

APPENDIX B
MATERIALS FOR COGNITIVE TESTS OF FIELDS OF R&D CHANGES

February 9, 2016

ICF International

HERD Cognitive Interview Changes to Taxonomy Recruitment E-Mail

To: Primary contact email
From: NSF Higher Education R&D Survey
Re: Changes to the FY 2016 Higher Education R&D Survey ([[inst_id]])

Dear [[firstname]] [[lastname]]:

For the upcoming National Science Foundation FY 2016 Higher Education R&D Survey, we are implementing several revisions to the fields of R&D for which you are asked to report expenditures. The changes better reflect the R&D currently being conducted at universities and colleges and make the fields more consistent with those used by other NSF surveys as well as the Department of Education's Classification of Instructional Programs (CIP).

Before we communicate the changes to all universities and colleges in the survey population, we would like to get some feedback from current survey respondents about how we are presenting the information. If you are interested in participating and are available for a 15 minute phone interview sometime in the next week (Month XX-XX), please contact Sean Rider from our survey staff at ICF International at support@HERDSurvey.org or (866) 936-9376. He will schedule a time for the phone call and send you the materials to review ahead of time.

Thank you for your help and for your continued participation in the HERD Survey.

Sincerely,
Ronda Britt
Project Officer, Higher Education R&D Survey
National Center for Science and Engineering Statistics
National Science Foundation

HERD Cognitive Interview Changes to Taxonomy Confirmation of Appointment E-mail

To: Primary contact email (or other person schedule)
CC: other attendees, including Jennifer or Sherri
From: NSF Higher Education R&D Survey
Re: Confirming meeting ([[inst_id]])
Atth: Field of R&D Crosswalk and E-mail Communication

Dear [[firstname]] [[lastname]]:

Thank you for agreeing to talk to us about the revised fields of R&D on the National Science Foundation's FY 2016 Higher Education R&D Survey. The phone call is scheduled for **DayoftheWeek, Month XX, at X:XX AM/PM**. At that time please call our conference line at 1-877-423-6338, participant passcode: 777133. [ICF staff name] will be leading the interview and I'll be taking notes.

I have attached a draft of an e-mail announcing the changes to the fields of R&D. The full list of FY 2016 fields and the changes from FY 2015 are presented in two potential formats, attached as List Option and Table Option. Please do not share this with others outside of your institution at this time. Take a few minutes to review the materials before our scheduled phone call.

February 9, 2016

ICF International

If you have any trouble accessing the attachments, have further questions or need to reschedule, you may reach me by email at support@HERDSurvey.org or call toll-free at (866) 936-9376.

Thank you very much for your help.

Sincerely,
Sean Rider
Data Collection Specialist
ICF International
NSF Higher Education R&D Survey

To: Primary contact e-mail
Cc: E-mails of others routinely copied on survey communications
From: NSF Higher Education R&D Survey

Re: Changes to the FY 2016 HERD Survey

Dear [[firstname]] [[lastname]]:

I am writing to inform you of some changes that will be implemented for the National Science Foundation's FY 2016 Higher Education Research and Development (HERD) Survey. This survey is expected to launch in November 2016 with a January 31, 2017 due date. I am telling you about these changes now, so you have more time to prepare for the survey.

The FY 2016 HERD Survey will include several revisions to the fields of R&D for which you were asked to report expenditures in Questions 9, 11, and 14 of the FY 2015 survey. These changes better reflect the R&D currently being conducted at universities and colleges and also make our fields more consistent with those used by other NSF surveys as well as the Department of Education's Classification of Instructional Programs (CIP).

Changes to the FY 2016 fields of R&D include the following:

- Fields will be listed on the survey in alphabetical order.
- The names of some fields have been revised to better reflect the disciplines included in those fields.
- New disciplines have been added as examples under many fields.
- Some disciplines have been reclassified under different fields.
- Four new fields have been added: (1) Industrial and Manufacturing Engineering under Engineering, (2) Natural Resources and Conservation under Life Sciences, (3) Materials Science under Physical Sciences, and (4) Anthropology under Social Sciences.

The attached table/list provides the fields of R&D for which you will be asked to report expenditures on the FY 2016 survey. Listed under each field are the disciplines included in that field. We have also noted the disciplines that have been reclassified under another field.

If you have any questions about these changes, please contact me at rbritt@nsf.gov or (703) 292-7765.

Sincerely,
Ronda Britt
Project Officer, Higher Education R&D Survey
National Center for Science and Engineering Statistics
National Science Foundation

Interview Protocol: Revised Fields of R&D Announcement

INTRODUCTION

[Interviewer introduces herself and reminds the interviewee that Sean is also on the phone taking notes. Tell them that their feedback will remain anonymous.]

Thanks so much for talking with me today. As you know from our initial contact, we are implementing several revisions to the fields of R&D you are asked to report expenditures for on the Higher Education R&D Survey. Before we announce the changes to everyone, we wanted to get some feedback on how we are presenting the information.

