

Courses Approved as Social Data Analytics Electives – May 19, 2022

This list indicates courses approved as SoDA electives with designations as to the distribution requirements against which each may be counted. Students or faculty may request that the Social Data Analytics Program Committee consider any additional courses or designations.

Designations:

- A** counts against Analytics requirement
- Q** counts against Quantification requirement
- C** counts against Computational / Informational requirement
- S** counts against Social requirement
- DC1** counts against Departmental Cluster 1 requirement
- DC2** counts against Departmental Cluster 2 requirement

Departmental Clusters

Approved electives carrying any of the following prefixes meet the “STAT or primarily social science department” distribution requirement, or “DC1”:

Eberly College of Science: STAT

College of Liberal Arts: APLNG, CAS, CLJ, CRIM, ECON, PLSC, PSY, SOC

College of Health and Human Development: HDFS

Intercollege: DEMOG

Approved electives carrying any of the following prefixes meet the “GEOG, IST, or primarily computer science or engineering department” distribution requirement, or “DC2”:

College of Information Sciences & Technology: IST

College of Engineering: CMPSC, CSE, EDSGN, EE, IE

Intercollege: DS

Approved electives carrying any of the following prefixes do not fall into either departmental cluster:

Eberly College of Science: PHYS

Approved SoDA electives meeting the Analytics distribution requirement (A)

The following courses are approved as carrying the (A) designation without further approval required.

| | | | | |
|----------------|-----|--|-------|-----|
| BAN | 541 | Data Mining for Business | No DC | +QC |
| STAT | 557 | Data Mining: Techniques and Applications | DC1 | +QC |
| STAT | 558 | Data Mining II | DC1 | +QC |
| STAT | 584 | Machine Learning: Tools and Algorithms | DC1 | +QC |
| CMPSC | 448 | Machine Learning and Algorithmic AI | DC2 | +QC |
| CSE / IE / IST | 561 | Data Mining Driven Design | DC2 | +QC |
| CSE | 584 | Machine Learning: Tools and Algorithms | DC2 | +QC |
| EDSGN | 561 | Data Mining Driven Design | DC2 | +QC |
| IST | 557 | Data Mining I | DC2 | +QC |
| IST | 558 | Data Mining II | DC2 | +QC |

The following variable title courses (597, unless otherwise indicated) have received temporary (A) designations:

| | | | |
|------|--|-----|------|
| HDFS | Data Mining for Human Development & Family Studies (Brick) | DC1 | +QCS |
| PLSC | Machine Learning (Desmarais) | DC1 | +QCS |
| STAT | Statistical Learning Theory (Zue) | DC1 | +QC |
| CSE | Advanced Big Data Analytics (Kifer) | DC2 | +QC |
| CSE | Data-Mining and Analytics (Lee) | DC2 | +QC |
| CSE | Machine Learning (Kifer) | DC2 | +QC |
| CSE | Numerics of Data Mining and Image Processing (Barlow) | DC2 | +QC |
| IST | Principles of Machine Learning (Honaver) | DC2 | +QC |
| IST | Elements of Machine Learning (Silverman) | DC2 | +QC |
| IST | Deep Learning (Giles) | DC2 | +QC |

Approved Social Data Analytics Electives with Designations (Q), (C), and (S)

The following courses are approved as carrying (Q) (C) and (S) designations.

| | | | |
|-------|-----|---|-----|
| APLNG | 578 | Computational and Statistical Methods for Corpus Analysis | DC1 |
| PLSC | 508 | Political Networks | DC1 |

