



TUOTANTOTALOUS (KAUPPATIETEET) INDUSTRIAL MANAGEMENT

(TUTA-KOODIN OPINTOJAKSOT)

(COURSE CODE TUTA)

Perusopinnot Core Studies

■ Basic Course in Quality

Tuotanto- ja palvelutoiminnan laatu

Code: TUTA1060

Credits: 5 ECTS

Prerequisites:-

Learning Outcomes: student will gain an understanding on the basics of Quality Management, the role of Quality and Quality Management Systems, Processes and Scorecards in various Businesses and various possibilities for the Development of Quality Procedures within a company on a Yearly Cycle.

Gene

ric skills: Course develops lifelong learning, critical and analytical thinking, problem-solving and decision-making skills.

Content: History of Quality Management, Quality Management Systems, Processes, Balanced Scorecards, Continuous Improvement, Self-Assessment, Audits and Reviews, Quality Standards, Quality Problem Solving Techniques and Tools, Quality Award Frameworks

Study Materials:

1. Total Quality Management and Operational Excellence: Text with Cases, John S. Oakland. ISBN: 978-0-41563550-9. London – Routledge, 4th edition (June 14, 2014)
2. Other course material provided by the lecturer

Teaching Methods: 30 h lectures, independent work 105 h

Modes of Study: written exam and participation in possible visitor lectures

Languages: English

Grading: Scale 1-5 or fail

Responsible Person: Katariina Pukkila-Palmunen

Teacher(s): Katariina Pukkila-Palmunen

Responsible Unit: School of Technology and Innovations

Additional information: available only to students of the B.Sc programme in Industrial Management and Information Systems and to students who have been granted right to minor in Industrial Management

■ Sustainable Energy Business

Sustainable Energy Business

Code: TUTA1110

Credits: 5 op

Prerequisites: -

Learning Outcomes: Student will gain an understanding on various business models on producing energy and sustainable development, as well as the role of distributed energy production in total energy production. After completing the course student can explain the concept of sustainable development, apply sustainable development when defining targets in energy production and can explain how the energy business development affects the environment, the financial development of companies and their surrounded society, as well as how the environmental- and energy business management systems are part of companies management- and quality management systems and the operational management of companies.

Generic skills: Lifelong learning, critical and analytical thinking, problem-solving and decision-making skills.

Content: Various energy sources and their business prerequisites from the perspective of sustainable development, factors affecting energy production and consumption, features of distributed energy production from the



perspective of sustainable development, energy consumption and various ways to save energy, basics of energy business, environmental- and energy management systems and related standards as part of the companies management and quality systems.

Modes of Study: Written exam and participation in possible visitor lectures

Languages: English

Study Materials:

Renewable Energy Systems. David Buchla, Thomas Kissell, Thomas Floyd. Pearson Education, Inc. 2015.

Sustainable Energy, Choosing Among Options. Jefferson W. Tester, Elisabeth M. Drake, Massachusetts Institute of Technology. 2005. ISBN: 0-262-20153-4.

Energy Visions 2050. VTT, Edita (2010)

Additional reading:

Environmental Science, Systems and Solutions, 5th edition. Michael L. McKinney, Robert M. Schoh, Logan Yonavjak. Jones & Bartlett Learning, 2013, USA. ISBN: 978-1-4496-6139-7.

Other course material provided by the lecturer

Teaching Methods: 30 h lectures, independent work 105 h

Grading: Scale 1–5 or fail

Responsible Person: University Teacher Katariina Pukkila-Palmunen

Teacher: Katariina Pukkila-Palmunen

Responsible Unit: School of Technology and Innovations

Additional Information: available only to students of the B.Sc programme in Industrial Management and Information Systems and to students who have been granted right to minor in Industrial Management

■ Projektitoiminta

Project Management

Koodi: TUTAC1030

Tyyppi: Pakollinen VY

Laajuus: 3 op

Vastuuorganisaatio: VY

Vastuuopettaja (VAMK): Timo Kankaanpää

Vastuuopettaja (VY): Ville Tuomi

Opettajatiimi: Ville Tuomi ja tuotantotalouden tuntiohjaajat

Opetuskieli: suomi

Osaamistavoitteet: kurssin suoritettuaan opiskelija osaa:

1. selittää projektitoimintaan liittyvät olennaiset käsitteet
2. kuvata projektinhallintaan liittyvät tietotarpeet ja miten näitä tietoja hankitaan ja hyödynnetään, sekä
3. laatia projektisuunnitelman.

Opintojakso kehittää kirjallista ilmaisua (projektisuunnitelman laatiminen) ja organisaation toiminnan tunteamista (projektien johtaminen).

Opiskelijan työmäärä: itsenäinen verkkotyöskentely 81 h (VY:n opiskelijat), VAMK:n opiskelijoilla mahdollisuus osallistua 2 h johdantoluontoon.

Edeltävät opinnot / Suositellut valinnaiset opinnot: -

Sisältö: projektikäsitteistö, yksittäisen projektin suunnittelu ja hallinta; projektisuunnitelman laatiminen, aikaohjaus, resurssiohjaus, projektin talous ja hinnoitus, poikkeamien taloudellinen hallinta, projektin laadunvarmistus ja riskien hallinta, projektitoiminnan konsepti, moniprojektiympäristö, monen yrityksen projektit, asiakkaan ja toimittajan projektien yhteensovittaminen, projektoivien yritysten verkko ja verkon hallinta, projektikulttuurit ja globaali organisaatio

Oppimateriaali: Pelin, Risto (2009); Projektinhallinnan käsikirja (sekä uudemmat että vanhemmat painokset käyvät) sekä opettajan materiaali (Moodlessa), Moodlen kurssiavain on projektitoiminta

Opetusmuoto / Opetusmenetelmät: itsenäinen verkkotyöskentely 81 h, voidaan suorittaa ympäri lukuvuoden. Opiskelija laatia projektisuunnitelman annettujen ohjeiden mukaisesti.

Arviointikriteerit: Asteikko 1-5/Hylätty.

Arvosana 1: osaa kirjoittaa projektisuunnitelman kaikki osiot selkeästi ja loogisesti, niin että suunnitelmasta näkee, että yli puolet kurssin sisällöstä on ymmärretty.

Arvosana 3: osaa kirjoittaa projektisuunnitelman kaikki osiot oikein, selkeästi ja loogisesti, niin että suunnitelmasta näkee, että yli puolet kurssin sisällöstä on ymmärretty. Projektityökalujakin on käytetty.

Arvosana 5: osaa kirjoittaa projektisuunnitelman kaikki osiot oikein, selkeästi ja loogisesti, niin että suunnitelmasta näkee kurssin sisällön ymmärtämisen. Projektityökaluja on käytetty havainnollisesti ja analyttisesti.

Arviointimenetelmät: Harjoitustyön arviointi projektisuunnitelman kaikkien osa-alueiden osalta.