We sent a draft of an e-mail announcing the change and a table listing all the fields noting where things changed from the FY 2015 survey. Did you receive the e-mail and the list of fields we sent? Did you have a chance to review them?

[If they did not receive a copy of the e-mail and table, be prepared to e-mail it to them immediately.]

[If they did not have a chance to review, give them a few minutes to review before beginning the interview]

First let's talk about the e-mail announcing the change.

1. Let's start with your overall reaction to the e-mail. What did you think of it? Generally speaking, did you find it clear or confusing?
 - a. Could you tell me more about that?

[If they already answered one of the following questions in their response to the open-ended one, you do not need to ask again]

2. In your opinion, did the message do a good job or a bad job of explaining why these changes to the fields are being made?
 - a. Could you tell me more about that?
3. In the e-mail there is a bulleted list of changes being made to the fields of R&D. Were there any items on the list that were unclear or could be expanded upon?
 - a. Could you tell me more about that?

4. Let's talk about the two options presented for changing the fields in the 2016 Survey. First, please take a look at the table option.
5. What do you think of the way the table is organized?
 - a. Was it easy or difficult to understand?
 - b. Can you tell me more about that?
6. Next, please take a look at the list option.
 - a. What do you think of the way the list is organized?
 - b. Was it easy or difficult to understand?
 - c. Can you tell me more about that?
7. Now, I'd like to ask you to find the new location for the field "Wood science." (This can be found on page X of the table, and on page Y of the list.)
 - a. In your opinion, which does a better job of notifying you about the change to wood science: the list or the table?
 - b. Can you tell me more about that?
8. Next, please find the new location for the field "Anthropology." (This can be found on page X of the table, and on page Y of the list.)
 - a. In your opinion, which does a better job of notifying you about the change to anthropology: the list or the table?
 - b. Can you tell me more about that?
9. Finally, comparing the table vs. the list...
 - a. Which one does a better job of indicating which fields are new (e.g., Industrial and Manufacturing Engineering)?
 - b. Which one does a better job of indicating where fields will be categorized next year?
10. Could you tell me a little bit more about how your institution determines what fields of R&D expenditures were in and how these revisions might impact that process?
11. How easy or difficult will it be to report expenditures in these new or revised fields for the upcoming survey, which will be due next January and will ask about expenditures during your institution's 2016 fiscal year?
12. Do you have any comments or questions about anything that we have not covered?

That's all of our questions. Thank you so much for your time today.

Fields of R&D for the **FY 2016** Higher Education Research and Development Survey

HERD 2016 Fields	Changes from FY 2015 HERD Survey
A. Computer and Information Sciences	
Artificial intelligence Computer and information technology administration and management Computer science Computer software and media applications Computer systems analysis Computer systems networking and telecommunications Data processing Information sciences, studies Information technology	Disciplines removed from this field: <ul style="list-style-type: none"> • Management information systems moved to Non-S&E Fields, Business Management and Business Administration.
B. Engineering	
1. Aerospace, Aeronautical, and Astronautical Engineering	
Aerodynamics Aerospace engineering Space technology	
2. Bioengineering and Biomedical Engineering	
Biological and biosystems engineering Biomaterials engineering Biomedical technology Medical engineering	
3. Chemical Engineering	
Biochemical engineering Chemical and biomolecular engineering Engineering chemistry Paper science Petroleum refining process Polymer, plastics engineering	Disciplines removed from this field: <ul style="list-style-type: none"> • Petroleum engineering moved to Other Engineering. • Wood science moved to Life Sciences, Agricultural Sciences.

Fields of R&D for the **FY 2016** Higher Education Research and Development Survey

HERD 2016 Fields	Changes from FY 2015 HERD Survey
4. Civil Engineering	
Architectural engineering Construction engineering Engineering management, administration Environmental, environmental health engineering Geotechnical and geoenvironmental engineering Sanitary engineering Structural engineering Surveying engineering Transportation and highway engineering Water resources engineering	Disciplines removed from this field: <ul style="list-style-type: none"> • Architecture moved to Non-S&E Fields, Other Non-S&E Fields.
5. Electrical, Electronic, and Communications Engineering	
Communications engineering Computer engineering Computer hardware engineering Computer software engineering Electrical and electronics engineering Laser and optical engineering Power Telecommunications engineering	
6. Industrial and Manufacturing Engineering NEW FIELD	
Industrial engineering Manufacturing engineering Operations research Systems engineering	Disciplines added to this field: <ul style="list-style-type: none"> • Industrial, manufacturing and systems engineering moved from Other Engineering. • Operations research moved from Mathematics and Statistics.
7. Mechanical Engineering	
Electromechanical engineering Mechatronics, robotics, and automation engineering	Disciplines removed from this field: <ul style="list-style-type: none"> • Engineering mechanics moved to Other Engineering.

