

**Pulaski Technical College - Advising Guide**  
**U of A STEM Prep Program - stemprep.uark.edu**

|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  | Required for Degree |      |       |      |      |      |       |       |      |      |      |      |      |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|---|--|--|---------------------|------|-------|------|------|------|-------|-------|------|------|------|------|------|--|
| STEM Prep                                                                                                                                                                                                                                                                                                                                                                                   |                                                                     |   |  |  | Done                | Curr | To do | BENG | BMEG | CHEG | CompS | CompE | CVEG | ELEG | INEG | MEEG | DATA |  |
| <b>English (6 hours)</b>                                                                                                                                                                                                                                                                                                                                                                    |                                                                     |   |  |  |                     |      |       | 3    | 3    | 3    | 3     | 3     | 3    | 3    | 3    | 3    | 3    |  |
| ENGL                                                                                                                                                                                                                                                                                                                                                                                        | 1311 English Composition I                                          |   |  |  |                     |      | 3     | 3    | 3    | 3    | 3     | 3     | 3    | 3    | 3    | 3    | 3    |  |
| ENGL                                                                                                                                                                                                                                                                                                                                                                                        | 1312/1312A English Composition II                                   |   |  |  |                     |      | 3     | 3    | 3    | 3    | 3     | 3     | 3    | 3    | 3    | 3    | 3    |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
| <b>Communications (3 hours)</b>                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       | BENG | BMEG | CHEG | CompS | CompE | CVEG | ELEG | INEG | MEEG | DATA |  |
| GNEG                                                                                                                                                                                                                                                                                                                                                                                        | 1103 Introduction to Engineering (U of A course)                    | X |  |  |                     |      | 3     | 3    | 3    | 3    | 3     | 3     | 3    | 3    | 3    | 3    |      |  |
| DASC                                                                                                                                                                                                                                                                                                                                                                                        | 10003 Intro to Data Science                                         | X |  |  |                     |      |       |      |      | 3    | 3     |       |      |      |      |      | 3    |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
| <b>Mathematics (12 hours)</b>                                                                                                                                                                                                                                                                                                                                                               |                                                                     |   |  |  |                     |      |       | BENG | BMEG | CHEG | CompS | CompE | CVEG | ELEG | INEG | MEEG | DATA |  |
| MATH                                                                                                                                                                                                                                                                                                                                                                                        | 1404 Calculus I                                                     | X |  |  |                     |      | 4     | 4    | 4    | 4    | 4     | 4     | 4    | 4    | 4    | 4    | 4    |  |
| MATH                                                                                                                                                                                                                                                                                                                                                                                        | 1405 Calculus II                                                    | X |  |  |                     |      | 4     | 4    | 4    | 4    | 4     | 4     | 4    | 4    | 4    | 4    | 4    |  |
| MATH                                                                                                                                                                                                                                                                                                                                                                                        | 2406 Calculus III                                                   | X |  |  |                     |      | 4     |      | 4    |      | 4     | 4     | 4    | 4    | 4    | 4    |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
| <b>Science (8-16 hours)</b>                                                                                                                                                                                                                                                                                                                                                                 |                                                                     |   |  |  |                     |      |       | BENG | BMEG | CHEG | CompS | CompE | CVEG | ELEG | INEG | MEEG | DATA |  |
| CHEM                                                                                                                                                                                                                                                                                                                                                                                        | 1305/1405 General Chemistry I                                       |   |  |  |                     |      | 3     | 3    | 3    | 3    | 3     | 3     | 3    | 3    | 3    | 3    | 4    |  |
| CHEM                                                                                                                                                                                                                                                                                                                                                                                        | 1302/1406 General Chemistry II                                      |   |  |  |                     |      |       | 4    | 4    | 4*   | 4*    | 4*    |      | 3*   | 4*   | 4*   | 4*   |  |
| BIOL                                                                                                                                                                                                                                                                                                                                                                                        | 1401/1302/ Biological Science                                       |   |  |  |                     |      | 4     | 4    |      | 4*   | 4*    |       | 4*   | 3*   | 4*   | 4*   | 4*   |  |
| GEOL                                                                                                                                                                                                                                                                                                                                                                                        | 1403 Physical Geology                                               |   |  |  |                     |      | 3*    |      |      | 4*   | 4*    | 4*    |      | 3*   | 4*   | 4*   | 4*   |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
| <b>Humanities and Social Science (15-18 hours)</b>                                                                                                                                                                                                                                                                                                                                          |                                                                     |   |  |  |                     |      |       | BENG | BMEG | CHEG | CompS | CompE | CVEG | ELEG | INEG | MEEG | DATA |  |
| <b>US History/Government (3 hours)</b>                                                                                                                                                                                                                                                                                                                                                      |                                                                     |   |  |  |                     |      |       | 3    | 3    | 3    | 3     | 3     | 3    | 3    | 3    | 3    | 3    |  |
| POLS                                                                                                                                                                                                                                                                                                                                                                                        | 1310/2003 American National Government                              |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             | 2311/2113 U.S. History to 1877, United States                       |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
| HIST                                                                                                                                                                                                                                                                                                                                                                                        | History I                                                           |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             | 2312/2123 U.S. History since 1877, United States                    |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
| HIST                                                                                                                                                                                                                                                                                                                                                                                        | History II                                                          |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
| <b>Economics (3-6 hours):</b>                                                                                                                                                                                                                                                                                                                                                               |                                                                     |   |  |  |                     |      |       | 3    | 3    | 3    | 3     | 3     | 3    | 3    | 3    | 3    |      |  |
| ECON                                                                                                                                                                                                                                                                                                                                                                                        | 2323/2310 Principles of Economics Macro, Principles of Economics I  |   |  |  |                     |      |       |      |      |      |       |       |      |      | 3    |      |      |  |
| ECON                                                                                                                                                                                                                                                                                                                                                                                        | 2322/2320 Principles of Economics Micro, Principles of Economics II |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
| <b>Social Science (3-6 hours)</b>                                                                                                                                                                                                                                                                                                                                                           |                                                                     |   |  |  |                     |      |       | 6    | 6    | 6    | 6     | 6     | 6    | 6    | 3    | 6    | 6    |  |
| ANTH                                                                                                                                                                                                                                                                                                                                                                                        | 2310 Cultural Anthropology                                          |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
| HIST                                                                                                                                                                                                                                                                                                                                                                                        | 2311 U.S. History to 1877                                           |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