Lisätietoja: Vaasan yliopiston ja Vaasan ammattikorkeakoulun yhteistyökurssi



■ Yrityksen reaaliprosessit *The Real Processes of a Company*

Koodi: TUTAC1090

Tyyppi: Pakollinen VY

Laajuus: 3 op

Vastuuorganisaatio: VY

Vastuuopettaja (VAMK): Lotta Saarikoski

Vastuuopettaja (VY): Ville Tuomi

Opettajatiimi: tuotantotalouden opettajat

Opetuskieli: Suomi

Osaamistavoitteet: Opintojakson suoritettuaan opiskelija osaa:

1. selvittää yrityksen reaaliprosessin kulun ja siihen keskeisesti liittyvät käsitteet ja käsitteiden väliset yhteydet
2. osaa syventää perehtymistään kurssi aihepiiriin (elinikäistä oppimista)

Opiskelijan työmäärä: 81h, josta lukujärjestykseen merkittyä lähiopetusta 12 h

Edeltävät opinnot / Suositellut valinnaiset opinnot: -

Sisältö: hankintatoimi ja -logistiikka, sisäinen logistiikka, tuotantoprosessi ja sen kehittäminen, laatu ja prosessit, läpimenoaika ja sen vaikutus sitoutuvaan pääomaan ja laatuun, jakelulogistiikka

Opiskelumateriaali:

1) Uusi-Rauva, Erkki; Miettinen, Asko; Kouri, Ilkka; Haverila, Matti J (2005), Teollisuustalous, Infacs Oy (tai uudempi). 2) opettajan materiaali (luentomateriaali ja Moodlen materiaali)

Opetusmuoto / Opetusmenetelmät: Luennot h ja tentti.

Arviointikriteerit: Asteikko 1-5/Hylätty.

Arvosana 1: ymmärtää vähintään puolet opintojakson sisällöstä (vähintään puolet tenttikysymyksistä on oikein).

Arvosana 3: ymmärtää suurimman osan opintojakson sisällöstä.

Arvosana 5: ymmärtää suurimman osan opintojakson sisällöstä (väh. 90 %).

Arviointimenetelmät: Tentti, joka arvioidaan em. kriteereillä

Lisätietoja: Vaasan yliopiston ja Vaasan ammattikorkeakoulun yhteistyökurssi

Aineopinnot Intermediate Studies

■ Basic Course in Logistics *Logistiikka, peruskurssi*

Code: TUTA2160

Credits: 5 ECTS

Prerequisites: TUTA2170 Introduction to Production Management and TUTA1090 The Real Processes of a Company

Learning Outcomes: Student will gain an understanding on the Basics and Challenges of International Logistics, Activities, Processes, Scorecards and Systems, as well as the Counterparts in Logistics. Course develops problem-solving and decision-making skills, critical and analytical thinking and lifelong learning.

Content: Strategic and Financial Logistics, Logistics and Information Technology, SCM, Order, Inventory, Warehousing and Transportation Management, International Logistics

Study Materials:

1. book: Contemporary Logistics, 11/E. Paul R. Murphy, A. Michael Knemeyer
ISBN-10:0132953463, Prentice Hall, 2015, published 01/10/2014

2. other course material provided by the lecturer

Teaching Methods: 30 h lectures, independent work 105 h

Modes of Study: written exam and participation in possible visitor lectures

Languages: English

Grading: Scale 1–5 or fail

Responsible Person: N.N.

Teacher(s): N.N., Katariina Pukkila-Palmunen

Responsible Unit: School of Technology and Innovations



Additional Information: available only to students majoring in Industrial Management, B. Sc. majoring in Industrial Engineering and Management, M. Sc. students of Industrial Systems Analytics, and to students who have been granted the right to minor in Industrial Management

■ Global Sourcing and Procurement

Kansainvälinen hankinta- ja ostotoiminta

Code: TUTA2140

Credits: 5 ECTS

Prerequisites: -

Learning Outcomes: Student will gain an understanding on the Strategic Roles of Sourcing, Procurement and Suppliers in Global Value Chain and Business Environment, understand various Sourcing Strategies, Processes, Organisation Models and Scorecards, able to perform Supply Research and Supplier Evaluations, setting up Supplier related Scorecards and understand the strategic difference between Outsourcing, Onshoring and Offshoring. Course develops oral, written and interpersonal skills (Group Work, English), critical and analytical thinking, problem-solving and decision-making skills and organisational operation.

Content: Role of Purchasing in the Value Chain, Purchasing Strategy and Management Process, Category Management, Supply Research, Performance Measurement, SCM, Outsourcing

Study Materials:

1. Purchasing and Supply Chain Management: Analysis, Strategy, Planning and Practice by Arjan J. van Weele, 5th edition, ISBN: 978-1-4080-1896-5, 2010, Cengage Learning EMEA
2. Delivering Customer Value through Procurement and Strategic Sourcing – A professional Guide to Creating a Sustainable Supply Network, Walter L. Wallace, Yusen Xia Pearson Education Inc., 2015, USA. ISBN-10: 0-13-388982-3
3. other course material provided by the lecturer

Teaching Methods: lectures 30 h, independent work 105 h

Modes of Study: written exam, written group work and participation in possible visitor lectures

Languages: English

Grading: Scale 1–5 or fail, 65% written exam and 35% group work

Responsible Person: Katariina Pukkila-Palmunen

Teacher(s): Katariina Pukkila-Palmunen

Responsible Unit: School of Technology and Innovations

Additional Information: available only to students of the B.Sc programme in Industrial Management and Information Systems and to students who have been granted right to minor in Industrial Management

■ Innovative Product Development and Product Lifecycle Management

Innovatiivinen tuotekehitys ja tuotteen elinkaaren hallinta

Code: TUTA2230

Credits: 5 ECTS

Prerequisites: basic studies in Industrial Management and Project Management

Learning Outcomes: student will gain an understanding on the Innovation Process and various Innovations Methods and Tools and their usage in Manufacturing Business, Open Innovations Networks and their Value, Product Development Process, Concept Design, Basic Principles and Role of PLM in a Company, Challenges of creating a Product Structure and Strategy within a Company regarding of the Industry in case and understanding the preconditions of PLM in e-Commerce. Course develops oral, written and interpersonal skills (Group Work, English), critical and analytical thinking, problem-solving and decision-making skills, product development and marketing and organisational operation.

Content: Basics of Innovations Process, Methods, Tools and Networks, Product Development and Piloting in Production, Concept Design, PLM and PLM Systems integration with other Business Applications, Product Structures and Strategies, Benefits and Challenges of a PLM System in various Industries, e-Business and PLM

Study Materials:

1. Managing Innovation. Tidd, Joe; Bessant, John & Pavitt Keith (2009 4th Edition), Wiley
2. Ulrich, Karl ja Eppinger Steven (2007 4th Edition), Product Design and Development, McGraw-Hill Inc
3. Product Lifecycle Management. Antti Saaksvuori, Anselmi Immonen. Springer. ISBN: 978-3-642-09684-6.
4. Product Lifecycle Management. John Stark. Springer. ISBN: 978-0-85729-546-0
5. Other course material provided by the lecturer

Teaching Methods: lectures and exercises 30h, independent work 105 h



Modes of Study: Written exam, written group work and participation in possible visitor lectures

Languages: English

Grading: Scale 1–5 or failed, 65% written exam and 35% group work

Responsible Person: Katariina Pukkila-Palmunen

Teacher: Katariina Pukkila-Palmunen

Responsible unit: School of Technology and Innovations

Additional Information: available only to students of the B.Sc programme in Industrial Management and Information Systems and to students who have been granted right to minor in Industrial Management

■ Kandidaatintutkielma

Bachelor's Thesis

Koodi: TUTA2980

Laajuus: 10 op

Edellytykset: tuotantotalouden perus- ja aineopinnot

Osaamistavoitteet: Opintojakson jälkeen opiskelija osaa valita tutkimusaiheen, laatia tutkimussuunnitelman sekä tuottaa itsenäisesti pienen tutkimuksen, hän osaa myös tunnistaa ja koota tarvittavan materiaalin työnsä tueksi. Opintojakso kehittää kriittistä ajattelua ja analyttisyyttä sekä IT-taitoja.