Fields of R&D for the **FY 2016** Higher Education Research and Development Survey

HERD 2016 Fields	Changes from FY 2015 HERD Survey
8. Metallurgical and Materials Engineering	
Ceramic sciences and engineering Geophysical, geological engineering Materials engineering Metallurgical engineering Mining and mineral engineering Textile sciences and engineering Welding	Disciplines removed from this field: <ul style="list-style-type: none"> • Materials science moved to the new field of Materials Science under Physical Sciences.
9. Other Engineering	
Agricultural engineering Engineering design Engineering mechanics, physics, and science Forest engineering Nanotechnology Naval architecture and marine engineering Nuclear engineering Ocean engineering Petroleum engineering Other engineering fields that cannot be classified using the fields listed above	Disciplines removed from this field: <ul style="list-style-type: none"> • Industrial, manufacturing and systems engineering moved to Industrial and Manufacturing Engineering. Disciplines added to this field: <ul style="list-style-type: none"> • Engineering mechanics, physics, and science moved from Mechanical Engineering. • Petroleum engineering moved from Chemical Engineering.
C. Geosciences, Atmospheric, and Ocean Sciences (previously called Environmental Sciences)	
1. Atmospheric Science and Meteorology	
Aeronomy Atmospheric chemistry and climatology Atmospheric physics and dynamics Extraterrestrial atmospheres Meteorology Solar Weather modification	

Fields of R&D for the **FY 2016** Higher Education Research and Development Survey

HERD 2016 Fields	Changes from FY 2015 HERD Survey
2. Geological and Earth Sciences	
Earth and planetary sciences Geochemistry Geodesy and gravity Geology Geomagnetism Geophysics and seismology Hydrology and water resources Minerology and petrology Paleomagnetism Paleontology Physical geography Stratigraphy and sedimentation Surveying	Disciplines removed from this field: <ul style="list-style-type: none"> • Cartography moved to Social Sciences, Other Social Sciences.
3. Ocean Sciences and Marine Sciences	
Biological oceanography Geological oceanography Marine biology Marine oceanography Marine sciences Oceanography, chemical and physical	
4. Other Geosciences, Atmospheric and Ocean Sciences	
Other fields that cannot be classified using the fields listed above.	

Fields of R&D for the **FY 2016** Higher Education Research and Development Survey

HERD 2016 Fields	Changes from FY 2015 HERD Survey
D. Life Sciences	
1. Agricultural Sciences	
<p>Agricultural business and management Agricultural chemistry Agricultural economics Agricultural engineering—report in Engineering Agricultural production operations Animal sciences Applied horticulture and horticultural business services Aquaculture Fishing and fisheries sciences and management Food science and technology Forestry International agriculture Plant sciences Soil sciences Wood science</p>	<p>Disciplines removed from this field:</p> <ul style="list-style-type: none"> • Conservation moved to Natural Resources and Conservation. • Renewable natural resources moved to Natural Resources and Conservation. • Landscape architecture moved to Non S&E Fields, Other Non-S&E Fields. • All veterinary disciplines moved to Health Sciences. <p>Disciplines added to this field:</p> <ul style="list-style-type: none"> • Agricultural economics moved from Social Sciences, Economics. • Wood science moved from Engineering, Chemical Engineering.
2. Biological and Biomedical Sciences (previously Biological Sciences)	
<p>Allergies and immunology Biochemistry, biophysics, and molecular biology Biogeography Biology and biomedical sciences, general Biomathematics, bioinformatics, and computational biology Biotechnology Botany and plant biology Cell, cellular biology, and anatomical sciences Epidemiology, ecology and population biology Genetics Microbiological sciences and immunology Molecular medicine Neurobiology and neuroscience Pharmacology and toxicology Physiology, pathology and related sciences Zoology, animal biology</p>	<p>Disciplines removed from this field:</p> <ul style="list-style-type: none"> • Foods and nutrition studies moved to Non-S&E Fields, Other Non-S&E Fields. • Nutritional sciences (renamed Dietetics and clinical nutrition services) moved to Health Sciences. • Physical anthropology moved to Social Sciences, Anthropology. • All veterinary disciplines moved to Health Sciences. <p>Disciplines added to this fields:</p> <ul style="list-style-type: none"> • Neurobiology and neuroscience moved from Health Sciences.

