GERM 1412 Elementary German II
4 Hours (3-4)
This is a conversation course conducted primarily in German for the student who has completed German 1411 or its equivalent. Intensive oral-aural drill and classroom interaction will enable students to master the lexical and grammatical structures necessary in carrying on conversations in German. Prerequisite: GERM 1411.

GERM 2311 Intermediate German I
3 Hours (3-2)
This course is conducted in German, and it includes a comprehensive review of German grammar and structure. Through classroom drill, discussion, and composition, the course emphasizes vocabulary expansion and the acquisition of a basic knowledge of German culture and literature. Prerequisite: GERM 1412.

GERM 2312 Intermediate German II
3 Hours (3-2)
A course designed to provide fluency in spoken and written German through intensive grammar presentation and review, through conversational practice, and through composition and reading. The course is conducted in German. Prerequisite: GERM 2311.

GOVT 2301 Federal and State Government I
3 Hours (3-0)
This course is a comparative investigation of federal and state government. It covers the foundation and development of the constitutions of the United States and Texas (Federalism), local governments, political parties, and interest groups.

GOVT 2302 Federal and State Government II
3 Hours (3-0)
In this class students will study the legislative, executive (including the bureaucracy), and judicial systems of the U.S. and Texas, and selected problems of public policy.

GOVT 2304 Introduction to Political Science
3 Hours (3-0)
This course is the introduction to the study of political science as a discipline-political philosophy, the theory and organization of the modern state, comparative political systems, and international relations.

GOVT 2311 Mexican-American Politics
3 Hours (3-0)
This course examines the historical and socio-political culture, and the political experience of Mexican-Americans at the local, state, and national level in the United States.

GOVT 2389 Government Internship
3 Hours (3-4)
This course is designed to integrate on-campus study with practical hands-on experience in government. In conjunction with class seminars, the individual student will set specific goals and objectives in the study of government.

GRPH 1359 Object Oriented Computer Graphics
3 Hours (2-4)
Mastery of the tools and transformation options of an industry standard draw program to create complex illustrations and follow them through to the color output stage. Mastery in the use of basic elements of good layout and design principles and use of the capabilities specific to vector (object oriented) drawing software to manipulate both text and graphics with emphasis on the use of bezier curves. Acquisition of images via scanning and the creative use of clip art is included.

HART 1380, 2380 Cooperative Education
3 Hours (1-0-20)
Career related activities encountered in the student’s area of specialization are offered through a cooperative agreement between the college, employer, and student. Under supervision of the college and the employer, the student combines classroom learning with work experience. Directly related to a technical discipline, specific learning objectives guide the student through the paid work experience. This course may be repeated if topics and learning outcomes vary. The student is required to work for wages at least 20 hours per week in air conditioning, refrigeration or a related field.

HART 1391 Special Topics in Heating, Air Conditioning, and Refrigeration Technologies/Technicians
3 Hours (2-2)
Topics address recently identified current events, skills, knowledge, and/or attitudes and behaviors pertinent to the technology or occupation and relevant to the professional development of the student.

HART 1401 Basic Electricity for HVAC
4 Hours (3-3)
Principles of electricity as required by HVAC, including proper use of test equipment, electrical circuits, and component theory and operation. The class will begin with basic electricity and progress through the study of transformers, power distribution, electric motors, motor controls and circuitry. The student will be introduced to the proper operation of various electrical meters and test instruments. This course, and HART 1407 must be taken first as the prerequisite to all the HART classes.

HART 1407 Refrigeration Principles
4 Hours (3-3)
An introduction to the refrigeration cycle, heat transfer theory, temperature/pressure relationship, refrigerant handling, refrigeration components and safety. The student will learn proper soldering and brazing techniques using oxy-acetylene and air-acetylene. The student will also be introduced to the proper use of hand tools and test instruments required in both service and installation. This course, and HART 1401 must be taken first as the prerequisite for all the other HART courses.