Sisältö: Tutkimusaiheen valinta ja tutkimussuunnitelman laatiminen; tutkielman aiheena voi olla: yrityksen toimeskianto, laitoksen projektissa tehtävä tutkimus tai opiskelijan valitsema aihe, aiheesta on aina sovittava työn ohjaajan kanssa, tutkielman ulkoasu on kirjoitusohjeiden mukainen ja laajuus on 35-50 sivua

1. tiedonhankintataidot 2 suoritetaan pakollisena osana kandidaatintutkielman tekemistä
2. seminaareissa käydään läpi mm. aiheen valintaa ja tutkimussuunnitelman tekemistä, kunkin opiskelijan on osallistuttava seminaareihin vähintään 3 kertaa työtä tehdessään
3. tutkimussuunnitelman ja valmiin työn esittäminen ovat pakollisia jokaiselle tutkielman tekijälle
4. tutkielman arvostelu: lopullinen tutkielma palautetaan sähköisesti PDF-muodossa Osuva-järjestelmään, tutkielman arvostelee ohjaaja

Kandidaatintutkielmasta kirjoitetaan kypsyysnäyte ohjaajan määräämästä aiheesta. Kypsyysnäytteeseen voi ilmoittautua, kun tutkielma on jätetty tarkastettavaksi lopullisessa muodossaan.

Oppimateriaali ja kirjallisuus: -

Toteutustavat: Seminaarit ja itsenäinen työskentely 270 h

Suoritustavat: Osallistuminen seminaareihin vähintään 3 kertaa, tutkielman laatiminen, kypsyysnäyte. Tutkielmaseminaari järjestetään sekä syys- että kevätlukukaudella. Opiskelija ilmoittautuu joko suomenkieliseen tai englanninkieliseen ryhmään (max. 30 h/ryhmä). Ilmoittautuessaan opiskelija sitoutuu kirjoittamaan tutkielmansa ko. lukukauden aikana.

Opetus- ja suorituskielet: suomi, englanti

Arvostelu: asteikolla 1-5 tai hylätty

Vastuuhenkilö: Ville Tuomi

Opettaja: Ville Tuomi ja tuotantotalouden opettajat

Vastuuorganisaatio: Tekniikan ja innovaatiojohtamisen akateeminen yksikkö

Lisätietoja: kts. kandidaatintutkielman laadintaohjeet sekä kirjoitusohjeet, kandidaatintutkielmat tarkistetaan Turnitin-plagiaatintunnistusjärjestelmällä

■ Nordic Perspectives on Marketing

Nordic Perspectives on Marketing

Code: MARK2022

Credits: 5 ECTS

Ks. Kurssikuvaus weboodista

■ Sales Management and Negotiation Skills

Code: TUTA2240

Credits: 5 ECTS

Prerequisites: Basic understanding of marketing principles

Learning Outcomes: The student understands the process of selling and how to lead sales-team.

After completing the course, you can analyze sales processes in organizations, identify practices of good sales management in organizations, plan, conduct and follow-up sales work, use various argumentation techniques



in selling, present and argue for your sales activities and reports in written and oral communication. Course develops oral, written and interpersonal skills (Group Work, English), critical and analytical thinking, problem-solving and decision-making skills, product development and marketing and organisational operation.

Content: The purpose of this course is to concentrate in theories and models for personal selling, negotiation skills and sales management, which are discussed and practiced in details with industry case examples. The lectures prepare the students for field work, which take places in close cooperation with sales oriented organizations. This course is an introduction to the field of sales management including various aspects of it, e.g. sales strategy, scorecards, personal selling and team leadership. It offers a comprehensive view on contemporary sales issues and tunes in the latest discussion on value creation in selling processes and business networks. The course, which has an interdisciplinary approach, has an emphasis on sales work in practice.

Study Materials:

1. Jobber, D. & Lancaster, G. (2012). Selling and Sales Management (9th Ed.). Pearson Education Ltd. Edinburgh Gate, Harlow, England.
2. The Mind of the Customer by Richard Hodge and Lou Schachter, ISBN: 0-07-147027-1, 2006, McGraw-Hill.
3. Other course material provided by the University Teacher
4. Additional reading will be informed in the beginning of the course by the University Teacher.

Teaching Methods: 135 hours divided into:

Scheduled (contact) hours: 48, Non-scheduled work: 87 (individual and group work)

Modes of Study: Written exam, written group work, participation in possible visitor lectures, in-class discussions

Languages: English

Grading: Scale 1-5 or fail, 65% written exam, 35% group work

Responsible Person: Katariina Pukkila-Palmunen

Teacher: Katariina Pukkila-Palmunen, professor Arto Rajala (Marketing), professor Peter Björk (Hanken)

Responsible Unit: School of Technology and Innovations

Additional information:

Available only to students of the B.Sc programme in Industrial Management and Information Systems and to students who have been granted right to minor in Industrial Management, altogether 30 students.

■ **Tuotannonohjaus, peruskurssi**

Introduction to Production Management

Koodi: TUTAC2170

Laajuus: 5 op

Edellytykset: MS-excel-ohjelman perustaidot (suositellaan tilastotieteen perusteiden osaamista)

Oppimistavoitteet: suoritettuaan kurssin opiskelija pystyy kehittämään tuotannonohjausprosessia sen eri vaiheissa, esimerkiksi valitsemalla menetelmiä kysynnän ennustamiseen tai varaston täydennyksiin

Sisältö: kysynnän ennustaminen, kapasiteettisuunnittelu, varastohallinta, tuotantosunnittelu, materiaali-tarvelaskenta, töidenjärjestely. Opintojakso kehittää kriittistä ajattelua ja analyttisyyttä sekä IT-taitoja (MS-excel).

Oppimateriaali ja kirjallisuus: 1. Krajewski, Ritzman & Malhotra (2007): Operations Management (soveltuvin osin) 2. opettajan materiaalit

Toteutustavat: luennot 12 h ja harjoitukset 12 h, yritysvierailuja / kirjatentti

Suoritustavat: aktiivinen osallistuminen lähiopetukseen + tentti tai pelkkä kirjatentti

Opetus- ja suorituskielet: opetuskieli suomi, suorituskielet suomi ja englanti

Arvostelu: asteikolla 1-5 tai hylätty

Vastuhenkilö: KTT Ville Tuomi

Opettaja: KTT Ville Tuomi, Katariina Pukkila-Palmunen

Vastuorganisaatio: Tekniikan ja innovaatiojohtamisen akateeminen yksikkö

Lisätietoja: vain tuotantotalouden opintosuunnan opiskelijoille, tekniikan tuotantotalouden suunnan opiskelijoille ja tuotantotalouden sivuaineoikeuden saaneille. Kurssin opetus on suomeksi, mutta kurssin voi suorittaa englanniksi kirjatenttinä.