Fields of R&D for the **FY 2016** Higher Education Research and Development Survey

HERD 2016 Fields	Changes from FY 2015 HERD Survey
3. Health Sciences (previously Medical Sciences)	
<p>Advanced, graduate dentistry and oral sciences Allied health and medical assisting services Bioethics, medical ethics Clinical medicine research Clinical/medical laboratory science/research and allied professions Communication disorders sciences and services Dentistry Dietetics and clinical nutrition services Health and medical administrative services Health, medical preparatory programs Gerontology, health sciences Kinesiology and exercise science Medical clinical science, graduate medical studies Medical illustration and informatics Medicine Mental health Nursing Optometry Osteopathic medicine, osteopathy Pharmacy, pharmaceutical sciences, and administration Podiatric medicine, podiatry Public health Radiological science Registered nursing, nursing administration, nursing research and clinical nursing Rehabilitation and therapeutic professions Veterinary biomedical and clinical sciences Veterinary medicine</p>	<p>Several medical fields that had been previously listed as individual examples here have been clustered under the name Clinical medicine research.</p> <p>Disciplines removed from this field:</p> <ul style="list-style-type: none"> • Neurosciences moved to Biological and Biomedical Sciences. • Pharmacology moved to Biological and Biomedical Sciences. <p>Disciplines added to this field:</p> <ul style="list-style-type: none"> • Clinical/medical laboratory technologies moved from Other Life Sciences. • Communication disorders sciences and services moved from Other Life Sciences. • Gerontology, health sciences moved from Other Life Sciences. • Health and medical administration services moved from Other Life Sciences. • Nursing moved from Other Life Sciences. • Registered nursing, nursing administration, nursing research and clinical nursing moved from Other Life Sciences. • All therapy and rehabilitation fields moved from Other Life Sciences. • Nutritional sciences (renamed Dietetics and clinical nutrition services) moved from Biological and Biomedical Sciences. • All Veterinary disciplines are now included in this field. Subdisciplines may have moved from Agricultural Sciences or Biological and Biomedical Sciences.
4. Natural Resources and Conservation	
<p>Natural resources conservation and research Natural resources economics Natural resources management and policy Renewable natural resources Wildlife and wildlands science and management</p>	<p style="text-align: right; color: red;">NEW FIELD</p> <p>Disciplines added to this field:</p> <ul style="list-style-type: none"> • Most disciplines in this field moved from Agricultural Sciences. • Natural resources economics moved from Social Sciences, Economics.

Fields of R&D for the **FY 2016** Higher Education Research and Development Survey

HERD 2016 Fields	Changes from FY 2015 HERD Survey
5. Other Life Sciences	
Other life sciences that cannot be classified using the fields listed above	<p>Disciplines removed from this field:</p> <ul style="list-style-type: none"> • Clinical/medical laboratory technologies moved to Health Sciences. • Communication disorders sciences and services moved to Health Sciences. • Gerontology, health sciences moved to Health Sciences. • Health and medical administration services moved to Health Sciences. • Nursing moved to Health Sciences. • Registered nursing, nursing administration, nursing research and clinical nursing moved to Health Sciences. • All therapy and rehabilitation fields moved to Health Sciences.
E. Mathematics and Statistics	
Applied mathematics Mathematics Statistics	<p>Disciplines removed from this field:</p> <ul style="list-style-type: none"> • Operations research moved to Engineering, Industrial and Manufacturing Engineering.
F. Physical Sciences	
1. Astronomy and Astrophysics	
Astronomy Astrophysics Planetary astronomy and science	
2. Chemistry	
(except Biochemistry—report in Biological and Biomedical Sciences) Analytical chemistry Chemical physics Environmental chemistry Forensic chemistry Inorganic chemistry Organic chemistry Organo-metallic chemistry Physical chemistry Polymer chemistry Theoretical chemistry	<p>Disciplines removed from this field:</p> <ul style="list-style-type: none"> • Pharmaceutical chemistry moved to Life Sciences, Health Sciences. <p>Disciplines added to this field:</p> <ul style="list-style-type: none"> • Chemical physics moved from Physics.
3. Materials Science	
Materials chemistry Materials science	<p>Disciplines added to this field:</p> <ul style="list-style-type: none"> • Materials science moved from Engineering, Metallurgical and Materials Engineering.

Fields of R&D for the **FY 2016** Higher Education Research and Development Survey

HERD 2016 Fields	Changes from FY 2015 HERD Survey
4. Physics	
Acoustics Atomic, molecular physics Condensed matter and materials physics Elementary particle physics Mathematical physics Nuclear physics Optics, optical sciences Plasma, high-temperature physics Theoretical physics	Disciplines removed from this field: <ul style="list-style-type: none"> • Chemical physics moved to Chemistry.
5. Other Physical Sciences	
Other physical sciences that cannot be classified using the fields listed above	
G. Psychology	
Clinical psychology Counseling and applied psychology Human development Research and experimental psychology	Disciplines removed from this field: <ul style="list-style-type: none"> • Animal behavior, part of Zoology, moved to Life Sciences, Biological and Biomedical Sciences. • Art therapy, part of Rehabilitation and therapeutic professions, moved to Life Sciences, Health Sciences
H. Social Sciences	
1. Anthropology	NEW FIELD
Cultural anthropology Medical anthropology Physical and biological anthropology	Disciplines added to this field: <ul style="list-style-type: none"> • Cultural anthropology moved from Sociology, Demography and Population Studies. • Physical and biological anthropology moved from Life Sciences, Biological and Biomedical Sciences.
2. Economics	
Applied economics Business development Development economics and international development Econometrics and quantitative economics Industrial economics International economics Labor economics Managerial economics Public finance and fiscal policy	Disciplines removed from the field: <ul style="list-style-type: none"> • Agricultural economics moved to Life Sciences, Agricultural Sciences. • Resource economics moved to Life Sciences, Natural Resources and Conservation.

