# 1. General Information

**1a.** Submitted by the College of: ENGINEERING

  Date Submitted: 12/10/2015

**1b.** Department/Division: College of Engineering

**1c.** Contact Person

  Name: Janet K. Lumpp

  Email: jklumpp@uky.edu

  Phone: 8592574985

  Responsible Faculty ID (if different from Contact)

  Name:

  Email:

  Phone:

**1d.** Requested Effective Date: Semester following approval

**1e.** Should this course be a UK Core Course? No

# 2. Designation and Description of Proposed Course

**2a.** Will this course also be offered through Distance Learning?: No

**2b.** Prefix and Number: EGR 102

**2c.** Full Title: Fundamentals of Engineering Computing

**2d.** Transcript Title:

**2e.** Cross-listing:

**2f.** Meeting Patterns

  LECTURE: 1

  LABORATORY: 2

**2g.** Grading System: Letter (A, B, C, etc.)

**2h.** Number of credit hours: 2

**2i.** Is this course repeatable for additional credit? No

  If Yes: Maximum number of credit hours:

  If Yes: Will this course allow multiple registrations during the same semester?

1

**2j. Course Description for Bulletin:** Fundamentals of Engineering Computing introduces students to the practice and principles of computer programming and computational problem solving. Students will engage in hands-on project-based problem solving using modern computer software and hardware, with a particular emphasis on problems and techniques commonly appearing in various domains of engineering. Open to students enrolled in the College of Engineering.

**2k. Prerequisites, if any:** Enrolled in the College of Engineering or MA ACT of at least 23 or equivalent.

**2l. Supplementary Teaching Component:**

**3. Will this course taught off campus?** Yes

  If YES, enter the off campus address: Paducah Campus

**4. Frequency of Course Offering:** Spring,

  Will the course be offered every year?: Yes

  If No, explain:

**5. Are facilities and personnel necessary for the proposed new course available?:** Yes

  If No, explain:

**6. What enrollment (per section per semester) may reasonably be expected?:** 72

**7. Anticipated Student Demand**

  Will this course serve students primarily within the degree program?: Yes

  Will it be of interest to a significant number of students outside the degree pgm?: No

  If Yes, explain:

**8. Check the category most applicable to this course:** Relatively New -- Now Being Widely Established,

  If No, explain:

**9. Course Relationship to Program(s).**

  a. Is this course part of a proposed new program?: Yes

  If YES, name the proposed new program: First-Year Engineering Program

  b. Will this course be a new requirement for ANY program?: Yes

  If YES, list affected programs: Biosystems Engineering, Chemical Engineering, Civil Engineering, Computer Engineering, Computer Science, Electrical Engineering, Materials Engineering, Mechanical Engineering, Mining Engineering

**10. Information to be Placed on Syllabus.**

  a. Is the course 400G or 500?: No

  b. The syllabus, including course description, student learning outcomes, and grading policies (and 400G-/500-level grading differentiation if applicable, from **10.a** above) are attached: Yes

## Distance Learning Form

Instructor Name:

Instructor Email:

Internet/Web-based:   No

Interactive Video:   No

Hybrid:   No

1.How does this course provide for timely and appropriate interaction between students and faculty and among students? Does the course syllabus conform to University Senate Syllabus Guidelines, specifically the Distance Learning Considerations?

2.How do you ensure that the experience for a DL student is comparable to that of a classroom-based student's experience? Aspects to explore: textbooks, course goals, assessment of student learning outcomes, etc.

3.How is the integrity of student work ensured? Please speak to aspects such as password-protected course portals, proctors for exams at interactive video sites; academic offense policy; etc.

4.Will offering this course via DL result in at least 25% or at least 50% (based on total credit hours required for completion) of a degree program being offered via any form of DL, as defined above?

If yes, which percentage, and which program(s)?

5.How are students taking the course via DL assured of equivalent access to student services, similar to that of a student taking the class in a traditional classroom setting?

