of Occupational Employment Projections and Occupational Employment Statistics by MERIC

ND: Non-disclosed data due to confidentiality restrictions from the U.S. Bureau of Labor Statistics

Using data from O*Net, skill proficiency scores were calculated by averaging the importance (IM) and level (LV) scores for each six-digit SOC occupation. IM and LV scores were then summed and standardized. The scores were standardized based on a 13-point scale, which is the result of summing both the 5-point importance scale and the 7-point level scale. The process generated a skills proficiency score that ranged from 0.0 (low skill proficiency) to 100.00 (high skill proficiency).

Skills refer to the developed capacities that facilitate learning and/or performance within occupations. Occupations with the highest science skills proficiency were

Atmospheric, Earth, Marine, and Sciences Teachers, Higher Education (score of 86.00), Physicists (score of 84.75), Chemistry Teachers, Higher Education (score of 83.75), Materials Scientists (score of 83.67), and Biological Sciences Teachers, Higher Education (score of 83.08).

Science-Intensive Occupations-MO Percent of US Wages & Projected Employment Growth

Occupation	Employment 2006	Employment 2016	Total Growth Openings 2006-2016*	MO Mean Wage	U.S. Mean Wage	MO % of U.S. Mean Wage
Health Specialties Teachers, Higher Ed.	4,630	5,280	652	\$103,990	\$80,700	128.86%
Mechanical Engineers	3,250	3,400	142	\$66,110	\$72,300	91.44%
Family and General Practitioners	2,950	3,080	130	\$160,730	\$153,640	104.61%
Dentists, General	2,210	2,080	0	\$150,170	\$137,630	109.11%
Chemists	1,990	2,110	121	\$61,910	\$63,490	97.51%
Aerospace Engineers	ND	ND	98	\$80,850	\$90,930	88.91%
Biological Technicians	1,780	2,140	359	\$34,290	\$37,810	90.69%
Medical Scientists, Except Epidemiologists	1,490	1,980	486	\$66,420	\$64,200	103.46%
Veterinarians	1,480	1,850	368	\$74,440	\$84,090	88.52%
Anesthesiologists	1,260	1,410	152	\$183,480	\$192,780	95.18%
Nursing Instructors and Teachers, Higher Ed.	1,120	1,350	225	\$61,030	\$57,500	106.14%
Surgeons	1,120	1,150	25	\$197,360	\$191,410	103.11%
Biological Science Teachers, Higher Ed.	910	1,050	140	\$66,910	\$71,780	93.22%
Obstetricians and Gynecologists	740	830	83	\$181,200	\$183,600	98.69%
Internists, General	730	750	17	\$168,590	\$167,270	100.79%
Pediatricians, General	630	650	18	\$138,660	\$145,210	95.49%
Chemical Engineers	620	660	40	\$80,290	\$81,500	98.52%
Engineering Teachers, Higher Ed.	560	650	89	\$81,540	\$79,510	102.55%
Natural Sciences Managers	530	580	42	\$96,180	\$104,040	92.45%
Zoologists and Wildlife Biologists	410	450	40	\$46,740	\$55,100	84.83%

Estimated annual average employment and wages for 2006. Projected annual average employment for 2016.

Source: Analysis of Occupational Employment Projections and Occupational Employment Statistics by MERIC

ND: Non-disclosed data due to confidentiality restrictions from the U.S. Bureau of Labor Statistics

*Growth Openings are defined as openings created by occupational creation or expansion

Science-Intensive Occupations - Skills Proficiency

Occupation	Reading Comprehension	Active Listening	Writing	Speaking	Mathematics	Science	Critical Thinking	Active Learning
Health Specialties Teachers, Higher Ed.	85.8	72.2	81.6	78.4	55.3	80.8	81.3	77.1
Mechanical Engineers	73.4	68.6	66.3	64.8	74.8	73.1	70.6	66.3
Family and General Practitioners	86.5	80.3	73.2	74.2	52.8	71.3	76.2	77.9
Dentists, General	79.9	74.7	58.4	69.3	44.8	74.6	77.0	75.1
Chemists	75.4	67.8	68.3	67.1	66.0	75.3	67.9	69.8
Aerospace Engineers	78.4	74.8	74.4	72.8	64.0	73.2	82.1	77.3
Biological Technicians	67.5	54.3	50.4	51.0	57.0	71.3	51.5	65.9
Medical Scientists, Except Epidemiologists	88.5	83.3	81.0	71.4	62.8	81.8	78.7	79.8
Veterinarians	82.8	78.8	65.2	73.6	67.0	72.6	76.5	74.9
Anesthesiologists	86.7	79.5	67.5	69.2	61.5	76.7	83.7	78.3
Nursing Instructors and Teachers, Higher Ed.	85.8	77.8	83.1	77.8	60.4	75.8	81.8	77.9
Surgeons	86.1	81.1	67.9	70.0	57.7	72.8	82.4	78.3
Biological Science Teachers, Higher Ed.	83.8	73.3	77.8	79.6	60.5	83.1	78.8	77.9
Obstetricians and Gynecologists	86.1	82.3	66.7	76.5	53.8	78.8	82.6	81.7
Internists, General	82.3	83.5	62.6	69.6	53.8	75.2	79.0	78.8
Pediatricians, General	81.8	80.1	65.2	71.2	61.1	72.6	81.8	79.2
Chemical Engineers	75.3	71.4	65.3	63.4	73.2	79.1	72.5	73.2
Engineering Teachers, Higher Ed.	82.5	73.6	79.4	77.6	83.6	82.8	85.2	83.9
Natural Sciences Managers	74.7	61.2	68.8	59.8	68.9	72.8	72.8	72.0
Zoologists and Wildlife Biologists	76.0	71.5	76.2	62.5	59.8	75.6	67.8	69.7

Skills proficiency reported on a 0.0 (low) to 100.0 (high) scale.

Source: Analysis of O*Net by MERIC

Technology-Intensive Occupations Summary

According to 2006 estimates, there were 69,453 technology-intensive jobs in Missouri earning an annual mean wage of \$68,824 per job, which is much higher than the state average wage of \$36,594. The projected number of technology-intensive jobs for 2016 is expected to increase by more than 13% to a total of 78,486 jobs. The average level of educational attainment for individuals employed in technology-intensive occupations in 2006 was a bachelor's degree or higher, plus work experience. In addition, workers in technology-intensive occupations accounted for 2.4% of all employment statewide.

Most technology-intensive jobs were in Self-Employed Workers, Manufacturing, Professional & Business Services, and Trade, Transportation & Utilities. The projected net change of technology-intensive occupations from 2006-2016 is more than 9,000 jobs.

Technology-Intensive Occupations - Employment by Industry in Missouri			
Industry	2006 Employment	2016 Employment	Net Change
Construction	53,178	61,219	8,041
Education & Health Services	59,899	68,710	8,811
Financial Activities	55,136	63,329	8,193
Government	62,900	71,587	8,687
Information	55,305	63,552	8,247
Manufacturing	63,385	71,878	8,493
Natural Resources & Mining	12,373	11,415	-958
Other Services (Except Government)	54,017	61,987	7,970
Professional & Business Services	63,424	72,052	8,628
Self-Employed Workers	65,742	74,650	8,908
Trade, Transportation, & Utilities	61,302	69,676	8,374
Missouri Total	69,453	78,486	9,033

Estimated average annual employment and wages for 2006.

Source: Analysis of Occupational Employment Statistics and O*Net by MERIC

In Missouri, technology-intensive occupations with the highest employment base were Computer Programmers (10,520 jobs at \$63,860), Computer Systems Analyst (9,620 jobs at \$69,600), Computer Software Engineers, Applications (7,040 jobs at \$74,190), Computer Software Engineers, Systems Software (5,600 jobs at \$75,210), and Network Systems and Data Communications Analysts (5,090 jobs at \$63,300).