■ **Introduction to Production Management**

Tuotannonohjaus, peruskurssi

Code: TUTA2170

Credits: 5 ECTS

Prerequisites: Basic skills in MS-excel, basic skills in statistics is recommended



Learning Outcomes: A student will be able to improve different phases of production management process, e.g. by choosing methods for forecasting demand or replenishing storage

Content: forecasting demand, capacity planning, stock management, material requirement planning, production planning, material requirements planning, scheduling. The course develops critical and analytical thinking and IT skills.

Learning Materials: Krajewski, Ritzman & Malhotra (2007): Operations Management

Teaching Methods: Book exam

Modes of Study: Self study + book exam

Languages: language(s) of instruction: Finnish; completion language(s): Finnish and English

Responsible Person: Dr. Ville Tuomi

Teacher: Dr. Ville Tuomi, Katariina Pukkila-Palmunen

Responsible Unit: School of Technology and Innovations

Additional Information: Available only to students majoring in Industrial Management, students of the Industrial Management and Engineering specialization, and to students who have been granted right to minor in Industrial Management. The teaching is in Finnish but the course can be completed in English as a book exam.

■ Tuotantolaitosten suunnittelu

Production Flow and Layout Planning

Koodi: TUTA2180

Laajuus: 5 op

Edellytykset: -

Osaamistavoitteet: Opintojakson jälkeen opiskelija osaa analysoida tuotantolaitoksen sijaintiin vaikuttavia tekijöitä ja valita sopivan sijaintipaikan, opiskelija osaa suunnitella tuotantolaitoksen layoutin karkealla tasolla ja tuntee tuotantolinjan tasapainottamisen periaatteet sekä ryhmäteknologian periaatteet, lisäksi opiskelija osaa ottaa huomioon tuotantolaitosten ergonomisia, laadullisia- ja ympäristönäkökohtia. Opintojakso kehittää yhteistyötaitoja (ryhmätyö), suullista ja kirjallista ilmaisua (harjoitustyön laatiminen ja esittäminen, suomi) sekä kriittistä ajattelua ja analyttisyyttä.

Sisältö: tuotantolaitoksen sijaintipaikan valinta, tuotantolaitoksen layout-suunnittelu, tuotantolinjan tasapainottaminen, ryhmäteknologian soveltaminen, tuotantolaitosten ergonomiset näkökohdat

Oppimateriaali ja kirjallisuus:

1. opettajan ilmoittama materiaali

lisämateriaalina voi soveltuvin osin käyttää:

- Stephens, M. P. & Meyers, F. E. Manufacturing Facilities – Design & Material Handling, Purdue University Press, 5th edition (2013)
 - Tompkins, J.; White, J.; Bozer, Y. & Tanchoco, J. Facilities planning, Wiley, 4th edition (2010)

Toteutustavat: lähiopetus, itsenäinen verkko-opiskelu ja ryhmätyöskentely 135 h

Suoritustavat: aktiivinen osallistuminen luennoille, harjoituksiin ja yritysvierailuille sekä harjoitustyö

Opetus- ja suorituskielet: suomi

Arvostelu: asteikolla 1-5 tai hylätty

Vastuhenkilö: KTT Ville Tuomi

Opettaja: KTT Ville Tuomi, Katariina Pukkila-Palmunen

Vastuuorganisaatio: Tekniikan ja innovaatiojohtamisen akateeminen yksikkö

Lisätietoja: kurssi on vain tuotantotalouden opintosuunnan opiskelijoille ja tuotantotalouden sivuaineoikeuden saaneille.

■ Tuotantotalouden kirjallisuustutkimus ja -analyysi

Literature Study and Analysis in Industrial Management

Koodi: TUTA2190

Laajuus: 1-5 op

Edellytykset: tuotantotalouden muut perus- ja aineopintokurssit

Osaamistavoitteet: opiskelija osaa etsiä, kuvata ja jäsenellä annetun aihepiirin käsitteet sekä soveltaa niitä annetun ongelman ratkaisuun. Opintojakso kehittää kriittistä ajattelua ja analyttisyyttä sekä kirjallista ilmaisua (Geneeriset taidot).

Sisältö: tuotantotalouden ajankohtaisia aihepiirejä

Oppimateriaali ja kirjallisuus: annetun aihepiirin kirjat, artikkelit sekä online-lähteet

Toteutustavat: opettajan antama yksilöllisen tehtävä, opiskelijan itsenäinen työskentely 27-135 h



Suoritustavat: kirjallisuustutkimus ja -analyysi annetusta aiheesta joka muotoillaan akateemiseksi raportiksi: kansilehti, sisällysluettelo, numeroidut kappaleet: käsitteet, jäsentely, analyysi / sovellus annetun ohjeen mukaisesti, lähdeluettelo

Opetus- ja suorituskielet: suomi

Arvostelu: hyväksytty / hylätty

Vastuuhenkilö: Jussi Kantola

Opettaja: Jussi Kantola, Petri Helo

Vastuuorganisaatio: Tekniikan ja innovaatiojohtamisen akateeminen yksikkö / Tuotantotalouden ja tietojärjestelmätieteen kandidaattiohjelma KTK

Lisätietoja: vain tuotantotalouden opintosuunnan opiskelijoille, jotka ovat KTK-tutkinnon loppuvaiheessa

Syventävät opinnot Advanced Studies

■ Advanced Course in Quality and Reliability Management

Laatujohtaminen ja luotettavuustekniikka

Code: TUTA3050

Credits: 5 ECTS

Prerequisites: TUTA1060 Basic Course in Quality or similar content related previous studies

Learning Outcomes: Student will gain a deeper understanding on Total Quality Management, Control and Continuous Improvement in various Industries and Businesses, understand the Role and Implementation of various Quality Standards, learn to create a integrated Business, Quality and Environmental Management System and Balanced Scorecards Palette, manage the yearly Quality System Assessments, Audits and Controlling Activities, build up Reliability Procedures within a Company and understand the Role and Implementation of various Maturity Models, also being able to build up Program and Project Quality. Course develops oral, written and interpersonal skills (Group Work, English), critical and analytical thinking, problem-solving and decision-making skills and organisational operation.

Content: Total Quality Management, Integrated Business, Quality and Environmental Management Systems, various Quality Standards, Assessments and Audits, Quality Management Awards and Frameworks, Maturity Models, Balanced Scorecards Palette, Program and Project Quality, Continuous Improvement, Quality Management Systems and Reliability in various Industries

Study Materials:

1. Total Quality Management and Operational Excellence: Text with Cases, by John S. Oakland, ISBN: 978-0-41563550-9, London - Routledge; 4 edition (June 14, 2014)
2. Managing, Controlling and Improving Quality by Douglas C. Montgomery, Cheryl L. Jenkins, Michele E. Phund, Wiley April 2010, ISBN: 978-0-471-69791-6
3. Other course material provided by the lecturer

Teaching Methods: lectures and exercises 30 h, independent work 105 h

Modes of Study: written exam, written group work and participation in possible visitor lectures

Languages: English

Grading: scale 1-5 or fail, 65% written exam and 35 % group work

Responsible Person: Katariina Pukkila-Palmunen

Teacher(s): Katariina Pukkila-Palmunen

Responsible Unit: School of Technology and Innovations

Additional Information: this course is available only for the master students in Industrial Management and Industrial Systems Analytics

■ Anticipation and Diffusion of Technological Innovations

Teknologisten innovaatioiden ennakointi ja levittäminen

Code: TUTA3220

Credits: 5 ECTS

Prerequisites: TUTA2230 Innovative Product Development and Product Lifecycle Management or otherwise acquired basic knowledge about product development and innovation management



Learning Outcomes: To understand the concept of technology progress, how technologies evolve, how technologies compete with each other and how this affects enterprises and their NPD, to be able to analyze the dynamics involved in technological innovations; in particular how social, economic and cultural factors interact with technological factors in innovation processes and diffusion of innovations, to be able to understand the generic factors influencing the diffusion of innovations and based these the student can analyze prediction of failure patterns of diffusion. Course develops lifelong learning, critical and analytical thinking and interpersonal skills.