6.How do course requirements ensure that students make appropriate use of learning resources?

7.Please explain specifically how access is provided to laboratories, facilities, and equipment appropriate to the course or program.

8.How are students informed of procedures for resolving technical complaints? Does the syllabus list the entities available to offer technical help with the delivery and/or receipt of the course, such as the Information Technology Customer Service Center (http://www.uky.edu/UKIT/)?

9.Will the course be delivered via services available through the Distance Learning Program (DLP) and the Academic Technology Group (ATL)?   NO

If no, explain how student enrolled in DL courses are able to use the technology employed, as well as how students will be provided with assistance in using said technology.

10.Does the syllabus contain all the required components?   NO

11.I, the instructor of record, have read and understood all of the university-level statements regarding DL.

Instructor Name:

SIGNATURE|CHE202|Kimberly W Anderson|EGR 102 NEW Dept Review|20150929

SIGNATURE|BJSTOK0|Barbara J Brandenburg|EGR 102 NEW College Review|20151022

SIGNATURE|JMETT2|Joanie Ett-Mims|EGR 102 NEW Undergrad Council Review|20160217

## New Course Form

https://myuk.uky.edu/sap/bc/soap/rfc?services=

Open in full window to print or save

**Attachments:**

[ Browse... ]    **Upload File**

| | ID | Attachment |
|---|---|---|
| Delete | 5664 | EGR 102 UGC Review Checklist.docx |
| Delete | 6234 | EGR 102 Syllabus Revised 21116.pdf |

[ First ] 1 [ Last ]

(*denotes required fields)

1. **General Information**

   a. * Submitted by the College of: ENGINEERING ▼    Submission Date: 12/10/2015

   b. * Department/Division: College of Engineering ▼

   c.

   * Contact Person Name: Janet K. Lumpp    Email: jklumpp@uky.edu    Phone: 8592574985

   * Responsible Faculty ID (if different from Contact)    Email:    Phone:

   d. * Requested Effective Date: ◉ Semester following approval OR ○ Specific Term/Year [1]

   e.

   Should this course be a UK Core Course? ○ Yes ◉ No

   **If YES, check the areas that apply:**

   ☐ Inquiry - Arts & Creativity          ☐ Composition & Communications - II

   ☐ Inquiry - Humanities                 ☐ Quantitative Foundations

   ☐ Inquiry - Nat/Math/Phys Sci          ☐ Statistical Inferential Reasoning

   ☐ Inquiry - Social Sciences            ☐ U.S. Citizenship, Community, Diversity

   ☐ Composition & Communications - I     ☐ Global Dynamics

2. **Designation and Description of Proposed Course.**

   a. * Will this course also be offered through Distance Learning? ○ Yes [4] ◉ No

   b. * Prefix and Number: EGR 102

   c. * Full Title: Fundamentals of Engineering Computing

   d. Transcript Title (if full title is more than 40 characters):

   e. To be Cross-Listed [2] with (Prefix and Number):

   f. * Courses must be described by at least one of the meeting patterns below. Include number of actual contact hours[3] for each meeting pattern type.

   | 1 | Lecture | 2 | Laboratory[1] | | Recitation | | Discussion |
   |---|---|---|---|---|---|---|---|
   | | Indep. Study | | Clinical | | Colloquium | | Practicum |
   | | Research | | Residency | | Seminar | | Studio |
   | | Other | | If Other, Please explain: | | | | |

   g. * Identify a grading system:
   ◉ Letter (A, B, C, etc.)
   ○ Pass/Fail
   ○ Medicine Numeric Grade (Non-medical students will receive a letter grade)
   ○ Graduate School Grade Scale

   h. * Number of credits: 2

   i. * Is this course repeatable for additional credit? ○ Yes ◉ No
   If YES: Maximum number of credit hours:
   If YES: Will this course allow multiple registrations during the same semester? ○ Yes ○ No

j. * Course Description for Bulletin:

