**ARTS**

**ART-SHU 301 *Introduction to Photography I.*** This course will be an introduction to the use of photography as a medium of documentation and art expression. The student will use photography to witness and create images to begin to understand their experience in Shanghai, and understand photography as an art medium. Basic digital photography techniques will be taught, including use of a digital camera and Photoshop. Lectures, technical demonstrations, and group critiques, as well as presentations by guest photographers will be included. Assignments on individual photographers and artists will be required. This course is for beginning photography students with minor or no experience with photography. Students will provide their own cameras. This course is open to all students with or without an art background. Note that attendance in the first class meeting is mandatory, otherwise you will be dropped from the course. *Prerequisite: None.*

**ART-SHU 306 *Moving Images.*** Moving images have become one of the most widely used media art forms because it allows both the artistic concentration of photography & the free-flowing imagery of movement.  Students acquire rudimentary skills in shooting & editing while working toward a personal statement in video. This course is open to all students with or without an art background. Note that attendance in the first class meeting is mandatory, otherwise you will be dropped from the course. *Prerequisite: None.*

**BIOLOGY**

**BIOL-SHU 250 *Organismal Systems.*** The array of organisms that populates the globe is astounding in its diversity and adaptability. This course uses fundamental concepts from the *Foundations of Science* curriculum to examine essential elements of animal physiology, including adaptations to environments such as deserts. This course develops an understanding of the relationship between structure and function of the organism; how structure develops through evolutionary and developmental processes; and how structure is related to the environment surrounding the organism.  *Prerequisite: Foundations of Biology I). This course satisfies Required Biology Course.*

**BIOL-SHU 997 Independent Study - Biology.** Prerequisite: Foundations of Science I-III (or Physics I&II, Foundations of Chemistry I&II, Foundations of Biology I&II), and a minimum GPA of 3.0 overall and in all science and mathematics courses required for the major, permission of a biology faculty member (at NYU-Shanghai, NYU-Abu Dhabi, or NYU-New York) who will act as a sponsor and mentor, and approval of the Director of Undergraduate Studies (DUS) in Biology. The faculty mentor must be selected in consultation with the DUS. Offered in the Fall, Spring or Summer. 2 to 4 points per term for a maximum of 4 points. This course aims at engaging students in research. It is designed to offer students an opportunity to observe neuroscience research up close and gain hands-on research experience by working as a member in an active research team. Independent Study I and II can be done with the same supervisor or two different supervisors. No lectures will be given. Student researchers are expected to attend and actively participate in lab/supervision meetings. A Proposal for Independent Study form must be filled out, signed by the DUS, and submitted to the Registrar. Requires a written report on the research to be evaluated by the faculty sponsor, with a copy submitted to the DUS and a copy to the Dean of Arts & Sciences.

**BIOL-SHU 999 Biology Undergraduate Research Thesis.** Prerequisites: Independent Study (BIOL-SHU 997 or 998), a minimum GPA of 3.65 overall, a minimum GPA of 3.65 in all science and mathematics courses required for the major, and permission of a sponsor and the Dean of Arts & Sciences. Open to Biology majors only. The faculty mentor must be selected in consultation with the Dean of Arts & Sciences. May not be used for the major in biology. Offered in the fall, spring, and summer. 2 points. For biology majors who have completed at least one semester of laboratory research (BIOL-SHU 997 or 998) and are able to expand this work into a thesis. Requires writing a Thesis (i.e., a full literature search of the subject and a formal written report on the research in publication form), which is defended in front of a committee of three faculty (which includes the faculty sponsor), chosen by the student in consultation with the faculty mentor. (The defense may be a brief oral presentation followed by a question-and-answer session.) The Thesis and defense must be evaluated by the committee, with the cover page of the thesis signed by all committee members, with a copy of the Thesis submitted to the Dean of Arts & Sciences. (It is recommended that the student meet with the faculty committee at least once mid-semester to evaluate and guide the student's progress on the thesis work.)

**BUSINESS**

**BUSF-SHU 5 *Principles of Finance for Non-majors*.** This course is for Non-Business and Non-Data Science with Finance Concentration students. It is a general elective course.

**BUSF-SHU 101 *Statistics for Business and Economics.*** This course introduces students to the use of statistical methods. Topics include: descriptive statistics; introduction to probability; sampling; statistical inference concerning means, standard deviations, and proportions; correlation; analysis of variance; linear regression, including multiple regression analysis. Applications to empirical situations are an integral part of the course. *Prerequisite: None.*

**BUSF-SHU 200C** ***The Globalization of Business Enterprise.*** The Globalization of Business Enterprise (GLOBE) focuses on globalization and its implications for business and individuals. The course examines the global business environment and practices, places emphasis on implications of the globalization on business strategy, functional policies, as well as on individuals who make decisions on their professional and personal lives. The course is composed of four modules that review the facts about globalization on a spectrum of macro to managerial to personal aspects and spark reflections about the future agenda for global business leaders. These four modules are: 1) introduction of globalization, its myths, and business consequences; 2) presentation of the theoretical framework that analyzes similarities and differences and related strategic/functional implications on business decision-makers; 3) strategic responses to globalization on how to overcome and take advantage of cross-border differences; 4) globalization and you: to help the students to understand the importance of planning a global career and expanding their horizons to become a better global citizen. As a key characteristic, the course uses real-world case studies as a foundation for the application of theory, analysis of strategy and discussions on successes and pitfalls. Open to Juniors and Seniors.