Occupations with the largest percentage of national mean wages were Fashion Designers (110.0%), Agricultural Engineers (107.5%), Orthotists and Prosthetists (105.7%), Electronic Equipment Installers and Repairers, Motor Vehicles (104.3%), and Multi-media Artists and Animators (103.3%).

From 2006 to 2016, technology-intensive occupations with the largest projected percent increases in employment are:

- Network Systems and Data Communications Analysts (2,270 jobs at 44.6% change)
- Computer Software Engineers, Applications (2,370 jobs at 33.7% change)
- Computer Software Engineers, Systems Software (1,530 jobs at 27.3% change)
- Computer Systems Analysts (2,010 jobs at 20.9% change)
- Computer and Information Scientists, Research (40 jobs at 19.1% change)

Technology-Intensive Occupations- Employment and Wages in Missouri

Occupation Title	Employment 2006	Employment 2016	Entry Wage	Average Wage	Expert Wage
Network Systems and Data Communications Analysts	5,090	7,360	\$42,040	\$63,300	\$73,930
Computer Software Engineers, Applications	7,040	9,410	\$48,030	\$74,190	\$87,270
Computer Software Engineers, Systems Software	5,600	7,130	\$56,250	\$75,210	\$84,680
Nuclear Engineers	ND	ND	ND	ND	ND
Computer Systems Analysts	9,620	11,630	\$49,810	\$69,600	\$79,490
Computer and Information Scientists, Research	210	250	\$59,590	\$91,790	\$107,880
Biomedical Engineers	180	210	\$54,090	\$75,150	\$85,680
Engineering Teachers, Postsecondary	560	650	\$50,410	\$81,540	\$97,100
Multi-Media Artists and Animators	510	590	\$27,790	\$56,330	\$70,600
Agricultural Engineers	90	100	\$54,520	\$72,810	\$81,960
Electronics Engineers, Except Computer	1,420	1,570	\$51,530	\$73,770	\$84,900
Fashion Designers	130	140	\$34,230	\$69,090	\$86,520
Orthotists and Prosthetists	140	150	\$40,180	\$63,940	\$75,820
Aerospace Engineering and Operations Technicians	ND	ND	ND	ND	ND
Sound Engineering Technicians	150	160	\$29,430	\$42,500	\$49,030
Chemical Engineers	620	660	\$41,940	\$80,290	\$99,460
Sales Engineers	640	680	\$43,130	\$69,030	\$81,980
Aerospace Engineers	ND	ND	\$63,220	\$80,850	\$89,670
Electrical Engineers	2,500	2,610	\$54,400	\$75,600	\$86,190
Electronic Equipment Installers and Repairers, Motor Vehicles	320	330	\$20,490	\$29,350	\$33,780

Estimated annual average employment and wages for 2006. Projected annual average employment for 2016.

Source: Analysis of Occupational Employment Projections and Occupational Employment Statistics by MERIC

ND: Non-disclosed data due to confidentiality restrictions from the U.S. Bureau of Labor Statistics

O*Net technology skills refer to the developed capacities that facilitate learning and/or performance within technological occupations. Occupations with the highest technology skills proficiency were Computer Software Engineers, Applications (score of 78.25), Computer Software Engineers, Systems Software (score of 74.33), Agricultural Engineers (score of 72.58), Aerospace Engineering and Operations Technicians (score of 71.92), and Orthotists and Prosthetists (score of 71.83).

Technology-Intensive Occupations-MO Percent of US Wages & Projected Employment Growth

Occupation	Employment 2006	Employment 2016	Total Growth Openings 2006-2016*	MO Mean Wage	U.S. Mean Wage	MO % of U.S. Mean Wage
Computer Systems Analysts	9,620	11,630	2,014	\$69,600	\$73,090	95.23%
Computer Software Engineers, Applications	7,040	9,410	2,370	\$74,190	\$83,130	89.25%
Computer Software Engineers, Systems Software	5,600	7,130	1,529	\$75,210	\$89,070	84.44%
Network Systems and Data Communications Analysts	5,090	7,360	2,274	\$63,300	\$68,220	92.79%
Electrical Engineers	2,500	2,610	115	\$75,600	\$79,240	95.41%
Electronics Engineers, Except Computer	1,420	1,570	143	\$73,770	\$83,340	88.52%
Sales Engineers	640	680	41	\$69,030	\$80,270	86.00%
Chemical Engineers	620	660	40	\$80,290	\$81,500	98.52%
Engineering Teachers, Postsecondary	560	650	89	\$81,540	\$79,510	102.55%
Multi-Media Artists and Animators	510	590	76	\$56,330	\$54,550	103.26%
Electronic Equipment Installers and Repairers, Motor Vehicles	320	330	7	\$29,350	\$28,130	104.34%
Computer and Information Scientists, Research	210	250	36	\$91,790	\$97,970	93.69%
Biomedical Engineers	180	210	31	\$75,150	\$75,440	99.62%
Sound Engineering Technicians	150	160	9	\$42,500	\$46,550	91.30%
Orthotists and Prosthetists	140	150	16	\$63,940	\$60,520	105.65%
Fashion Designers	130	140	11	\$69,090	\$62,810	110.00%
Agricultural Engineers	90	100	5	\$72,810	\$67,710	107.53%
Nuclear Engineers	ND	ND	57	ND	\$94,420	95.76%
Aerospace Engineering and Operations Technicians	ND	ND	5	ND	\$54,930	75.13%
Aerospace Engineers	ND	ND	98	\$80,850	\$90,930	88.91%

Estimated annual average employment and wages for 2006. Projected annual average employment for 2016.

Source: Analysis of Occupational Employment Projections and Occupational Employment Statistics by MERIC

*Growth Openings are defined as openings created by occupational creation or expansion

Technology-Intensive Occupations - Skills Proficiency

Occupation	Reading Comprehension	Active Listening	Writing	Speaking	Mathematics	Science	Critical Thinking	Active Learning
Network Systems and Data Communications Analysts	67.8	65.8	56.5	57.8	46.1	32.4	67.1	67.8
Computer Software Engineers, Applications	74.9	67.1	61.3	64.8	58.3	47.7	81.0	75.8
Computer Software Engineers, Systems Software	74.6	64.1	57.5	58.6	72.3	56.3	78.3	77.4
Nuclear Engineers	70.4	72.5	72.3	65.4	73.7	62.3	73.2	68.0
Computer Systems Analysts	71.7	66.3	59.3	52.8	51.8	28.6	69.8	72.4
Computer and Information Scientists, Research	81.9	73.4	73.9	69.0	71.3	68.2	79.8	86.3
Biomedical Engineers	76.7	67.2	65.3	68.6	70.6	71.6	64.8	69.6
Engineering Teachers, Postsecondary	82.5	73.6	79.4	77.6	83.6	82.8	85.2	83.9
Multi-Media Artists and Animators	75.8	77.6	63.2	62.8	58.3	46.9	59.3	68.3
Agricultural Engineers	77.8	68.8	74.3	67.0	81.3	78.1	72.9	74.3
Electronics Engineers, Except Computer	78.1	68.8	67.2	63.3	71.3	63.6	69.2	73.0
Fashion Designers	58.8	63.5	61.8	70.0	69.5	41.1	74.5	76.3
Orthotists and Prosthetists	71.8	70.8	63.1	70.5	49.2	53.9	73.5	70.8
Aerospace Engineering and Operations Technicians	76.9	73.3	70.3	67.6	71.3	64.6	74.3	73.8
Sound Engineering Technicians	62.8	66.9	41.5	62.4	36.9	26.6	63.8	67.8
Chemical Engineers	75.3	71.4	65.3	63.4	73.2	79.1	72.5	73.2
Sales Engineers	78.0	77.6	71.6	68.3	75.5	68.8	73.3	72.0
Aerospace Engineers	78.4	74.8	74.4	72.8	64.0	73.2	82.1	77.3
Electrical Engineers	75.1	71.0	59.6	58.3	64.6	63.2	73.7	70.8
Electronic Equipment Installers and Repairers, Motor Vehicles	57.7	60.6	44.2	61.4	60.8	42.4	60.2	67.3

Skills proficiency reported on a 0.0 (low) to 100.0 (high) scale.