Fundamentals of Engineering Computing introduces students to the practice and principles of computer programming and computational problem solving. Students will engage in hands-on project-based problem solving using modern computer software and hardware, with a particular emphasis on problems and techniques commonly appearing in various domains of engineering. Open to students enrolled in the College of Engineering.

k. Prerequisites, if any:

Enrolled in the College of Engineering or MA ACT of at least 23 or equivalent.

l. Supplementary teaching component, if any: ○ Community-Based Experience ○ Service Learning ○ Both

3. * Will this course be taught off campus? ◉ Yes ○ No

If YES, enter the off campus address: Paducah Campus

4. Frequency of Course Offering.

    a. * Course will be offered (check all that apply): ☑ Fall ☑ Spring ☐ Summer ☐ Winter

    b. * Will the course be offered every year? ◉ Yes ○ No

       If No, explain:

5. * Are facilities and personnel necessary for the proposed new course available? ◉ Yes ○ No

If No, explain:

6. * What enrollment (per section per semester) may reasonably be expected? 72

7. Anticipated Student Demand.

    a. * Will this course serve students primarily within the degree program? ◉ Yes ○ No

    b. * Will it be of interest to a significant number of students outside the degree pgm? ○ Yes ◉ No

       If YES, explain:

8. * Check the category most applicable to this course:

☐ Traditional – Offered in Corresponding Departments at Universities Elsewhere
☑ Relatively New – Now Being Widely Established
☐ Not Yet Found in Many (or Any) Other Universities

9. Course Relationship to Program(s).

    a. * Is this course part of a proposed new program? ◉ Yes ○ No

       If YES, name the proposed new program:

       First-Year Engineering Program

    b. * Will this course be a new requirement [5] for ANY program? ◉ Yes ○ No

       If YES [5], list affected programs::

       Biosystems Engineering, Chemical Engineering, Civil Engineering, Computer Engineering, Computer Science, Electrical Engineering, Materials Engineering, Mechanical Engineering, Mining Engineering

10. Information to be Placed on Syllabus.

    a. * Is the course 400G or 500? ○ Yes ◉ No

       If YES, the *differentiation for undergraduate and graduate students must be included* in the information required in **10.b.** You must include: (i) ident additional assignments by the graduate students; and/or (ii) establishment of different grading criteria in the course for graduate students. (See SR

    b. ☑ * The syllabus, including course description, student learning outcomes, and grading policies (and 400G-/500-level grading differentiation if appl

       10.a above) are attached.

[1] Courses are typically made effective for the semester following approval. No course will be made effective until all approvals are received.
[2] The chair of the cross-listing department must sign off on the Signature Routing Log.

https://iweb.uky.edu/curricularproposal/Form_NewCourse.aspx?Notif=55E73CC1605A0860E100800080A3B9... 2/18/2016

[1] In general, undergraduate courses are developed on the principle that one semester hour of credit represents one hour of classroom meeting per week for a semester, exclusive of any laboratory meeting. Laboratory meeting, generally, re
two hours per week for a semester for one credit hour. (from SR 5.2.1)
[4] You must also submit the Distance Learning Form in order for the proposed course to be considered for DL delivery.
[5] In order to change a program, a program change form must also be submitted.

Rev 8/09

# Course: EGR 102

# University Senate Syllabi Guidelines Review Checklist

**General Course Information**

☒ Full and accurate title of the course

☐ Departmental and college prefix

☒ Course prefix, number and section number

☐ Scheduled meeting day(s), time and place

**Instructor Contact Information** (if specific details are unknown, "TBA" is acceptable for one or more fields)

☒ Instructor name

☐ Contact information for teaching/graduate assistant, etc.

☐ Preferred method for reaching instructor

☒ Office phone number

☒ Office address

☒ UK email address

☒ Times of regularly scheduled office hours and if prior appointment is required

**Course Description**

☒ Reasonably detailed overview of the course

☒ Student learning outcomes

☐ Course goals/objectives

☒ Required materials (textbook, lab materials, etc.)