**BUSF-SHU 210 *Business Analytics.*** This course introduces the basic principles and techniques of applied mathematical modeling for managerial decision making. You will learn to use some important analytic methods (e.g. forecasting, data mining, optimization, Monte Carlo simulation), to recognize their assumptions and limitations, and to employ them in decision making. The course is entirely hands-on. The emphasis will be on model formulation and interpretation of results, not on mathematical theory. The emphasis is on models that are widely used in diverse industries and functional areas, including finance, marketing, and operations.  *Prerequisite:  A prior Statistics Course. This course satisfies Business elective for Business and Finance/ Marketing major.*

**BUSF-SHU 211 *Design Thinking*.** Design thinking is a novel approach to problem-solving you can apply to any discipline. It gives you the superpower to rapidly develop concepts, products, services, strategies, and systems that are both innovative and responsive to actual user needs and desires. This course takes an up-close and personal look at the origins and spread of design thinking, helps you understand the strengths and weakness of the method, and shows you how to use it to solve anything creatively. At the heart of design thinking is collaboration. Get ready to learn from your friends, embrace the power of storytelling, and make things that matter. *Prerequisite: None.*

**BUSF-SHU 221 *Professional Responsibility & Leadership*.** Professional Responsibility and Leadership (PRL) is an interdisciplinary course designed to helps students: Become more familiar with the variety of ethical dilemmas that can arise in the course of business practice & in one's personal life; Understand the different values and principles that can inform and guide decision-making in such ambiguous and difficult situations; Gain experience articulating  and defending courses of action as future societal & business leaders; and Begin the process of developing professional ethics in harmony with their own personal values. The format of the course is a discussion seminar. Each class session may include a variety of activities, including: discussion, in-class reading and writing, role-playing, and other participatory exercises. These various activities will be designed and facilitated by the instructor to allow students to engage in a reflective dialogue. These discussions draw from three different sources: 1) the students’ own personal experiences and values; 2) expert insights drawn from a variety of academic disciplines including philosophy, literature, history, and art, as well as the natural and social sciences; and 3) relevant business cases. In each class session, students consider a set of expert accounts identified by the instructor as starting points for discussion, and then they integrate their experiences with business cases that have personal relevance for them. The overarching themes of this dialogue include: 1) the relationship between business and society on a global, national and local basis; 2) the foundations of personal and professional business ethics; and 3) the exercise of leadership in organizations. These themes are developed in reference to a series of cases that have been either drawn from recent news reports on business practice or drafted specifically for this course by NYU Stern faculty. In this way, the PRL classroom is ‘flipped’ – the course focuses primarily on the students’ own interests and refines them both through dialogue and in reference to expert sources. Rather than involving the one-way dispensation of ‘content’ from faculty to student, the course unfolds as a ‘process’ of students and faculty working together in response to open-ended, age-old questions. While there may be no ‘right’ answer to such questions in the way that mathematical problems may be solved, still there are answers that are better or worse for individuals, organizations and societies. In this light, students are encouraged to challenge themselves and each other to make the world a better place, and to discover how they can thrive individually and collectively. *Prerequisite: None. Satisfies 2 credits of Business Major Non-Finance/Non-Marketing elective.*

**BUSF-SHU 232 *Entrepreneurship Explored*.** This course investigates the conspicuous activities of entrepreneurship such as raising capital, running factories, organizing supply chains and working out how to take existing products to new markets alongside the more private and primary first move behind entrepreneurial activity: sensitivity to pleasures and pains that others might overlook. You will gain useful tools and strategies you may apply whether you want to start a startup, thrive in a large organization, and everything between. Most classes use cases, an effective way to gain accelerated experience by absorbing a large number of stories of new ventures in a short time. These cases are complemented by visits from guest entrepreneurs and economists, who will share their ideas about entrepreneurship and economic dynamism, as well as field trips to Shanghai startups, and a team design challenge. This course is not just for students who want to be entrepreneurs. Any student who is driven to create change should enroll. *Prerequisite: None.*

**BUSF-SHU 250 *Principles of Financial Accounting.*** Develops students’ abilities to understand business transactions and financial statements and to determine the most appropriate financial measures for these events. Investigates the underlying rationale for accounting practices and assesses their effectiveness in providing useful information for decision making. Emphasis is placed on accounting practices that purport to portray corporate financial position, operating results, cash flows, manager performance, and financial strength.*Prerequisite: None.*

**BUSF-SHU 288 Doing Business in China.** The course is designed to help the students to better understand business practices, environment, and cultures in China. Special focus will be placed on the understanding of the political, institutional, and financial contexts within which business activities unfold. The course will also discuss the implications of regional and global factors in shaping opportunities and constraints on businesses in China as well as the impact of Chinese business on international markets. Learning goals of the course are to: 1. Become knowledgeable in select concepts of the businesses in China; 2. Obtain essential knowledge on the evolution and development of business in China; 3. Develop an awareness of the political, socioeconomic, and cultural aspects of life in China, including critiques of common intercultural stereotypes around values and assumptions related to Chinese society and business practices; 4. Gain practical experience in interacting with diverse Chinese business communities.

**BUSF-SHU 303 *Corporate Finance.*** This course analyzes the major financial decisions made by corporate managers. The major topics include the objective of the firm, investment valuation and capital budgeting, risk management, capital structure and dividend policy. Insights from behavioral corporate finance that help better understand corporate decisions in practice will also be discussed. There will be emphasis on both developing the tools and mindset of the financial practitioner as well as examining specific applications in the form of examples, case discussions, and classroom simulations. *Prerequisite: BUSF-SHU 202*.

**BUSF-SHU 305 *Debt Instruments and Markets.***  This course describes important fixed income securities and markets and develops tools for valuing debt instruments and managing interest rate risk. The course covers traditional bond pricing, term structure, and interest rate risk concepts. It also covers the analytical and institutional aspects of fixed income derivatives, such as interest rate swaps, forwards, futures, and options, as well as bonds with embedded options and mortgage-backed securities. Topics also include credit risk, bond portfolio, management, financial engineering, and international fixed income. The study of fixed income is quantitative and technical by nature. *Prerequisite: BUSF-202.*

**BUSF-SHU 309** ***Financial Statement Analysis***. The course analyzes how firms communicate through financial statements. Students use financial statement analysis as an integral part of the strategic analysis of firms, while understanding how accounting regulations and managerial discretion influence presented financial statements. Course modules include strategic analysis, risk and profitability analysis using ratios, accounting analysis, and prospective analysis. By the end of the course, students can interpret and analyze financial statements, analyze cash flows, make judgments about earnings quality, uncover hidden assets and liabilities, and use financial statement analysis prospectively to forecast and value firms using cash flow-based and accounting-based valuation methods. Students who wish to pursue careers in investment banking, investment management, consulting, and accounting are encouraged to take the course. *Prerequisite: Principle of Financial Accounting.*

