# WINONA STATE UNIVERSITY
## NEW AND REVISED COURSE AND PROGRAM APPROVAL FORM

Routing form for new and revised courses and programs.          Course or Program **STAT 100 – Numbers and Data in Society**

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**Department Recommendation**

_____          *1/24/14*          *bdeppa @ winona.edu*
Department Chair                                    Date                    e-mail address

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**Dean's Recommendation**  ___✓___ Yes     _____ No*

_Charla SMintchni_    *1/29/14*
Dean of College          Date

*The dean shall forward their recommendation to the chair of the department, the chair of A2C2, and the Vice President for Academic Affairs.

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**A2C2 Recommendation**   _____ Approved      _____ Disapproved


_____   _____
Chair of A2C2                                   Date

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**Graduate Council Recommendation** _____ Approved      _____ Disapproved
(if applicable)


_____   _____
Chair of Graduate Council                Date

_____   _____
Director of Graduate Studies              Date

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**Faculty Senate Recommendation**     _____ Approved      _____ Disapproved


_____   _____
President of Faculty Senate                Date

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**Academic Vice President Recommendation**      _____ Approved      _____ Disapproved


_____   _____
Academic Vice President                   Date

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**Decision of President** _____ Approved      _____ Disapproved


_____   _____
President                          Date

Please forward to Registrar.

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Registrar  _____  Please notify department chair via e-mail that curricular change has been recorded.
                Date entered

[Revised 9-1-10]

# WINONA STATE UNIVERSITY
## PROPOSAL FOR A NEW COURSE

This form is to be used to submit a proposal for a new undergraduate or graduate course. Every item on this form must be completed prior to submission to A2C2. The department proposing a new course must include a *Financial and Staffing Data Sheet* and a *New and Revised Course and Program Approval Form* with the department chairperson's and Dean's signatures. Refer to Regulation 3-4, *Policy for Changing the Curriculum*, for complete information on submitting proposals for curricular changes.

Department __**Mathematics and Statistics**_____     Date ___**1/20/14**_____

_**STAT 100**_____     ___**Numbers and Data in Society**_____     __**03**__
Course No.                               Course Title                                                                                                    Credits*

This proposal is for a(n):   __**X**____ Undergraduate Course          _____ Graduate Course

Is this course for USP?  ____Yes**  _**X**__ No          Is this course for GEP?  _**X**_ Yes**  ____ No

List all Major Codes to which this proposal applies as a required course: **None**

List all Major Codes to which this proposal applies as an elective course: **None**

List all Minor Codes to which this proposal applies as a required course: **None**

List all Minor Codes to which this proposal applies as an elective course: **None**

Prerequisites  _**none**__

Grading method  _____ Grade only     _____ P/NC only     ___**X**__ Grade and P/NC Option

Frequency of offering  _**Every semester**_____

What semester do you anticipate that will this course be offered for the first time? ____**Fall 2014**_____
Note:  The approval process for a new course typically takes at least four to six weeks

\* If this course will change the number of credits for any major or minor, the form *Proposal for a Revised Program* must also be submitted and approved according to the instructions on that form.

\*\*For General Education Program (GEP) or University Studies (USP) course approval, the form *Proposal for General Education Courses* or *Proposal for University Studies Courses* must also be completed and submitted according to the instructions on that form.

**Please provide all of the following information:**
(Note: a syllabus or other documentation may not substitute for this)

**A. Course Description**

1. Description of the course as it will appear in the WSU catalog, including the credit hours, any prerequisites, and the grading method. If the course can be repeated, indicate the maximum number of credit hours for which this can be done.