☐ Outline of the content, which must conform to the Bulletin description

☒ Summary description of the components that contribute to the determination of course grade

☒ Tentative course schedule that clarifies topics, specifies assignment due dates, examination date(s)

☒ Final examination information: date, time, duration and location

☒ For 100-, 200-, 300-, 400-, 400G- and 500-level courses, numerical grading scale and relationship to letter grades for undergraduate students

☐ For 400G-, 500-, 600- and 700-level courses, numerical grading scale and relationship to letter grades for graduate students. (Graduate students cannot receive a "D" grade.)

☒ Relative value given to each activity in the calculation of course grades (Midterm=30%; Term Project=20%, etc.)

☒ Note that undergraduate students will be provided with a Midterm Evaluation (by the midterm date) of course performance based on criteria in syllabus

☒ Policy on academic accommodations due to disability. Standard language is below:
   If you have a documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours. In order to receive accommodations in this course, you must provide me with a Letter of Accommodation from the Disability Resource Center (DRC). The DRC coordinates campus disability services available to students with disabilities. It is located on the corner of Rose Street and Huguelet Drive in the Multidisciplinary Science Building, Suite 407. You can reach them via phone at (859) 257-2754 and via email at drc@uky.edu. Their web address is http://www.uky.edu/StudentAffairs/DisabilityResourceCenter/.

**Course Policies**

☒ Attendance

☒ Excused absences

☒ Make-up opportunities

☒ Verification of absences

☒ Submission of assignments

☒ Academic integrity, cheating & plagiarism

☐ Classroom behavior, decorum and civility

☐ Professional preparations

☐ Group work & student collaboration

**UGE Review** (Date)

Add class/lab meeting days and times to syllabus ("TBA" is okay)

**Committee Review** (Date)

Comments

<div align="center">

EGR 102
Fundamentals of Engineering Computing

</div>

**Instructor:**             Dr. Janet K. Lumpp
**Office Address:**    697 F. Paul Anderson Tower
**Email:**               jklumpp@uky.edu
**Office Phone:**      257-4985

**Office hours:**            Monday and Wednesday, 2 to 3:30 PM

**Course Description:** Fundamentals of Engineering Computing introduces students to the practice and principles of computer programming and computational problem solving. Students will engage in hands-on project-based problem solving using modern computer software and hardware, with a particular emphasis on problems and techniques commonly appearing in various domains of engineering. Open to students enrolled in the College of Engineering.

**Prerequisites:** Enrolled in the College of Engineering or MA ACT of at least 23 or equivalent.

**Credit Hours:** 2 credits

**Class meeting pattern:** 3 hour lecture/lab once per week.

**Student Learning Outcomes:**

After completing this course, the student will be able to:
1. Design, document, implement, and test programs to solve basic engineering problems.
2. Apply basic algorithmic problem-solving techniques (decision structures, loops, functions)
3. Explain the architecture of computing systems.
4. Demonstrate an understanding of the representation and manipulation of data in a computer system, including basic data structures such as strings and arrays.
5. Compare and contrast computer solutions for engineering applications.

**Required Materials:**

Personal computer capable of running software packages available through UK Downloads and freeware versions specified by the instructor.

**Description of Course Activities and Assignments**
**Course Assignments**
Attendance will be taken each class meeting. Homework and quizzes will be submitted and graded via Canvas.

| Attendance | 10% | Class meetings |
| Homework | 30% | 11 assignments, 20 points each |
| Quizzes | 20% | 11 quizzes, 10 points each |
| Midterm Exams | 20% | 2 exams, 50 points each |
| Final Exam | 20% | 100 points |

## Summary Description of Course Assignments

*Attendance* will be taken at all class meetings to reinforce responsibility to teammates. Students are expected to withdraw from the class if more than 20% (more than 3) of the classes scheduled for the semester are missed (excused or unexcused) per university policy. Each unexcused absence results in a 1% deduction in the course grade. *Homework* assignments will include programming and lab reports. All assignments are due before the start of class and submitted in Canvas. *Quizzes* must be completed in Canvas before the start of class and cover the reading and video lecture content to emphasize vocabulary and relationships among computing concepts. **For students with unexcused absences, late** homework and quizzes will be accepted for one week past the due date for 50% credit. *Midterm exams* will cover content from homework and quizzes. The *final exam* will be comprehensive over all course content.