HART 1441 Residential Air Conditioning
4 Hours (3-3)
A study of components, applications, and installation of mechanical air conditioning systems including operating conditions, troubleshooting, repair, and charging of air conditioning systems. This course covers proper recovery, recycle, and reclaim procedures. The student will also study the chemical make-up of refrigerants and how they affect the atmosphere. Replacement refrigerants and the problems they pose will also be covered. The student will gain a working knowledge of the various components used in air conditioning and refrigeration systems. The student will study various refrigerant oils and the type refrigerants they are designed for. Prerequisite: HART 1401 and HART 1407.

HART 1445 Gas and Electric Heating
4 Hours (3-3)
A study of the procedures and principles used in servicing heating systems including gas fired and electric furnaces. The student will be introduced to proper testing and troubleshooting techniques. The class will cover proper wiring, gas controls, thermostats, spark ignition and venting procedures. Prerequisite: HART 1401.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours (Lecture-Laboratory)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUEN 1147, 1148, 2147, 2148</td>
<td>Men's Choir I, II, III, IV</td>
<td>1 Hour (0-5)</td>
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<tr>
<td>MUSI 1151, 1152, 2151, 2152</td>
<td>Jazz Singers I, II, III, IV</td>
<td>1 Hour (0-4)</td>
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<tr>
<td>MUSI 1159, 2159</td>
<td>Musical Theatre I, II</td>
<td>1 Hour (1-2)</td>
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<tr>
<td>MUSI 1162, 1165</td>
<td>Diction I, II</td>
<td>1 Hour (1-1)</td>
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<tr>
<td>MUSI 1163, 1164</td>
<td>Jazz Improvisation I, II</td>
<td>1 Hour (0-3)</td>
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<tr>
<td>MUSI 1181, 1182, 2181, 2182</td>
<td>Class Piano I, II, III, IV</td>
<td>1 Hour (2-1)</td>
</tr>
<tr>
<td>MUSI 1183, 1184, 2183, 2184</td>
<td>Class Voice I, II, III, IV</td>
<td>1 Hour (2-1)</td>
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<tr>
<td>MUSI 1301</td>
<td>Fundamentals of Music</td>
<td>3 Hours (3-0)</td>
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<tr>
<td>MUSI 1304</td>
<td>Public School Music Methods and Materials</td>
<td>3 Hours (3-0)</td>
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<tr>
<td>MUSI 1306</td>
<td>Music Appreciation</td>
<td>3 Hours (3-0)</td>
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<tr>
<td>MUSI 1308</td>
<td>Survey of Music Literature</td>
<td>3 Hours (3-0)</td>
</tr>
<tr>
<td>MUSI 1309</td>
<td>Survey of Music Literature II</td>
<td>3 Hours (3-0)</td>
</tr>
<tr>
<td>PHIL 1301</td>
<td>Introduction to Philosophy</td>
<td>3 Hours (3-0)</td>
</tr>
<tr>
<td>MUSI 1310</td>
<td>American Music: History of Country Music</td>
<td>3 Hours (3-0)</td>
</tr>
<tr>
<td>MUSI 1310</td>
<td>American Music: Jazz</td>
<td>3 Hours (3-0)</td>
</tr>
<tr>
<td>MUSI 1310</td>
<td>American Music: Rock 'n' Roll Music</td>
<td>3 Hours (3-0)</td>
</tr>
<tr>
<td>OSHT 1320</td>
<td>Energy Industrial Safety</td>
<td>3 hours (3-0)</td>
</tr>
<tr>
<td>OSHT 1301</td>
<td>Introduction to Safety and Health Technology</td>
<td>3 Hours (3-0)</td>
</tr>
</tbody>
</table>

**MUSI 1301 American Music: History of Country Music**
A course designed to enable student to trace the development of country music and its function in American culture from Appalachia in the 1920s to present. Credit will be given only once for MUSI 1310.

**MUSI 1310 American Music: Jazz**
A course designed to enable student to examine the influence and history of Jazz in America and to probe its influence on American music, culture, and society. Credit will be given only once for MUSI 1310.

**MUSI 1310 American Music: Rock 'n' Roll Music**
A course designed to enable student to examine the effect of historical events on American popular music culture. Course includes listening and reporting on music in context of recent American History. Credit will be given only once for MUSI 1310.

