ERP 2110: Introduction to Enterprise Resource Planning (ERP) (ERP 246)
Prerequisite: IST 1750
Fundamentals of enterprise resource planning (ERP) systems concepts, and the importance of integrated information systems in an organization. The focus of this course is on illustrating procurement, production, and sales business processes using ERP software. Use of SAP’s ERP Business Suite as an example ERP system.

ERP 4110: ERP Systems in Health Care Industry (ERP 301)
Prerequisite: IST 1750
Specialization of ERP systems and concepts to the field of Health Care, with special emphasis on Business Process Integration in this environment.

ERP 4220: Introduction to Enterprise Decision Dashboards
Prerequisite: IST 1750
Study design and implementation principles for enterprise decision dashboards utilizing enterprise-wide databases to support decision making for SAP HANA & BW, Business Objects Dashboards, IBM Watson Analytics, SAS Visual Analytics, or similar tools used for practical assignments.

ERP 4610: Customer Relationship Management in ERP Environment
Prerequisite: ERP 2110 or preceded or accompanied by ERP 5110
The course emphasizes identification (targeting), acquisition, retention, and development (expansion) of (profitable) customers, as well as effective and efficient management of customers, using information technology. SAP CRM, S/4HANA, and Sybase mobile application development are used.

Prerequisite: IST 1750
This course provides a technical overview of Enterprise Resource Planning Systems and their impact on organizations. SAP’s ERP system is introduced to illustrate the concepts, fundamentals, framework, general information technology context, the technological infrastructure, and integration of business enterprise-wide applications.

ERP 5130: ERP Enterprise Resource Planning in Small and Mid-size Enterprises
Prerequisite: BUS 5101 OR ERP 2110 or ERP 5110
This course provides an overview of enterprise applications for small and midsize companies. SAP Business One is introduced to illustrate the enterprise-wide application for entrepreneurs, which manage business functions across sales, operation, and financials, all in a single integrated system.

ERP 5210: Performance Dashboards, Scorecard, Data Visualization
Prerequisite: ERP 2110 or preceded or accompanied by ERP 5110
This course will study different performance management systems including dashboards, management cockpit, scorecards, and strategy maps in an organization. SAP’s BW, Business Objects Xcelsius, Crystal Reports, and Sybase Unwired Platform will be used to develop the applications.

ERP 5240: Enterprise Portal and Mobile Application Development
Prerequisites: Programming knowledge and either ERP 2110 or preceded or accompanied by ERP 5110
This course provides conceptual foundation and hands on experience in web-based applications development deployed through an Enterprise Portal and Mobile platform. SAP Netweaver Enterprise Portal and tools including Visual Composer, Web Dynpro, and Sybase Unwired Platform will be used for apps. Prerequisite:

ERP 5310: Supply Chain Management Systems
Prerequisite: ERP 2110 or preceded or accompanied by ERP 5110
This course introduces data-oriented techniques for business intelligence. Topics include Business Intelligence architecture, Business Analytics, and Enterprise Reporting. SAP Business Information Warehouse, BusinessObjects, or similar tools will be used to access and present data, generate reports, and perform analysis.

ERP 5410: Use of Business Intelligence
Prerequisites: IST 3423 or equivalent and (ERP 2110 or preceded or accompanied by ERP 5110)
This course introduces data-oriented techniques for business intelligence. Topics include Business Intelligence architecture, Business Analytics, and Enterprise Reporting. SAP Business Information Warehouse, BusinessObjects, or similar tools will be used to access and present data, generate reports, and perform analysis.

ERP 6210: Enterprise Resource Planning (ERP) Systems Configuration and Integration
Prerequisite: ERP 5110
Implementation and design practices for business processes in Enterprise Resource Planning (ERP) systems. The course will examine and apply techniques used in SAP ERP system for system configuration and integration, with a focus on Financial Accounting, logistics, Controlling, and production.

ERP 6220: Data Modeling & Visualization Prototyping for Enterprise Decision Dashboards
Prerequisite: ERP 5110 and one of ERP 5410, ERP 6444 or IS&T 6444
Study how to integrate data modeling and visualization prototyping in design and implementation of enterprise decision dashboards for descriptive, predictive, and prescriptive analytics. Assignments and project implementations use SAP HANA & BW, Design Studio, IBM Watson, and SAS Visual Analytics. Semester project prepared.

