University of North Texas at Dallas
Fall 2016 SYLLABUS

MATH 3400 (001) **Number Theory** (3CR)			
Department of	Mathematics and Information Sciences	**School of**	Liberal Arts and Sciences
Instructor Name	Byungik "Ike" Kahng		
Office Location	2-224		
Office Phone	972-338-1570		
Email Address	byungik.kahng@untdallas.edu		
Class Time & Room	TuTh 11:30 – 12:50 at 2-336		
Office Hours	Mon - Thu 08:30AM – 10:00AM, or by appointment		
Catalog Description	Factorizations, congruencies, quadratic reciprocity, finite fields, quadratic forms, diophantine equations		
Prerequisite(s)	Math 2000 or Math 3000		
Required Text and Software	• Introduction to Analytic Number Theory by Tom Apostol, 2nd edition, 2013, Springer, 978-0387-901633 • Wolfram Mathematica (http://www.unt.edu/rss/MathematicaPage.htm)		
Recommended Text	• Elementary Number Theory by K. Rosen, Pearson, 978-0321-500311		

Core Objectives:	
	This course addresses the core objectives of **critical thinking skills, communication skills**, and **empirical and quantitative skills** **1. Critical Thinking Skills** – to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information **2. Communication Skills** – to include effective development, interpretation and expression of ideas through written, oral and visual communication **3. Empirical and Quantitative Skills** – to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions

Student Learning Outcomes: Upon a successful completion of this course the students will	
1	Gain awareness of the properties of integers, prime numbers, congruence and other fundamental concepts of number theory.
2	Be able to state and prove simple theorems in number theory.
3	Be able to locate, process and organize information and express the conclusion in mathematical writing.
4	Be able to think critically and creatively so as to prove or disprove mathematical statements.

Course Outline

This schedule is subject to change by the instructor. Any changes to this schedule will be communicated through the class website and the official UNT e-mail. Besides the scheduled assignments, additional readings and activities may be added. Such changes will be communicated through the class page.

	Tuesday	Thursday
W01 (08/21 – 08/27)	Sets and Numbers I Induction Principle	Sets and Numbers II Equivalence Relation
W02 (08/28 – 09/03)	(1.1) – (1.3) Greatest Common Divisor	(1.4) – (1.6) Prime Numbers and Prime Factorization
W03 (09/04 – 09/10)	(1.7) – (1.8) Division Algorithm and Euclidean Algorithm	Review of Chapter 1
W04 (09/11 – 09/17)	(5.1) – (5.3) Congruence	(5.4) – (5.6) Fermat's Theorem and Lagrange's Theorem
W05 (09/18 – 09/24)	(5.7) – (5.9) Polynomials	(5.10) – (5.11) Cross Classification and Decomposition Property
W06 (09/25 – 10/01)	Review of Chapter 5 Review for Exam 1	**Exam 1** (Thursday, 09/29, 11:30 – 12:50)
W07 (10/02 – 10/08)	(2.1) – (2.3) Möbius Function and Euler Totient Function	(2.4) – (2.5) Möbius Function and Euler Totient Function
W08 (10/09 – 10/15)	(2.6) – (2.8) Dirichlet Products and Dirichlet Inversion	(2.9) – (2.11) Multiplicative Functions
W09 (10/16 – 10/22)	(2.12) – (2.13) Liouville's Function and Divisor Function	(2.15) – (2.17) Series of Arithmetic Functions
W10 (10/23 – 10/29)	(2.18) – (2.19) Derivatives of Arithmetic Functions	Review of Chapter 2
W11 (10/30 – 11/05)	(3.1) – (3.4) Asymptotic Equalities and Asymptotic Formulas	(3.5) – (3.7) Average Orders
W12 (11/06 – 11/12)	(3.8) – (3.9) Applications // More Average Orders	(3.10) – (3.12) Dirichlet Products // More applications
W13 (11/13 – 11/19)	Review of Chapter 3 Review for Exam 2	**Exam 2** (Thursday, 11/17, 10:00 – 11:20)
W14 (11/20 – 11/26)	(4.1) – (4.3) Chebyshev's Functions	**Thanks Giving** (11/26, 2015 – 11/28, 2015)
W15 (11/27 – 12/03)	(4.4) Prime Number Theorem and Its Equivalent Forms	Project Presentation
W16 (12/04 – 12/10)	Project Presentation	**Final Paper Due** (Sturday, 12/10, 11:59 PM)

Course Evaluation Methods

This course will utilize the following instruments to determine student grades.