**MGMT-SHU 18*****Strategic Analysis****.* This course provides an introduction to the basic frameworks of modern strategy that aim to help firms establish and sustain competitive advantages. The objective of this course is to introduce students to the role of the “general manager,” who is faced by core strategic choices that concern the long-term performance of the firm, and provide them with the necessary skills to formulate and implement effective strategies. This course is equally relevant for students who want to work with companies as consultants, attorneys or investors, helping clients understand and solve critical strategic issues. From this course, you’ll learn to think critically and analytically about competitive business situations. You’ll also learn to embrace uncertainty, ambiguity and complexity of these situations, and to help firms improve the decision making process with sensible and actionable solutions. Firm performance is jointly determined by external economic and internal organizational forces. As a general manager, students need to have the ability to conduct strategic analysis at both the firm and industrial levels. To help them develop these analytical skills, this course is organized around four questions that are central to firms' strategic decisions: • What is the firm’s external environment? • What is the firm’s competitive advantage? • With whom should the firm compete? • How should the firm compete? To answer these questions, we will cover the following four main topics in this course: • Industry analysis: the environment, opportunities, threats, industry competition • Firm level strategy: competitive advantage • Competitive dynamics • Corporate strategy This course combines interactive lectures and case analyses. While the lectures provide a synthesized theoretical framework as the guidance for logical thinking, the case analyses offer an opportunity to integrate and apply the theoretical framework in a practical way

**MGMT-SHU 301 *Management and Organizations*.** This course addresses contemporary management challenges stemming from changing organizational structures, complex environmental conditions, new technological developments, and increasingly diverse workforces. It highlights critical management issues involved in planning, organizing, controlling, and leading an organization. Ultimately, it aims to strengthen students’ managerial potential by providing general frameworks for analyzing, diagnosing, and responding to both fundamental and complex organizational situations. It also provides opportunities for students to enhance their communication and interpersonal skills, which are essential to effective management. The structure of the course encourages learning at multiple levels: through in-class lectures, exercises, and discussions; in small teams carrying out projects; and in individual reading, study, and analysis. *Prerequisite: None.*

**MKTG-SHU 2 *Consumer Behavior*.** This course presents a comprehensive, systematic, and practical conceptual framework for understanding people as consumers—the basic subject matter of all marketing. It draws on the social sciences to evaluate the influence of both individual and ecological factors on market actions. Students discuss relevant psychological and sociological theories and study how they can be used to predict consumers' reactions to strategic marketing decisions. Basic methodologies for research in consumer behavior are developed and applied. Course emphasis is on developing applications of behavioral concepts and methods for marketing actions.

**MKTG-SHU 3 *Advertising Management.***This course provides students with a comprehensive framework and tools to understand the advertising process and to appreciate managerial and theoretical perspectives in advertising. It tackles the stages in developing an advertising plan- from analyzing the situation and defining clear advertising objectives to execution. Students learn tools related to various skill areas in advertising, including account planning, media planning and buying, and copywriting/art direction, while developing a broader appreciation of how each skill area fits into the overall structure of the advertising process. Coursework involves a comprehensive group project that utilizes learning in all functional areas of advertising, while simulating the development of an advertising campaign. *Prerequisite: Intro to Marketing (MKTG-SHU 1)*

**MKTG-SHU 9 *Research for Customer Insights*.** This course provides students with both research and managerial perspectives in the development and application of marketing research tools and procedures. It describes the development of research designs from problem formulation to analysis and submission of the research report. It also covers the analysis of techniques in marketing research, such as focus groups, experimental design, surveys, sampling, statistical analysis, and reporting. Cases are utilized in the development of methods and in specific areas of application.

**MKTG-SHU 57 *Digital Marketing*.**Provides an introduction to fundamental concepts in digital marketing. Students will learn through business case studies reflecting recent frameworks in the field, and in-class exercises on metrics and methods for evaluating the success of digital marketing. Students will also explore the psychology of virality and social influence in digital contexts. *Prerequisite: Intro to Marketing*.

**MKTG-SHU 110** ***Topics: Practicum on Innovation and Branding.*** Innovation is the process by which an organization generates creative new ideas and converts them into viable commercial products. Branding, on the other hand, is the process of creating a unique image for the product in the consumers’ mind. This perception reflects on the organization as a whole. Moreover, branding aims to establish a differentiated presence in the marketplace to attract and retain loyal customers. Thus, innovation and branding are inextricably linked for organizational success, or survival, in today’s hyper-competitive business landscape. This course aims to equip students with knowledge in both the innovation and branding processes. By participating in the International L’Oreal Brandstorm Competition, students will gain practical experience in formulating an idea, develop branding around said idea, and then pitching said idea (innovation and branding) in a competitive forum. Students will also develop an understanding of the role of design and innovation as a collaborative, multidisciplinary group activity; and improve writing and presentation skills. The course incorporates multiple ways of learning including: lectures, case studies, ethnographic research, industry expert feedback on projects and guest presentations, and design activities in the interactive media lab. In essence, the course integrates a project-based learning approach.

*Prerequisites: None.*Satisfies IMB Major, and Business Major - Marketing Elective if Intro to Marketing has been taken, otherwise Non-finance/Non-marketing Elective)

**SOCIAL FOUNDATIONS**

**CCSF-SHU 123 *Contemporary Chinese Political Thought (formerly China's Political Thought in the Post-Maoist Era*).** This course introduces students to perspectives on contemporary Chinese political and social thought as presented in academic publications, media reports, social commentary and postings on the Chinese Internet. It covers selected key topics in the disciplines of political, social, and cultural studies. It examines and compares Chinese and Western views on major developments and current issues. The course also introduces students to a variety of styles of writing and research methods as well as skills of cultural translation relevant to the study of contemporary China and Chinese thought. *Prerequisite: None.*

**JOUR-SHU 9202  *Methods and Practice: Journalism.*** It provides an introduction to the work of the reporter, with particular focus on covering China, and offers students a chance to learn and practice basic journalism skills, including news writing, descriptive & feature writing, and writing for TV etc. Feedback on assignments is given in individual meetings.  Visiting speakers and field trips also offer insights into the role of the journalist and the challenges faced. Prerequisites: None.