Source: Analysis of O*Net by MERIC

Engineering-Intensive Occupations Summary

According to 2006 estimates, there were 55,796 engineering-intensive jobs in Missouri earning an annual mean wage of \$67,556, which is much higher than the state average wage of \$36,594. The projected number of engineering-intensive jobs for 2016 is expected to increase by more than 12.7% to a total of 62,900 jobs. The average level of educational attainment for individuals employed in engineering-intensive occupations in 2006 was a bachelor's degree or higher, plus work experience. In addition, workers in engineering-intensive occupations accounted for 1.92% of all employment statewide.

Most engineering-intensive jobs were in Trade, Transportation & Utilities, Government, Manufacturing, and Self-Employed Workers. The projected net change of engineering-intensive occupations from 2006-2016 is over 7,100 jobs.

Engineering-Intensive Occupations - Employment by Industry in Missouri			
Industry	2006 Employment	2016 Employment	Net Change
Construction	46,432	52,745	6,313
Education & Health Services	44,597	50,456	5,859
Financial Activities	21,831	26,273	4,442
Government	54,808	61,801	6,993
Information	44,765	51,015	6,250
Manufacturing	52,845	59,761	6,916
Natural Resources & Mining	32,146	34,460	2,314
Other Services (Except Government)	34,758	40,424	5,666
Professional & Business Services	54,298	61,205	6,907
Self-Employed Workers	51,817	58,608	6,791
Trade, Transportation, & Utilities	54,976	61,983	7,007
Missouri Total	55,796	62,900	7,104

Estimated annual average employment and wages for 2006.

Source: Analysis of Occupational Employment Statistics and O*Net by MERIC

In Missouri, engineering-intensive occupations with the highest employment base were Operating Engineers and Other Construction Equipment Operators (9,140 jobs at \$43,020), Computer Software Engineers, Applications (7,040 jobs at \$74,190), Computer Software Engineers, Systems Software (5,600 jobs at \$75,210), Civil Engineers (5,020 jobs at \$68,840), and Mechanical Engineers (3,250 jobs at \$66,110).

Occupations with the largest percentage of national mean wages were Airline Pilots, Co-pilots, and Flight Engineers (166.4% of national mean wages), Locomotive Engineers (134.5% of national mean wages), Operating Engineers and Other Construction Equipment Operators (112.8% of national mean wages), Electrical and Electronic Engineering Technicians (99.7% of national mean wages), and Industrial Engineers (98.1% of national mean wages).

From 2006 to 2016, engineering-intensive occupations with the largest projected percent increases in employment are:

- Computer Software Engineers, Applications (2,370 jobs at 34% change)
- Computer Software Engineers, Systems Software (1,530 jobs at 37% change)
- Industrial Engineers (670 jobs at 21% change)
- Biomedical Engineers (30 jobs at 17% change)
- Engineering Teachers, Higher Education (90 jobs at 16% change)

Engineering-Intensive Occupations- Employment and Wages in Missouri

Occupation Title	Employment 2006	Employment 2016	Entry Wage	Average Wage	Expert Wage
Operating Engineers & Other Construction Equipment Operators	9,140	9,850	\$27,850	\$43,020	\$50,610
Computer Software Engineers, Applications	7,040	9,410	\$48,030	\$74,190	\$87,270
Computer Software Engineers, Systems Software	5,600	7,130	\$56,250	\$75,210	\$84,680
Civil Engineers	5,020	5,260	\$47,360	\$68,840	\$79,590
Mechanical Engineers	3,250	3,400	\$47,120	\$66,110	\$75,600
Industrial Engineers	3,240	3,910	\$48,970	\$70,060	\$80,600
Electrical Engineers	2,500	2,610	\$54,400	\$75,600	\$86,190
Engineering Managers	1,960	2,050	\$70,240	\$95,850	\$108,660
Civil Engineering Technicians	1,960	1,990	\$27,860	\$40,540	\$46,880
Aerospace Engineers	ND	ND	\$63,220	\$80,850	\$89,670
Electrical and Electronic Engineering Technicians	1,550	1,600	\$32,480	\$52,000	\$61,760
Electronics Engineers, Except Computer	1,420	1,570	\$51,530	\$73,770	\$84,900
Environmental Engineers	1,360	1,510	\$46,610	\$70,720	\$82,770
Engineers, All Other	1,170	1,200	\$45,390	\$72,850	\$86,590
Industrial Engineering Technicians	1,110	1,220	\$28,950	\$45,160	\$53,270
Airline Pilots, Copilots, and Flight Engineers	ND	ND	ND	\$189,550	ND
Engineering Technicians, Except Drafters, All Other	790	790	\$30,460	\$50,480	\$60,500
Locomotive Engineers	780	880	\$57,820	\$77,340	\$87,100
Stationary Engineers and Boiler Operators	750	780	\$27,560	\$40,340	\$46,730
Sales Engineers	640	680	\$43,130	\$69,030	\$81,980

Estimated annual average employment and wages for 2006. Projected annual average employment for 2016.

Source: Analysis of Occupational Employment Projections and Occupational Employment Statistics by MERIC

ND: Non-disclosed data due to confidentiality restrictions from the U.S. Bureau of Labor Statistics

There was no specific O*Net skill that was expressly for occupations within Engineering, however many of the skills necessary for those occupations were highlighted within O*Net's scores. The top 20 engineering occupations scored the highest skills proficiencies within critical thinking, reading comprehension and active listening.

Engineering-Intensive Occupations-MO Percent of US Wages & Projected Employment Growth

Occupation	Employment 2006	Employment 2016	Total Growth Openings 2006-2016*	MO Mean Wage	U.S. Mean Wage	MO % of U.S. Mean Wage
Operating Engineers and Other Construction Equipment Operators	9,140	9,850	709	\$43,020	\$38,130	112.82%
Computer Software Engineers, Applications	7,040	9,410	2,370	\$74,190	\$83,130	89.25%
Computer Software Engineers, Systems Software	5,600	7,130	1,529	\$75,210	\$89,070	84.44%
Civil Engineers	5,020	5,260	249	\$68,840	\$71,710	96.00%
Mechanical Engineers	3,250	3,400	142	\$66,110	\$72,300	91.44%
Industrial Engineers	3,240	3,910	671	\$70,060	\$71,430	98.08%
Electrical Engineers	2,500	2,610	115	\$75,600	\$79,240	95.41%
Engineering Managers	1,960	2,050	85	\$95,850	\$111,020	86.34%
Civil Engineering Technicians	1,960	1,990	36	\$40,540	\$42,580	95.21%
Aerospace Engineers	ND	ND	98	\$80,850	\$90,930	88.91%
Electrical and Electronic Engineering Technicians	1,550	1,600	48	\$52,000	\$52,140	99.73%
Electronics Engineers, Except Computer	1,420	1,570	143	\$73,770	\$83,340	88.52%
Environmental Engineers	1,360	1,510	157	\$70,720	\$72,350	97.75%
Engineers, All Other	1,170	1,200	29	\$72,850	\$85,260	85.44%
Industrial Engineering Technicians	1,110	1,220	111	\$45,160	\$47,490	95.09%
Airline Pilots, Copilots, and Flight Engineers	ND	ND	148	\$189,550	\$113,940	166.36%
Engineering Technicians, Except Drafters, All Other	790	790	3	\$50,480	\$56,060	90.05%
Locomotive Engineers	780	880	102	\$77,340	\$57,520	134.46%
Stationary Engineers and Boiler Operators	750	780	34	\$40,340	\$47,640	84.68%
Sales Engineers	640	680	41	\$69,030	\$80,270	86.00%

Estimated annual average employment and wages for 2006. Projected annual average employment for 2016.