Fields of R&D for the **FY 2016** Higher Education Research and Development Survey

HERD 2016 Fields	Changes from FY 2015 HERD Survey
3. Political Science and Government	
Comparative government Government Legal systems Political economy Political science Political theory	Disciplines removed from this field: <ul style="list-style-type: none"> • International relations and affairs moved to Other Social Sciences. • Public policy analysis moved to Other Social Sciences. • Public administration has moved to Non-S&E Fields, Other Non-S&E fields. • Regional studies moved to Other Social Sciences.
4. Sociology, Demography, and Population Studies	
Comparative and historical sociology Complex organizations Cultural and social structure Demography and population studies Group interactions Rural sociology Social problems and welfare theory Sociology	Disciplines removed from the field: <ul style="list-style-type: none"> • All subdisciplines of anthropology moved to Anthropology.
5. Other Social Sciences	
Archeology Area, ethnic, cultural, gender, and group studies Cartography City, urban, community and regional planning Criminal science and corrections Criminology Geography Gerontology, social sciences International relations and national security studies Linguistics Public policy analysis Regional studies Urban studies, affairs	Disciplines added to this field: <ul style="list-style-type: none"> • Cartography moved from Geosciences, Atmospheric, and Ocean Sciences, Geological and Earth Science. • International relations and affairs moved from Political Science and Government. • Public policy analysis moved from Political Science and Government. • Regional studies moved from Political Science and Government. Disciplines removed from this field: <ul style="list-style-type: none"> • History of science moved to Non-S&E Fields, Humanities.
I. Other Sciences	
Use this category for R&D that involves at least one S&E field (rows A–H) if it is impossible to report multidisciplinary or interdisciplinary R&D expenditures in specific fields.	

Fields of R&D for the **FY 2016** Higher Education Research and Development Survey

HERD 2016 Fields	Changes from FY 2015 HERD Survey
J. Non-S&E Fields	
1. Education	
Education administration and supervision Education research Teacher education, specific levels and methods Teaching fields	
2. Law	
Law Legal studies	
3. Humanities	
English language and literature, letters Foreign languages and literatures History, including history and philosophy of science and technology Humanities, general Liberal arts and sciences Philosophy and religious studies Theology and religious vocations	Disciplines added to this field: <ul style="list-style-type: none"> History of science moved from Social Science, Other Social Sciences.
4. Visual and Performing Arts	
Drama, theatre arts and stagecraft Film, video, and photographic arts Fine and studio arts Music	
5. Business Management and Business Administration (previously Business and Management)	
Business administration Business management Business, managerial economics Management information systems and services Marketing management and research	Disciplines added to this field: <ul style="list-style-type: none"> Management information systems moved from Computer and Information Sciences.
6. Communication and Communications Technologies (previously Communication, journalism, and library science)	
Communication and media studies Communications technologies Journalism Radio, television, and digital communication	Disciplines removed from this field: <ul style="list-style-type: none"> Library science moved to Other Non-S&E Fields.
7. Social Work	
(no specific examples)	

Fields of R&D for the **FY 2016** Higher Education Research and Development Survey

HERD 2016 Fields	Changes from FY 2015 HERD Survey
8. Other Non-S&E Fields	
<p>Architecture Family, consumer sciences and human sciences Foods, nutrition, and wellness studies Landscape architecture Library science Military technology and applied science Parks, sports, recreation, leisure and fitness Public administration and public affairs Other non-S&E fields that cannot be classified using the fields listed above</p> <p>Also, use this category for R&D that involves multiple non-S&E fields if it is impossible to report multidisciplinary or interdisciplinary R&D expenditures in specific fields.</p>	<p>Disciplines added to this field:</p> <ul style="list-style-type: none"> • Architecture moved from Engineering, Civil Engineering. • Food and nutrition studies moved from Life Sciences, Biological and Biomedical Sciences. • Landscape architecture moved from Life Sciences, Agricultural Sciences. • Library science moved from Communication and Communication Technologies. • Public administration moved from Social Sciences, Political Science and Government.

