\[ 3 - x - 2y = f(x, y) \]
\[ 2 - y - x = g(x, y) \]

Nullclines:
\[ \dot{x} = 0 \text{ when } y = 0 \]
\[ \dot{y} = 0 \text{ when } x = 0 \]

Four fixed points: \( \lambda = -1 \).
Chapter 6  Faculty & Staff

Goals
A great university is defined in large part by its outstanding faculty. The University of Michigan attracts faculty members with commitment to excellence in both teaching and research, as shown by the high quality of its graduates and the superior research and scholarship by its faculty. With regard to the staff, the University seeks the highest level of performance from the fewest number of staff members necessary to support the institution’s excellence in academics, research and service.

Overview
The faculty headcount at the University of Michigan is 7,056, while the total of faculty full-time equivalents (FTEs) is 6,031. Instructional appointments comprise 3,389 FTEs, and another 2,643 FTEs are individuals with clinical, research and other titles who are primarily involved in health care, research, and related scholarly activities.

Although statistics can hardly capture the full scope of the faculty’s activities and accomplishments, a summary of some of their awards and honors provides a glimpse into their successes. The U-M faculty currently includes 25 members of the National Academy of Sciences, 30 members of the National Academy of Engineering, 58 members of the Institute of Medicine and 83 members of the American Academy of Arts and Sciences. In addition, many faculty members have been awarded MacArthur Foundation Fellowships (aka “genius” awards), Emmy and Grammy awards, National Medals of Art, and countless other honors bestowed by scholarly and professional societies.

U-M faculty members are primarily involved in teaching, research and scholarship. However, the faculty also have service responsibilities to the university and broader academic community and society at large, as well as administrative duties and an important role in setting academic policies for admissions, the granting of degrees, and the content of the curriculum.

Staff members play key roles in the efficient and productive operation of nearly all facets of the University. Staff members are involved in the conduct and administration of research; they provide academic, housing and other services for students; handle financial operations of the institution; manage the physical and digital infrastructure of the campus; and monitor the many federal, state and professional compliance rules the institution must follow.

The average age of staff members is increasing; today 40 percent of the staff is 50 or older, whereas 33 percent fell in that age range as of Fall 2005. U-M Human Resources estimates that close to 20 percent of the current staff will retire by 2020.

The likelihood that a significant fraction of experienced faculty and staff members will retire during the next five to ten years offers several challenges. The skills provided by retiring employees will need to be replaced during a period when there will be pressure to control personnel growth. At the same time, the numbers of positions that will open provide an opportunity for reorganization in how responsibilities are fulfilled.

For More Information
Human Capital Report

Other chapters provide information related to faculty activity, including indicators of the teaching workload (Chapter 8) and research activity (Chapter 9). The quality of the faculty influences the U-M’s placement in many national and international rankings (Chapter 12). Diversity indicators for the faculty, staff and students are reported in Chapter 7.

Charts in Chapter 6

6.1.1 Academic Workforce, Headcount by Title, Fall 2015.
6.1.2 Academic Workforce, Full-Time Equivalents by Title, Fall 2015.
6.1.4 Detail for “All Other Academic Workforce,” by Full-Time Equivalents, 2005-15.
6.2.1 Tenured/Tenure-Track Faculty, Headcount by Title, Fall 2005-15.
6.2.2 New Hires and Departures of Tenured/Tenure-Track Faculty; Annual Net Change and Cumulative Change, 2005-15.
6.2.3 Age Distribution of Tenured/Tenure-Track Faculty, Fall 2005 and 2015.
6.3.1 Faculty Distribution by Discipline Groups, Fall 2015.
6.3.2 Faculty Members Elected to the National Academy of Sciences, the National Academy of Engineering and the Institute of Medicine, by Discipline, 2015.
6.5.1 Headcount of Regular Staff, Fall 2005-15.
6.5.2 Full-time Equivalent of Staff (excluding U-M Health System Staff), by Fund Sources, 2004-14.
6.6 Age Distribution of Staff, Fall 2005 and Fall 2015.

More than half of the academic workforce (tenured/tenure-track faculty and lecturers) is involved in instruction, whether you measure by headcount or full-time equivalents.

6.1.1 Academic Workforce, Headcount by Title, Fall 2015.

6.1.2 Academic Workforce, Full-Time Equivalents by Title, Fall 2015.


The total academic workforce is 7,056 by headcount and 6,031 by full-time equivalents (FTEs), based on data collected on November 1 each year. The difference is due to several factors: some individuals hold a fractional academic appointment and a fractional staff appointment, for instance, or may work part-time at the University and have a second position with another employer.