## Course Grading

Grading Scale
90 – 100% = A
80 – 89% = B
70 – 79% = C
60 – 69% = D
< 60% = E

## Tentative Course Schedule

Q = weekly quiz on reading and/or technical content
HW = homework problems, drawings, calculations, etc
*Italic* = Lecture, reading, on-line content topics
**Bold** = Hands-on lab activities in-class

| Week | Topics | Assignments |
|------|--------|-------------|
| 1 | *Welcome, Review Syllabus* <br> *What is a computer? Building blocks: CPU, memory, and storage* <br> **Downloading and installing development software** | |
| 2 | *Instructions and coding; variables; basic input-output* <br> **Basics of the Integrated Development Environment (IDE):** <br> **Running and debugging programs** | Q1 <br> HW1 |
| 3 | *Number systems and data representations* <br> **Converting units and performing calculations** | Q2 <br> HW2 |

| 4 | *Boolean logic, structured programming, and control flow*<br>**Programs to make decisions** | Q3<br>HW3 |
|---|---|---|
| 5 | *Interfacing, Input and Output*<br>**LEDs, switches, LCDs and graphics**<br>Review for Midterm Exam #1 | Q4<br>HW4 |
| 6 | *Loops*<br>**Using random numbers; finding minimum, maximum, and average** | Midterm<br>Exam #1 |
| 7 | *Functions and procedural programming*<br>**Debugging tools and techniques** | Q5<br>HW5 |
| 8 | *Functions and procedural programming (continued)*<br>**Building a simple hand-held computer game** | Q6<br>HW6 |
| 9 | *Algorithms, data structures and files*<br>**Processing and storing collected data** | Q7<br>HW7 |
| 10 | *Algorithms, data structures and files (continued)*<br>**Interactive applications**<br>Review for Midterm Exam #1 | Q8<br>HW8 |
| 11 | *Serial interfacing with hardware*<br>**Interfacing with serial peripherals** | Midterm<br>Exam#2 |
| 12 | *Analog interfacing with hardware*<br>**Logging Sensor Data and Data Analysis** | Q9<br>HW9 |
| 13 | *Representation of Floating-Point Numbers*<br>**Floating-point errors, implementing a numerical algorithm** | Q10<br>HW10 |
| 14 | *Interacting with web services, networking. Social and ethical issues related to using computers.*<br>**"Scraping" data from a web site** | Q11<br>HW11 |
| 15 | *Simulation. Modeling.*<br>**Monte Carlo methods.** | |
| 16 | **Comprehensive Final Exam** | |

## Final Exam Information

Comprehensive final exam during the designated final exam time.

## Mid-term Grade

Mid-term grades will be posted in myUK by the deadline established in the Academic Calendar (http://www.uky.edu/registrar/content/academic-calendar)

## Submission of Assignments:

**Canvas** (uk.instructure.com) will be used for posting class announcements and assignments. Use your Link Blue login and password to access Canvas based courses.

Canvas is also accessible through a smartphone app. Students are responsible for regularly checking the class Canvas site and checking email.

## Attendance Policy.

Attendance will be taken at all class meetings. Students are expected to withdraw from the class if more than 20% (more than 3) of the classes scheduled for the semester are missed (excused or unexcused) per university policy.

## Excused Absences (boilerplate)
Students need to notify the professor of absences prior to class when possible. *Senate Rules 5.2.4.2* defines the following as acceptable reasons for excused absences: (a) serious illness, (b) illness or death of family member, (c) University-related trips, (d) major religious holidays, and (e) other circumstances found to fit "reasonable cause for nonattendance" by the professor.