**COMPUTER ENGINEERING**

**CENG-SHU 202 *Computer Architecture.*** The main ambition of this course is to teach you how a modern computer works, starting from its most elementary components (transistors, resistors, capacitors) and then climbing up the ladder of abstraction to reach a high-level programming language like C and its compilation in machine code. In this excursion, we will learn (among other things) how to turn electrons into digital logic, how to make machine instructions execute faster through pipelining and prediction, and how to organize memory in hierarchies in order to make it more efficient. Since the only way to learn computer architecture is by practicing it, we will design a register transfer level (RTL) implementation of a MIPS-like processor in Verilog, and implement a simulator of the very same architecture in C. Preliminary syllabus of the course. General introduction to the course Dataflow and parallelism From silicon to transistors The digital abstraction Number systems Programming in C: basic types and control flow Programming in C: arrays, strings and functions Programming in C: pointers, structures and unions Programming in C: linked lists and beyond Programming in C: the Unix System interface Boolean logic Karnaugh maps Latches and flip-flops Finite state machines Binary and Synchronous Decision Diagrams Programming and simulating in Verilog [part I] Programming and simulating in Verilog [part II] Digital building blocks Compilation from C to MIPS Single-cycle microarchitectures Multi-cycle microarchitectures Pipelining and dependence hazards Out-of-order execution Memory hierarchies and cache Virtual memory Memory models and multiprocessor programming Equivalency: This course counts for CSCI-UA 201 Computer Systems Organization.

**CHEMISTRY**

**CHEM-SHU 126** ***Foundations of Chemistry II.*** This course is a continuation of Foundations of Chemistry I. Topics covered include the theories of intermolecular interactions, molecular orbital theory, reaction kinetics, chemical equilibria, acid-base reactions, properties of solutions, properties of solids, phase changes, transition-metal chemistry, coordination chemistry, electrochemistry, and nuclear chemistry. Students will reinforce and refine their physical and chemical intuition with a problems-based approach. *Prereq: CHEM-SHU 125 Foundations of Chemistry I AND prereq or coreq: MATH-SHU 121 Calculus or MATH-SHU 201 Honors Calculus*

**COMPUTER SCIENCE**

**CSCI-SHU 11 *Introduction to Computer Programming.*** An introduction to the fundamentals of computer programming. Students design, write, and debug computer programs. No prior knowledge of programming is assumed. Students will learn programming using Python, a general purpose, cross-platform programming language with a clear, readable syntax. Most class periods will be part lecture, part lab as you explore ideas and put them into practice. This course is suitable for students not intending in majoring in computer science as well as for students intending to major in computer science but having no programming experience. Students with previous programming experience should instead take Introduction to Computer Science.  *Prerequisite: None.*

**CSCI-SHU 101 *Introduction to Computer Science.*** This course has three goals. First, the mastering of a modern object-oriented programming language, enough to allow students to tackle real-world problems of important significance. Second, gaining an appreciation of computational thinking, a process that provides the foundations for solving real-world problems. Finally, providing an overview of the very diverse and exciting field of computer science - a field which, arguably more than any other, impacts how we work, live, and play today.

*Prerequisite: Prerequisite: Introduction to Computer Programming or placement exam. Equivalency: This course counts for CSCI-UA 101.*

**CSCI-SHU 210 *Data Structures.*** Use and design of data structures, which organize information in computer memory. Stacks, queues, linked lists, binary trees: how to implement them in a high-level language, how to analyze their effect on algorithm efficiency, and how to modify them. Programming assignments. *Prerequisite: Intro to Computer Science or Instructor's consent. Equivalency: This course counts for CSCI-UA 102 Data Structures (NY).*

**CSCI-SHU 308 *Computer Networking.*** This course takes a top-down approach to computer networking. After an overview of computer networks and the Internet, the course covers the application layer, transport layer, network layer and link layers. Topics at the application layer include client-server architectures, P2P architectures, DNS and HTTP and Web applications. Topics at the transport layer include multiplexing, connectionless transport and UDP, principles or reliable data transfer, connection-oriented transport and TCP and TCP congestion control. Topics at the network layer include forwarding, router architecture, the IP protocol and routing protocols including OSPF and BGP. Topics at the link layer include multiple-access protocols, ALOHA, CSMA/CD, Ethernet, CSMA/CA, wireless 802.11 networks and link layer switches. The course includes simple quantitative delay and throughput modeling, socket programming and network application development and Ethereal labs. *Prerequisite: CSCI-215.*

**CSCI-SHU 2314 *Discrete Mathematics.*** This course is an introduction to discrete mathematics, emphasizing proof and abstraction, as well as applications to the computational sciences. Topics include sets, relations, and functions, graphs and trees, algorithms, proof techniques, and order of magnitude analysis, Boolean algebra and combinatorial circuits, formal logic and languages, automata, and combinatorics, probability, and statistics. *Co-requisite MATH-SHU 121 or MATH-SHU 201. Equivalent to MATH-UA 120.*

**ECONOMICS**

**BPEP-SHU 9042 *The Political Economy of East Asia: China’s Development in a Comparative Perspective.*** This course focuses on China’s political and economic development over the last century and a half with particular attention to the last 33 years, the so-called Reform Period. Our three primary objectives are to (1) understand the historical trajectory of China’s development path; (2) consider in what ways and to what degree the growth experiences of East Asia’s high-performing economies helped inform China’s economic policymakers decisions and shed light on the prospects for the long-term success of reforms in China; (3) assess the state of China’s contemporary political economy. *Prerequisite: ECON-150 and SOCS-160.*