Content: the course contains two parts: 1) anticipation and management of technological innovations, both sustaining and disruptive innovations; 2) generic factors influencing the diffusion of innovations and prediction of future patterns of diffusion

Study Materials: for the book exam:

- 1) Christensen, C. M. (2011 or newer ed., also hard cover ed. 1997 can be used.): The Innovator's Dilemma, The Revolutionary Book That Will Change the Way You Do Business
- 2) Tidd, J. (2010 or newer ed.): Gaining Momentum: Managing the Diffusion of Innovations (except chapters 8 and 9)

For the classroom teaching:

- 1) the books mentioned above
- 2) scientific articles

Teaching Methods: classroom teaching (PBL) OR self-study 135 h

Modes of Study: active participation and assignments OR book exam

Languages: language(s) of instruction: English; completion language(s): English

Grading: scale 1-5 or fail

Responsible Person: Dr. Ville Tuomi

Teacher(s): Dr. Ville Tuomi, Katariina Pukkila-Palmunen

Responsible Unit: School of Technology and Innovations

Additional Information: this course is available only for the master students in Industrial Management or Marketing.

■ Building Trust in Industrial Networks

Code: TUTA3280

Credits: 3 ECTS

Prerequisites: students are expected to be familiar with the basic issues of management

Learning Outcomes: After completing the course the student can synthesize information regarding the trust management in networks. Identify, explain and predict individual behaviour in networks connected with trust sustaining and building. Appreciate the importance of trust in networks in industrial management. Identify and evaluate the role of leadership, human resource management, knowledge management in the strategy of trust management. This course will also support the development of students' skills in the area of reading and analyse academic literature. The course develops organizational, communication and interpersonal skills.

Content: Orientation on trust in industrial management (definitions, types of trust); The importance of trust in networks; The process of trust in management: building, rebuilding and sustaining trust in networks; Identifying organizational and interpersonal trust; Trust and relations with partners in networks; Trust and learning processes in networks; Authentic Trust and leadership; Loyalty trust as a concept which generates innovation; Trust and human resource management; Trust and knowledge management in networks; Measuring trust – quantitative and qualitative studies; New technologies and trust in networks (cybertrust).

Study Materials:

1. lecture material
2. books and book chapters
3. web resources
4. scientific articles supplied by the teacher

Teaching Methods: lectures 16 h, independent work 65 h

Modes of Study: lectures 16 h, independent work 65 h

Languages: English

Grading: scale 1-5 or fail

Responsible Person: Joanna Paliszkievicz

Teacher(s): Joanna Paliszkievicz, Sara Tilabi

Responsible Unit: School of Technology and Innovations

Additional Information: available only to students of the Master's Programme in Industrial Management



■ Contemporary Topics in Industrial Management

Tuotantotalouden erityiskysymyksiä

Code: TUTA3060

Credits: 2-5 ECTS

Prerequisites: -

Learning Outcomes: Students gain deeper understanding regarding some contemporary topics in Industrial Management. The topics may be chosen by the students. Course develops written skills (English).

Content: Depends on the choice of the student, please see the list below.

Study Materials:

- 1) Holweg, M. & N. Oliver (2015) *Crisis, Resilience and Survival: Lessons from the Global Auto Industry*, Cambridge University Press
- 2) Simchi-Levi, D. (2010 or newer) *Operations Rules: Delivering Customer Value through Flexible Operations*, The MIT Press
- 3) Bicheno, J. & Holweg, M. (2009 or newer) *The Lean Toolbox: The Essential Guide to Lean Transformation*, PICSIE Books
- 4) White, M.A. & G.D. Bruton, (2006 or newer), *The Management of Technology and Innovation – A Strategic Approach*, Thomson South-Western. (Parts 1-3)
2. Garnsey, E. & J. McGlade, (2006) *Complexity and Coo-Evolution: Continuity and Change in Socio-Economic Systems, Business & Economy*, Edward Elgar Publishing Limited
- 5) Kawasaki G. (2015) *Portfolio Hardcover The Art of the Start 2.0: The Time-Tested, Battle-Hardened Guide for Anyone Starting Anything*, Penguin Group
- 6) McKinsey & Company Inc, T. Koller, M. Koedhard & D. Wessels, (2010) *Valuation: Measuring and Managing the Value of Companies*, 5th Edition, Wiley
- 7) Bartneck, N., V. Klaas & H.Schönherr (2009) *Optimizing Processes with RFID and Auto ID: Fundamentals, Problems and Solutions, Example Applications*, Publicis Publishing
- 8) Oshri Ilan (2011) *Offshoring Strategies: Evolving Captive Center Models*, the MIT Press
- 9) Hislop, D. (2005 or newer) *Knowledge Management in Organizations: A Critical Introduction*, Oxford, UK, Oxford University Press

Teaching Methods: self-study 54-135 h

Modes of Study: written summary from one book (=2,5 ECTS) or two books (=5 ECTS) (20 pages/book)

Languages: English

Grading: pass / fail

Responsible Person: Dr. Rayko Toshev

Teacher(s): Dr. Rayko Toshev, Dr. Ville Tuomi

Responsible Unit: School of Technology and Innovations

Additional Information: -

■ Enterprise Resource Planning

Yrityksen toiminnanohjaus

Code: TUTA3200

Credits: 3 ECTS

Prerequisites: Introduction to Production Management or previous studies with similar content

Learning Outcomes: The learning outcome of this course is that the student will understand how ERP (Enterprise Resource Planning) systems are used in daily business, the student is able to analyze how ERP systems support business processes, will also learn to complete simple tasks with SAP system related to sales, manufacturing and purchasing. Course develops IT skills (SAP) and written skills (report submission).

By the end of this course students should be able to: (1) Understand the key elements of an ERP system used in an organization, (2) Complete basic transactions related to sales and distribution (SD), (3) Complete purchasing related transactions, (4) Understand how production planning related transactions are conducted, (5) Document SAP processes for work instruction purposes.

Content: This course will give an introduction to ERP as part of production organization, the lectures will cover, transaction system principles, generic structure of ERP system, ERP implementation project and IT investments, IT part of Business Strategy, the exercises are related to ERP functionality and transactions (1) Sales and distribution, (2) Materials management, (3) Inventory Management, (4) Production Planning and Control, (5) Logistics execution, (6) Finance and control, Enterprise Resource Planning will be discussed as part of global IT environment of a company. A guest lecturer from industry will be giving a talk on applications.