   **STAT 100 – Numbers and Data in Society (3 S.H.)**
   **The purpose of this course is to help students develop a better understanding of numbers and data in today's society. Quantitative and statistical reasoning skills will be developed through a variety of topics for which numbers and data are commonly encountered (e.g., government, politics, medicine, media, advertising, and sports). A conceptual understanding of these topics and how they affect many aspects of everyday life will be emphasized. Meets GOAL 4 – Mathematical/Logical Reasoning.**

2. Course outline of the major topics, themes, subtopics, etc., to be covered in the course. This outline should be, at a minimum, a two-level outline, i.e., consisting of topics and subtopics. This information will be submitted to MnSCU by the WSU Registrar's office.

1. **Historical Appreciation of Numbers and Data in Society**
    a. **Historical purpose of collecting numbers and data (e.g., history of U.S. Census bureau, Centers for Disease Control, World Health Organization, World Bank, etc.)**
    b. **Visual depictions of numbers and data of historical importance (e.g., John Snow's visual depiction of contaminated wells, Florence Nightingale's rose diagrams, Napoleon's march to Moscow, the Challenger Explosion, etc.)**

2. **Numbers and Data in Government**
    a. **Why governments collect data**
    b. **Understanding large numbers**
    c. **The use of percentages and rates for large numbers**
    d. **Concept of percent change (e.g., percent change in national debt)**
    e. **Concept of rates (e.g., debt / citizen, murders / 10,000 people, etc.)**
    f. **The use of estimates in government (e.g., poverty line, population growth, etc.)**
    g. **(Optional) Additional topics related to statistical issues commonly found in government data**
    h. **Case study dealing with government data**

3. **Numbers and Data in the Media**
    a. **Why journalists use numbers and data**
    b. **Rights and responsibilities of public data**
    c. **Numbers and data in opinion polls and elections**
        i. **Concept of population versus sample**
        ii. **Concept of random samples and sampling variation**
        iii. **Concepts of representative samples and scope of inference**
        iv. **Concepts of bias, confounding, etc., in studies and surveys**
        v. **Concept of margin-of-error and statements of confidence**
        vi. **Drawing conclusions about the population based on information obtained in a random sample**
    d. **Telling a complete and fair story with numbers and data**
    e. **(Optional) Additional topics related to statistical issues commonly found in the media**
    f. **Case study: Prepare a newsworthy story for general consumption using numbers, data, and visualization**

4. **Numbers and Data in Sports**
    a. **The use of numbers and data to evaluate performance**
        i. **Summaries of numerical data ( e.g., mean, median, standard deviation)**
        ii. **Numerical and graphical summaries useful for making comparisons**
    b. **Methods and issues of rankings**
    c. **Evaluation of streaks from a probability perspective**
    d. **(Optional) Additional topics related to statistical issues commonly found in sports data**
    e. **Case study dealing with sports data**

5. **Numbers and Data in Medicine and Public Health**
    a. **Understanding risk**
        i. **Concept of conditioning in a 2x2 table**
        ii. **Purpose of row/column percentages**
        iii. **Methods to compare row/column percentages (e.g., absolute difference, relative risk ratio, percentage difference)**
        iv. **Understanding absolute risk versus relative risk**
    b. **Tests for identifying diseases**
        i. **Concerns and issues with testing for disease conditions**
        ii. **Measuring the accuracy of tests (e.g. , calculating sensitivity, specificity, positive and negative predictive value)**
    c. **Designed Experiments versus Observational Studies**
        i. **Understand the difference between experimentation and observation**
        ii. **Identify elements of a well-designed experiment**
        iii. **Understand the concept of correlation and its distinction from causation**
        iv. **Understand the concept of confounding and limitations on conclusions that can be drawn from observational studies**
    d. **(Optional) Additional topics related to statistical issues commonly found in public health data**
    e. **Case study dealing with public health data**

6. **(Optional) Additional topics at discretion of instructor**
    a. **Topics must promote quantitative and statistical reasoning skills**
    b. **Topics must be of general interest to all students**

3.a  Instructional delivery methods utilized:  (Please check all that apply).