Fields of R&D for the FY 2016 Higher Education Research and Development Survey

A. Computer and Information Sciences

- Artificial intelligence
- Computer and information technology administration and management
- Computer science
- Computer software and media applications
- Computer systems analysis
- Computer systems networking and telecommunications
- Data processing
- Information sciences, studies
- Information technology
- ~~Management information systems~~ (*moved to Non-S&E Fields, Business Management and Business Administration*)

B. Engineering

1. Aerospace, Aeronautical, and Astronautical Engineering

- Aerodynamics
- Aerospace engineering
- Space technology

2. Bioengineering and Biomedical Engineering

- Biological and biosystems engineering
- Biomaterials engineering
- Biomedical technology
- Medical engineering

3. Chemical Engineering

- Biochemical engineering
- Chemical and biomolecular engineering
- Engineering chemistry
- Paper science
- ~~Petroleum engineering~~ (*moved to Other Engineering*)
- Petroleum refining process
- Polymer, plastics engineering
- ~~Wood science~~ (*moved to Life Sciences, Agricultural Sciences*)

4. Civil Engineering

- Architectural engineering
- ~~Architecture~~ (*moved to Non-S&E Fields, Other Non-S&E Fields*)
- Construction engineering
- Engineering management, administration
- Environmental, environmental health engineering
- Geotechnical and geoenvironmental engineering
- Sanitary engineering

Fields of R&D for the FY 2016 Higher Education Research and Development Survey

- Structural engineering
- Surveying engineering
- Transportation and highway engineering
- Water resources engineering
- 5. **Electrical, Electronic, and Communications Engineering**
 - Communications engineering
 - Computer engineering
 - Computer hardware engineering
 - Computer software engineering
 - Electrical and electronics engineering
 - Laser and optical engineering
 - Power
 - Telecommunications engineering
- 6. **(NEW) Industrial and Manufacturing Engineering**
 - Industrial engineering** *(moved from Other Engineering)*
 - Manufacturing engineering** *(moved from Other Engineering)*
 - Operations research** *(moved from Mathematics and Statistics)*
 - Systems engineering** *(moved from Other Engineering)*
- 7. **Mechanical Engineering**
 - Electromechanical engineering
 - ~~Engineering mechanics~~ *(moved to Other Engineering)*
 - Mechatronics, robotics, and automation engineering
- 8. **Metallurgical and Materials Engineering**
 - Ceramic sciences and engineering
 - Geophysical, geological engineering
 - Materials engineering
 - ~~Materials science~~ *(moved to Physical Sciences, Materials Science)*
 - Metallurgical engineering
 - Mining and mineral engineering
 - Textile sciences and engineering
 - Welding
- 9. **Other Engineering**
 - Agricultural engineering
 - Engineering design
 - Engineering mechanics, physics, and science** *(moved from Mechanical Engineering)*
 - Forest engineering
 - ~~Industrial engineering~~ *(moved to Industrial and Manufacturing Engineering)*
 - ~~Manufacturing engineering~~ *(moved to Industrial and Manufacturing Engineering)*
 - Nanotechnology
 - Naval architecture and marine engineering

Fields of R&D for the FY 2016 Higher Education Research and Development Survey

Nuclear engineering

Ocean engineering

Petroleum engineering (*moved from Chemical Engineering*)

~~Systems engineering~~ (*moved to Industrial and Manufacturing Engineering*)

Other engineering fields that cannot be classified using the fields above

C. Geosciences, Atmospheric, and Ocean Sciences (previously Environmental Sciences)

1. Atmospheric Science and Meteorology

Aeronomy

Atmospheric chemistry and climatology

Atmospheric physics and dynamics

Extraterrestrial atmospheres

Meteorology

Solar

Weather modification

2. Geological and Earth Sciences

~~Cartography~~ (*moved to Social Sciences, Other Social Sciences*)

Earth and planetary sciences

Geochemistry

Geodesy and gravity

Geology

Geomagnetism

Geophysics and seismology

Hydrology and water resources

Minerology and petrology

Paleomagnetism

Paleontology

Physical geography

Stratigraphy and sedimentation

Surveying

3. Ocean Sciences and Marine Sciences

Biological oceanography

Geological oceanography

Marine biology

Marine oceanography

Marine sciences

Oceanography, chemical and physical

4. Other Geosciences, Atmospheric and Ocean Sciences

Other fields that cannot be classified using the fields listed above

D. Life Sciences

Fields of R&D for the FY 2016 Higher Education Research and Development Survey

1. Agricultural Sciences

Agricultural business and management
Agricultural chemistry
Agricultural economics (*moved from Social Sciences, Economics*)
Agricultural engineering—report in Engineering
Agricultural production operations
Animal sciences
Applied horticulture and horticultural business services
Aquaculture
~~Conservation~~ (*moved to Natural Resources and Conservation*)
Fishing and fisheries sciences and management
Food science and technology
Forestry
International agriculture
~~Landscape architecture~~ (*moved to Non S&E Fields, Other Non-S&E Fields*)
Plant sciences
~~Renewable natural resources~~ (*moved to Natural Resources and Conservation*)
Soil sciences
~~Veterinary medicine~~ (*moved to Health Sciences*)
Wood science (*moved from Engineering, Chemical Engineering*)