Students anticipating an absence for a major religious holiday are responsible for notifying the instructor in writing of anticipated absences due to their observance of such holidays no later than the last day in the semester to add a class. Two weeks prior to the absence is reasonable, but should not be given any later. Information regarding major religious holidays may be obtained through the Ombud (859-257-3737, http://www.uky.edu/Ombud/ForStudents_ExcusedAbsences.php.

Students are expected to withdraw from the class if more than 20% of the classes scheduled for the semester are missed (excused) per University policy.

Per *Senate Rule 5.2.4.2*, students missing any graded work due to an excused absence are responsible: for informing the Instructor of Record about their excused absence within one week following the period of the excused absence (except where prior notification is required); and for making up the missed work. The professor must give the student an opportunity to make up the work and/or the exams missed due to an excused absence, and shall do so, if feasible, during the semester in which the absence occurred.

## Verification of Absences (boilerplate)
Students may be asked to verify their absences in order for them to be considered excused. *Senate Rule 5.2.4.2* states that faculty have the right to request "appropriate verification" when students claim an excused absence because of illness, or death in the family. Appropriate notification of absences due to University-related trips is required prior to the absence when feasible and in no case more than one week after the absence.

## Academic Integrity (boilerplate)
Per University policy, students shall not plagiarize, cheat, or falsify or misuse academic records. Students are expected to adhere to University policy on cheating and plagiarism in all courses. The minimum penalty for a first offense is a zero on the assignment on which the offense occurred. If the offense is considered severe or the student has other academic offenses on their record, more serious penalties, up to suspension from the University may

be imposed.

Plagiarism and cheating are serious breaches of academic conduct. Each student is advised to become familiar with the various forms of academic dishonesty as explained in the Code of Student Rights and Responsibilities. Complete information can be found at the following website: http://www.uky.edu/Ombud. A plea of ignorance is not acceptable as a defense against the charge of academic dishonesty. It is important that you review this information as all ideas borrowed from others need to be properly credited.

*Senate Rules 6.3.1* (see http://www.uky.edu/Faculty/Senate/ for the current set of *Senate Rules*) states that all academic work, written or otherwise, submitted by students to their instructors or other academic supervisors, is expected to be the result of their own thought, research, or self-expression. In cases where students feel unsure about a question of plagiarism involving their work, they are obliged to consult their instructors on the matter before submission.

When students submit work purporting to be their own, but which in any way borrows ideas, organization, wording, or content from another source without appropriate acknowledgment of the fact, the students are guilty of plagiarism.

Plagiarism includes reproducing someone else's work (including, but not limited to a published article, a book, a website, computer code, or a paper from a friend) without clear attribution. Plagiarism also includes the practice of employing or allowing another person to alter or revise the work, which a student submits as his/her own, whoever that other person may be. Students may discuss assignments among themselves or with an instructor or tutor, but when the actual work is done, it must be done by the student, and the student alone.

When a student's assignment involves research in outside sources or information, the student must carefully acknowledge exactly what, where and how he/she has employed them. If the words of someone else are used, the student must put quotation marks around the passage in question and add an appropriate indication of its origin. Making simple changes while leaving the organization, content, and phraseology intact is plagiaristic. However, nothing in these Rules shall apply to those ideas, which are so generally and freely circulated as to be a part of the public domain.

Please note:  Any assignment you turn in may be submitted to an electronic database to check for plagiarism.

### Accommodations due to disability (boilerplate)
If you have a documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours. In order to receive accommodations in this course, you must provide me with a Letter of Accommodation from the Disability Resource Center (DRC). The DRC coordinates campus disability services available to students with disabilities. It is located on the corner of Rose Street and Huguelet Drive in the Multidisciplinary Science Building, Suite 407. You can reach them via phone at (859)

257-2754 and via email at drc@uky.edu. Their web address is http://www.uky.edu/StudentAffairs/DisabilityResourceCenter/.