**ECON-SHU 1** ***Principles to Macroeconomics*.** Focuses on the economy as a whole (the "macroeconomy"). Begins with the meaning and measurement of important macroeconomic data (on unemployment, inflation, and production), then turns to the behavior of the overall economy. Topics include long-run economic growth and the standard of living; the causes and consequences of economic booms and recessions; the banking system and the Federal Reserve; the stock and bond markets; and the role of government policy. *Prerequisite: None.*

**ECON-SHU 202 *Intermediate Macroeconomics.*** Study of aggregate economic analysis with special attention paid to the determination of the level of income, employment, and inflation. Critically examines both the theories and the policies associated with them. *Prerequisites: ECON-150 & 201.*

**ECON-SHU 238 History of Modern Economic Growth: Exploring China From a Comparative Perspective.** The course introduces the history of modern economic growth, with a special focus on China. It will be organized around two main themes: the Industrial Revolution and the Great Divergence. To understand why some nations became developed but the others failed, this course tries to analysis the important evidences and theories about how institution, geography, technology and culture shape the long-term economic development. The class will first focus on how did modern economic growth take place and spread worldwide; and then we move to apply these frameworks to China and explore the historical trajectory of the rise of China. *Prerequisite: None.*

**ECON-SHU 251 *Economics of Global Business.*** The objective of this course is to provide future decision-makers with a systematic understanding of critical aspects of economic development and the global business environment. We will examine the basic workings of the national economies (macroeconomics) and then explain the role of international trade and international finance. We show how the forces of globalization affect international business, down to the impact on the future careers of NYU students. The challenges presented by tepid economic growth in Europe, a soft landing in China, and the changing dynamics in the US, and the long run prospects for global economic growth and development are discussed The course is divided into three parts: • Part I Understanding the modern macro economy. An understanding of the modern macro economy is essential in order to look at the relationships among countries. We start by defining the measures that characterize evolving economic well-being, from economic growth to inflation and income distribution. We examine how the economy grows in the long term and the role of productivity. We focus on the business cycle and how fiscal and monetary policies affect the economy in the short run and long run. Finally, we explore the role of banks and central breaks and the importance of financial stability and the consequences of financial crises. • Part II Trade and trade policy. As international trade plays a central role in fostering globalization, we start with an examination of the economics of international trade in goods and services. We examine the role of comparative advantage as a determinant of the location of production and the direction of trade. We also examine the reasons for and effects of government policies that create impediments to international trade. We show the impact of tariff and subsidies on real life situations, such as the agricultural barriers in Europe and the effect of the MTA on Chinese exports. • Part III Exchange rates, international finance, crises and development. The final module addresses the role of money and finance in an international context. We start with the Balance of Payments and macroeconomics of international financial flows. We then turn to the role of exchange rates in international finance and explore the factors that determine exchange rates such as inflation, growth and interest rates. Government exchange rate policies and the choice between fixed and flexible exchange rates are examined. We discuss the impact of the non-convertibility of the yuan, we ask when a monetary union such as the Euro area makes sense and discuss whether the Euro will survive. In short, Economics of Global Business provides NYU students with an overview of global economic issues. It serves as the basis for the International Studies Project and is a guide for many elective courses in international business and economics. Prerequisite: *ECON-SHU 150*.

**GLOBAL CHINA STUDIES**

**GCHN-SHU 263 *Voices from the Margin: Modern Chinese and Sinophone Writers.*** The literary scene in the modern and contemporary Chinese-speaking world is diverse, vast, and challenging for the migrant and exilic minds whose creative energies are often driven by their poignant insights to the turbulent events around them. Working in, outside, and between places like mainland China, Taiwan, Hong Kong, America, and parts of Southeast Asia, Chinese-language writers ask questions about nationalism, tradition, ethno-linguistic politics, and cultural authenticity. They speak from and across multiple cultural margins to probe the nature of modernity, cross-cultural contact, and otherness amid the global flows of labor and ideas.

This course invites students to participate in the ongoing discursive and historiographical debates over the study of “modern Chinese literature” through a fast-emerging transnational and comparative perspective. Reading stories, novels, and essays by both established and marginalized writers, we place the traditional nation-based rubric of Chinese literary studies in critical dialogues with a set of jarring historical contexts: Euro-American imperialism, Chinese emigration and their settler-colonial history, the post-1949 political split, and global decolonization movements, among others. We ask: how do writers represent China on the world stage? Where in their works can we discern stylistic and cultural hybridization? How do they variously cement or deconstruct the conventional East-West divide? What alternative literary geographies and worldviews do they offer? We begin with the satirical modernists of Republican-era China. Next, we turn to Hong Kong and Taiwan for identity debates, colonial legacies, nativism, and postmodern cultures. In light of the global migration history, we also study narratives from Chinese-speaking America, Malaysia, and Singapore to analyze how writers creatively deconstruct the notion of Chineseness. Finally, we discuss the changing terms of exclusion and inclusion of ethnic minorities in present-day Han-Chinese societies, to further expose the internal fractures within the global Sinophone cultures.

**HUMANITIES**

**PHIL-SHU 150 (formerly HUMN-** **SHU 203) *Central Problems in Philosophy.*** Albert: This course is an introduction to the problems and methods of contemporary philosophy. Topics may include: 1. What is the relationship between mind and body? 2. Can belief in the existence of the external world be justified? 3. Are there any good arguments for the existence of God? 4. Can we act freely if everything that we do is determined by laws of nature? 5. Is there a theory of how we ought to live?  *Prerequisite: None.*