2. Biological and Biomedical Sciences (previously Biological Sciences)

Allergies and immunology
Biochemistry, biophysics, and molecular biology
Biogeography
Biology and biomedical sciences, general
Biomathematics, bioinformatics, and computational biology
Biotechnology
Botany and plant biology
Cell, cellular biology, and anatomical sciences
Epidemiology, ecology and population biology
~~Foods and nutrition studies~~ (*moved to Non-S&E Fields, Other Non-S&E Fields*)
Genetics
Microbiological sciences and immunology
Molecular medicine
Neurobiology and neuroscience (*moved from Health Sciences*)
~~Nutritional sciences~~ (*renamed Dietetics and clinical nutrition services and moved to Health Sciences*)
Pharmacology and toxicology
~~Physical anthropology~~ (*moved to Social Sciences, Anthropology*)
Physiology, pathology and related sciences
~~Veterinary medicine~~ (*moved to Health Sciences*)
Zoology, animal biology

Fields of R&D for the FY 2016 Higher Education Research and Development Survey

3. Health Sciences (previously Medical Sciences)

Advanced, graduate dentistry and oral sciences

Allied health and medical assisting services

Bioethics, medical ethics

Clinical/medical laboratory science/research and allied professions
(*moved from Other Life Sciences*)

Clinical medicine research (includes several medical fields that had been previously listed separately)

Communication disorders sciences and services (*moved from Other Life Sciences*)

Dentistry

Dietetics and clinical nutrition services (*previously Nutritional sciences; moved from Biological and Biomedical Sciences*)

Gerontology, health sciences (*moved from Other Life Sciences*)

Health and medical administrative services (*moved from Other Life Sciences*)

Health, medical preparatory programs

Kinesiology and exercise science

Medical clinical science, graduate medical studies

Medical illustration and informatics

Medicine

Mental health

~~Neurosciences~~ (*moved to Biological and Biomedical Sciences*)

Nursing (*moved from Other Life Sciences*)

Optometry

Osteopathic medicine, osteopathy

~~Pharmacology~~ (*moved to Biological and Biomedical Sciences*)

Pharmacy, pharmaceutical sciences, and administration

Podiatric medicine, podiatry

Public health

Radiological science

Registered nursing, nursing administration, nursing research and clinical nursing (*moved from Other Life Sciences*)

Rehabilitation and therapeutic professions (*Some subdisciplines moved from Other Life Sciences.*)

Veterinary biomedical and clinical sciences

Veterinary medicine (*Some subdisciplines moved from Agricultural Sciences or Biological and Biomedical Sciences.*)

4. (NEW) Natural Resources and Conservation

Natural resources conservation and research (*moved from Agricultural Sciences*)

Natural resources economics (*moved from Social Sciences, Economics*)

Natural resources management and policy

Fields of R&D for the FY 2016 Higher Education Research and Development Survey

Renewable natural resources (*moved from Agricultural Sciences*)

Wildlife and wildlands science and management

5. Other Life Sciences

~~Clinical/medical laboratory technologies~~ (*moved to Health Sciences*)

~~Communication disorders sciences and services~~ (*moved to Health Sciences*)

~~Gerontology, health sciences~~ (*moved to Health Sciences*)

~~Health and medical administrative services~~ (*moved to Health Sciences*)

~~Nursing~~ (*moved to Health Sciences*)

~~Occupational therapy~~ (*part of Rehabilitation and therapeutic professions; moved to Health Sciences*)

~~Physical therapy~~ (*part of Rehabilitation and therapeutic professions; moved to Health Sciences*)

~~Registered nursing, nursing administration, nursing research and clinical nursing~~ (*moved to Health Sciences*)

~~Rehabilitation services~~ (*part of Rehabilitation and therapeutic professions; moved to Health Sciences*)

~~Therapeutic services~~ (*part of Rehabilitation and therapeutic professions; moved to Health Sciences*)

Other life sciences that cannot be classified using the fields listed above

E. Mathematics and Statistics

Applied mathematics

Mathematics

~~Operations research~~ (*moved to Engineering, Industrial and Manufacturing Engineering*)

Statistics

F. Physical Sciences

1. Astronomy and Astrophysics

Astronomy

Astrophysics

Planetary astronomy and science

2. Chemistry (except Biochemistry—report in Biological and Biomedical Sciences)

Analytical chemistry

Chemical physics (*moved from Physics*)

Environmental chemistry

Forensic chemistry

Inorganic chemistry

Organic chemistry

Organo-metallic chemistry

~~Pharmaceutical chemistry~~ (*moved to Life Sciences, Health Sciences*)

Physical chemistry

Fields of R&D for the FY 2016 Higher Education Research and Development Survey

Polymer chemistry
Theoretical chemistry

3. (NEW) Materials Science

Materials chemistry
Materials science (*moved from Engineering, Metallurgical and Materials Engineering*)