- **Exams**: *written tests designed to measure the knowledge and the understanding on the course materials.*
- **Assignments**: *small-scale written assignments designed to supplement, reinforce and assess the course materials and the ability to write and prove mathematical statements.*
- **Final Project**: a *written assignment in larger scale that include more extensive writing.*

Grading Policy:

Activities/Assignments	Value (percentages)
Exam 1	30%
Exam 2	30%
Assignments	20%
Final Project	20%
Total:	**100%**

Grade Determination

A: 90% ≤ (Total Score)
B: 80% ≤ (Total Score) < 90%
C: 70% ≤ (Total Score) < 80%
D: 60% ≤ (Total Score) < 70%
F: (Total Score) < 60%.

Instructor Specific Policies and Procedures

Exam Policy:
Exams must be taken in person as scheduled, except for documented emergencies approved by the instructor in individual bases. A one-page formula sheet is allowed but not the whole class note. TI-84 level calculators are allowed, but calculators with computer algebra system (such as TI-89, TI-92 or Voyage 2000) are not allowed during the exam. Other than pre-approved calculators, no other computing aid (such as those supported by tablets and smart phones) is allowed. Cell phones are allowed but they are for emergency calls only.

Assignment Policy:
The written assignments and the final project must be submitted electronically through the course website. Use a single-file pdf format to ensure the safe submission. Late submission will be accepted with the late penalty of 20% per day. In any case, the final submission must be done before the final exam.

Technology Requirement:
Besides the university's technology requirement, all students must get Wolfram Mathematica or CDF Player. It is available for free at https://www.wolfram.com/cdf-player/. Detailed instruction will be communicated through the class page. Every assignment must be submitted in a single-file pdf format. This can be done by some free websites such as https://online2pdf.com/. Detailed instruction will be communicated through the class page.

University Policies and Procedures

Online "Netiquette":
Emails should use proper "netiquette," i.e., no writing in all caps (usually denotes yelling), no curse words, and no "flaming" messages (angry, personal attacks). Racial, ethnic, or gender slurs will not be tolerated, nor will pornography of any kind. Any violation of netiquette policies may result in a loss of points or removal from the course. Repeated online misconduct may be subject to more serious sanctions, such as warnings and other sanctions in accordance with the University's policies and procedures. Refer to the Student Code of Student Rights Responsibilities and Conduct at http://www.untdallas.edu/osa/policies. Respect is a given principle in all online communication. Therefore, please be sure to proofread all of your written communication prior to submission.

Students with Disabilities (ADA Compliance):
The University of North Texas Dallas faculty is committed to complying with the Americans with Disabilities Act (i.e., ADA). Students' with documented disabilities are responsible for informing faculty of their needs for reasonable accommodations and providing written authorized documentation. Grades assigned before an accommodation is provided will not be changed as accommodations are not retroactive. For more information, you may visit the Student Life Office, Suite 200, Building 2 or call 972-780-3632.

Blackboard Learn Accessibility Statement: University of North Texas at Dallas is committed to ensuring its online and hybrid courses are usable by all students and faculty including those with disabilities. If you encounter any difficulties with technologies, please contact our ITSS Department. To better assist them, you would want to have the operating system, web browser and information on any assistive technology being used.
Blackboard Learn course management system's accessibility statement is also provided:
http://www.blackboard.com/Platforms/Learn/Resources/Accessibility.aspx

Instructional technology tools, such as Turnitin, Respondus, Panopto, and publisher cartridge content (i.e. MyLab, Pearson, etc.) may NOT be fully ADA compliant. Please contact our Disability Office should you require additional assistance utilizing any of these tools.

Student Evaluation of Teaching Effectiveness Policy:
The Student Evaluation of Teaching Effectiveness (i.e., SETE) is a requirement for all organized classes at UNT. This short survey will be made available to you at the end of the semester, providing you a chance to comment on how this class is taught. I am very interested in the feedback I get from students, as I work to continually improve my teaching. I consider the SETE to be an important part of your participation in this class.

Academic Integrity:
Academic integrity is a hallmark of higher education. You are expected to abide by the University's code of conduct and Academic Dishonesty policy. Any person suspected of academic dishonesty (i.e., cheating or plagiarism) will be handled in accordance with the University's policies and procedures. Refer to the Student Code of Student Rights Responsibilities and Conduct at http://www.untdallas.edu/osa/policies for complete provisions of this code.