**INTERACTIVE MEDIA ARTS**

**INTM-SHU 101 *Interaction Lab.*** In this foundation course students will be asked to think beyond the conventional forms of human computer interaction (i.e. the keyboard and mouse) to develop interfaces that consider the entire human body, the body’s capacity for gesture, as well as the relationship between the body and its environment. Students will learn the fundamentals of electronics and programming as they build projects using the Arduino microcontroller platform. Arduino is a small computer based on open source hardware and software. When used in conjunction with various sensors and actuators, Arduino is capable of gathering information about and acting upon the physical world. In addition to these physical computing techniques, students will also learn to harness the methods of traditional computation. The fundamentals of programming: variables, conditionals, iteration, functions, arrays and objects, will be explored using the Processing programming language. Processing has a simplified syntax and approachable computer graphics programming model, making it an ideal platform for first-time programmers. Students will gain a deeper appreciation of the expressive possibilities of computation as they learn to author their own software, and not simply use that which has been provided to them. Additional topics will include algorithmic drawing and animation techniques, digital modeling and fabrication, data exchange, manipulation, and presentation, as well as control of images, audio and video, including computer vision techniques. Structured weekly exercises are aimed at building specific skills, however students are free to pursue their own diverse interests in their midterm and final projects.
*Elective Category: Electronics & Physical Computing if counted as an elective.*
*Prerequisite: None*

**INTM-SHU 110 *Application Lab*.** In this foundation course students will be exposed to current trends and provocative topics at the intersection of interactive media and business, and they will be asked to produce project-based responses to the challenges posed to them by guest speakers, taken from readings, and as a result of critical dialog. Throughout the semester students will be introduced to emerging business models and trends including open source. User experience design, user testing, agile development methods, source code control, as well as computer programming fundamentals will be the focus of the first third of the semester. HTML, CSS, and JavaScript (including: variables, conditionals, iteration, functions, arrays, objects and data structures) will be introduced then. Rapid mobile application development frameworks will be the topic of the middle third, and application programming interfaces (APIs), microcontrollers, sensors, and actuators, as well as Internet of Things (IoT) platforms, will be the vehicles for student exploration in the final third. The role and value of collaboration will be better appreciated as students learn to face the challenges and benefits of group work. Students will be expected to produce a series of iterative projects that establish their newfound understanding of the topics introduced to them. This is a required course for the IMB Major.
*Elective Category: Business of Emerging Media if counted as an elective.
Prerequisite: None*

**INTM-SHU 120 *Communications Lab.*** In this foundation course, designed to provide students with a framework to effectively communicate through digital means, students will explore the possibilities of digital media by successively producing projects that make use of digital images, audio, video, and the Web. Students learn in a laboratory context of hands-on experimentation, and principles of interpersonal communications, media theory, and human factors will be introduced in readings and investigated through discussion. Students will learn the principles of digital imaging, recording and editing audio and video, and the basics of fundamental web languages HTML, CSS and JavaScript, in order to establish a diverse digital toolkit. Both traditional and experimental outputs, including online and interactive media platforms, will be explored. Weekly assignments, group and independent projects, as well as project reports and documentation will be assigned in each of the core areas of study. *Elective Category: New Media & Entertainment if counted as an elective.
Prerequisite: None*

**INTM-SHU 284*****Digital Sculpting for Facial Animation.***This 14-week course breaks down into 4 stages : 1. basic topology of head model (student’s profile photos as reference), 2. high-poly sculpting and projection texturing, 3. blend shapes animation, 4. final project. In the final project, students get to choose either lip-sync animation or conceptual piece utilizing the created head models. The course covers digital modelling / sculpting techniques including polygonal modelling, digital sculpting and blend-shape facial animation. Overview of digital editing / compositing and sound design will also be introduced to assist with students’ final project at the end of the semester. Category: New Media & Entertainment.  *Elective Category: New Media & Entertainment
Prerequisite: None*

**INTM-SHU 400 *Capstone Studio - Interactive Media Arts.***The IMA Capstone Studio course asks students to develop three components: 1) an interactive project and documentation, 2) a research paper, and 3) a personal portfolio. For the interactive project, students are asked to produce a working proof-of-concept that illustrates both their unique interests as well as evidence of competency within the field of interactive media production. Students are encouraged to develop their project around a theme they have previously explored in their work. Projects will be presented and critiqued repeatedly throughout the capstone process to peers, faculty, and industry professionals. A final presentation of the interactive project will be delivered in week 10. The research paper will be a 4000-5000 word essay focused on some aspect of the interactive project. Culture, theory, philosophy, or history, the project context, and / or production methods can provide possible topics for research. For example, students may write about their project’s reception by a set of users specifically, or by users who are part of a larger culture, society, or market. It is important that students think beyond the project itself though, situating it in a broader context accessible through research. Students will also be guided in the production of an online portfolio to showcase their work and accomplishments to the outside world. Graduates will be evaluated by their portfolio when applying for jobs, graduate school, artist residencies, grants, and the like. Portfolios will be tailored to the demands of each student’s future goals and target audience.

New Category: Studio

Old Categories: Studio

*Prerequisite: Student must be a senior*

**MATHEMATICS**

**MATH-SHU 142 *Honors Linear Algebra II*.** This is the follow-up course of Honors Linear Algebra I, continuing the study of operators on finite-dimensional vector spaces. Topics covered include eigenspaces, multiplicities of eigenvalues, diagonalization, inner product spaces, orthogonality, the Gram-Schmidt procedure, projections, minimization, Riesz representation theorem, adjoint operators, self-adjoint operators, normal operators, advanced spectral theory, isometries, singular value decomposition, bilinear forms, nilpotent operators, Jordan decomposition, minimal polynomials. *Prerequisite:  Grade of C or better in MATH-SHU 141 (Honors Linear Algebra I).*

**MATH-SHU 160 *Networks and Dynamics.*** The preliminary goal of this course is to study how complex systems function and evolve. Today’s world requires us to understand how the interactions between individual units give rise to a collective behavior, such as the neural network underlying our brain functions, social networks like Facebook or WeChat, or the spreading of a disease. The language for providing a scientific understanding of such systems is the mathematics of network theory and dynamical systems, which relies on linear algebra and differential equations. These topics are integrated in this unifying course that introduce mathematical models and methods to analyze them. A knowledge of a scientific computing software will be useful but not required. *Prerequisite: Grade of C or better in MATH-SHU 121 (Calculus) and 140 (Linear Algebra).*