The following variable title courses (597, unless otherwise indicated) have received temporary (Q) (C) and (S) designations:

| | | | |
|------|--|--|-----|
| HDFS | | Health Technology and Personal Data Collection [HDFS 497] (Brick) | DC1 |
| HDFS | | Bayesian Methods for Human Development & Family Studies (Oravec) | DC1 |
| HDFS | | Data Mining for Human Development & Family Studies* (Brick) | DC1 |
| PLSC | | Big Data and the Law (Zorn) | DC1 |
| PLSC | | Big Data Approaches to the Study of Political Representation (Monroe) [PLSC 551] | DC1 |
| PLSC | | Political Events Data (Schrodt) | DC1 |
| PLSC | | Robust Methods* (Honaker) | DC1 |
| PLSC | | Social and Political Network Analysis (Desmarais) | DC1 |
| PLSC | | Text as Data (Monroe) | DC1 |
| SOC | | Methods of Social Network Analysis (Felmlee) | DC1 |
| STAT | | Statistical Privacy in Large Databases (Slavkovic) | DC1 |
| CSE | | Computational Pragmatics (Passonneau) | DC2 |
| CSE | | Data Privacy, Learning and Statistical Analysis (Smith) | DC2 |
| CSE | | Social Network Data Analytics (Lee) | DC2 |
| GEOG | | Spatio-Temporal Movement Analysis (Andris) [GEOG 560] | DC2 |
| GEOG | | Big Data & Place (MacEachren) | DC2 |
| IST | | Data-Driven Approaches to Computational Theories of Language (Reitter) | DC2 |
| IST | | Foundations of Data Privacy (Rajtmajer) | DC2 |
| IST | | Principles of Artificial Intelligence (Honavar) | DC2 |

| | | |
|-----|--|-----|
| IST | How the Mind Works (Reitter) | DC2 |
| IST | Visualization and Advanced Analysis of Social Networks (Yen / Kropczynski) | DC2 |

** These courses also satisfy the analytics requirement (A).*

Approved Social Data Analytics Electives with Designations (Q) and (S)

The following courses are approved as carrying at least the (Q) and (S) designations.

| | | |
|------------|-----|--|
| CAS | 563 | Pairs & Pairings; Quantitative Methods for Interdependent Data |
| CLJ / SOC | 515 | Research Methods in Criminology and Deviance |
| COMM | 506 | Introduction to Mass Communication Research |
| COMM | 516 | Data Analysis |
| PLSC | 501 | Methods of Political Analysis |
| PLSC | 502 | Statistical Methods for Political Research |
| PLSC | 503 | Multivariate Analysis for Political Research |
| PLSC | 504 | Topics in Political Methodology |
| PLSC | 505 | Time Series Analysis in Political Science |
| PLSC / SOC | 518 | Survey Methods I: Survey Design |
| PLSC / SOC | 519 | Survey Methods II: Analysis of Survey Data |
| PPOL | 503 | Statistics for Public Policy 1 |
| PPOL | 506 | Statistics for Public Policy 2 |
| HDFS | 516 | Methods of Research in Human Development |
| HDFS | 519 | Methods of Statistical Analysis in Human Development |
| HDFS | 523 | Strategies for Data Analysis in Developmental Research |
| HDFS | 526 | Measurement in Human Development |
| HDFS | 527 | Social Epidemiology |
| HDFS | 528 | Observational Methodologies for Development |

| | | |
|------|-----|---|
| HDFS | 530 | Longitudinal Structural Equation Modeling |
| HDFS | 534 | Person-Specific Data Analysis |
| HDFS | 536 | Research Methods in Developmental Processes |
| HDFS | 575 | Applied Longitudinal Data Analysis |
| MGMT | 539 | Social Networks and Organizations |
| SOC | 513 | Sociological Research Methods |
| SOC | 572 | Foundations in Causal Analysis in the Social Sciences |
| SOC | 573 | Demographic Techniques |
| SOC | 574 | Statistical Methods for Social Research |
| SOC | 575 | Statistical Methods for Nonexperimental Research |
| SOC | 576 | Applied Mathematical Demography |
| SOC | 577 | Techniques of Event History Modeling |
| SOC | 578 | Multilevel Regression Models |
| SOC | 579 | Spatial Demography |
| STAT | 507 | Epidemiological Research Methods |
| STAT | 509 | Design and Analysis of Clinical Trials |
| PSY | 507 | Analysis of psychological data 1 |
| PSY | 508 | Analysis of psychological data 2 |
| PSY | 511 | Introduction to Classical and Modern Test Theory |
| PSY | 531 | Multilevel Theory, Measurement, & Analysis |
| PSY | 535 | Research methods in I/O Psychology |