Source: Analysis of Occupational Employment Projections and Occupational Employment Statistics by MERIC

ND: Non-disclosed data due to confidentiality restrictions from the U.S. Bureau of Labor Statistics

*Growth Openings are defined as openings created by occupational creation or expansion

Engineering-Intensive Occupations - Skills Proficiency

Occupation	Reading Comprehension	Active Listening	Writing	Speaking	Mathematics	Science	Critical Thinking	Active Learning
Operating Engineers and Other Construction Equipment Operators	53.0	57.4	40.8	45.3	44.6	38.1	47.6	52.7
Computer Software Engineers, Applications	74.9	67.1	61.3	64.8	58.3	47.7	81.0	75.8
Computer Software Engineers, Systems Software	74.6	64.1	57.5	58.6	72.3	56.3	78.3	77.4
Civil Engineers	62.5	55.3	53.1	55.3	44.8	29.2	57.3	50.0
Mechanical Engineers	73.4	68.6	66.3	64.8	74.8	73.1	70.6	66.3
Industrial Engineers	65.8	64.8	59.6	58.2	61.8	37.6	62.3	62.3
Electrical Engineers	75.1	71.0	59.6	58.3	64.6	63.2	73.7	70.8
Engineering Managers	62.5	58.3	60.4	60.5	55.3	16.7	61.5	57.3
Civil Engineering Technicians	63.3	58.3	55.1	57.5	67.8	40.3	60.5	61.5
Aerospace Engineers	78.4	74.8	74.4	72.8	64.0	73.2	82.1	77.3
Electrical and Electronic Engineering Technicians	56.2	53.5	46.9	52.0	53.5	32.5	56.6	55.8
Electronics Engineers, Except Computer	78.1	68.8	67.2	63.3	71.3	63.6	69.2	73.0
Environmental Engineers	60.5	56.3	59.4	57.3	53.1	9.4	61.4	50.0
Engineers, All Other	ND	ND	ND	ND	ND	ND	ND	ND
Industrial Engineering Technicians	58.3	64.3	53.8	55.0	56.8	36.6	63.8	63.5
Airline Pilots, Copilots, and Flight Engineers	74.1	77.2	46.2	69.1	60.8	57.3	79.2	72.0
Engineering Technicians, Except Drafters, All Other	ND	ND	ND	ND	ND	ND	ND	ND
Locomotive Engineers	60.7	65.1	46.5	56.0	28.2	12.8	51.0	52.3
Stationary Engineers and Boiler Operators	58.7	52.3	47.2	49.2	49.5	43.9	55.1	54.8
Sales Engineers	78.0	77.6	71.6	68.3	75.5	68.8	73.3	72.0

Skills proficiency reported on a 0.0 (low) to 100.0 (high) scale.

Source: Analysis of O*Net by MERIC

ND: Non-disclosed data not available on O*Net

Mathematics-Intensive Occupations Summary

According to 2006 estimates, there were 24,394 mathematics-intensive jobs in Missouri earning an annual mean wage of \$64,083 per job, which is much higher than the state average wage of \$36,594. The projected number of mathematical-intensive jobs for 2016 is expected to increase by more than 19.9% to a total of 29,261 jobs. The average level of educational attainment for individuals employed in mathematical-intensive occupations in 2006 was a bachelor's degree or higher, plus work experience. In addition, workers in mathematics-intensive occupations accounted for 0.84% of all employment statewide.

Most mathematics-intensive jobs were in Self-Employed Workers, Professional & Business Services, Education & Health Services and Manufacturing. The projected net change of mathematics-intensive occupations from 2006 to 2016 is over 4,800 jobs.

Mathematics-Intensive Occupations - Employment by Industry in Missouri			
Industry	2006 Employment	2016 Employment	Net Change
Construction	18,879	23,108	4,229
Education & Health Services	22,796	27,545	4,749
Financial Activities	15,899	20,079	4,180
Government	22,746	27,321	4,575
Information	20,914	25,343	4,429
Manufacturing	22,057	26,542	4,485
Natural Resources & Mining	5,363	5,622	259
Other Services (Except Government)	13,969	17,975	4,006
Professional & Business Services	22,863	27,445	4,582
Self-Employed Workers	23,518	28,285	4,767
Trade, Transportation, & Utilities	21,716	26,233	4,517
Missouri Total	24,394	29,261	4,867

Estimated annual average employment and wages for 2006.

Source: Analysis of Occupational Employment Statistics and O*Net by MERIC

In Missouri, mathematics-intensive occupation with the highest employment base were Mechanical Engineers (3,250 jobs at \$66,110), Drywall and Ceiling Tile Installers (2,240 jobs at \$45,690), Mathematical Science Teachers, Higher Education (970 jobs at \$61,690), Operations Research Analysts (900 jobs at \$64,790), and Sales Engineers (640 at \$69,030).

Occupations with the largest percentage of national mean wages were Actuaries (127.6% of national mean wages), Drywall and Ceiling Tile Installers (125.1% of national mean wages), Marine Engineers (113.4% of national mean wages), Agricultural Engineers (107.5% of national mean wages), and Mathematical Science Teachers, Higher Education (105.3% of national mean wages).

From 2006 to 2016, mathematics-intensive occupations with the largest percent increases in employment are:

- Mathematical Science Teachers, Higher Education (200 jobs at 20.62% change)
- Chemistry Teachers, Higher Education (60 jobs at 16.22% change)
- Engineering Teachers, Higher Education (90 jobs at 16.07% change)
- Physics Teachers, Higher Education (30 jobs at 12.5% change)
- Actuaries (40 jobs at 12.12% change)

Mathematics-Intensive Occupations- Employment & Wages in Missouri

Occupation Title	Employment 2006	Employment 2016	Entry Wage	Average Wage	Expert Wage
Mechanical Engineers	3,250	3,400	\$47,120	\$66,110	\$75,600
Drywall and Ceiling Tile Installers	2,240	2,390	\$28,280	\$45,690	\$54,400
Mathematical Science Teachers, Higher Ed.	970	1,170	\$35,140	\$61,690	\$74,970
Operations Research Analysts	900	990	\$42,860	\$64,790	\$75,760
Sales Engineers	640	680	\$43,130	\$69,030	\$81,980
Engineering Teachers, Higher Ed.	560	650	\$50,410	\$81,540	\$97,100
Statisticians	420	440	\$36,380	\$62,360	\$75,340
Chemistry Teachers, Higher Ed.	370	430	\$40,240	\$65,330	\$77,870
Actuaries	330	370	\$52,540	\$109,310	\$137,700
Physics Teachers, Higher Ed.	240	270	\$43,360	\$71,140	\$85,030
Atmospheric & Earth Sciences Teachers, Higher Ed.	190	210	\$42,570	\$67,590	\$80,100
Agricultural Engineers	90	100	\$54,520	\$72,810	\$81,960
Physicists	90	90	\$64,730	\$100,010	\$117,660
Hydrologists	70	70	\$45,000	\$65,320	\$75,470
Materials Scientists	50	50	\$46,200	\$71,300	\$83,850
Petroleum Engineers	ND	ND	ND	ND	ND
Marine Engineers and Naval Architects	ND	ND	ND	ND	ND
Mathematicians	ND	ND	\$59,910	\$83,060	\$94,630

Estimated annual average employment and wages for 2006. Projected annual average employment for 2016.

Source: Analysis of Occupational Employment Projections and Occupational Employment Statistics by MERIC

ND: Non-disclosed data due to confidentiality restrictions from the U.S. Bureau of Labor Statistics

O*Net mathematical skills refer to the developed capacities that facilitate learning and/or performance within mathematical occupations. Occupations with the highest mathematical skills proficiency were Mathematicians (score of 89.83), Operation Research Analysts (score of 86.17), Physicists (score of 84.92), Mathematical Science Teachers, Higher Education (score of 84.58), and Engineering Teachers, Higher Education (score of 83.58).

