Courses Approved as Social Data Analytics Electives – October 26, 2023

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.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>DC</th>
<th>Additional Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAN 541</td>
<td>Data Mining for Business</td>
<td>No DC</td>
<td>+QC</td>
</tr>
<tr>
<td>DAAN 570</td>
<td>Deep Learning</td>
<td>No DC</td>
<td>+QC</td>
</tr>
<tr>
<td>STAT 508</td>
<td>Applied Data Mining and Statistical Learning</td>
<td>DC1</td>
<td>+QC</td>
</tr>
<tr>
<td>STAT 557</td>
<td>Data Mining: Techniques and Applications</td>
<td>DC1</td>
<td>+QC</td>
</tr>
<tr>
<td>STAT 558</td>
<td>Data Mining II</td>
<td>DC1</td>
<td>+QC</td>
</tr>
<tr>
<td>STAT 584</td>
<td>Machine Learning: Tools and Algorithms</td>
<td>DC1</td>
<td>+QC</td>
</tr>
<tr>
<td>CMPSC 448</td>
<td>Machine Learning and Algorithmic AI</td>
<td>DC2</td>
<td>+QC</td>
</tr>
<tr>
<td>CSE / IE / IST 561</td>
<td>Data Mining Driven Design</td>
<td>DC2</td>
<td>+QC</td>
</tr>
<tr>
<td>CSE 584</td>
<td>Machine Learning: Tools and Algorithms</td>
<td>DC2</td>
<td>+QC</td>
</tr>
<tr>
<td>EDSGN 561</td>
<td>Data Mining Driven Design</td>
<td>DC2</td>
<td>+QC</td>
</tr>
<tr>
<td>IST 557</td>
<td>Data Mining I</td>
<td>DC2</td>
<td>+QC</td>
</tr>
<tr>
<td>IST 558</td>
<td>Data Mining II</td>
<td>DC2</td>
<td>+QC</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>DC</th>
<th>Additional Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDFS</td>
<td>Data Mining for Human Development &amp; Family Studies (Brick)</td>
<td>DC1</td>
<td>+QCS</td>
</tr>
<tr>
<td>PLSC</td>
<td>Machine Learning (Desmarais)</td>
<td>DC1</td>
<td>+QCS</td>
</tr>
<tr>
<td>STAT</td>
<td>Statistical Learning Theory (Zue)</td>
<td>DC1</td>
<td>+QC</td>
</tr>
<tr>
<td>CSE</td>
<td>Advanced Big Data Analytics (Kifer)</td>
<td>DC2</td>
<td>+QC</td>
</tr>
<tr>
<td>CSE</td>
<td>Data-Mining and Analytics (Lee)</td>
<td>DC2</td>
<td>+QC</td>
</tr>
<tr>
<td>CSE</td>
<td>Machine Learning (Kifer)</td>
<td>DC2</td>
<td>+QC</td>
</tr>
<tr>
<td>CSE</td>
<td>Numerics of Data Mining and Image Processing (Barlow)</td>
<td>DC2</td>
<td>+QC</td>
</tr>
<tr>
<td>IST</td>
<td>Principles of Machine Learning (Honaver)</td>
<td>DC2</td>
<td>+QC</td>
</tr>
<tr>
<td>IST</td>
<td>Elements of Machine Learning (Silverman)</td>
<td>DC2</td>
<td>+QC</td>
</tr>
</tbody>
</table>
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 (Oravecz) 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
Approved Social Data Analytics Electives with Designations (Q) and (S)