The following variable title courses (597, unless otherwise indicated) have received temporary (Q) and (S) designations:

| | |
|-----|-----------------------------|
| BBH | Multilevel Modeling (Mogle) |
| CAS | Measurement (Dillard) |

| | |
|-------------|--|
| COMM | Advanced Data Analysis (Oliver) |
| HDFS | Advanced Topics in Latent Class Analysis (Bray) |
| HDFS / STAT | Item Response Theory Models for College Testing Data (Loken) |
| HDFS | Applied Longitudinal Data Analysis (Ram) |
| HDFS | Intensive Longitudinal Data (Ram) |
| HDFS | Person-Specific EMA (Molenaar) |
| HDFS | Quasi-Experimental Methods (Shores) |
| PLSC | Causal Inference (Keele) |
| PLSC | Measurement Theory (Fariss) |
| SOC | Causal Analysis (Firebaugh) |
| SOC | Spatial Analysis of Social Data (Chi) |
| SOC | Seminar in Longitudinal Analysis (Johnson) |
| STAT | Spatial Models (Shaby) |
| PSY | Introduction to exploratory data analysis and data management (Hallquist) |
| PSY | Structural equation modeling (Johnson) |
| PSY | Transparent, Open, and Reproducible Research Practices in the Social and Behavioral Sciences (Gilmore) |
| RPTM | Social Networks and Data Analytics (Pan) |

Approved Social Data Analytics Electives with Designations (Q) and (C)

The following courses are approved as carrying at least the (Q) and (C) designations.

| | | | |
|------|-----|--|-----|
| STAT | 463 | Applied Time Series Analysis | DC1 |
| STAT | 540 | Statistical Computing | DC1 |
| STAT | 555 | Statistical Analysis of Genomics Data | DC1 |
| STAT | 557 | *Data Mining: Techniques and Applications (formerly Data Mining I) | DC1 |

| | | | |
|----------------|-----|--|-------|
| STAT | 558 | *Data Mining II | DC1 |
| STAT | 561 | Statistical Inference 1 | DC1 |
| STAT / CSE | 584 | *Machine Learning: Tools and Algorithms | DC1/2 |
| CMPSC | 448 | *Machine Learning and Algorithmic AI | DC2 |
| CSE | 550 | Numerical Linear Algebra | DC2 |
| CSE | 551 | Numerical Solution of Ordinary Differential Equations | DC2 |
| CSE | 552 | Numerical Solution of Partial Differential Equations | DC2 |
| CSE | 553 | Introduction to Approximation Theory | DC2 |
| CSE | 555 | Numerical Optimization Techniques | DC2 |
| CSE | 556 | Finite Element Methods | DC2 |
| CSE | 557 | Concurrent Matrix Computation | DC2 |
| CSE | 560 | Theory of Graphs and Networks | DC2 |
| CSE / IE / IST | 561 | *Data Mining Driven Design | DC2 |
| CSE | 562 | Probabilistic Algorithms | DC2 |
| CSE | 564 | Complexity of Combinatorial Problems | DC2 |
| CSE | 583 | Pattern Recognition—Principles and Applications (EE 552) | DC2 |
| CSE | 585 | Digital Image Processing II (EE 555) | DC2 |
| CSE | 586 | Topics in Computer Vision | DC2 |
| DS | 410 | Data Analytics at Scale | DC2 |
| EDSGN | 561 | *Data Mining Driven Design | DC2 |
| GEOG | 586 | Geographic Information Analysis | DC2 |
| IST | 556 | Web Analytics: Research Approaches for Online Data | DC2 |
| IST | 557 | *Data Mining: Techniques and Applications (formerly Data Mining I) | DC2 |
| IST | 558 | *Data Mining II | DC2 |
| IST | 562 | Theoretical Foundations of Information Science | DC2 |

MATH Hierarchical Algorithms and Deep Learning (Xu) no DC

** These courses also satisfy the analytics requirement (A).*

Approved Social Data Analytics Electives with Designations (C) and (S)