4. Physics

Acoustics
Atomic, molecular physics
~~Chemical physics~~ (*moved to Chemistry*)
Condensed matter and materials physics
Elementary particle physics
Mathematical physics
Nuclear physics
Optics, optical sciences
Plasma, high-temperature physics
Theoretical physics

5. Other Physical Sciences

Other physical sciences that cannot be classified using the fields listed above

G. Psychology

~~Animal behavior~~ (*part of Zoology; moved to Life Sciences, Biological and Biomedical Sciences*)
~~Art therapy~~ (*part of Rehabilitation and therapeutic professions; moved to Life Sciences, Health Sciences*)
Clinical psychology
Counseling and applied psychology
Human development
Research and experimental psychology

H. Social Sciences

1. (NEW) Anthropology

Cultural anthropology (*moved from Sociology, Demography, and Population Studies*)

Medical anthropology

Physical and biological anthropology (*moved from Life Sciences, Biological and Biomedical Sciences*)

2. Economics

~~Agricultural economics~~ (*moved to Life Sciences, Agricultural Sciences*)

Applied economics

Business development

Development economics and international development

Econometrics and quantitative economics

Fields of R&D for the FY 2016 Higher Education Research and Development Survey

- Industrial economics
 - International economics
 - Labor economics
 - Managerial economics
 - Public finance and fiscal policy
 - ~~Resource economics~~ (*moved to Life Sciences, Natural Resources and Conservation*)
3. Political Science and Government
- Comparative government
 - Government
 - ~~International relations and affairs~~ (*moved to Other Social Sciences*)
 - Legal systems
 - Political economy
 - Political science
 - Political theory
 - ~~Public administration~~ (*moved to Non-S&E Fields, Other Non-S&E fields*)
 - ~~Public policy analysis~~ (*moved to Other Social Sciences*)
 - ~~Regional studies~~ (*moved to Other Social Sciences*)
4. Sociology, Demography, and Population Studies
- ~~Anthropology, cultural and social~~ (*moved to Anthropology*)
 - Comparative and historical sociology
 - Complex organizations
 - Cultural and social structure
 - Demography and population studies
 - Group interactions
 - Rural sociology
 - Social problems and welfare theory
 - Sociology
5. Other Social Sciences
- Archeology
 - Area, ethnic, cultural, gender, and group studies
 - Cartography** (*moved from Geosciences, Atmospheric, and Ocean Sciences, Geological and Earth Sciences*)
 - City, urban, community and regional planning
 - Criminal science and corrections
 - Criminology
 - Geography
 - Gerontology, social sciences
 - ~~History of science~~ (*moved to Non-S&E Fields, Humanities*)
 - International relations and national security studies** (*moved from Political Science and Government*)
 - Linguistics
 - Public policy analysis** (*moved from Political Science and Government*)

Fields of R&D for the FY 2016 Higher Education Research and Development Survey

Regional studies (*moved from Political Science and Government*)

Urban studies, affairs

I. Other Sciences

Use this category for R&D that involves at least one S&E field (rows A–H) if it is impossible to report multidisciplinary or interdisciplinary R&D expenditures in specific fields.

J. Non-S&E Fields

1. Education

Education administration and supervision

Education research

Teacher education, specific levels and methods

Teaching fields

2. Law

Law

Legal studies

3. Humanities

English language and literature, letters

Foreign languages and literatures

History, including history and philosophy of science and technology

Humanities, general

Liberal arts and sciences

Philosophy and religious studies

Theology and religious vocations

4. Visual and Performing Arts

Drama, theatre arts and stagecraft

Film, video, and photographic arts

Fine and studio arts

Music

5. Business Management and Business Administration (previously Business and Management)

Business administration

Business management

Business, managerial economics

Management information systems and services (*moved from Computer and Information Sciences*)

Marketing management and research

6. Communication and Communications Technologies (previously Communication, Journalism, and Library Science)

Fields of R&D for the FY 2016 Higher Education Research and Development Survey

Communication and media studies
Communications technologies
Journalism
~~Library science~~ (*moved to Other Non-S&E Fields*)
Radio, television, and digital communication

7. Social Work

(no specific examples)

8. Other Non-S&E Fields

Architecture (*moved from Engineering, Civil Engineering*)

Family, consumer sciences and human sciences

Foods, nutrition, and wellness studies (*moved from Life Sciences, Biological and Biomedical Sciences*)

Landscape architecture (*moved from Life Sciences, Agricultural Sciences*)

Library science (*moved from Communication and Communications Technologies*)

Military technology and applied science

Parks, sports, recreation, leisure and fitness

Public administration and public affairs (*moved from Social Sciences, Political Science and Government*)

Other non-S&E fields that cannot be classified using the fields listed above

Also, use this category for R&D that involves multiple non-S&E fields if it is impossible to report multidisciplinary or interdisciplinary R&D expenditures in specific fields.