**MATH-SHU 233 *Theory of Probability.*** This course is an introduction for mathematics majors to the mathematical treatment of random phenomena occurring in the natural, physical, and social sciences. Topics covered include axioms of mathematical probability, combinatorial analysis, the binomial distribution, Poisson and normal approximations, random variables, probability distributions, generating functions, and Markov chains and their applications. *Prerequisite: Grade of C or better in MATH-SHU 123 (Multivariable Calculus) and 140 (Linear Algebra). Not open to students who have taken MATH-SHU 235 (Probability and Statistics).*

**MATH-SHU 250 *Mathematics of Finance*.** This course is an introduction to the mathematics of finance. Topic covered include bonds, interest rates and present value, options and contracts, arbitrage and replication, binomial models, conditional expectations and design of European options, stopping times and American options, random walks and Brownian motion, log-normal model of stock prices, Black-Scholes price formula, Ito integrals and stochastic differential equations, Black-Scholes theory. *Prerequisite: MATH-SHU 123 (Multivariable Calculus) and 233 (Theory of Probability) or 235 (Probability and Statistics).*

**MATH-SHU 252 *Numerical Analysis.*** In numerical analysis, one explores how mathematical problems can be analyzed and solved with a computer. This has very broad applications in mathematics, physics, engineering, finance, and the life sciences. This course gives an introduction to numerical analysis for mathematics majors. Theory and practical examples using Matlab will be combined to study a range of topics, from simple root-finding procedures to differential equations and the finite element method. *Prerequisite: Grade of C or better in MATH-SHU 123 (Multivariable Calculus) and 140 (Linear Algebra).*

**MATH-SHU 262 *Ordinary Differential Equations.*** This course introduces the main ideas of ordinary differential equations. Topics include vector fields, existence and uniqueness of solutions of first-order differential equations (lin- ear and non-linear), stability, higher order differential equations, Series Solutions of second order linear differential equations, Laplace transform and numerical methods, nonlinear systems, boundary value problems.

*Prerequisite: Grade of C or better in MATH-SHU 121 (Calculus) and 140 (Linear Algebra).*

**MATH-SHU 263 *Partial Differential Equations.*** Many laws of physics are formulated as partial differential equations. This course discusses the simplest examples, such as waves, diffusion, gravity, and static electricity. Nonlinear conservation laws and the theory of shock waves are discussed, as well as further applications to physics, chemistry, biology, and population dynamics. *Prerequisite: Grade of C or better in MATH-SHU 262 (Ordinary Differential Equations).*

**MATH-SHU 328 (formerly 202) *Honors Analysis I.*** This course is a continuation of Honors Calculus, focusing on integration and on sequences of functions. It will cover Riemann’s integral, integration techniques, basic topology, convergence of sequences of functions, uniform convergence, series of functions, power series, the rigorous definition of the exponential, logarithmic, and trigonometric functions, the Arzela-Ascoli theorem, and Fourier series. *Prerequisite: Grade of C or better in MATH-SHU 201 (Honors Calculus).*

**MATH-SHU 377 *Differential Geometry*.** This course investigates the differential properties of curves and surfaces. Topics covered include differential manifolds, tangent bundle, vector fields, differential forms, Stoke’s theorem, Riemannian geometry, geodesics, and the exponential map. *Prerequisite: MATH-SHU 329 (Honors Analysis II).*

**NEURAL SCIENCE**

**NEUR-SHU 100 *Math Tools for Life Sciences.*** This course will provide a broad introduction to basic mathematical and statistical tools for a quantitative analysis in the life sciences. It will cover a broad range of topics, including introduction to linear algebra, probability, linear regression, and statistical tests.  We will use the mathematical programming language MATLAB for in-class demonstrations, computer lab during recitations and homework assignments. *Prerequisite: BIOL-SHU 22 (Foundations of Biology II) or permission by the instructor.*

**NEUR-SHU 222 *Perception*.** How do humans and other animals obtain knowledge about the world? It is easy to take perception for granted, but complex processes (only partly understood) underlie our ability to understand the world by seeing, hearing, feeling, tasting, and smelling it. Perception has fascinated philosophers, physicists, and physiologists for centuries. Currently, perception is a central topic not only in neuroscience, but also in psychology, cognitive science, and computer science. How do scientists approach perception? We seek to discover lawful relations between perceptual experiences and the physical world and to develop models of the processes and mechanisms that produce these connections. To accomplish this, we need accounts of the information, the computational processes, and the neural mechanisms involved in perception. In this course, we will discuss fundamental problems in perception (primarily vision), and learn about techniques that are applied in attempts to solve these problems. The learning outcomes of this course include a better understanding of human perception and critical thinking skills for the analysis and interpretation of the related research reports. *Prerequisite: NEUR-SHU 201 (Introduction to Neural Science) or PSYC-SHU 101 (Introduction to Psychology).*

**NEUR-SHU 251 *Behavioral and Integrative Neuroscience.***This lecture and laboratory course addresses the physiological and anatomical bases of behavior. Lectures and laboratory experiments will emphasize mammalian sensory, motor, regulatory, and motivational mechanisms involved in the control of behavior, and higher mental processes such as those involved in language and memory. *Prerequisite: NEUR-SHU 201 (Introduction to Neural Science).*

**NEUR-SHU 261 *Special topics: Neurobiology of Decision Making*.** This special topics course will review recent research that combines psychological, economic, and neurobiological approaches to study human and animal decision-making. The course will focus on our current understanding regarding the neural underpinnings of decision-making, and how evidence concerning the neural processes associated with choices might be used to advance economic and psychological theories of decision-making. Topics covered include valuation, value learning, perceptual and value-based decisions. *Prerequisite: NEUR-SHU 201 (Introduction to Neural Science) or permission by the instructor.*

**NEUR-SHU 401 *Neural Science Honors Seminar.*** Students attend regular meetings to learn research basics and discuss recent advances in neuroscience and research related issues. *Prerequisite: Students must have completed (or enrolled in) all remaining major requirements. Open only to students qualified and having been recommended by the Director of Undergraduate Studies for Neural Science.*

**NEUR-SHU 997/998 *Neural Science Capstone/Independent Study I(Fall, 2-4 points) & II (Spring, 2-4 points)*.** Provides supervised research activities in laboratories. Undergraduates are matched with a faculty member working in an area of interest to the student. Students gain experience in many aspects of research and attend regular lab/supervision meetings to discuss recent advances in neuroscience and research-related issues. Independent Study must have a combined total of at least 4 credits but no more than 8 credits to fulfill the major capstone course requirement. The 4-credit requirement can be fulfilled in one semester with a 4-credit load or over two semesters with a 2-credit load in each semester. Independent Study I and II can be done with the same supervisor or two different supervisors.