Study Materials:

1. Magal, S. R., & Word, J. (2011). Integrated business processes with ERP systems. Wiley Publishing. Chicago
2. Daniel E. O'Leary (2000), Enterprise Resource Planning Systems: Systems, Life Cycle, Electronic Commerce and Risk
3. Articles provided in Moodle

Teaching Methods: lectures and labs 30 h, independent work 51 h

Modes of Study: submitted assignment

Languages: English

Grading: scale 1-5 or fail

Responsible Person: Petri Helo

Teacher(s): Petri Helo, Rayko Toshev

Responsible Unit: School of Technology and Innovations

Additional Information: this course is only for master students in Industrial Management replaces Enterprise Resource Planning – SAP

■ Master's Thesis

Pro Gradu -tutkielma

Code: TUTA3980

Credits: 30 ECTS

Prerequisites: Master's level studies of industrial management

Learning Outcomes: Student will be able to conduct independent research work and practically apply the skills attained in the diverse fields of Industrial Management and to use the relevant literature to support the student's own research work and written report. Course develops critical and analytical thinking, interpersonal skills and organisational operation skills (Generic skills).

Content: The thesis consists of the following parts:

TUTA3985 Research Plan and Presentation 10 ECTS

TUTA3986 Master's Thesis 20 ECTS

TUTA3987 Master's Thesis Presentation 0 ECTS

The topic can be specified from a project in a company or organization, a research in the School of Technology and Innovations (Industrial Management), or a subject of the student's own choosing. The topic must always be agreed upon with the thesis supervisor. After the topic is chosen a research plan video has to be made (TUTA3985). The research plan contains at least an overview of the topic area, preliminary research questions, constraints, required theories, description of data collection and analyses methods, time table and a preliminary table of contents. Research plan presentation in the seminar is recommended. The research plan is presented in the beginning of the thesis work. The results are saved as a video presentation close to the end of the thesis work (TUTA3987). It is recommended to present the results also in the seminar. Thesis seminars are good occasions to find a topic or discuss the challenges in the thesis process. **The final version of the thesis (PDF) is submitted digitally to the Osuva publications archive. The student will also e-mail the thesis to the supervisor and to Education Services.** The thesis is graded by the Dean on the basis of the thesis evaluators' recommendations. **After submitting the thesis for review and before graduation, the student needs to pass an examination based on the topic of the thesis, i.e. a maturity exam. The thesis supervisor will prepare the question(s) for this examination and it will take place in EXAM electronic exam service.**

Study Materials: Video presentations

Teaching Methods: Personal supervision, thesis seminars, independent work 810 h

Modes of Study: Independent research and writing work, TUTA3985 research plan including a mandatory video presentation and optional personal presentation, TUTA3986 thesis work, TUTA3987 research results including a video presentation and optional personal presentation

Languages: English or Finnish

Grading: Assessment scale for thesis: sufficient (1), satisfactory (2), good (3), very good (4), excellent (5)

Responsible Person: Jussi Kantola, Emmanuel Ndzibah

Teacher(s): professors of Industrial Management

Responsible Unit: School of Technology and Innovations

Additional Information: all Master's Theses and presentations will be checked with the Turnitin plagiarism detection software



■ New Knowledge Creation and Organizational Learning in Product Development *Uuden tiedon luominen ja organisaation oppiminen tuotekehityksessä*

Code: TUTA3210

Credits: 5 ECTS

Prerequisites: -

Learning Outcomes: This course focuses on the central role of humans in product development. The students will understand theories of organizational learning and knowledge creation in product development context, and know how to apply different methods to support new knowledge creation and organizational learning in the context of product and service development in organizations. This course develops organizational operation, problem-solving and decision-making skills and interpersonal skills (Generic skills).

Content: Individual learning at work, competence, motivation, learning organization and organizational learning, knowledge creation theories, responsive environment, systems thinking - putting pieces together for new product and service development / innovation.

Study Materials:

1. lecture materials in Moodle
2. Kantola, J. "Organizational Resource Management" book
3. Senge P. "Fifth Discipline" book
4. online tools and web resources
5. scientific articles supplied by the teacher

Teaching Methods: lectures 14 h, workshop 14 h, work on assignments 90 h, exam and preparation for it 17 h = 135 h

Modes of Study: lectures, workshops and student assignments in teams

Languages: English

Grading: scale 1-5 or fail, exam (50%), course assignments (50%), activity (+)

Responsible Person: Jussi Kantola

Teacher(s): Jussi Kantola; teaching assistants Ebo Kwegyir-Afful and Faisal Imran

Responsible Unit: School of Technology and Innovations

Additional Information: Individual modes of study are possible.

■ Operations Strategy

Tuotantostrategia

Code: TUTA3080

Credits: 5 ECTS

Prerequisites: -

Learning Outcomes: After completing this course the student will be able to list major forces that drive corporate competition and name proven strategic management models, during the course student assess various types of industries and determine the position of a company within its business area, customized data collection methods are utilized with the help of the virtual learning environment (Moodle), working in groups, students apply strategy evaluation tools and build hierarchical model for multi criteria decision making, they put into practice in a real case study analytical evaluation tools to classify major business factors, categorize company strategic goals and prepare tailored plan how to reach aspired strategic type. Course develops oral, written and interpersonal skills (group work and seminar in English), critical and analytical thinking, problem-solving and decision-making skills, organisational operation and IT-skills (especially Excel and AHP application).

Content: introduction, basic theories of strategy, lean strategies, technology management, research methods, e.g. analytical hierarchy process AHP and strategic networking strategic corporate planning as a scientific problem

Study Materials:

1. Braun, Ernest, 1998, Technology in Context, Technology Assessment for Managers, The Management of Technology & Innovation, Routledge, London and New York
2. Markides, Constantinos C.: All the right moves; a Guide to Crafting Breakthrough Strategy, Harvard Business School Press., Boston 2000
3. Cantwell, John, (Editor) 2004, Globalization and the Location of Firms, Edward Elgar Publishing Limited UK4. Doz Yves, Kosonen Mikko 2008, Fast Strategy: How strategic agility will help you stay ahead of the game
5. International Journals, e.g. Harvard Business Review, Research Technology Management, Product Innovation Management, Technology Management etc., A selection of approx. 20 scientific articles within the area

Teaching Methods: lectures and tutoring 15 hours and seminars 20 hours, independent work 100 h. Seminars will be prepared during the course on the basis of real industrial cases and research within the area

Modes of Study: according to RBL-process, students have to participate at least in presenting the literature



reference at the beginning and the final case study report, course is based on the lectures, seminars, literature references and written assignments, no examination

Languages: language(s) of instruction: teaching and seminars in English; completion language(s): English

Grading: scale 1-5 or fail

Responsible Person: Josu Takala

Teacher(s): Yang Liu, Josu Takala

Responsible Unit: School of Technology and Innovations

Additional Information: -

■ Product and Service Design in Practice

Tuote- ja palvelusuunnittelu käytännössä

Code: TUTA3230

Credits: 5 ECTS

Prerequisites: TUTA2230 Innovative Product Development and Product Lifecycle Management or similar course is recommended

Learning Outcomes: This course teaches conceptual design work in teams. The students will learn axiomatic design theory, and to do design work in teams in real customer setting. Course develops product development and marketing, critical and analytical thinking, interpersonal skills (Generic skills).

