



COMPETENCE MATRIX INTERNATIONAL SERVICE TECHNICIANS



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Disclaimer

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Introduction to learning materials Borgund

This material is aimed at bridging the description of the content of the IST training course to the actual learning/teaching environment. It gives a practical focus to the work and offers an opportunity for all stakeholders (students, teachers and companies) to set out a training course programme. It contains training tasks that can be put into practice and can also be models for the development of new training tasks.

This bank of resources gives schools and companies a dynamic instrument to develop their own IST course and provides a good starting point for continuing the development as working practices change and demands of students change.

Most of the material is in English as it often will be the working language of the training course. However, which language to use when carrying out the course is a decision that must be made locally.

The learning tasks cover the areas of the competence matrix. In the folders can be found complete lessons plans registered according to the common template below. Feel free to use these adapted to your purposes. The tasks can be delivered in any format, on paper or through your own learning platform.

Task title:

(Descriptive task title.)

Competence matrix:

(References to areas and steps of competence matrix.)

National curriculum:

(References to national curriculum.)

Task:

(Description of learning task.)

I/O- list

Inputs

0.00	S0:4	Emergency stop switch
0.01	S1:4	Start switch

Outputs

10.00	Q1:A1	M1, transport of sand into mixer
10.01	H1:1	indicator lamp «In operation»
10.02	Q2:A1	Valve V1, water in
10.03	Q3:A1	mixing motor M2, right motion
10.04	Q4:A1	mixing motor M2, left motion
10.05	Q5:A1	M3, transport os cement into mixer
10.06	Q6:A1	valve V2, emptying mixer

Programming of PLC

Competence Matrix:

area 7, steps 1 to 4

National curriculum:

Plan, fit, start up and document programmable logic control systems for analog and digital applications for electric, hydraulic and pneumatic systems. In addition to use of digital tools for programming, configuring and fault finding.

Task description:

Development and testing of PLC-program for control system in concrete mixing plant.

Use the attached I/O-list as a starting point for a step by step development, visualisation and testing by simulation, of a PLC-program to give the mixing plant the following functions:

Step 1:

When the start switch is operated, motor M1 starts and runs for two minutes, to transport sand into the mixing plant. Lamp indicating plant in operation must also be turned on.

Step 2:

When M1 has been running for 30s, water is let into the mixing plant for 20s by valve V1.

Step 3:

The mixing motor M2 should start at the same time as V1 is opened. This motor must alternate between rotating for 30s to the left and 30s to the right. This cycle is to be repeated 8 times.

Step 4:

When M2 starts its third leftwards rotation, motor M3 must start and run for 25s, to transport cement into the mixing plant.

Step 5:

When M2 starts its final cycle, valve V2 must open, to empty the finished concrete from the mixer.

Calibration of signal interface

Competence matrix:

area 3, steps 1 to 3

National curriculum:

Plan and document control loops for temperature, pressure, speed, level and volume. Fit and start up of at least two of those quantities.

Task description:

You are at an industrial plant to install various equipment. Amongst other equipment, the foreman wants you to help him install a temperature sensor, in order for him to monitor the temperature in his own office.

The foreman brings you a PT-100 sensor and an interface for you to fit. The interface is to be calibrated to deliver 4 mA at 10 celsius and 20 mA at 42 celsius.

When you have finished fitting and connecting the sensor and interface, the foreman brings a multimeter and a 24Vdc power supply. He wishes you to check if the calibration is correct. Use the multimeter and power supply to find the amount of current delivered by the interface, and calculate the temperature this current corresponds to. Is this correct for the actual temperature in the room?

Equipment required for task:

PT-100 temperature sensor

Interface (puck)

24Vdc power supply

Multimeter

Resistors for calibration of interface

Possibly a 250 ohm resistor to connect in series with the multimeter.

Task title: Communicating Across Cultures

(Descriptive task title.)

Competence matrix:

(References to areas and steps of competence matrix.)

14.2

National curriculum:

(References to national curriculum.)

References to the course International English can be found at the links below.

Task:

(Description of learning task.)

Communicating Across Cultures - Part 1

<http://ndla.no/en/node/7934?fag=56850&meny=1379&tema=93662>

Communicating Across Cultures - Part 2

<http://ndla.no/en/node/78489?fag=56850&meny=1379&tema=93662>

Learning content related to intercultural situations, complete with exercises.

Task title: Greeting Etiquette

(Descriptive task title.)

Competence matrix:

(References to areas and steps of competence matrix.)

14.2

National curriculum:

(References to national curriculum.)

References to the course International English can be found at the links below.

Task:

(Description of learning task.)

Greeting Etiquette

<http://ndla.no/en/node/77922?fag=56850&meny=1379&tema=93662>

Learning content related to one specific aspect of intercultural communication, complete with exercises.

Task title: Trade and Intercultural Communication

(Descriptive task title.)

Competence matrix:

(References to areas and steps of competence matrix.)

14.2

National curriculum:

(References to national curriculum.)

References to the course International English can be found at the links below.

Task:

(Description of learning task.)

Trade and Intercultural Communication

<http://ndla.no/en/node/71097?fag=56850&meny=1379&tema=93662>

Learning content related to intercultural communication, complete with exercises.

Task title: Role play about technical problem

(Descriptive task title.)

Competence matrix:

(References to areas and steps of competence matrix.)

13.3, 1-9 (according to problem selected), 14.1

National curriculum:

(References to national curriculum.)

English:

- ▲ understand and use a wide general vocabulary and an academic vocabulary related to his/her own education programme
- ▲ express him/herself in writing and orally in a varied, differentiated and precise manner, with good progression and coherence
- ▲ use technical and mathematical information in communication

Task:

(Description of learning task.)

Role play performed in pairs, one student is the hosting worker, and the other one is a new employee.

Preparation: Contact an experienced worker at the workplace, and obtain information about a relevant operation for a service technician to perform.

Hosting worker: Introduce the new employee to the work operation to be performed. Use language to explain, and physical objects, models or pictures to show. You should also ask questions to make sure the new employee understands what to do.

New employee: Ask relevant questions to make sure you have fully understood.

Company practice and service trip abroad

Competence Matrix:

area: any of the technical areas plus area 12, 13 and 14, steps 1 to 4

National curriculum:

Any part of the technical part of the curriculum plus language, travel and intercultural skills.

Task description:

After your company practice period and service trip abroad, do the following:

- 1) Make a presentation (PPT) in English to describe the company, its main area of business and your personal experiences and learning outcomes (referring to the competence matrix) from the practice and service trip.
- 2) Use the presentation from 1) to inform your fellow students and to document your learning outcomes.