**OSHT 1320 Energy Industrial Safety**
An overview for industrial workers of state/federal regulations and guidelines which require industrial safety training. Topics include the 29 C.F.R. 1910, 1926 and National Fire Protection Association (NFPA) 70E standards such as confined space entry, emergency action, lock out/tag out, arc flash, and other work related subjects. Students will describe the basic components of safety, health, and environmental systems as defined by the Occupational Safety and Health Administration; describe Hazardous Waste Operator (HAZWOPER) standards; locate Material Safety Data Sheets (MSDS) and interpret the data; select and don Personal Protective Equipment (PPE); perform lock out/tag out procedures; complete a confined space and hot work permit; select and employ fall protection equipment; and fill out a Job Hazard Analysis (JHA).

**PHIL 1301 Introduction to Philosophy**
“Introduction to Philosophy” samples the writings of thinkers who over the past 2500 years have challenged the human intellect with questions about the meaning of existence, the nature of reality, and the validity of knowledge. The course encourages students to re-examine and clarify their own beliefs and values.
MATH 2420 Differential Equations
4 Hours (4-0)
This course is designed to produce student proficiency in first order equations, linear differential equations, differential operators, Laplace transforms, and the applications of differential equations. It also introduces power series methods, linear systems, and numerical methods. Prerequisite: Requires a “C” or greater in MATH 2415. Course fee.

MCHN 1320 Precision Tools and Measurement
3 Hours (3-0)
An introduction to the modern science of dimensional metrology. Emphasis on the identification, selection, and application of various types of precision instruments associated with the machining trade. Practice of basic layout and piece part measurements while using standard measuring tools.

MRKG 1311 Principles of Marketing
3 Hours (3-0)
Introduction to the marketing mix functions and process. Includes identification of consumer and organizational needs and explanation of environmental issues. Students will identify the marketing mix components in relation to market segmentation; explain the environmental factors which influence consumer and organizational decision-making processes; and outline a marketing plan.

MUAP 1166, 1167 Woodwind Instruments I, II
1 Hour (2-1)

MUAP 1168 Brass Instruments
1 Hour (2-1)

MUAP 1169, 1170, 2169, 2170 Brass Instruction I, II, III, IV
1 Hour (0-2)

MUAP 1171, 1172, 2171, 2172 String Instruction I, II, III, IV
1 Hour (0-2)

MUAP 1173, 1174, 2173, 2174 Percussion Instruction I, II, III, IV
1 Hour (0-2)

MUAP 1175, 1176, 2175, 2176 Woodwind Instruction I, II, III, IV
1 Hour (0-2)

MUAP 1177, 1178, 2177, 2178 Keyboard Instruction I, II, III, IV
1 Hour (0-2)
Intermediate piano. A series of courses designed to provide students with the skills necessary to perform artistically at the piano in a variety of performance settings. One 30-minute private lesson per week. Prerequisite: Instructor’s permission.

MUAP 1179, 1180, 2179, 2180 Voice Instruction I, II, III, IV
1 Hour (0-2)

MUAP 1188 Percussion Instruments
1 Hour (2-1)

MUAP 1190, 2190 String Instruments I, II
1 Hour (2-1)

MUAP 1269, 1270, 2169, 2170 Brass Instruction I, II, III, IV
2 Hours (0-2)

MUAP 1271, 1272, 2271, 2272 String Instruction I, II, III, IV
2 Hours (0-2)

MUAP 1273, 1274, 2273, 2274 Percussion Instruction I, II, III, IV
2 Hours (0-2)

MUAP 1275, 1276, 2275, 2276 Woodwind Instruction I, II, III, IV
2 Hours (0-2)

MUAP 1277, 1278, 2277, 2278 Keyboard Instruction I, II, III, IV
2 Hours (0-2)
Advanced Piano. Prerequisite: MUSI 2178 or instructor’s permission.

MUAP 1279, 1280, 2279, 2280 Keyboard Instruction I, II, III, IV
2 Hours (0-2)
Advanced piano. A series of courses designed to provide students with the skills necessary to perform artistically at the piano in a variety of performance settings. One 60-minute private lesson per week. Prerequisite: Instructor’s permission.