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

BAN 830 DESCRIPITIVE ANALYTICS FOR BUSINESS
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
EDPSY 558 Foundations and Applications of Structural Equation Modeling
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 517 HDFS 517: Multilevel Methods for Developmental Research
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)
EDPSY Introduction to Learning Analytics (Zou)
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.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Designation</th>
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</thead>
<tbody>
<tr>
<td>STAT 463</td>
<td>Applied Time Series Analysis</td>
<td>DC1</td>
</tr>
<tr>
<td>STAT 540</td>
<td>Statistical Computing</td>
<td>DC1</td>
</tr>
<tr>
<td>STAT 555</td>
<td>Statistical Analysis of Genomics Data</td>
<td>DC1</td>
</tr>
<tr>
<td>STAT 557</td>
<td>*Data Mining: Techniques and Applications (formerly Data Mining I)</td>
<td>DC1</td>
</tr>
<tr>
<td>STAT 558</td>
<td>*Data Mining II</td>
<td>DC1</td>
</tr>
<tr>
<td>STAT 561</td>
<td>Statistical Inference 1</td>
<td>DC1</td>
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<tr>
<td>STAT / CSE 584</td>
<td>*Machine Learning: Tools and Algorithms</td>
<td>DC1/2</td>
</tr>
<tr>
<td>CMPSC 448</td>
<td>*Machine Learning and Algorithmic AI</td>
<td>DC2</td>
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<tr>
<td>CSE 550</td>
<td>Numerical Linear Algebra</td>
<td>DC2</td>
</tr>
<tr>
<td>CSE 551</td>
<td>Numerical Solution of Ordinary Differential Equations</td>
<td>DC2</td>
</tr>
<tr>
<td>CSE 552</td>
<td>Numerical Solution of Partial Differential Equations</td>
<td>DC2</td>
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<tr>
<td>CSE 553</td>
<td>Introduction to Approximation Theory</td>
<td>DC2</td>
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<tr>
<td>CSE 555</td>
<td>Numerical Optimization Techniques</td>
<td>DC2</td>
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<tr>
<td>CSE 556</td>
<td>Finite Element Methods</td>
<td>DC2</td>
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<tr>
<td>CSE 557</td>
<td>Concurrent Matrix Computation</td>
<td>DC2</td>
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<tr>
<td>CSE 560</td>
<td>Theory of Graphs and Networks</td>
<td>DC2</td>
</tr>
<tr>
<td>CSE / IE / IST 561</td>
<td>*Data Mining Driven Design</td>
<td>DC2</td>
</tr>
<tr>
<td>CSE 562</td>
<td>Probabilistic Algorithms</td>
<td>DC2</td>
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<tr>
<td>CSE 564</td>
<td>Complexity of Combinatorial Problems</td>
<td>DC2</td>
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<tr>
<td>CSE 583</td>
<td>Pattern Recognition—Principles and Applications (EE 552)</td>
<td>DC2</td>
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<td>CSE 585</td>
<td>Digital Image Processing II (EE 555)</td>
<td>DC2</td>
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<tr>
<td>CSE 586</td>
<td>Topics in Computer Vision</td>
<td>DC2</td>
</tr>
<tr>
<td>Code</td>
<td>Course Title</td>
<td>Department</td>
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<tr>
<td>DS</td>
<td>410 Data Analytics at Scale</td>
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<tr>
<td>EDSGN</td>
<td>561 *Data Mining Driven Design</td>
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</tr>
<tr>
<td>GEOG</td>
<td>586 Geographic Information Analysis</td>
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<tr>
<td>IST</td>
<td>556 Web Analytics: Research Approaches for Online Data</td>
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<tr>
<td>IST</td>
<td>557 *Data Mining: Techniques and Applications (formerly Data Mining I)</td>
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<tr>
<td>IST</td>
<td>558 *Data Mining II</td>
<td></td>
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<tr>
<td>IST</td>
<td>562 Theoretical Foundations of Information Science</td>
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<tr>
<td>PHYS</td>
<td>580 Elements of Network Science and Its Applications</td>
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</tr>
</tbody>
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</tr>
</thead>
<tbody>
<tr>
<td>STAT</td>
<td>Bayesian Studies (Lin)</td>
<td></td>
<td>DC1</td>
</tr>
<tr>
<td>STAT</td>
<td>High-Dimensional Modeling and Applications (R Li)</td>
<td></td>
<td>DC1</td>
</tr>
<tr>
<td>STAT</td>
<td>*Statistical Learning Theory (Zue)</td>
<td></td>
<td>DC1</td>
</tr>
<tr>
<td>CSE</td>
<td>*Advanced Big Data Analytics (Kifer)</td>
<td></td>
<td>DC2</td>
</tr>
<tr>
<td>CSE</td>
<td>Advanced Topics In Deep Learning for NLP (Zhang)</td>
<td></td>
<td>DC2</td>
</tr>
<tr>
<td>CSE</td>
<td>*Data-Mining and Analytics (Lee)</td>
<td></td>
<td>DC2</td>
</tr>
<tr>
<td>CSE</td>
<td>Natural Language Processing (Passonneau)</td>
<td></td>
<td>DC2</td>
</tr>
<tr>
<td>CSE</td>
<td>Deep Learning for Pattern Discovery</td>
<td></td>
<td>DC2</td>
</tr>
<tr>
<td>CSE</td>
<td>Graph Mining (Madduri)</td>
<td></td>
<td>DC2</td>
</tr>
<tr>
<td>CSE</td>
<td>*Machine Learning (Kifer)</td>
<td></td>
<td>DC2</td>
</tr>
<tr>
<td>CSE</td>
<td>*Numerics of Data Mining and Image Processing (Barlow)</td>
<td></td>
<td>DC2</td>
</tr>
<tr>
<td>CSE</td>
<td>Regularity on Interdisciplinary Large Data Sets (Liu)</td>
<td></td>
<td>DC2</td>
</tr>
<tr>
<td>CSE</td>
<td>Vision-Based Tracking (Collins)</td>
<td></td>
<td>DC2</td>
</tr>
<tr>
<td>GEOG</td>
<td>Advanced Observation of Earth [GEOG 497] (Cervone)</td>
<td></td>
<td>DC2</td>
</tr>
<tr>
<td>GEOG</td>
<td>GeoInformatics (Cervone)</td>
<td></td>
<td>DC2</td>
</tr>
</tbody>
</table>
**GEOG**  Spatiotemporal Studies in GIScience [GEOG 560] (Yu)  DC2

**IST**  Big Data Fundamentals (Yen / Giles)  DC2

**IST**  Artificial Emotional Intelligence  (Wang)  DC2

**IST**  Reproducibility in Data Science  (Rajtmajer)  DC2

**IST**  *Principles of Machine Learning  (Honavar)  DC2

**IST**  Data Science for Researchers, Scholars, and Practitioners (Honavar)  DC2

**IST**  *Elements of Machine Learning  (Silverman)  DC2

**IST**  Natural Language Processing for Sentiment, Semantics, and Discourse  (Wilson)  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.

**BAN**  831  Data Visualization for Business  No DC

**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.

DS  560

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

IST  Principles of Causal Inference (Honavar)  DC2
IST  User Experience Evaluation (Gui)  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:

BBH 501

BBH 502

BBH 503

BBH 504

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 Fairness, Incentives, and Mechanism Design (Hosseini) DC2

IST Crowdsourcing & Crowd-Al Systems (Huang) DC2

IST Foundations of Technology Ethics and Policy (Susser) DC2
Approved Social Data Analytics Electives with Designation (C)

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

BAN 832 No DC
CSE 520, 522, 530, 531, 532, 537, 541, 542, 563, 565, 588 DC2
GEOG 501D, 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 Core Spatial Programming [GEOG 560] (Greatrex) DC2
GEOG What Can Radar and Electro-optical Remote Sensing Do for You? [GEOG 560] (Cervone) DC2
PSY Seminar in Matlab DC1