Content: product and service development contexts, principles of design, axiomatic design theory, product and service design methods and tools

Study Materials:

1. Suh, N.P., 2001, Axiomatic Design: Advances and Applications, Oxford University Press, New York, NY
2. lecture materials in Moodle
3. online tools and web resources
4. scientific articles provided by the teacher

Teaching Methods: lectures 14 h, customer visits and audits 24 h, design work in teams 87 h, quizzes and preparation 10 h

Modes of Study: lectures, design work in teams, customer visits, customer audits

Languages: English

Grading: scale 1-5 / fail, 2 quiz 20 % (10 % each), design project 80%, activity (+)

Responsible Person: Jussi Kantola

Teacher(s): Jussi Kantola; teaching assistant Beatrice Obule-Abila

Responsible Unit: School of Technology and Innovations

■ Production Operations Management Methods

Tuotannonohjauksen menetelmät

Code: TUTA3240

Credits: 5 ECTS

Prerequisites: Operations Research

Learning Outcomes: The learning outcome of this course is that the student is able to understand a set of advanced methods and models in productions / operations management to apply production planning and control tools and techniques for decision-making. Course develops problem-solving and decision-making skills (labs) and IT skills (scheduling software).

By the end of this course students should be able to: (1) Understand current trends in P/OM area, (2) Understand and apply production scheduling, (3) Analyse lead-time, work-in progress, process variability, (4) Understand push/pull boundary and related material control methods.

Content: This course will cover the following topics: integration of productions / operations management; capacity planning; production performance and assessment; production dynamics and constraints and theory of constraints; impact of variability and managing in production systems; push vs pull production system; manufacturing execution systems and production scheduling; production planning and control; and production platforms and concept of flexibility.

Study Materials:

1. Wallace Hopp (2007) Supply Chain Science, Mcgraw-Hill/Irwin



2. Wallace Hopp and Mark L. Spearman (2008) Factory Physics 3rd edition, Mcgraw-Hill / Irwin
3. articles

Teaching Methods: lectures and labs 23 hours, independent assignment work, group work 112 h

Modes of Study: four submitted assignments

Languages: language(s) of instruction: English; completion language(s): English

Grading: scale 1-5 or fail

Responsible Person: Petri Helo

Teacher(s): Petri Helo, Pornthep Anussornnitisarn

Responsible Unit: School of Technology and Innovations

Additional Information: this course is available only for the master students in Industrial Management, replaces advanced course in production operations management

■ Project Management

Projektinjohtaminen

Code: JOHT3019

Credits: 5 ECTS

Ks. Kurssikuvaus Weboodista

■ Project Work in Industrial Management

Tuotantotalouden työkurssi

Code: TUTA3070

TUTA3071 Quality

TUTA3072 Times

TUTA3073 Production Management

TUTA3074 Logistics

TUTA3075 agreed separately

Credits: 2-5 ECTS for the course, 2-3 ECTS per part

Prerequisites: bachelor level studies in industrial management

Learning Outcomes: the student can solve practical problems by the application of relevant theory and report the results according to the standards of the School of Technology and Innovations (Industrial Management). Course develops problem-solving skills, critical and analytical thinking and written skills (English).

Content: the course can be compiled from a number of elements 1) The Project Work course can be completed by carrying out project based development work in companies and other organizations, the amount of credits granted for each project varies with the difficulty of the task, the content of each project is to be agreed upon with the relevant teacher. It may be possible to carry out project work as a part of ongoing, wider research project of the department of production 2) a second option is to take part in the TIMES consulting competition (Tournament in Management and Engineering Skills) jointly arranged together with the TUTTI Student Society. The winning team of the local elimination rounds will be able to participate in the international ESTIEM semifinals. Participating in a business game will give a maximum of 3 ECTS. We recommend that the course is completed by participation in several different events and projects, combining the different options available to the student

Study Materials: depend on the topic

Teaching Methods: self-study 54 - 135 h

Modes of Study: self-study (projects) or participating in TIMES

Languages: English

Grading: pass or fail

Responsible Person: Dr. Rayko Toshev

Teacher(s): Dr. Rayko Toshev, Dr. Ville Tuomi

Responsible Unit: School of Technology and Innovations

Additional Information: the industrial management project work course can be completed around the year, and is not tied a specific course schedule (except the TIMES), the course should consist of at least two different part performances, the part performances are added to the student's credit registry upon completion.

■ Research Methods

Code: TECH3010



Credits: 5 ECTS

ks. Kurssikuvaus WebOodista

■ Simulation of Production Systems

Tuotantojärjestelmien simulointi

Code: TUTA3250

Credits: 3 ECTS

Prerequisites: Introduction to Production Management TUTA2170, Basic Course in Statistics STAT1020 or previous studies with similar content.

Learning Outcomes: As an outcome of this course, participants learn how to develop computer simulation models of real or conceptual systems, and how to correctly design, analyze and interpret the results of computer simulation experiments. The course develops problem-solving and decision-making skills (Excel labs) and IT skills (simulation software).

By the end of this course students should be able to: (1) Understand the possible applications of production simulation systems, (2) To apply basic tools of simulation in context of operations management and management science, (3) Use MS Excel based simulation for simple stochastic problems, (4) Use 3D simulation software by using built-in-machinery models catalog, (5) To evaluate simulation model results. The course will also support the development of students' skills in the areas of IT skills and written skills.

Content: This course will give an introduction simulation of production systems. The lectures will cover the concepts of continuous and discrete event simulation, stochastic process, statistical ranking and selection procedures, verification and validation of simulation models, functionality related to use MS Excel based simulation tools, production simulation by using Visual Components 3D Automate software, creating own 3D simulation model based on tutorial.

Study Materials: Manuel, L., Laguna, M. & Marklund, J. (2005) Business Process Modeling, Simulation and Design, Pearson Education India

Teaching Methods: lectures and labs 20 hours, independent work 60 h

Modes of Study: Written report on the work tasks and participation in exercises, submitted assignments

Languages: language(s) of instruction: English completion language(s): English

Grading: scale 1-5 or fail,

1: The student is able, with guidance, to utilise the methods learnt during the study unit.

3: The student is able to utilise the methods learnt during the study unit independently.

5: The student is able to utilise the methods learnt during the study unit independently and is able apply the learnt knowledge in new contexts.

Responsible Person: Petri Helo

Teacher(s): Rayko Toshev, Petri Helo

Responsible Unit: School of Technology and Innovations

Additional Information: this course is available only for the master students in Industrial Management

■ Supply Chain Design and Management

Toimitusketjujen suunnittelu ja johtaminen

Code: TUTA3120

Credits: 5 ECTS

Prerequisites: Introduction to Production Management, Global Sourcing and Procurement, Basic course in Logistics or previous studies with similar content.

Learning Outcomes: student will gain a deeper understanding and knowledge in Global Logistics and Supply Chain Management, introduce Models and Tools in Designing, Managing and Optimizing the Supply Chain Network. Course develops oral, written and interpersonal skills (Group Work, English), critical and analytical thinking, problem-solving and decision-making skills, organisational operation and IT-skills (Excel, portal application).

Content: Supply Chain Performance, Drivers and Metrics, Designing Global Supply Chain and Distribution Networks, Demand Forecasting, Aggregate and Sales and Operations Planning, Cycle and Safety Inventories, Product Availability Optimization, Transportation, Sourcing and Pricing Decisions, Information Technology and Sustainability in Supply Chain

Study Materials:

1. Supply Chain Management, 5/E. Sunil Chopra, Northwestern University, Peter Meindl, ISBN-10: 0132743957. Prentice Hall, 2013. Cloth, 528 pp. Published 01/26/2012.