Mathematics-Intensive Occupations-MO Percent of US Wages & Projected Employment Growth

Occupation Title	Employment 2006	Employment 2016	Total Growth Openings 2006-2016*	MO Mean Wage	U.S. Mean Wage	MO % of U.S. Mean Wage
Mechanical Engineers	3,250	3,400	142	\$66,110	\$72,300	91.44%
Drywall and Ceiling Tile Installers	2,240	2,390	154	\$45,690	\$36,520	125.11%
Mathematical Science Teachers, Higher Ed.	970	1,170	196	\$61,690	\$58,560	105.34%
Operations Research Analysts	900	990	90	\$64,790	\$66,950	96.77%
Sales Engineers	640	680	41	\$69,030	\$80,270	86.00%
Engineering Teachers, Higher Ed.	560	650	89	\$81,540	\$79,510	102.55%
Statisticians	420	440	17	\$62,360	\$69,900	89.21%
Chemistry Teachers, Higher Ed.	370	430	62	\$65,330	\$63,870	102.29%
Actuaries	330	370	35	\$109,310	\$85,690	127.56%
Physics Teachers, Higher Ed.	240	270	36	\$71,140	\$70,090	101.50%
Atmospheric & Earth Sciences Teachers, Higher Ed.	190	210	28	\$67,590	\$73,280	92.24%
Agricultural Engineers	90	100	5	\$72,810	\$67,710	107.53%
Physicists	90	90	5	\$100,010	\$96,850	103.26%
Hydrologists	70	70	0	\$65,320	\$68,140	95.86%
Materials Scientists	50	50	3	\$71,300	\$76,160	93.62%
Petroleum Engineers	ND	ND	2	ND	\$103,960	0.00%
Marine Engineers and Naval Architects	ND	ND	2	ND	\$76,200	0.00%
Mathematicians	ND	ND	0	\$83,060	\$90,870	91.41%

Estimated annual average employment and wages for 2006. Projected annual average employment for 2016.

Source: Analysis of Occupational Employment Projections and Occupational Employment Statistics by MERIC

ND: Non-disclosed data due to confidentiality restrictions from the U.S. Bureau of Labor Statistics

*Growth Openings are defined as openings created by occupational creation or expansion

Mathematics-Intensive Occupations - Skills Proficiency

Occupation Title	Reading Comprehension	Active Listening	Writing	Speaking	Mathematics	Science	Critical Thinking	Active Learning
Mathematicians	84.3	64.2	72.5	62.7	89.8	71.9	83.9	81.2
Operations Research Analysts	79.2	72.2	69.5	66.3	86.2	68.1	79.8	74.7
Physicists	85.3	69.4	77.4	68.1	84.9	84.8	83.9	81.0
Mathematical Science Teachers, Higher Ed.	72.8	68.6	63.3	73.9	84.6	49.2	76.7	69.7
Engineering Teachers, Higher Ed.	82.5	73.6	79.4	77.6	83.6	82.8	85.2	83.9
Actuaries	71.1	70.9	60.4	62.8	83.6	40.8	73.6	78.3
Agricultural Engineers	77.8	68.8	74.3	67.0	81.3	78.1	72.9	74.3
Atmospheric & Earth Sciences Teachers, Higher Ed.	84.7	73.0	80.7	74.8	78.0	86.0	82.1	81.9
Materials Scientists	79.5	72.5	66.8	65.3	77.8	83.7	81.3	74.8
Physics Teachers, Higher Ed.	79.1	68.8	72.6	75.3	77.6	78.7	78.2	74.8
Marine Engineers and Naval Architects	66.8	68.4	66.3	62.8	76.3	68.2	68.3	66.6
Chemistry Teachers, Higher Ed.	82.1	67.0	75.3	76.0	76.1	83.8	76.7	77.7
Drywall and Ceiling Tile Installers	58.6	60.3	52.3	58.4	75.8	49.5	65.1	53.4
Sales Engineers	78.0	77.6	71.6	68.3	75.5	68.8	73.3	72.0
Hydrologists	77.3	65.8	72.6	67.0	75.3	77.1	72.3	72.0
Statisticians	72.6	69.2	73.9	68.6	74.9	66.7	73.7	78.0
Mechanical Engineers	73.4	68.6	66.3	64.8	74.8	73.1	70.6	66.3
Petroleum Engineers	75.6	71.6	67.4	64.6	74.5	66.0	71.9	72.2

Skills proficiency reported on a 0.0 (low) to 100.0 (high) scale.

Source: Analysis of O*Net by MERIC

“Today, with the emergence of the information age, the strength of a country is based on knowledge. National greatness will arise not from our natural resources or our factories, but from our people, people with new skills and ideas.”

-Michael Milken, Milken Institute

Gateway Skills Education Summary

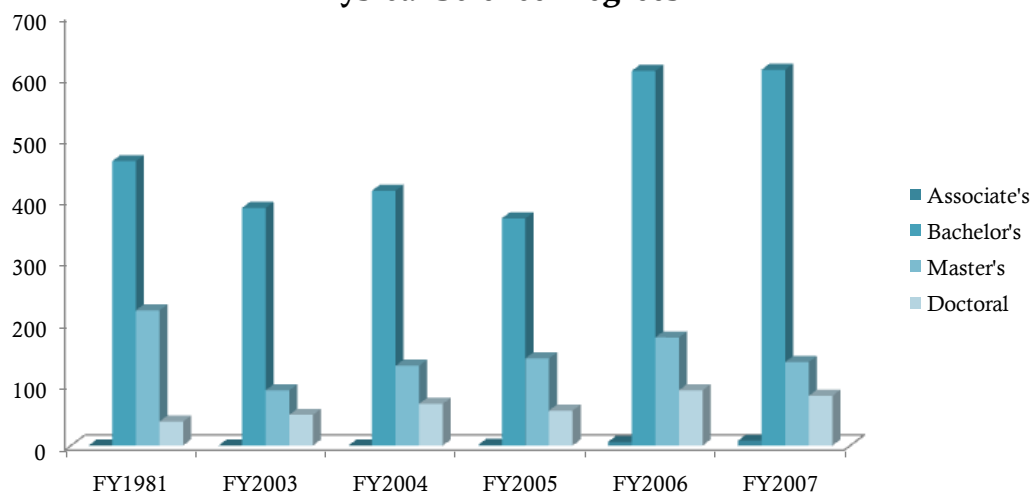
Physical Science

In the Fall of 2007, a total of 837 post-secondary degrees in physical science were conferred in Missouri, of which 73.1% were bachelor's degrees, 16.2% were master's degrees, and 9.7% were doctoral degrees. Although the number of bachelor's degrees in physical science has significantly increased since the Fall of 1981, the number of physical science degrees as a percentage of all bachelor's degrees has decreased during that time period. This indicates that proportionally more graduates are obtaining bachelor's degrees in physical science in Missouri.

Physical Science						
Degrees Conferred by Higher Education Institutions in Missouri						
	FY1981	FY2003	FY2004	FY2005	FY2006	FY2007
Associate's- Number	0	0	0	1	6	8
Associate's- % of All Degrees	0.00%	0.00%	0.00%	0.01%	0.06%	0.08%
Bachelor's- Number	463	387	415	370	610	612
Bachelor's- % of All Degrees	2.19%	1.23%	1.30%	1.14%	1.73%	1.71%
Master's- Number	220	90	130	142	176	136
Master's- % of All Degrees	3.01%	0.60%	0.83%	0.86%	1.08%	0.81%
Doctoral- Number	39	50	68	57	90	81
Doctoral- % of All Degrees	7.10%	6.26%	8.22%	6.45%	9.59%	7.89%

Since the Fall of 1981, the number of master's degrees in physical science has significantly decreased, and the number of physical science degrees as a percentage of all master's degrees has likewise decreased. However, the number and percent of doctoral degrees in physical science has increased since Fall of 1981. This indicates that overall Missouri is producing more graduates with advanced degrees in physical science.