Tenured and tenure-track faculty members and lecturers handle the majority of instructional activities. Clinical faculty members also play a role in instruction. Research and primary faculty include individuals involved in research, mentoring of graduate students and research fellows, and those who serve as librarians, curators, and archivists.

“All Other Academic Workforce” includes not-on-track faculty, supplemental instructional faculty (adjunct/visiting), supplemental research faculty (adjunct/visiting), and emeritus faculty.
The tenured/tenure-track faculty numbers have grown by 296 FTE between 2004 and 2014, and the number of clinical faculty (see 6.1.4) has nearly doubled over the same period.


6.1.4 Detail for “All Other Academic Workforce,” by Full-Time Equivalents, 2004-14.


The academic group growing most rapidly is the clinical faculty. The bulk of this group is comprised of physicians who provide clinical care throughout the U-M Health System. Counts are recorded as of November 1 of each year.
The total tenured and tenure-track faculty headcount has increased from 2,837 in Fall 2005 to 3,096 in Fall 2015, an increase of 259 over the decade.

6.2.1 Tenured/Tenure-Track Faculty, Headcount by Title, Fall 2005-15.


Growing the faculty ranks has been a priority over the last decade. Most recently, then-President Coleman announced in November, 2007 a commitment from the central administration to hire 100 new tenure-track faculty members to expand interdisciplinary teaching and research. This initiative has focused on identifying individuals who create new clusters of junior faculty to contribute to teaching and research in common areas, such as the emerging topics of alternative energy and environmental sustainability. As of June 2011, the final cluster topics were identified.

In 2010, the central administration also funded an additional 50 new faculty positions to address the unanticipated growth in undergraduate student enrollment and to enhance the students’ academic experience through a reduced student/faculty ratio and smaller class sizes that are closer to those of other top universities.

The 150 faculty positions funded by the central administration through these two initiatives are additions to the faculty; the schools and colleges have their own funds to fill vacancies and add new faculty to meet their needs.

**NOTE:** A new category – not on track – was added to the faculty beginning in 2007. In 6.2.1, the not-on-track faculty members are included in the totals for 2007 and later in order to show comparable faculty member totals across the decade.

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2 “Coleman outlines faculty hiring program, new initiatives in speech,” *University Record*, November 19, 2007.

3 “Final interdisciplinary junior faculty clusters chosen,” *University Record*, June 20, 2011.

4 *Budget Presentation to the Board of Regents, June 17, 2010.*
There has been a net increase in tenured and tenure-track faculty in eight of the last ten years.

6.2.2 New Hires and Departures of Tenured/Tenure-Track Faculty; Annual Net Change and Cumulative Change, 2005-15.

The hiring and departure decisions reported above occurred during the academic year leading up to November 1 of the year on the chart. Departures include faculty members who retire or who leave the University for other positions.
In 2005, 47 percent of the faculty was age 50 and older; today the fraction has increased to 54 percent.

6.2.3 Age Distribution of Tenured/Tenure-Track Faculty, Fall 2005 and 2015.

Tenured and tenure-track faculty members are spread broadly across the academic disciplines. Outside of the tenure-track nearly half of the faculty members are in medicine.

### 6.3.1 Faculty Distribution by Discipline Groups\(^5\), Fall 2015.

<table>
<thead>
<tr>
<th>Discipline Group</th>
<th>All Faculty (7,066)</th>
<th>Tenured/Tenure Track Faculty (3,190)</th>
<th>Lecturers (871)</th>
<th>All Other Faculty (2,995)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humanities &amp; the Arts</td>
<td>669</td>
<td>361</td>
<td>291</td>
<td>226</td>
</tr>
<tr>
<td>Social Sciences</td>
<td>1,158</td>
<td>683</td>
<td>463</td>
<td>214</td>
</tr>
<tr>
<td>Physical Sciences &amp; Engineering</td>
<td>1,116</td>
<td>768</td>
<td>249</td>
<td>463</td>
</tr>
<tr>
<td>Biological and Other Health Sciences</td>
<td>989</td>
<td>426</td>
<td>134</td>
<td>1,921</td>
</tr>
<tr>
<td>Medicine</td>
<td>2,878</td>
<td>945</td>
<td>100</td>
<td>12</td>
</tr>
<tr>
<td>All Other Faculty</td>
<td>945</td>
<td>426</td>
<td>134</td>
<td>1,921</td>
</tr>
</tbody>
</table>

**SOURCE:** U-M Human Resources Information Services.

The “All Other Faculty” group includes clinical faculty, research faculty, adjunct and visiting faculty, librarians, curators and archivists. Some individuals with a faculty title have been excluded from this chart, as they cannot be assigned to a discipline group due to their involvement in multidisciplinary or other broadly defined teaching, research or academic duties.

