Program for Undergraduate Research, Scholarship, and Arts (URSA) Conference, (Thursday, April 12, 2012 from 12 – 5:30 p.m.)

Talks in KN-164 (noon – 1:30)

1. 12 – 12:15, Alejandra Herrera (Dr Luigi Manca)
Abstract: My subject is Sexism in journalism, in my case Sexism on the front page of national newspapers. The newspapers consisted of The Chicago Tribune, The Washington Post, and The New York Times.

2. 12:15 – 12:30, Dominic Rocco (Dr Nona Jones)
Abstract: The objective of this study is to analyze and evaluate the current marketing plan being used by small business owner Mardy Chizek for Charism Elder Living Services, and recommend a detailed integrated marketing communications plan based on this analysis. The plan includes a promotions opportunity analysis, corporate strategies, objectives, and all relevant advertising, promotion, personal selling, sponsorship, and database programs.

3. 12:30 – 12:45, Bohdan Khomtchouk (Dr Preston Aldrich)
Abstract: Zipf's law predicts a linear relationship between word rank and frequency in communicative systems, and is widely reported in texts yet remains enigmatic as to its origins. Computer simulations have shown that communicative systems emerge at an abrupt phase transition in the fidelity of mappings between symbols and objects. Since the phase transition approximates the Heaviside or step function, we show that Zipfian scaling is expected based on the Laplace transform which yields 1/s.

4. 12:45 – 1, Tayaba Azher
Abstract: The research focused on the physiological consequences of prescribing Folic Acid to pregnant women to prevent neural tube defects in newborns. As low as 15ng/ml of Folic Acid has been shown to cause epigenetic modifications to the cytosine residues in the CpG dinucleotides.

5. 1 – 1:15, Frankie Lewandowski (Dr Luigi Manca)
Abstract: I will be cross examining the effects negative publicity has on athlete endorsements.

6. 1:15 – 1:30, Kelly Mitchum and Sana Latif (Dr Luigi Manca)
Abstract: We will be reviewing how cartoon characters from syndicated television shows such as The Simpsons, Family Guy, American Dad, and South Park portray certain characters from different races and backgrounds. In the process we will use the episodes to help breakdown why they act a certain way and what race they are reflecting.

Talks in KN-164 (1:30 – 3)

1. 1:30 – 1:45, Eddie Price (Dr Ellen Ziliak)

Abstract: In this talk, we will discuss the process of doing arithmetic in a group extension. A group extension is a group which is built from two smaller groups, namely a normal subgroup and a quotient group. In addition to these two groups we also need a map, called the 2-cocycles, on each pair of elements in the quotient group. This map describes how to lift products in the quotient group to products in the group extension. In this talk we will describe how to do arithmetic in a group extension assuming the 2-cocycles are known. We will then show that in fact we only need to know the 2-cocycles for each relator in a finite presentation for the quotient group for Q to be able to do arithmetic in a group extension.

2. 1:45 – 2, Saba Husain (Dr Manu Kaur)

Abstract: As modern day dependence on digital technology increases, an important question is the extent to which our identity is protected in these digital transactions. In this expository paper we look at the mathematics behind the scenes that helps secure our identity and privacy as we use various smart cards in our everyday lives. In particular, we study the security techniques used in credit cards.

3. 2 – 2:15, Gonzalo Landeros (Dr Manu Kaur)

Abstract: The purpose of this project is to create a homophonic cipher that helps build strong passwords and to implement the cipher as an android application for smart phones.

4. 2:15 – 2:30, Natalia Poniatowska (Dr Manu Kaur and Dr Ellen Ziliak)

Abstract: A Quasigroup is a set of elements with one binary operation whose multiplication table forms a Latin square. These algebraic structures are similar to groups, however they are not required to be associative. This non-associativity has many applications, one such area is Cryptology. A widely studied and used cryptographic tool is Message Authentication Code, MAC. In this presentation I discuss a type of a MAC, called QMAC, which was introduced by Meyer. The construction of a QMAC and its security concerns will be discussed.

5. 2:30 – 2:45, Amreen Barde, Kiran Munir, and Mehak Sandhu (Dr Manu Kaur)

Abstract: With the advent of complex technology and advancements in medical data transfer and storage, the need for security and privacy of patients by hospitals and physicians is essential. The transfer of important patient information, in the form of encrypted data, is accomplished by cryptographic methods and by digital watermarking, a method used to embed data onto an image. We discuss stream ciphers used in medical imaging and the advantage of using such ciphers. We further present a method that uses RC4 stream cipher for encrypting patient information and follows it by a Discrete Cosine Transform.

Talks in KN-164 (3 – 4:30)

1. 3 – 3:15, Jessica Rovner (Dr Manu Kaur and Dr Ellen Ziliak)

Abstract: Public key cryptosystems have traditionally made use of Abelian groups, but the need to ensure security has led to the exploration of noncommutative groups as a starting point for developing new approaches. In particular, polycyclic groups possess a variety of qualities that suggest they could serve as a useful foundation for secure methods. An examination of the structure and characteristics of polycyclic groups will demonstrate how they fulfill the basic requirements of what is desired in an effective cryptosystem.

2. 3:15 – 3:30, Christina Rubik (Dr Manu Kaur)

Abstract: Enigma was a machine used by the Germans in World War II to encrypt secret messages. The encrypted statements were sent freely between various German operators, however, the enemy could intercept, yet not decrypt the disclosure. The recipient needed the Enigma Machine to decipher the message. The machine is equipped with internal hardware and mechanical structures that allow for an abundance of possible encryptions, thus rendering it secure against brute force attack. I will describe the machine and its cryptanalysis that finally led to the end of World War II.