Physical Science Degrees

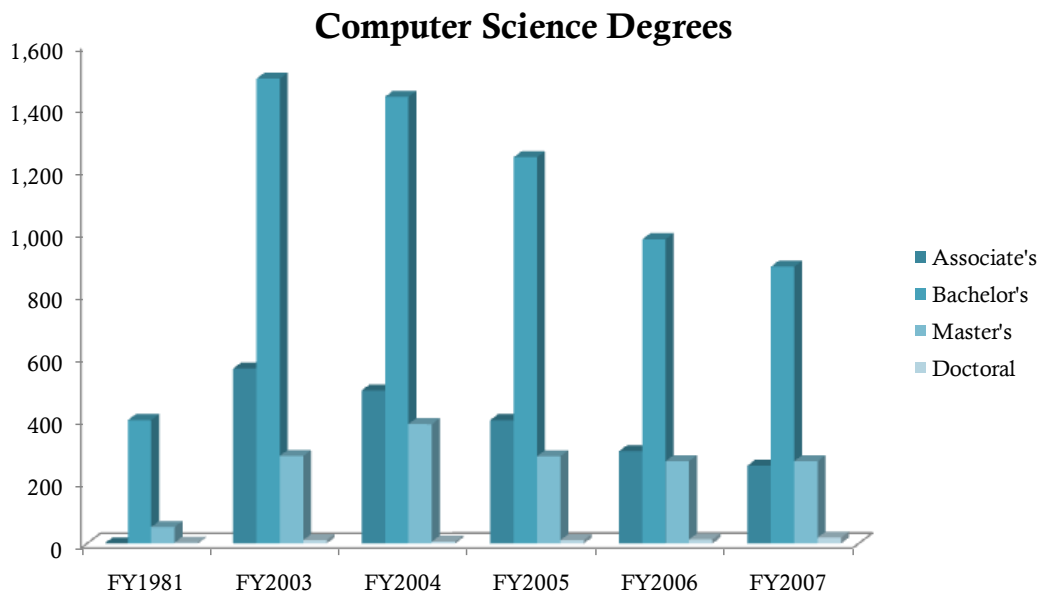


Computer Science

In the Fall of 2007, a total of 1,421 post-secondary degrees in computer science were conferred in Missouri, of which 62.5% were bachelor's degrees, 18.6% were master's degrees, and 1.3% were doctoral degrees. The number of bachelor's degrees in computer science has significantly increased since the Fall of 1981, as has the number of computer science degrees as a percentage of all bachelor's degrees during that time period. This indicates that overall more graduates are obtaining bachelor's degrees in computer science in Missouri.

Computer Science						
Degrees Conferred by Higher Education Institutions in Missouri						
	FY1981	FY2003	FY2004	FY2005	FY2006	FY2007
Associate's- Number	0	561	491	396	296	250
Associate's- % of All Degrees	0.00%	6.17%	5.11%	3.92%	2.90%	2.39%
Bachelor's- Number	396	1,491	1,433	1,239	976	888
Bachelor's- % of All Degrees	1.87%	4.75%	4.50%	3.81%	2.77%	2.48%
Master's- Number	53	281	383	280	264	264
Master's- % of All Degrees	0.73%	1.88%	2.46%	1.70%	1.61%	1.58%
Doctoral- Number	3	11	6	11	13	19
Doctoral- % of All Degrees	0.55%	1.38%	0.73%	1.24%	1.39%	1.85%

Since the Fall of 1981, the number of master's degrees in computer science has significantly increased, and the number of computer science degrees as a percentage of all master's degrees has likewise increased. In addition, the number and percent of doctoral degrees in computer science has increased since Fall of 1981. This indicates that Missouri is producing more graduates with advanced degrees in computer science.

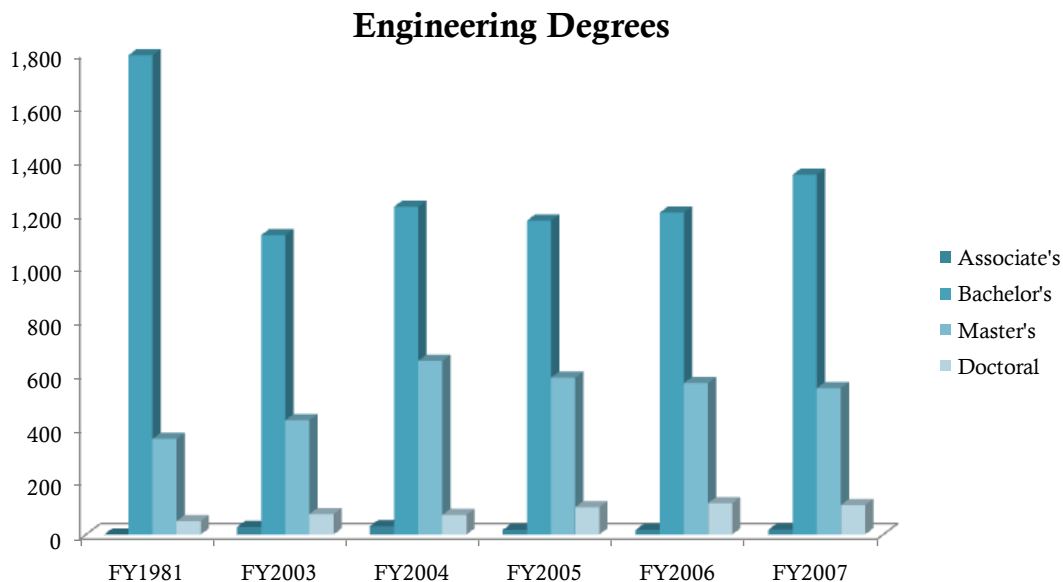


Engineering

In the Fall of 2007, a total of 2,020 post-secondary degrees in engineering were conferred in Missouri, of which 66.6% were bachelor's degrees, 27.0% were master's degrees, and 5.4% were doctoral degrees. The number of bachelor's degrees in engineering has decreased since the Fall of 1981, and the number of engineering bachelor's degrees as a percentage of all bachelor's degrees has also decreased significantly during that time period. This indicates that proportionally fewer graduates are obtaining bachelor's degrees in engineering in Missouri.

Engineering						
Degrees Conferred by Higher Education Institutions in Missouri						
	FY1981	FY2003	FY2004	FY2005	FY2006	FY2007
Associate's- Number	0	28	31	17	17	18
Associate's- % of All Degrees	0.00%	0.31%	0.32%	0.17%	0.17%	0.17%
Bachelor's- Number	1,791	1,119	1,225	1,173	1,203	1,345
Bachelor's- % of All Degrees	8.47%	3.56%	3.84%	3.61%	3.41%	3.75%
Master's- Number	357	427	649	586	566	547
Master's- % of All Degrees	4.88%	2.86%	4.17%	3.56%	3.46%	3.27%
Doctoral- Number	50	76	73	102	117	110
Doctoral- % of All Degrees	9.11%	9.51%	8.83%	11.54%	12.47%	10.71%

Since the Fall of 1981, the number of master's degrees in engineering has significantly increased, while the number of engineering master's degrees as a percentage of all master's degrees has decreased. The number and percent of doctoral degrees in engineering have increased since the Fall of 1981. Percentage wise, Missouri is producing fewer graduates with bachelor's and master's degrees in engineering since 1981 while producing more doctoral degrees.