| **Auditorium/Classroom: X** | ITV | Online | Web Enhanced | **Web Supplemented: X** |
|---|---|---|---|---|
| Laboratory: | Service Learning | Travel Study | Internship/Practicum | |
| Other:  (Please indicate) | | | | |

3.b.  MnSCU Course media codes:  (Please check all that apply).

| None: | 3. Internet | 6. Independent Study | 9.  Web Enhanced |
|---|---|---|---|
| 1. Satellite | 4. ITV Sending | 7. Taped | 10. **Web Supplemented: X** |
| 2. CD Rom | 5. Broadcast TV | 8. ITV Receiving | |

4. Course requirements (papers, lab work, projects, etc.) and means of evaluation.

**Requirements: Active class participation and completion of in-class activities, case studies, homework problems, midterm exams, and a final exam.**

**Evaluation: Students will be assessed based on their participation in class and their performance on homework problems, case studies, midterm exams, and the final exam.**

5. Course materials (textbook(s), articles, etc.).

**Possible resources include:**

- *Statistics: Concepts and Controversies* **by David S. Moore and William I. Notz. W.H. Freeman & Company, 2013. ISBN 10: 1-4641-2566-X; ISBN-13: 978-1-4641-2566-9**
- *Statistical Reasoning for Everyday Life* **by Jeff Bennett, William L. Briggs, and Mario F. Triola.  Pearson, 2012. ISBN-10: 0321890132; ISBN-13: 9780321890139**
- **Resources from the NSF-funded CATALST project (http://www.tc.umn.edu/~catalst/about)**
- **Timely articles from various news sources involving numbers and data**

6. List the student learning outcomes for this course and how each outcome will be assessed.

| **Learning Outcome (A successful student will…)** | **Assessment Method** |
|---|---|
| **Discuss and apply basic concepts which are essential for statistical literacy, including percentages and rates, basic graphical representations of data, basic data summaries, sampling variation, probability, and risk** | **Homework Assignments** <br> **Case Studies** <br> **Exams** |
| **Understand how data are produced and what makes data trustworthy and reliable** | **Homework Assignments** <br> **Case Studies** <br> **Exams** |
| **Appreciate how data can be used to enhance our understanding of our world and in decision making** | **Case Studies** |
| **Critically evaluate the presentation and use of data by others** | **Homework Assignments** <br> **Case Studies** <br> **Exams** |
| **Interpret numbers and data and communicate the information contained therein effectively themselves** | **Homework Assignments** <br> **Case Studies** <br> **Exams** |

**B. Rationale**

Provide a rationale for the new course.  The rationale should include the following items.

1.  A statement of the major focus of the course.

**Numerical and statistical literacy are becoming increasingly important for our students, both in their professional futures and as they become more informed citizens.  This course will equip students with the core skills they need to be numerically and statistically literate. Quantitative and statistical reasoning skills will be developed through a variety of topics for which numbers and data are commonly encountered (e.g., government, politics, medicine, media, advertising, and sports).  A conceptual understanding of these topics and how they affect many aspects of everyday life will be emphasized.  Overall, this course will prepare students to be better** *consumers* **of statistics rather than to equip them to** *do* **statistical analyses.**

2. A statement of how this course will contribute to the departmental curriculum.

**Our current introductory statistics courses focus on methods for data analysis. Such courses are required for students who will most likely have to do a statistical analysis at some point, either in future courses in their major or in their future careers. The proposed course, STAT 100, has been designed for students who will inevitably encounter data and the results of statistical analyses carried out by others (e.g., opinion polls or articles making claims based on recent studies) but who will most likely never have to carry out a statistical analysis on their own. These students will benefit much more from a course focusing on numeracy and statistical literacy, and at this point we have no such course; therefore, we believe that STAT 100 is a worthwhile addition to our departmental curriculum. Also, pending approval, STAT 100 would fulfill Goal 4 of the Minnesota Transfer Curriculum under the GEP.**

3. A statement of why this course is to be offered at this level (i.e. 100-, 200-, 300-, 400-, or 500-level)

**This is a general education course with no prerequisites and is intended for students from all majors/backgrounds.**

4. Identification of any courses which may be dropped, if any, if this course is implemented.

**No courses will be dropped. Our department is currently offering two sections of MATH 100 every semester. Pending approval, we anticipate that we would instead offer one section of MATH 100 and one section of STAT 100 every semester, instead.**

## C. Impact of This Course on Other Departments, Programs, Majors, and Minors
Provide a statement of the impact of this course on other departments, programs, majors, and minors.