3. 3:30 – 3:45, Sameer Syed (Dr Tim Comar)

Abstract: Enumerating hextile knot mosaics for the figure-8 knot.

4. 3:45 – 4, Scott Baier (Dr Ellen Ziliak)

Abstract: My presentation will focus on the construction of binary linear codes and determining the amount of errors that will be detected and corrected by that code. In addition, I will touch on some real world applications that use some form of coding.

5. 4 – 4:15, Trisha Russo (Dr Manu Kaur)

Abstract: Elliptic curve cryptography (ECC) is gaining popularity because of its advantages over previously used public-key algorithms. The complexity of ECC and security is what distinguishes this cryptosystem from others and why it is so interesting. In this talk, I will discuss the mathematics behind elliptic curve cryptosystem, its advantages and disadvantages, and how the ElGamal system is applied.

Talks in KN-164 (4:30 – 5:30)

1. 4:30 – 4:45, Jamison Montgomery (Dr Luigi Manca)

Abstract: The objective is to give a thorough definition of false light privacy, and explain how your privacy can be violated by social networks from your employer, peers, and even law enforcement.

2. 4:45 – 5, James (Conor) Caplice (Dr Elizabeth Kubek)

Abstract: I will be speaking on my senior seminar thesis paper which I am currently in the process of finishing with the aid and guidance of Dr. Kubek. The content pertains to the fourteen novels written by Kurt Vonnegut with a focus on the prevalent theme of loneliness which encapsulates them. More specifically, the subject matter is regarding the excessive use, over dramatization, and satirical nature of this theme and how each individual book – as well as the multi-novel narrative which emerges – is indicative of an altogether different meaning and message in Kurt Vonnegut's writings.

3. 5 – 5:15, Nusrean Haddad, Ibrahim Haleem, and Noora Shubbak (Dr MeShelda Jackson, Dr James Pelech, and Dr Ovid Wong)

Abstract: Benedictine and Saint Ethelreda are completing their eighth year of a university-school partnership. Using a Response to Intervention (RTI) approach, university students tested and provided intervention addressing school age students' learning needs at a selected school. These interventions are aligned with best teaching practices that form the evolving curriculum. In addition, the curriculum is being aligned and modified to reflect the skills from the required standardized achievement test.

4. 5:15 – 5:30, Sean Gill (Dr Elizabeth Kubek)

Abstract: The presentation will be exploring Third/Multiple genders with focus in Indian-Hindu cultures. The presentation will also explain the contrast between the reality of Third/Multiple genders, and the Western Culture ideas of categorizing concepts and more importantly, people.

Talks in KN-126 (3 – 4:30)

1. 3 – 3:15, Sirin Homsi (Dr Allison Wilson)

Abstract: The objective is to investigate which specific estrogen receptor (ER) cadmium binds to, ER alpha, ER beta, or GPR30, using RAW 264.7 monocyte macrophage cell line. Apoptosis was determined by looking at the mitochondrial membrane potential by fluorescence microscopy. Cells were induced with cadmium for the three different receptors and observed for apoptosis activity.

2. 3:15 – 3:30, Dalia Qubbaj (Dr. Christine Isom-Verhaaren)

Abstract: This thesis first compares the Benedict Anderson model of an 'imagined' community to the Arab population of historical Palestine, who formed a distinct national identity as a Palestinian people protecting their homeland in unison with manifestation of anti-Zionist newspapers throughout the Arab lands of the Ottoman Empire. Second, using this, this paper will display the evolution of Palestinian national identity of Palestinians living in the Diaspora after the creation of the state of Israel in 1948, including oral history interviews as a primary source to document the lives and experiences of the Palestinian Diaspora of the Chicago area.

3. 3:30 – 3:45, Raydha Saleem (Dr Luigi Manca)

Abstract: My paper explores sexual utopia in magazine advertisements. It explains the types of women that are portrayed in magazine advertisements and how they are exactly portrayed in those advertisements.

4. 3:45 – 4, David Mickiewicz (Dr Phil Novack-Gottshall)

Abstract: This presentation is on morphometric proxies for trilobite body size. Using measurements from trilobite specimens to find which individual fragments correlate best with overall body size. Statistical analyses based on anteroposterior and transverse lengths will be used to find the best correlation.

5. 4 – 4:15, Julie Fossel (Dr Brian Patterson)

Abstract: The purpose of this research project was to examine differences in technology usage among high school and college students, and the ways access to everything from Facebook to Twitter might promote political engagement and learning. 163 high school students and 118 college students completed a paper survey over the past 12 months. Participants were asked a series of demographic questions, followed by approximately 60 items that measured several aspects of technology usage and its application to politics. Basic descriptive analytical techniques were used, including Chi-square and t-tests, on these data.

Talks in KN-126 (4:30 – 5:30)

1. 4:30 – 4:45, Ryan Seeley and Andy Crutchfield (Dr Manu Kaur)

Abstract: We will be discussing the Vigenere cipher, a major historical cipher in cryptology history. We will explain the history of the cipher as well as the mathematics behind its encryption, decryption, as well as current research of the cipher.

2. 4:45 – 5, Mariola Teczar (Dr Nona Jones)

Abstract: An IMC campaign was created as a requirement for Promotional Strategies Marketing 330 class. The product created was an organic facial called Alamar. The campaign included an in-depth competitor analysis, yearly projections, marketing strategies, a marketing website, and promotional materials. Handmade samples were handed out as they represented a realistic promotional marketing tool.