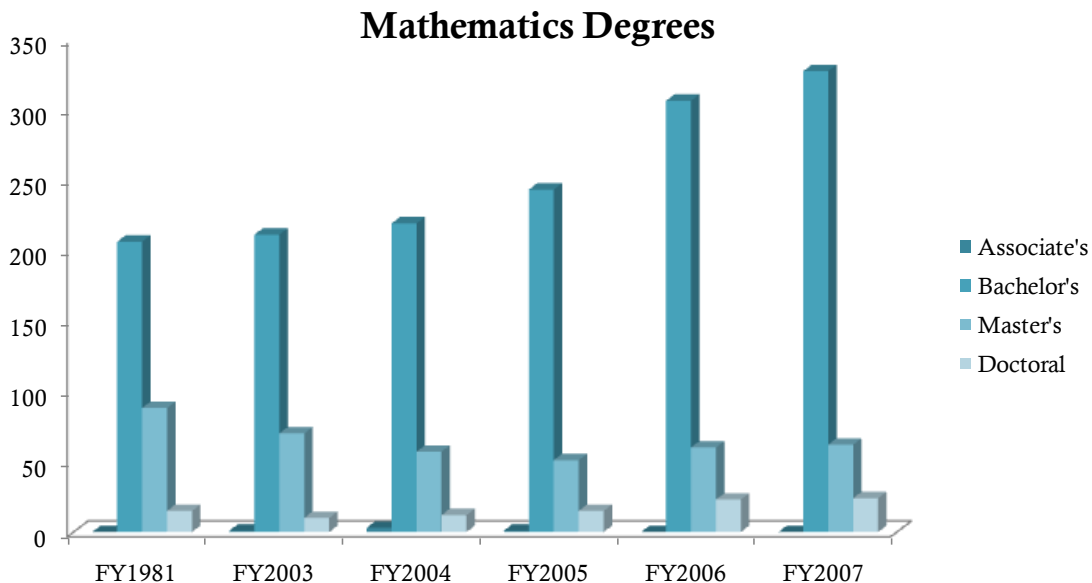


Mathematics

In the Fall of 2007, a total of 423 post-secondary degrees in mathematics were conferred in Missouri, of which 77.3% of mathematics degrees were bachelor's, 14.7% were master's degrees, and 5.7% were doctoral degrees. The number of bachelor's degrees in mathematics has increased since the Fall of 1981, while mathematics degrees as a percent of all bachelor's degrees has also increased. This indicates that while Missouri is producing more graduates with degrees in mathematics over time, the state is not keeping up with the rate of advanced degrees overall.

Mathematics						
Degrees Conferred by Higher Education Institutions in Missouri						
	FY1981	FY2003	FY2004	FY2005	FY2006	FY2007
Associate's- Number	0	1	3	1	0	0
Associate's- % of All Degrees	0.00%	0.02%	0.03%	0.01%	0.00%	0.00%
Bachelor's- Number	206	211	219	243	306	327
Bachelor's- % of All Degrees	0.97%	0.67%	0.69%	0.75%	0.87%	0.91%
Master's- Number	88	70	57	51	60	62
Master's- % of All Degrees	1.20%	0.47%	0.37%	0.31%	0.37%	0.37%
Doctoral- Number	15	10	12	15	23	24
Doctoral- % of All Degrees	2.73%	1.25%	1.45%	1.70%	2.45%	2.34%

Since the Fall of 1981, the number of master's degrees in mathematics has decreased, while the number of doctoral degrees in mathematics has increased. However, the number of mathematics doctoral degrees as a percentage of degrees has decreased during the past 26 years.



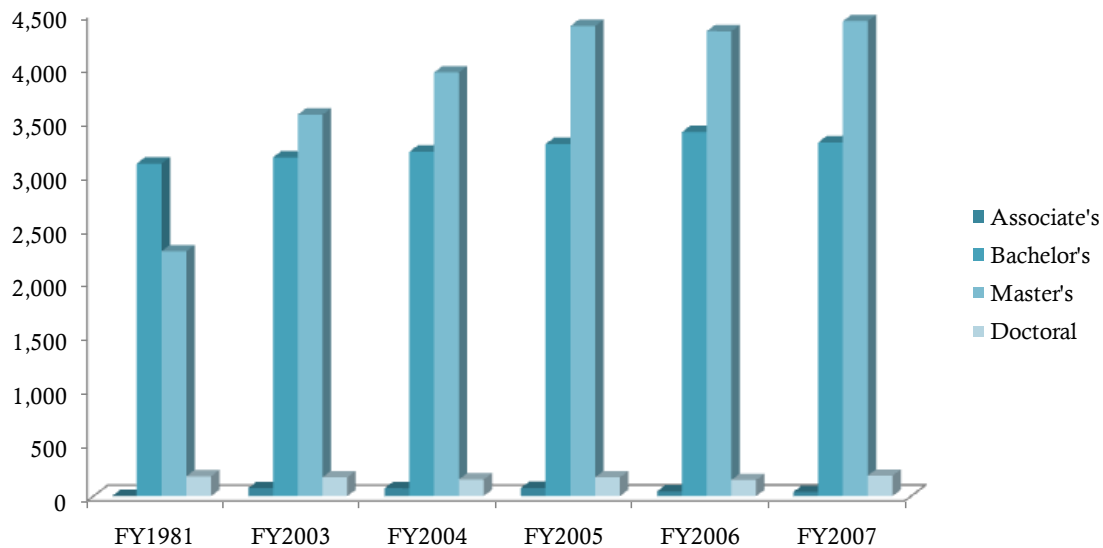
Education

In the Fall of 2007, a total of 7,956 post-secondary degrees in education were conferred in Missouri, of which 41.5% were bachelor's degrees, 55.7% were master's degrees, and 2.3% were doctoral degrees. The number of bachelor's degrees in education has increased since the Fall of 1981, while education degrees as a percent of all bachelor's degrees has decreased over the same time period. This indicates that proportionally fewer graduates are obtaining bachelor's degrees in education in Missouri.

Education						
Degrees Conferred by Higher Education Institutions in Missouri						
	FY1981	FY2003	FY2004	FY2005	FY2006	FY2007
Associate's- Number	0	75	74	77	45	39
Associate's- % of All Degrees	0.00%	0.82%	0.77%	0.76%	0.44%	0.37%
Bachelor's- Number	3,101	3,159	3,211	3,283	3,395	3,298
Bachelor's- % of All Degrees	14.67%	10.06%	10.08%	10.10%	9.62%	9.20%
Master's- Number	2,283	3,558	3,951	4,384	4,335	4,429
Master's- % of All Degrees	31.23%	23.79%	25.36%	26.65%	26.50%	26.44%
Doctoral- Number	185	176	155	175	150	190
Doctoral- % of All Degrees	33.70%	22.03%	18.74%	19.80%	15.99%	18.50%

Since the Fall of 1981, the number of master's degrees in education has significantly increased, while the number of doctoral degrees in education has remained flat. In addition, the number of education doctoral degrees as a percentage of all doctoral degrees has significantly decreased since the Fall of 1981. This indicates that, while Missouri is producing more graduates with advanced degrees in education over time, the state is not keeping up with the rate of advanced degrees overall.

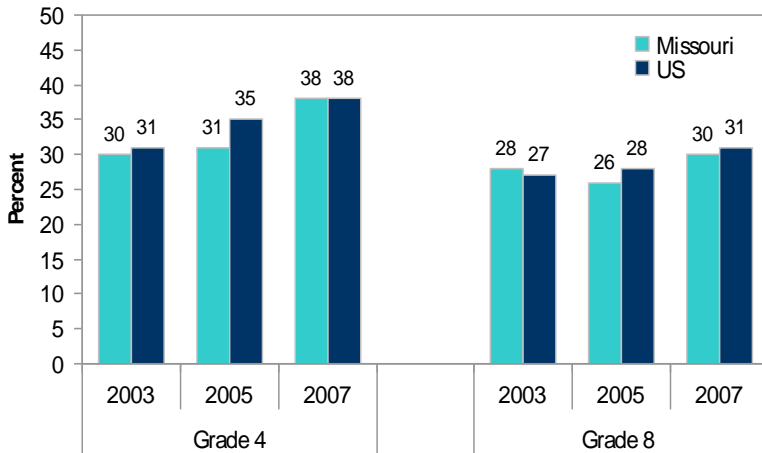
Education Degrees



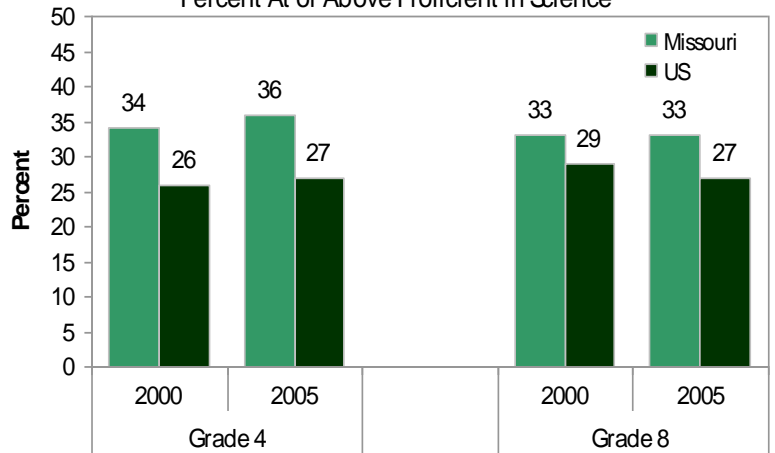
Missouri's National Assessment of Educational Progress