TurnItIn Statement:
Students may be required to submit written assignments for this class to Turnitin, a web-based plagiarism detection service. Before submitting your paper to Turnitin, please remove your title page and other personal information. (OPTIONAL: Any paper that is not submitted to Turnitin prior to submission to the instructor will not be accepted by the instructor and will not be graded).

Attendance and Participation Policy:
The University attendance policy is in effect for this course. Class attendance in the Blackboard classroom and participation is expected because the class is designed as a shared learning experience, and because essential information not in the textbook will be discussed in the discussion board. Online presence and participation in all class discussions is essential to the integration of course material and your ability to demonstrate proficiency. Students are responsible for notifying the instructor if they will be missing online class requirements, and they must share their reason for missing class.

Online Attendance: *Attendance for this online or hybrid course is considered when you are logged in and active in Blackboard, i.e., posting assignments, taking quizzes, or completing Discussion Boards. If you are absent/not active in the course shell, it is **YOUR** responsibility to let the instructor know immediately, upon your return, the reason for your absence **if** it is to be excused. Note that all instructors will follow the university policy of **14 consecutive days of unexcused absences/inactivity (i.e., failure to post assignments, take quizzes, or complete Discussion Boards) in a distance learning course resulting in failure of the course.***

Diversity/Tolerance Policy:
Students are encouraged to contribute their perspectives and insights to class discussions. However, offensive & inappropriate language (swearing) and remarks offensive to others of particular nationalities, ethnic groups, sexual preferences, religious groups, genders, or other ascribed statuses will not be tolerated. Disruptions which violate the Code of Student Conduct will be referred to the Office of Student Life as the instructor deems appropriate.

Technology Requirements:
Blackboard Learn 9.1 is the platform software for this course.

- *Internet Explorer® 10 from Microsoft (26 October 2012 for Windows 8, 26 February 2013 for Windows 7)*
- *Internet Explorer 9 from Microsoft (14 March 2011). There are some configuration options for Internet Explorer that may make some features of Blackboard Learn difficult to use.*
- *Safari® 6 from Apple (25 July 2012)*
- *Safari 5 from Apple (7 June 2010)*
- *Safari 5 for Windows is an exception. Apple's continued support for this browser is unclear, and Blackboard does not test it.*
- *Firefox® 21 (stable channel) from Mozilla (14 May 2013)*
- *Firefox 17 (ESR channel) from Mozilla (14 May 2013)*
- *Chrome™ 27 (stable channel) from Google (21 May 2013)*

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AY 2016-2017 FA Weekly Schedule

Time	Mon.	Tue.	Wed.	Thu.
08:30 ~ 08:45 08:45 ~ 09:00 09:00 ~ 09:15 09:15 ~ 09:30 09:30 ~ 09:45 09:45 ~ 10:00	**Office Hour** **2-224**	**Office Hour** **2-224**	**Office Hour** **2-224**	**Office Hour** **2-224**
10:00 ~ 10:15 10:15 ~ 10:30 10:30 ~ 10:45 10:45 ~ 11:00 11:00 ~ 11:15 11:15 ~ 11:30	**Math 1680-030** **Elementary** **Prob & Stat** **2-337**	**Math 1100-003** **College Algebra** **1-244**	**Math 1680-030** **Elementary** **Prob & Stat** **2-337**	**Math 1100-003** **College Algebra** **1-244**
11:30 ~ 11:45 11:45 ~ 12:00 12:00 ~ 12:15 12:15 ~ 12:30 12:30 ~ 12:45 12:45 ~ 1:00P	**Math 1680-002** **Elementary** **Prob & Stat** **2-337**	**Math 3400-001** **Number Theory** **2-336**	**Math 1680-002** **Elementary** **Prob & Stat** **2-337**	**Math 3400-001** **Number Theory** **2-336**
1:00P ~ 1:15P 1:15P ~ 1:30P 1:30P ~ 1:45P 1:45P ~ 2:00P 2:00P ~ 2:15P 2:15P ~ 2:30P	Available upon Appointment 2-224	Available upon Appointment 2-224	Available upon Appointment 2-224	Available upon Appointment 2-224
2:30P ~ 2:45P 2:45P ~ 3:00P 3:00P ~ 3:15P 3:15P ~ 3:30P 3:30P ~ 3:45P 3:45P ~ 4:00P				Available upon Appointment 2-224
4:00P ~ 4:15P 4:15P ~ 4:30P 4:30P ~ 4:45P 4:45P ~ 5:00P 5:00P ~ 5:15P 5:15P ~ 5:30P				Available upon Appointment 2-224