MUAP 2240 Instrumental Techniques
2 Hours (2-2)

MUEN 1121, 1122, 2121, 2122 Wind Ensemble I, II, III, IV
1 Hour (0-5)

MUEN 1123, 1124, 2123, 2124 Band I, II, III, IV
1 Hour (0-5)

MUEN 1125, 1126, 2125, 2126 Orchestra I, II, III, IV
1 Hour (0-5)

MUEN 1131, 1132, 2131, 2132 Studio Ensemble I, II, III, IV
1 Hour (0-4)

MUEN 1133, 1134, 2133, 2134 Brass Ensemble I, II, III, IV
1 Hour (0-4)

MUEN 1135, 1136, 2135, 2136 String Ensemble I, II, III, IV
1 Hour (0-4)

MUEN 1137, 1138, 2137, 2138 Woodwind Ensemble I, II, III, IV
1 Hour (0-4)

MUEN 1139, 1140, 2139, 2140 Percussion Ensemble I, II, III, IV
1 Hour (0-4)

MUEN 1141, 1142, 2141, 2142 Chamber Singers I, II, III, IV
1 Hour (0-5)

MUEN 1143, 1144, 2143, 2144 Chorale I, II, III, IV
1 Hour (0-5)

MUEN 1145, 1146, 2145, 2146 Women’s Choir I, II, III, IV
1 Hour (0-5)
DEMRF 1310 Diesel Engine Testing and Repair I
3 Hours (2-4)
Introduction to testing and repairing diesel engines including related systems and specialized tools. Learn to identify, inspect, test and measure, and disassemble engine parts.

DEMRF 1317 Basic Brake Systems
3 Hours (2-4)
Basic principals of brake systems of diesel powered equipment with an emphasis on maintenance, repairs, and troubleshooting. Understand the basic theory and operation of the brake systems, diagnose brake components for wear and usability, repair brake components by rebuilding or replacing parts, and adjust brake components.

DEMRF 1321 Power Train I
3 Hours (2-4)
Fundamental repair and theory of power trains including clutches, transmissions, drive shafts, and differentials. Emphasis on inspection and repair. Prerequisite: DEMRF 1329.

DEMRF 1332 Heating, Ventilation, and Air Conditioning (HVAC) Troubleshooting and Repair
3 Hours (2-4)
Introductory course on heating, ventilation and air conditioning theory, testing, and repair. Emphasis on refrigerant reclamation, safety procedures, specialized tools, and repairs.

DEMRF 1329 Preventive Maintenance
3 Hours (2-3)
An introductory course designed to provide the student with basic knowledge of proper servicing practices. Content includes record keeping and condition of major systems and overview of written portion of the Texas Commercial Drivers License test.

DEMRF 1330 Steering and Suspension I
3 Hours (2-4)
An introductory course covering the design, functions, and repair of steering suspension systems. Students will troubleshoot and repair failed components or replace parts on various steering and suspension systems.

DEMRF 1335 Automatic Power Shift and Hydrostatic Transmissions I
3 Hours (2-4)
A study of the operation, maintenance, and repair of automatic power shift hydrostatic transmissions. Prerequisite: DEMRF 1335

DEMRF 1403 Basic Driving Skills
4 Hours (2-6)
Introduction to the use of a class 8 combination vehicle. Emphasis on safe operation and driving skills in preparation to obtain a Texas commercial Drivers License (CDL). Prerequisite: DEMRF 1329 (Special lab fees apply)

DEMRF 2312 Diesel Engines Testing and Repair II
3 Hours (2-4)
Coverage of testing and repairing diesel engines including related systems specialized tools. Learn to disassemble and reassemble engine parts. Prerequisite: DEMRF 1310.

DEMRF 2332 Electronic Controls
3 Hours (2-4)
Advanced skills in diagnostic and programming techniques of electronic control systems. Prerequisite: DEMRF 1305

DEMRF 2334 Advanced Diesel Tune-Up and Troubleshooting
3 Hours (2-4)
Advanced concepts and skills required for tune-up and troubleshooting procedures of diesel engines. Emphasis on the science of diagnostics using specialized tools and advanced concepts. Prerequisite: DEMRF 1310.