ERP 6444: Essentials of Data Warehouses
Prerequisite: IST 3423 or Comp Sci 304 or equivalent relational database experience
This course presents the topic of data warehouses and the value to the organization. It takes the student from the database platform to structuring a data warehouse environment. Focus is placed on simplicity and addressing the user community needs.

ERP 6610: Advanced Customer Relationship Management
Prerequisite: ERP 2110 or preceded or accompanied by ERP 5110
This course provides conceptual foundation and hands on experience in web-based applications development deployed through an Enterprise Portal and Mobile platform. SAP Netweaver Enterprise Portal and tools including Visual Composer, Web Dynpro, and Sybase Unwired Platform will be used for apps. Prerequisite:
## ERP Courses, Computer & Software Skills, Curriculum Mapping

### ERP Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Course Title</th>
<th>Course Supplement Software/SAP Modules Mappings</th>
<th>Course Focus</th>
<th>Joint Industry Certificate</th>
<th>Undergraduate Students Curriculum Options</th>
<th>Graduate Certificate (4 courses)</th>
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</thead>
<tbody>
<tr>
<td>ERP 2110</td>
<td>Intro to ERP</td>
<td>SAP ECC, FI, MM, SD, PP, CO, HR/CHM</td>
<td>Spring, Summer, Fall</td>
<td>ERP Certificate Courses (4 courses)</td>
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<tr>
<td>ERP 4110</td>
<td>ERP Systems in Health Care Industry</td>
<td>WebTech, OpenVista, etc.</td>
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<tr>
<td>ERP 4200</td>
<td>Introduction to Enterprise Decision Dashboard Prototyping</td>
<td>SAP EW/EB, SAP HANA Studio, HANA Cloud Platform (HCP), Fiori, Predictive Analytics/Lumira, SAP Designer Studio, SAS Visual Analytics &amp; Statistics, IBM Watson Analytics Applications</td>
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<tr>
<td>ERP 4610</td>
<td>Customer Relationship Management</td>
<td>SAP ERP Marketing Campaign Mgmt &amp; Lead &amp; Opportunity Mgmt, Service &amp; Interaction Center, CRM Analytics, CRM Reporting, SAP Mobility (Eclipse), SAS Enterprise Miner</td>
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<tr>
<td>ERP 5110</td>
<td>ERP Design &amp; Implementation</td>
<td>SAP ECC, FI, MM, SD, PP, CO, HR/CHM</td>
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<tr>
<td>ERP 5130</td>
<td>ERP in Small &amp; Medium Enterprise</td>
<td>Microsoft Dynamics, Power BI, CRM</td>
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<tr>
<td>ERP 5210</td>
<td>Dashboards, Scorecards, and Data Visualization</td>
<td>SAP ECC, FI, CO, SAP Design Studio, SAP EW, BI query Reporting, Tableau, SAP Predictive Analytics/Lumira, IBM Watson Analytics Platform</td>
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<tr>
<td>ERP 5240</td>
<td>Enterprise Portal and Mobile Application Development</td>
<td>SAP Portal, Netweaver technology, Visual Composer, Web Dynpro, SAP Mobility (Eclipse), SAP UIS</td>
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<tr>
<td>ERP 5410</td>
<td>Use of Business Intelligence</td>
<td>SAP BW/BI: Data Warehouse, BI query, InfoCube, SAP HANA, BusinessObjects Predictive Analytics/Lumira &amp; R, Web Intelligence, Business Explorer</td>
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<tr>
<td>ERP 5510</td>
<td>ERP System Administration</td>
<td>ASO, Solution Manager</td>
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<tr>
<td>ERP 6100</td>
<td>ERP Configuration</td>
<td>SAP ECC &amp; S/4 HANA Configuration, FI, MM, SD, PP, CO</td>
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<tr>
<td>ERP 6200</td>
<td>Data Modeling &amp; Visualization Prototyping for Enterprise Decision Dashboards</td>
<td>SAP HANA Studio (data modeling, provisioning, ETL), Predictive Analytics/Lumira, HANA Cloud Platform (HCP), Fiori, SAP Designer Studio, SAS Visual Analytics &amp; Visual Statistics, IBM Watson Analytics, SAP Web IDE</td>
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<tr>
<td>ER/IST 6444</td>
<td>Data Warehouse</td>
<td>SAP BW/BI: Data Warehouse Administration, ETL, Analytics, Reports, BI Queries, SAP HANA Studio</td>
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<tr>
<td>IS 1750</td>
<td>Introduction to MIS</td>
<td>SAP ECC Overview</td>
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<tr>
<td>IS 3443</td>
<td>Information Retrieval &amp; Analysis</td>
<td>SAS Enterprise Miner, SAS Text Miner, SAP Predictive Analytics (Social Network Analysis)</td>
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<tr>
<td>IS 6448</td>
<td>Database Marketing</td>
<td>SAS, SAS Enterprise Miner</td>
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<tr>
<td>BUS 1210</td>
<td>Financial Accounting</td>
<td>SAP FI</td>
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<td>BUS (note 1)</td>
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<td>BUS 1300</td>
<td>Business Operations</td>
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<td>BUS (note 1)</td>
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<td>BUS 4241</td>
<td>Supply Chain and Project Mgt.</td>
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<td>BUS (note 3)</td>
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<tr>
<td>MFG 2211</td>
<td>Engineering Accounting and Finance</td>
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<tr>
<td>MFG 3553</td>
<td>Manufacturing</td>
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<td>MFG 3592</td>
<td>Operational and Production Mgmt.</td>
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<td>MFG 5614</td>
<td>Supply Chain Management</td>
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<td>MFG 5708</td>
<td>Supply Chain and Material Management</td>
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<tr>
<td>MFG 5765</td>
<td>Production Planning and Scheduling</td>
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<tr>
<td>MFG 5765</td>
<td>Design for Manufacture</td>
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<tr>
<td>MFG 5797</td>
<td>Integrated Product and Process Design</td>
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<td>MFG 3710</td>
<td>Prosthetic Engineering Design</td>
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<tr>
<td>MFG 5763</td>
<td>Principles and Practice of Computer Aided Design</td>
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<tr>
<td>STAT 5260</td>
<td>Statistical Data Analysis using SAS</td>
<td>SAS Base</td>
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<td>STAT 5346</td>
<td>Regression Analysis</td>
<td>SAS Base</td>
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<td>STAT 5383</td>
<td>Geometric Analysis</td>
<td>SAS Base</td>
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### Note:
- **R**: Required Course
- **E**: Elective Course
- **E1**: ERP Emphasis
- **E2**: ERP Minor
- **E3**: Digital Supply Chain Emphasis
- **E4**: Digital Supply Chain Minor
- **R1**: ERP Business Intelligence
- **R2**: Digital Supply Chain Design