**1.** Clearly state the impact of this course on courses taught in other departments. Does this course duplicate the content of any other course? Is there any effect on prerequisites for this or any other courses?

**No impact on courses taught in other departments is anticipated. This course does not duplicate the content of other courses. There is no anticipated effect on prerequisites.**

2. Would approval of this course change the total number of credits required by any major or minor of any department? If so, explain the effects which this course would have.

**Approval of STAT 100 would not change the number of credits required for any major or minor in other departments.**

3. If this course has an impact on the major or minor of any other department or program, it is the responsibility of the department submitting the course proposal to send written notification to the department(s) or program(s) affected. State clearly which other programs are affected by this proposal and whether the other departments have been notified and/or consulted. Attach letter(s) of understanding from impacted department(s).

**No other departments or programs are affected by this proposed course.**

## D. Attach to This Proposal a Completed
1. *Financial and Staffing Data Sheet*
2. *New and Revised Course and Program Approval Form*

## E. Department Contact Person for this Proposal:

__**Christopher Malone**_____     __**457-2989**_____     __**cmalone@winona.edu**_____
Name (please print)                                              Phone                        e-mail address

## F. Review by Department A2C2 Representative

I have reviewed this proposal and certify that it is complete ____*Tisha Hooks*_____
Signature of A2C2 representative

<u>Definitions for codes in 3a and 3b:</u>

01-Satellite:

02- CD ROM:

03- Internet:  Predominately = where all, or nearly all, course activity occurs in an online environment.  One to two activities may occur face-to-face in a classroom, with the maximum being two activities.

04 – ITV Sending:   a course in which students are in the classroom with the instructor, other students join via interactive television technology from other geographically separate locations

05 – Broadcast TV:

06 – Independent Study:  a course in which the teacher develops specialized curriculum for the student(s) based on department guidelines in the University course catalog

07 – Taped:  a course in which the teacher records the lessons for playback at a later date

08 – ITV Receiving:   a course in which students are not in the classroom with the teacher, other students join via interactive television technology from other geographically separate locations

09 – Web Enhanced- Limited Seat Time: For a course in which students are geographically separate from the teacher and other students for a majority of required activities. However, some on-site attendance is required. The course includes synchronous and/or asynchronous instruction.

10 – Web Supplemented- No Reduced Seat Time: For a course utilizing the web for instructional activities. Use of this code may assist your college/university in tracking courses for "smart classrooms" and/or facility usage.

# WINONA STATE UNIVERSITY
## FINANCIAL AND STAFFING DATA SHEET

Course or Program__**STAT 100 – Numbers and Data in Society**__

Include a Financial and Staffing Data Sheet with any proposal for a new course, new program, or revised program.

Please answer the following questions completely.  Provide supporting data.

1.  Would this course or program be taught with existing staff or with new or additional staff?  If this course would be taught by adjunct faculty, include a rationale.

    **This course would be taught with existing staff.  Our department currently offers two sections of MATH 100 every semester.  If this course is approved, then in future semesters we plan to offer one section of MATH 100 and one section of STAT 100 every semester, instead.**

2.  What impact would approval of this course/program have on current course offerings?  Please discuss number of sections of current offerings, dropping of courses, etc.

    **See the answer to the previous question.  We may offer one less section of MATH 100 per semester, but MATH 100 is not a required course for any major or minor.**

3.  What effect would approval of this course/program have on the department supplies?  Include data to support expenditures for staffing, equipment, supplies, instructional resources, etc.