In addition to the categorization by disciplines shown here, 246 members of the faculty are primarily affiliated with units that do not neatly fit into a discipline. Of these, 7 are tenured or tenure track, 85 are lecturers and 154 are other faculty types.

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\(^5\) A list of disciplines assigned to each group is found in Appendix C.
107 active and retired U-M faculty members are elected members of the National Academies.

### 6.3.2 Faculty Members of the National Academy of Sciences, the National Academy of Engineering and the Institute of Medicine, by Discipline, 2015.

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Active Faculty</th>
<th>Emeritus Faculty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical</td>
<td>28</td>
<td>11</td>
</tr>
<tr>
<td>Engineering</td>
<td>16</td>
<td>13</td>
</tr>
<tr>
<td>Social Sciences</td>
<td>11</td>
<td>7</td>
</tr>
<tr>
<td>Life &amp; Other Health Sciences</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td>Physical Science &amp; Mathematics</td>
<td>4</td>
<td>2</td>
</tr>
</tbody>
</table>

Source: Member Directories, National Academies of Sciences/National Academy of Engineering/Institute of Medicine.

Membership in the National Academies is considered to be one of the highest honors bestowed upon scientists, engineers and scholars in recognition of their distinguished and continuing achievements in original research. To date, more than 400 members of the National Academies have won Nobel Prizes.

Through the Academies, U-M faculty members serve as a source for independent, unbiased expertise on challenging issues facing the nation and the world. Their advice and insights help shape policies, inform public opinion and advance the pursuit of science, engineering and medicine.

Election to these prestigious societies is through nomination and selection by existing members in recognition of extraordinary achievements and commitment to service. In rare instances, an individual has been elected to more than one academy. U-M currently has six faculty members elected to two academies.
The salaries of U-M faculty members (excluding medical faculty) are competitive with their public university peers, and lag their private university peers.

6.4 Average Faculty Salaries by Rank for U-M\(^6\) and Peer Groups\(^7\), Adjusted for Inflation\(^8\), FY2005-15.

The current average annual salary of full professors at the University of Michigan is $44,400 less than the average of full professors at private peer institutions, and $12,300 more than the average of full professors at public peers. U-M associate professors currently earn $22,100 less than their private university counterparts and $4,900 more than associate professors at public peers. Assistant professors at the U-M currently earn $19,300 below those at private peer universities and $900 more than at public peers. All comparisons exclude medical school faculty.

Since FY2005, the pay gap has grown between U-M faculty at all levels and those at private peer universities, while the pay gap has narrowed between the U-M and its public peers. The change from last year to the current year brought full professor salaries closer to those at private peers, while the spread increased between U-M and private peer associate and assistant professors.

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\(^6\) Faculty from the U-M and peer medical schools are not included in the data.

\(^7\) A list of the “official” peers used for comparison on this page is found in Appendix A.

\(^8\) Based on FY2015 U.S. Consumer Price Index.
The rate of growth in total Ann Arbor campus staff is low, increasing at an average annual rate of 1.1 percent over the last decade.

6.5.1 Headcount of Regular Staff, Fall 2005-15.


The headcount for each fiscal year is based on appointment data as of November 1. “Regular Staff” excludes supplemental staff, graduate student instructors, graduate student research assistants, graduate staff assistants, research fellows, and any non-faculty staff from U-M Health System.

9 “Staff” excludes individuals whose primary appointment is in a faculty position.
About one-third of the total number of non-Health System staff members on campus directly serve the University’s academic mission and are supported out of the General Fund. The remaining two-thirds of the staff – funded by other sources – take part in externally sponsored research or auxiliary activities, such as plant operations and student housing.

6.5.2 Full-time Equivalent of Staff (excluding U-M Health System Staff), by Fund Sources, 2005-15.


Staff FTEs paid by the General Fund were 36 percent of the total in 2004, and 36 percent of the total in 2014. Each year’s FTE total is based on November 1 appointment data.

Financial support for “Other Staff” comes from the Designated Fund, Expendable Restricted Fund, Sponsored Fund, and Auxiliary Fund.

The definition of staff for this chart does not include any of the faculty ranks.

10 “Staff” excludes individuals whose primary appointment is in a faculty position.
In 2005, 33 percent of the Ann Arbor campus non-Health System staff\textsuperscript{11} was age 50 and older; today that has grown to 40 percent.

6.6 Age Distribution of Staff, Fall 2005 and Fall 2015.

\begin{figure}
\centering
\includegraphics[width=\textwidth]{age_distribution_bar_chart.png}
\caption{Age Distribution of Staff, Fall 2005 and Fall 2015.}
\end{figure}

\textsuperscript{11}“Staff” excludes individuals whose primary appointment is in a faculty position.

\textsuperscript{11} SOURCE: U-M Human Resources Data.