DFTG 1305 Technical Drafting
3 Hours (2-4)
Introduction to the principles of drafting to include terminology and fundamentals, projection methods, geometric construction, sections, auxiliary views, and reproduction processes. Software: AutoCAD

DFTG 1309 Basic Computer-Aided Drafting
3 Hours (2-4)
An introduction to basic computer-aided drafting. Emphasis is placed on drawing setup; creating and modifying geometry; storing and retrieving predefined shapes; placing, rotating, and scaling objects, adding text and dimensions, using layers, coordinating systems; as well as input and output devices. Co-require: DFTG 1305. Software: AutoCAD.

DFTG 1317 Architectural Drafting - Residential
3 Hours (2-4)
Architectural drafting procedures, practices, and symbols, including preparation of detailed working drawings for residential structure with emphasis on light frame construction methods. Prerequisite: DFTG 1309. Software: AutoCAD Architecture

DFTG 1345 Parametric Modeling and Design
3 Hours (2-4)
Use of parametric-based design software for 3D design and drafting. Emphasis on the parametric modeling techniques used to create rendered assemblies, orthographic drawings, auxiliary views, and details from 3-dimensional models. Prerequisite: DFTG 2340. Software: Autodesk Inventor.

DFTG 1325 Blueprint Reading and Sketching
3 Hours (3-0)
An introduction to reading and interpreting working drawings for fabrication processes and associated trades. Use of sketching techniques to create pictorial and multiple-view drawings.

DFTG 1391 Special Topics in Drafting
3 Hours (2-4)
Topics address recently identified current events, skills, knowledge, and/or attitudes and behaviors pertinent to the technology or occupation and relevant to the professional development of the student.

DFTG 2302 Machine Drafting
3 Hours (2-4)
Production of detail and assembly drawings of machines, threads, gears, cams, tolerances and limit dimensioning, surface finishes, and precision drawings. Prerequisite: DFTG 1309. Software: AutoCAD.