A Proposal for Independent Study form must be filled out, signed by the Director of Undergraduate Studies for Neural Science, and submitted to the Registrar. This course requires a written report on the research to be evaluated by the faculty supervisor, with a copy submitted to the DUS.

*Prerequisite: Students must have completed (or enrolled in) all remaining major requirements.*

**PHYSICS**

**PHYS-SHU 12 *General Physics II*.**This course is an introduction to electricity and magnetism, light, geometrical and wave optics. Many concepts from General Physics I will be used in this course such as velocity, acceleration, force, Newton’s laws of motion, work and energy.  The course uses high school algebra, geometry and trigonometry, vectors and vector arithmetic, and some basic calculus. The algebra, geometry, and trig are essential. The course has lecture, homework and laboratory components. *Prerequisite: PHYS-SHU 11*

**PHYS-SHU 93 *Foundations of Physics II Honors.***Continuation of Foundation of Physics I. Topics include electric charge and electric field, electric potential, Gauss’s law, capacitor, current, circuits, magnetic fields, induction, electromagnetic waves, and Maxwell’s equations (in an integral form). This is the second semester of a four-semester calculus-based introduction to Physics, and is intended for physics majors and other interested students. *Prerequisite: Foundation of Physics I Honors (PHYS-SHU 91), Freshman Math (including linear algebra, vectors, linear vector spaces and matrices, functions of several variables, partial derivatives, multiple integrals)*

**PHYS-SHU 94 *Physics II Lab*.**This laboratory course is to accompany Physics II lecture PHYS-SHU 12. Experiments in electricity and magnetism, and optics are chosen to illustrate the experimental foundations of physics presented in the lecture courses. The laboratory will also emphasize scientific writing. *Prerequisite: Foundation of Physics I Laboratory (PHYS-SHU 71)*

**PHYS-SHU 96 *Foundations of Physics IV Honors.*** Continuation of Foundation of Physics III. Topics include Relativity, Photon, Quantum Mechanics, Molecules and Condensed Matter, Nuclear Physics, Particle Physics and Cosmology. This is the fourth semester of a four-semester calculus-based introduction to Physics, and is intended for physics majors and other interested students. *Prerequisite: Foundation of Physics I Honors (PHYS-SHU 91), Foundation of Physics II Honors (PHYS-SHU 93), Foundation of Physics III Honors (PHYS-SHU 95)*

**PSYC-SHU 234 *Developmental Psychology*.**This course is designed to give students a comprehensive overview of developmental psychology following a chronological approach, covering normative growth and development from conception to adolescence. Specifically, we will examine physical, cognitive, social, and emotional development with an emphasis on psychosocial development in context. This course not only covers major theories and research findings on human development, but also provides students with the opportunity to appreciate the practical significance of sound theory and research. *Prerequisite: PSYC-SHU 101.*

**PSYC-SHU 349 *Cultures of Psychology*.** The purpose of this course is to critically examine the ways that culture--with regard to race/ethnicity, gender, and social class--has shaped major theoretical perspectives in psychology, and to familiarize students with the impact of cultural factors on the evolution of various psychological constructs. Students will explore the multifaceted nature of their own cultural backgrounds and apply it to the establishment of their worldviews. Critical examination of the process of psychological research and scholarship will be emphasized. *Prerequisite: PSYC-SHU 101.*

**SOCIAL SCIENCE**

**SOCS-SHU 253 *Nature in Social Thought.*** What’s nature? What’s our relationship to it? In this course, we examine various answers to these questions from past generations of social thinkers. We survey a range of texts from different parts of the world, written under different historical circumstances. We consider the ideas on these pages in their respective social and political contexts. Whereas some of the ideas are long gone with time, others become sediments of time – continuing to shape, and be shaped by, our thoughts and deeds. In fact, many of these ideas still inform and inspire empirical research and theoretical debates in the social sciences. As an introduction to environmental social theory, this course provides a selective overview of (1) the intellectual lineage of “nature” in different social scientific traditions, and (2) the ongoing empirical investigations into our relationship with nature in the Anthropocene. *Prerequisite: Successful completion of GPS, or instructor’s permission.*

**SOCS-SHU 318 *Ethnographic Methods*.**This course is a practicum-based seminar in methods of ethnographic fieldwork and anthropological inquiry and writing. The course explores the conceptual and critical basis of ethnography through fieldwork assignments and readings. The approach of the course is both experiential and experimental––how do we build theories about the world and our place in it? How does anthropology secure evidence and meaning in ways that are empirical, comparative, and deeply theoretical? The course offers students the opportunity for creative and rigorous training in ethnographic methods as well as a chance to produce a piece of ethnographic work.  *Prerequisites: None.*

**SOCS-SHU 426 *Poverty and Inequality Around the Globe*.** This seminar examines the causes and consequences of poverty and rising inequality around the globe. Students will study the ways in which poverty and inequality are shaped by multifaceted contexts; understand the theories underlying strategies and programs which address key poverty and inequality issues faced by many developed, developing and least developed countries; and learn about different countries' experiences addressing their own poverty and inequality issues. We consider philosophies of global justice and the ethics of global citizenship, and students are expected to critically reflect upon their own engagements with poverty relief activities and aspirations for social changes. Students should be prepared to tackle advanced social science readings, analysis, and writing. Open to seniors, and to other students with instructor’s permission.

*There are no prerequisites for the class although students should be prepared to tackle advanced social science readings and analysis.*