The following courses are approved as carrying at least the (C) and (S) designations.

| | | | |
|------|-----|--|-----|
| GEOG | 571 | Intelligence Analysis, Cultural Geography, and Homeland Security | DC2 |
| GEOG | 588 | Planning GIS for Emergency Management | DC2 |
| GEOG | 591 | GIS for Health Analysis | DC2 |
| IST | 530 | Foundations in Social Informatics | DC2 |
| IST | 555 | Intelligent Agents and Distributed Decision Making | DC2 |

The following variable title courses (597, unless otherwise indicated) have received temporary (C) and (S) designations:

| | | |
|------|--|-----|
| PSY | Transparent, Open, and Reproducible Research Practices in the Social and Behavioral Sciences [PSY 511] (Gilmore) | DC1 |
| GEOG | Spatial Thinking (Klippel) | DC2 |
| GEOG | *Visual Analytics: Leveraging Geo-Social Data (MacEachren / Hardisty) | DC2 |
| GEOG | Representation and Analysis of Space-Time Dynamics [GEOG 560] (Peuquet) | DC2 |
| GEOG | Virtual Reality for the Environmental and Spatial Sciences [GEOG 560] (Klippel) | DC2 |
| IST | AI For Humanity (Yadav) | DC2 |

** These courses also satisfy the analytics requirement (A).*

Approved Social Data Analytics Electives with Designation (Q)

The following courses are approved as carrying the (Q) designation.

STAT 500, 501, 502, 503, 504, 505, 506, 510, 511, 512, 513, 514, 515, 517, 518, 519, 525, 544, 551, 552, 553, 562, 565

The following variable title courses (597, unless otherwise indicated) have received temporary (Q) designations:

IST Principles of Causal Inference (Honavar) DC2

STAT Causal Inference (Lock Morgan) DC1

Approved Social Data Analytics Electives with Designation (S)

The following courses are approved as carrying the (S) designation.

Departmental Cluster DC1:

CLJ 500, 501, 512, 558

HDFS 501, 502, 506, 509, 520, 522, 524, 525, 528, 529, 531, 532, 533, 537, 539, 540, 544, 546, 549, 565, 569, 577, 579

PLSC 534, 540, 541, 542, 550, 551, 552, 553, 554, 555, 556, 560, 561, 563, 564, 565, 566, 586

SOC 501, 502, 512, 521, 522, 523, 524, 525, 526, 527, 528, 529, 540, 531, 532, 533, 534, 537, 538, 544, 546, 551, 553, 557, 560, 584

Departmental Cluster DC2:

GEOG 501B, 501C, 520

IST 520, 521, 525, 526, 556

No DC:

LDT 581

RSOC 525

Courses with temporary (S) designation:

PLSC Psychology of Terrorism (Hatemi) DC1

IST The Psychology of Deception—Deception in the Information Age DC2

IST Foundations in Technology Ethics, Law, and Policy (Susser) DC2

IST Crowdsourcing & Crowd-AI Systems (Huang) DC2

Approved Social Data Analytics Electives with Designation (C)

The following courses are approved as carrying at least the (C) designation.

| | | |
|------|---|-------|
| CSE | 520, 522, 530, 531, 532, 537, 541, 542, 563, 565, 588 | DC2 |
| GEOG | 501D, 560, 565, 580, 583, 584, 585 | DC2 |
| IST | 441, 510 | DC2 |
| DAAN | 871 | No DC |

The following variable title courses (597, unless otherwise indicated) have received temporary (C) designations:

| | | |
|------|--|-----|
| CSE | Public Cloud Computing (Urgaonkar) | DC2 |
| GEOG | Advanced Geographic Information Systems Modeling [GEOG 497] (Andris) | DC2 |
| GEOG | Geovisual Analytics [GEOG 560] (Robinson) | DC2 |
| GEOG | What Can Radar and Electro-optical Remote Sensing Do for You? [GEOG 560] (Cervone) | DC2 |
| PSY | Seminar in Matlab | DC1 |