### Note:
- Note 1: Choose ONE course from this group
- Note 2: Choose ONE course from this group
- Note 3: Choose ONE course from this group
- Note 4: Choose AT LEAST ONE from this group
Undergraduate (for all majors)

- ERP Emphasis (3 courses)
- ERP Minor* (5 courses)
- Digital Supply Chain minor* (5 courses)

Graduate Certificate & non-Degree (4 Courses)**

- Enterprise Resource Planning (ERP)
- Business Intelligence (BI)
- Digital Supply Chain (SCM)

Graduate

- MS IST
- MBA
- MS Manufacturing Engineering (thesis)
- MEng Manufacturing Engineering
- MS Eng. Mgt.
- ...

* Minors are offered for students of all S&T majors
** A student who completes a Graduate Certificate, having earned a grade of “B” or better in each of the Certificate courses, requirements for minimum undergraduate GPA and for GRE/GMAT requirement will be waived for Graduate programs listed.
ERP Supported Business & IT Areas

- **Customer Relation Management**
  - ERP6640
  - ERP4610
  - ERP5310
  - ERP5110

- **Supplier Relation Management**
  - ERP5310
  - ERP5110
  - ERP6120

- **Advanced Planning & Scheduling**
  - ERP5310

- **Transactional applications (B2B/B2C, e-commerce)**
  - ERP2110
  - ERP5240
  - ERP5130
  - ERP5110
  - ERP6120

- **BI, Data Mining**
  - ERP5410 ★
  - IST6443
  - ERP4220 ★
  - ERP6220 ★

- **Data Warehouse**
  - ERP5410 ★
  - ERP6444 ★
  - IST6444 ★
  - ERP4220 ★
  - ERP6220 ★

- **Visualization/Dashboard/Scorecard**
  - ERP5210 ★
  - ERP6220 ★
  - ERP4220 ★

- **SCM and Collaborative Logistics**
  - ERP5310

- **Course covers Big Data Analytics**
  - ERP5310

- **Course covers Mobile app**
  - ERP5310

**Course covers Big Data Analytics**
**Course covers Mobile app**

**BI:** Business Intelligence
**CRM:** Customer Relation Management
**SRM:** Supplier Relation Management