    **No effect on departmental supplies is anticipated.**

[Revised 9-05]

**Present:** Joyati Debnath, Brant Deppa (chair), Jeff Draskoci-Johnson, Eric Errthum, Tisha Hooks, April Kerby, Steve Leonhardi, Chris Malone, Mike Markegard, Barry Peratt, Sam Schmidt, Samuel Tsegai, Aaron Wangberg, Nicole Williams, Lee Windsperger

**New Business:** Note: All of the items below were considered after the department waived the 40-hour rule without objection.

**Motions from the Statistics Subgroup**
**1. STAT 100 – new course proposal and GEP proposal**
    The new STAT 100 course proposal and GEP proposal were approved without objection.

**2. New program:  B.S. Data Science (DSCI) major, minor, and courses**
(i) The department approved two versions of the major, both without objection. The Math department indicated a preference for Version 2, but voted to accept Version 1 if Computer Science preferred that one. Chris was directed to submit whichever one Computer Science preferred. (Their discussion was still pending as of our meeting.)
(ii) The minor was approved without objection, also with the understanding that Computer Science might want to edit certain courses in the elective list.
(iii) All new courses associated with the proposed data science major were approved without objection.  These include DSCI 210, DSCI 310, DSCI 395, DSCI 488, DSCI 492, and DSCI 495.
(iv) The notifications for the conversion of STAT 325 to DSCI 325 and STAT 425 to DSCI 425 were approved without objection.


**3. Program revisions:  B.S. Statistics (STAT) major, minor, and courses**
   (i) All revisions, both to the major and to the minor were approved without objection.
   (ii) STAT 395 and STAT 495, i.e. the analogous courses to DSCI 395 and DSCI 495, were approved without objections.

Supporting documentation for items 1 – 3 above were sent to the department by Tisha Hooks (STAT 100) and Chris Malone (DSCI and STAT programs) via e-mail (01/22/14).

**4. Notifications re: STAT**
The following notifications seek Departmental approval. 1) In Spring, 2013, the department voted to make STAT 310 the prerequisite for a number of upper-division STAT courses. Either this paperwork was not submitted, or got lost. 2) The note in the course description for STAT 305 was corrected to read STAT 305 instead of Math 305. 3) A notification to edit course description slightly and to allow ECON 222 to serve as a possible prerequisite for STAT 310. 4) Include DSCI 210 as a prerequisite for STAT 370.
    The department approved the submission/resubmission of all of these notifications.

**5. Notifications re: MATH courses**
The following notifications were submitted for departmental approval. (i) A change in course title for MATH 112 from "Modeling with Functions" to "Applied Precalculus"  (ii) A change in the catalog description of MATH 112. (See the catalog language at the end of these minutes.) (iii) A change in number for MATH 140 to MATH 132 AND a change in prerequisites from "MATH 112 - Modeling with Functions, MATH 115 - College Algebra, or MATH 120 - Precalculus" to "MATH 112 – Applied Precalculus, MATH 115 - College Algebra, or MATH 120 - Precalculus" (iv) A change in the catalog description of MATH 132. (See the catalog language at the end of these minutes.)
    The department approved all of these changes without objection.

**6. Proposal re: MATH 117 from Steve, Barry, and Jeff**
    The department approved without objection the proposal to submit MATH 117 as a new course and also the proposal to submit it as a GEP course under Goal 4. Since the Math Subgroup had not had a chance to vote on the committee's work, the department waived normal procedures without objection. (The documents were handed out in the meeting.)

Secretary's note: If there is any confusion at to what, exactly, the department agreed to in Items 1-6 above, I can supply copies of the A2C2 paperwork upon request. Summaries of the proposals re: data science and statistics are attached below.

**7. Adjourn**
    We adjourned about 12:50 p.m.
                                        Respectfully submitted,
                                        Jeff Draskoci-Johnson