2. Supply Chain Network Design: Applying Optimization and Analytics to the Global Supply Chain. Michael Watson, Sara Lewis, Peter Cacioppi, Jay Jayaraman, ISBN-10: 0-13-301737-0, Pearson Education Inc., 2013
3. other course material provided by the lecturer

Teaching Methods: lectures and exercises 30 h, independent work 105 h

Modes of Study: written exam, written group work and participation in possible visitor lectures

Languages: English

Grading: scale 1-5 or fail, 65% written exam and 35% group work

Responsible Person: Katariina Pukkila-Palmunen

Teacher(s): Katariina Pukkila-Palmunen

Responsible Unit: School of Technology and Innovations

Additional Information: this course is available only for the master students in Industrial Management and Industrial Systems Analytics

■ Sustainable Supply Chain Management and Circular Economy

Kestävä toimitusketjun johtaminen ja kiertotalous

Code: TUTA3290

Credits: 5 ECTS

Prerequisites: A student should have basic knowledge concerning SCM as well as sustainability.

Learning Outcomes: to understand the concept of sustainable supply chain management, to understand the concept of circular economy, to understand different frameworks for circular economy, to be able to analyze sustainability of supply chains from the perspective of circular economy as well as to be able to analyze circular economy in supply chains in three levels: micro level (product planning) meso level (companies) as well as macro level (regions) as well as to understand how to develop sustainable supply chains in all the different levels. The course will also support the development of students' working skills in groups as well as individually in a virtual working environment. It will also support the development of lifelong learning, analytical and critical thinking as well as problem-solving skills.

Content: the course contains two parts: 1) the concept of sustainable supply chain management (SSCM), 2) the concept and frameworks of circular economy (CE), 3) sustainable supply chain management from the perspective of circular economy, 4) circular economy in supply chains in micro level (product planning), meso level (companies) as well as macro level (regions), 5) development of sustainable supply chains in all the different levels.

Study Materials:

1. Kirchherr, J., Reike, D. & Hekkert, M. (2017). Conceptualizing the circular economy: An analysis of 114 definitions. *Resources, Conservation & Recycling*, Vol. 127, pp. 221-232
2. Touboulic, Anne and Walker, Helen Lisbeth 2015. Theories in sustainable supply chain management: a structured literature review. *International Journal of Physical Distribution & Logistics Management* 45 (1/2), pp. 16-42.
3. Joyce, Alexandre & Paquin, Raymond L. (2016). The triple layered business model canvas: A tool to design more sustainable business models. *Journal of Cleaner Production*, Vol. 135, pp. 1474-1486.
4. Other material offered in the Moodle.

Teaching Methods: classroom teaching 6 h AND self-study 119 h (PBL)

Modes of Study: active participation and assignments

Languages: language(s) of instruction: English; completion language(s): English

Grading: scale 1-5 or fail

Responsible Person: Dr. Ville Tuomi

Teacher(s): Dr. Ville Tuomi, Dr. Ari Sivula

Responsible Unit: School of Technology and Innovations

Additional Information: this course is available for the master's students in Industrial Management, but participation of a student from other programmes is also possible.

■ Technology Management

Teknologijahtaminen

Code: TUTA3030

Credits: 5 ECTS

Prerequisites: Innovative Product Development and Product Lifecycle Management TUTA2230, Introduction to Production Management TUTA2170 or previous studies with similar content.



Learning Outcomes: By the end of the course the students will understand the concept of technology evolution, technology life cycle, technology portfolios, technology readiness level and technology roadmaps. Participants will get complete view of the processes from inventions and innovation to state of the art, maturity and obsolescence. Practical skills how to select between different technological opportunities and understand challenges that accompany technological changes. Participants will work in a group to develop managing technology skills - to select proper technologies for the project work and plan possible implementation in an existing company, startup or consulting firm.

In the course, students will learn to:

1. Develop an awareness of the range, scope, and complexity of technological innovation, and the issues related to managing technological change.
2. Understand different approaches to managing innovation.
3. Clearly identify drivers and barriers to technological innovation within an organization.

Content: The aim of this course is to teach students Technology management in theory and in practice. The course combines technology driven strategies and operations management, strategic networking and dynamic decision making, all from the application point of view. The course approach is pragmatic enabling students to start from the business strategy of the enterprise by utilizing technology and knowledge transfer mechanisms to be implemented in the core business processes. Course provides possibility to use advanced technologies (Technobothnia Labs - 3D printing and 3D Scanning, Digital Manufacturing, Virtual and Augmented Reality). The tools applied in the course include, but are not limited to the following:

- Brainstorming and Mapping Innovation
- Technology life cycle and technology roadmaps
- Technology readiness level
- Technology project portfolio matrix
- Scenario planning
- SWOT, PESTEL, NPV, Break-even

Study Materials:

Fifty selected articles are available from the course Moodle platform in file repository. The textbooks are available at Tritonia library.

1. Tidd, J., & Bessant, J. (2013). *Managing innovation: Integrating technological, market and organizational change* (5th ed.). Chichester: Wiley.
2. Trott, P. (2017). *Innovation management and new product development* (Sixth edition). New York: Pearson.
3. Garton, C. & Mc Culloch, E.: *Fundamentals of Technology Project Management*, McPress, 2005
4. Burgelman, R.; Christensen, C.; Wheelwright, S. & Maidique, M.: *Strategic Management of Technology and Innovation*, 4th ed. McGraw-Hill, 2003
5. Follett, J. (2014). *Designing for emerging technologies: UX for genomics, robotics, and the Internet of things*. Sebastopol, CA: O'Reilly.

Teaching Methods: 30 hours combining theory and seminars, exercises and Laboratory workshop

Modes of Study: Individual article presentation, groups final case presentation and case study report, 50% attendance required

Languages: English

Grading: scale 1-5 or fail,

1: The student is able, with guidance, to utilise the methods learnt during the study unit.

3: The student is able to utilise the methods learnt during the study unit independently.

5: The student is able to utilise the methods learnt during the study unit independently and is able apply the learnt knowledge in new contexts.

Responsible Person: Josu Takala

Teacher(s): Rayko Toshev, Josu Takala

Responsible Unit: School of Technology and Innovations

Additional Information:

Industrial Internship

■ Industrial Internship

Työharjoittelu

Code: TUTA2950/TUTA3950

Credits: 1-5 ECTS

Prerequisites:



Learning Outcomes: the student learns to apply studied theory in to a practical situation. Course develops critical and analytical thinking.

Content: internship in a company or public organization, the aim is to gather practical work experience

Study Materials: -

Teaching Methods: internship in a company or public organization

Modes of Study: internship and written report

Languages: Finnish, English

Grading: pass/fail

Responsible Person: N.N.

Teacher(s): N.N.

Responsible Unit: School of Technology and Innovations

Additional Information: Participation: industrial internship, 2 weeks of full-time work gives one credit unit, the Industrial Management unit's assistant approves the course credit on the basis of the student's internship report and the attached work certificate. Can be done as a part of either the bachelor's degree or the master's degree, for more detailed instructions on internships and the internship report, see University of Vaasa website.