| HIST                                                                                                                                                                                                                                                                                                                                                                                        | 2312 U.S. History since 1877                                        |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
| HIST                                                                                                                                                                                                                                                                                                                                                                                        | 1311 History of Civilization I                                      |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
| HIST                                                                                                                                                                                                                                                                                                                                                                                        | 1312 History of Civilization II                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
| POLS                                                                                                                                                                                                                                                                                                                                                                                        | 2320 American State and Local Government                            |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
| POLS                                                                                                                                                                                                                                                                                                                                                                                        | 2330 Intro Comp Politics                                            |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
| POLS                                                                                                                                                                                                                                                                                                                                                                                        | 1310/2003 American National Government                              |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
| PSYC                                                                                                                                                                                                                                                                                                                                                                                        | 2300 Psychology and the Human Experience                            |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
| SOCI                                                                                                                                                                                                                                                                                                                                                                                        | 2300 Introduction to Sociology                                      |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
| SOCI                                                                                                                                                                                                                                                                                                                                                                                        | 2333 Social Problems                                                |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
| <b>Fine Arts (3 hours)</b>                                                                                                                                                                                                                                                                                                                                                                  |                                                                     |   |  |  |                     |      |       | 3    | 3    | 3    | 3     | 3     | 3    | 3    | 3    | 3    | 3    |  |
| ARTS                                                                                                                                                                                                                                                                                                                                                                                        | 2300 Introduction to Visual Arts                                    |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
| FILM                                                                                                                                                                                                                                                                                                                                                                                        | 2300 Introduction to Film                                           |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
| MUSC                                                                                                                                                                                                                                                                                                                                                                                        | 2300 Introduction to Music                                          |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
| THEA                                                                                                                                                                                                                                                                                                                                                                                        | 2300 Introduction to Theatre                                        |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
| <b>Humanities (0-3 hours)</b>                                                                                                                                                                                                                                                                                                                                                               |                                                                     |   |  |  |                     |      |       | 3    | 3    | 3    | 0     | 0     | 3    | 3    | 3    | 3    |      |  |
| Any intermediate I foreign language                                                                                                                                                                                                                                                                                                                                                         |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
| PHIL                                                                                                                                                                                                                                                                                                                                                                                        | 1310 Introduction to Philosophy                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      | 3    |      |  |
| ENGL                                                                                                                                                                                                                                                                                                                                                                                        | 2337 World Literature from Beginning to 1650                        |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
| ENGL                                                                                                                                                                                                                                                                                                                                                                                        | 2338 World Literature from 1650 to present                          |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
| PHIL                                                                                                                                                                                                                                                                                                                                                                                        | 1330 Introduction to Critical Thinking                              |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
| PHIL                                                                                                                                                                                                                                                                                                                                                                                        | 2350 Introduction to Logic                                          |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
| <b>Technical Electives</b>                                                                                                                                                                                                                                                                                                                                                                  |                                                                     |   |  |  |                     |      |       | BENG | BMEG | CHEG | CompS | CompE | CVEG | ELEG | INEG | MEEG | DATA |  |
| CSCE                                                                                                                                                                                                                                                                                                                                                                                        | 2004 Programming Foundations I (U of A course)                      | X |  |  |                     |      |       |      |      | 4    | 4     |       |      |      |      |      | 3    |  |
| DASC                                                                                                                                                                                                                                                                                                                                                                                        | 12203 Role of Data Science in Today's World                         | X |  |  |                     |      |       |      |      |      |       |       |      |      |      |      | 3    |  |
| DASC                                                                                                                                                                                                                                                                                                                                                                                        | 10201 R Programming for Data Science                                | X |  |  |                     |      |       |      |      |      |       |       |      |      |      |      | 3    |  |
| DASC                                                                                                                                                                                                                                                                                                                                                                                        | 16003 Python Programming for Data Science                           | X |  |  |                     |      |       |      |      |      |       |       |      |      |      |      | 3    |  |
| DASC                                                                                                                                                                                                                                                                                                                                                                                        | 21303 Data Privacy & Ethics                                         | X |  |  |                     |      |       |      |      |      |       |       |      |      |      |      | 3    |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                               |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
| All courses have been evaluated by the University of Arkansas College of Engineering. Courses taken outside of these courses are not guaranteed to transfer. The number of hours correspond to the number of hours need by each degree program. Classes listed in multiple sections will only count in one section. Always check courseequivalency.uark.edu for updated course information. |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
| *Indicates an elective. If there are multiple in a section, choose one.                                                                                                                                                                                                                                                                                                                     |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                     |   |  |  |                     |      |       |      |      |      |       |       |      |      |      |      |      |  |