DFTG 2306 Machine Design
3 Hours (2-4)
Theory and practice of design. Projects in problemsolving, including press fit, bolted and welded joints, and transmission components. Prerequisites: DFTG 2340 Software: Autodesk Inventor.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Hours (Lecture-Tutorial)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HART 1401</td>
<td>Advanced Air Conditioning Controls</td>
<td>4 Hours (3-3)</td>
</tr>
<tr>
<td>HART 1401</td>
<td>Theory and application of electrical control devices, electromechanical controls and/or pneumatic controls. This course covers the proper methods for troubleshooting electrical control devices and control circuits. The student will study the correct wiring for components such as lock-out relays, oil failure controls, and thermostats. The student will be introduced to solid state controls and their functions. Prerequisite: HART 1401.</td>
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</tr>
<tr>
<td>HART 1402</td>
<td>Air Conditioning Troubleshooting</td>
<td>4 Hours (3-3)</td>
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<tr>
<td>HART 1402</td>
<td>An advanced course in application of troubleshooting principles and use of test instruments to diagnose air conditioning and refrigeration components and system problems including conducting performance tests. The student will use knowledge gained from previous classes or industry experience in order to improve their skill in determining system problems. Prerequisite: HART 1401 and HART 2442.</td>
<td></td>
</tr>
<tr>
<td>HART 1403</td>
<td>Commercial Refrigeration</td>
<td>4 Hours (3-3)</td>
</tr>
<tr>
<td>HART 1403</td>
<td>Theory of and practical application in the maintenance of commercial refrigeration; medium, and low temperature applications and ice machines. The student will be introduced to various controls and components used in these applications. This course covers piping procedures, wiring, operation, and troubleshooting. The student will also study air cooled, water cooled, and evaporative condensers and their applications. Prerequisite: HART 1401 and HART 1407.</td>
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</tr>
<tr>
<td>HART 1404</td>
<td>Air Conditioning Systems Design</td>
<td>4 Hours (4-0)</td>
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<tr>
<td>HART 1404</td>
<td>A study of the properties of air and results of cooling, heating, humidifying or dehumidifying; heat gain and heat loss calculations including equipment selection and balancing the air system. This course covers psychometrics and design procedures developed to select proper equipment for air conditioning systems. The student will be introduced to Manual J for heating and cooling loads. The student will also study proper duct sizing and design techniques. Prerequisite: HART 1401 or Instructor Approval. Capstone course.</td>
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<tr>
<td>HART 1405</td>
<td>Heat Pumps</td>
<td>4 Hours (3-3)</td>
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<tr>
<td>HART 1405</td>
<td>A study of heat pumps, heat pump control circuits, defrost controls, auxiliary heat, air flow, and other topics related to heat pump systems. This course covers specialized refrigeration systems such as heat pumps, cascade systems, chill water systems, and gas absorption systems. The student will learn the distinctive type controls and equipment necessary for these systems. Prerequisite: HART 1401 and HART 1407.</td>
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<tr>
<td>HIST 1301</td>
<td>United States History To 1877</td>
<td>3 Hours (3-0)</td>
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<tr>
<td>HIST 1301</td>
<td>This course is a survey of U.S. history from the beginnings through Reconstruction. It includes such topics as the European heritage, the colonies in North America, the creation and development of the American nation, and the sectional differences that led to the Civil War and Reconstruction.</td>
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<tr>
<td>HIST 1302</td>
<td>United States History Since 1877</td>
<td>3 Hours (3-0)</td>
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<tr>
<td>HIST 1302</td>
<td>This class is a survey of U.S. history from Reconstruction to the present. Topics include the development of the West, the growth of big business and its accompanying problems, American Imperialism, the causes and results of World Wars I and II, and the post war world. May be taken before 1301.</td>
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</tr>
<tr>
<td>HIST 1316</td>
<td>History of Christianity</td>
<td>3 Hours (3-0)</td>
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<tr>
<td>HIST 1316</td>
<td>This course is a historical survey of the development of Christianity and its role in world history, from its origins to the present time covering theological and institutional issues. Course may be taken for either credit or non-credit. Also PHIL 1316.</td>
<td></td>
</tr>
<tr>
<td>HIST 2301</td>
<td>Texas History</td>
<td>3 Hours (3-0)</td>
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<tr>
<td>HIST 2301</td>
<td>This class covers the history of Texas from pre-Columbian times to the present. Topics will include native American cultures, colonization by Europeans, the Texas Republic, the Civil War, and modern Texas. Emphasis will be given to the roles of ethnic groups and women. May be substituted for one semester of U.S. History.</td>
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<tr>
<td>HIST 2311</td>
<td>Western Civilization I</td>
<td>3 Hours (3-0)</td>
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<tr>
<td>HIST 2311</td>
<td>This course is a history of Western civilization before c. 1500, stressing the origin and development of political, economic, and religious institutions. The class also covers the theory and practice of historical research.</td>
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<tr>
<td>HIST 2312</td>
<td>Western Civilization II</td>
<td>3 Hours (3-0)</td>
</tr>
<tr>
<td>HIST 2312</td>
<td>This course is a history of Western civilization since c. 1500, stressing imperialism, nationalism, revolution, and the rise of science. The class also covers the theory and practice of historical research.</td>
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</tr>
<tr>
<td>HIST 2321</td>
<td>World Civilizations I</td>
<td>3 Hours (3-0)</td>
</tr>
<tr>
<td>HIST 2321</td>
<td>This class surveys the origin and development of civilizations in Asia, Africa, Europe, and the Americas from the beginning to c 1500. Material stresses the origin and development of political, economic, and religious institutions. The class also covers the theory and practice of historical research.</td>
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<tr>
<td>HIST 2322</td>
<td>World Civilizations II</td>
<td>3 Hours (3-0)</td>
</tr>
<tr>
<td>HIST 2322</td>
<td>This course continues the development of world civilizations in response to Western expansion from c. 1500. Topics stress imperialism, nationalism, revolution, and the rise of science. The class also covers the theory and practice of historical research.</td>
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<tr>
<td>HIST 2327</td>
<td>Mexican- American History</td>
<td>3 Hours (3-0)</td>
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<tr>
<td>HIST 2327</td>
<td>This course is a general survey of the experience of Americans of Mexican ancestry in the development of American society. The class will emphasize Native American and Spanish culture along with political, economic, and social events.</td>
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