Missouri has been in-line with the national average for students in both 4th and 8th grades in scoring at or above proficient in math with the National Assessment of Educational Progress (NAEP) in 2007. However, the math scores for students scoring at or above proficient have declined as they transition from Grade 4 to Grade 8. In science, Missouri students scored above the national average and have a more consistent transition between 4th and 8th grade.

National Assessment of Educational Progress (NAEP)
Percent At or Above Proficient in Math

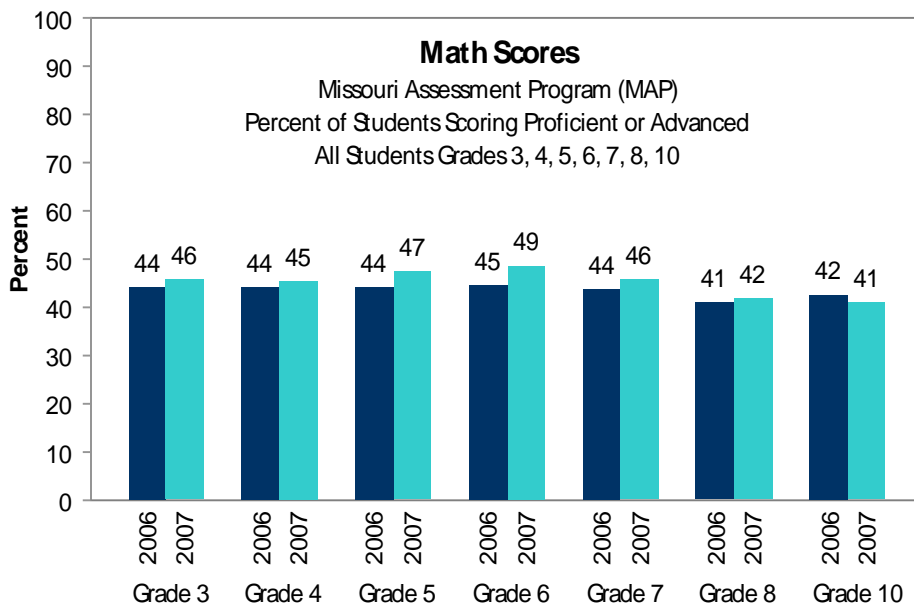


National Assessment of Educational Progress (NAEP)
Percent At or Above Proficient in Science

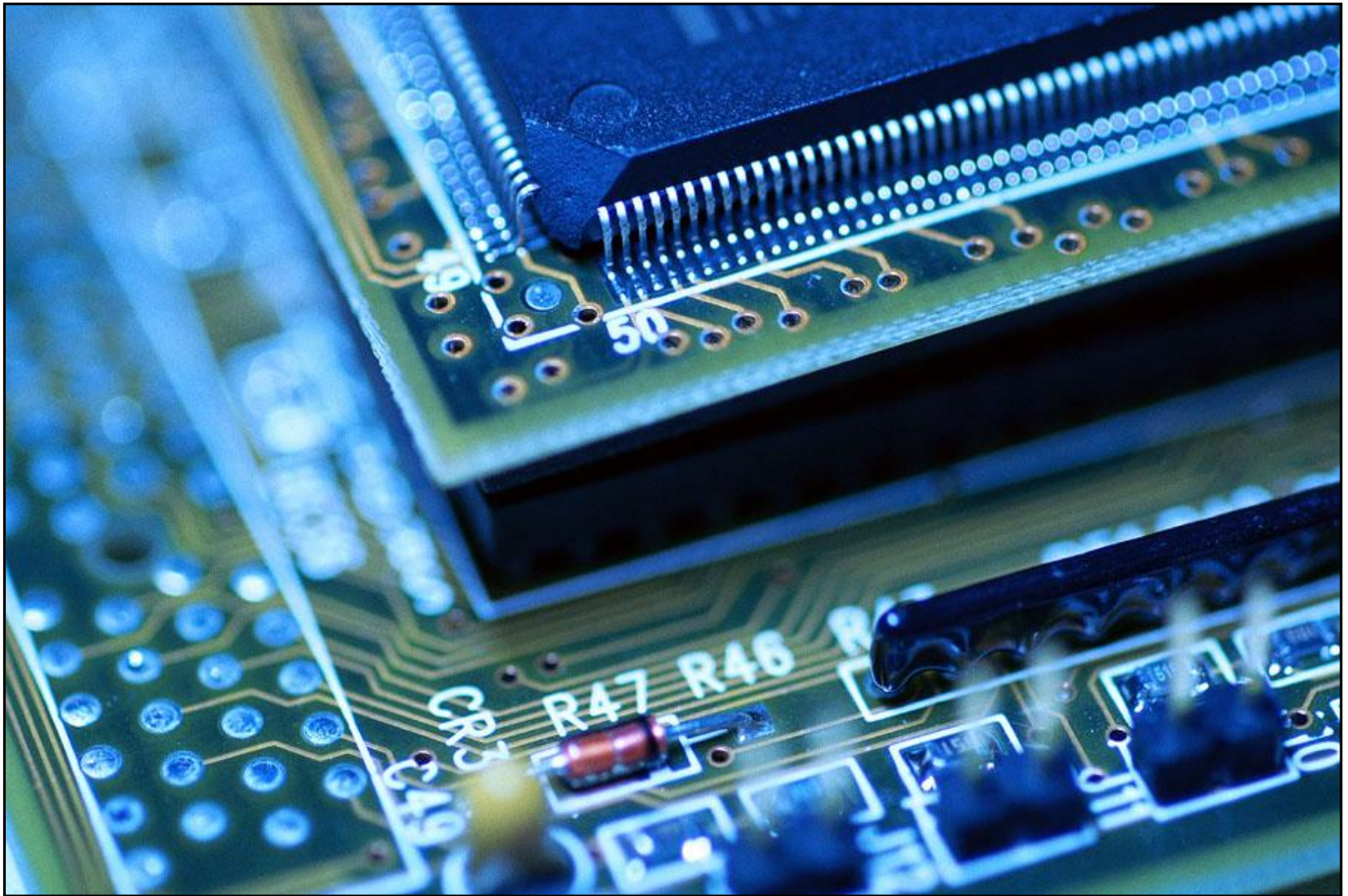


Source: National Center for Education Statistics

The percentage of Missouri students scoring at proficient and advanced levels on the Missouri Assessment Program (MAP) in math seems to hold steady from Grades 3 through 7 before experiencing declines upon reaching Grades 8 and 10. However, between 2006 and 2007, all of the tested grades have increased their proficient or advanced scoring percentages, except for Grade 10.



Source: DESE



Data Sources: U.S. Census Bureau, MERIC Long-term Occupational Projections, MERIC Occupational Employment and Wage Survey, Occupational Information Network, Department of Elementary and Secondary Education. Education and experience ratings reflect the typical training needed to obtain employment in the occupation using national averages, and do not reflect required training; produced by the US Department of Labor (BLS, ETA).

