MATERIALS IN ENGINEERING DESIGN, IMPORTANT TRENDS AND INNOVATIONS

3 CPD POINTS

SAIChE 438



Presented By: John Broli of Engineers for Africa (E4A)

Course Outline

The main objective is to develop skills of attendees to assess materials design as a total systems approach, and to evaluate a number of economically viable materials for each application considered.
Economic benefits are firstly achieved through the evaluation of different materials and assessing the most suitable and thus effective materials given the critical variables such as pressure, temperature, corrosion, load bearing and other important parameters. Benefits are also achieved through optimisation of the design and a deeper understanding of how design approaches and parameters can be leveraged to savings and profits.

This extensive Course covers an in-depth review of important materials in engineering design.
Materials are central to virtually every engineering design and most engineering problems. This course is thus of interest to all engineers and covers a wide range of material types and applications in engineering. Every year we update with new trends and improvements with materials.
We cover various high-performance grades of metals, non-metals such as plastics, concrete and glass.
All courses of E4A are directed at practical application of the theories of each of the course main topics and thus the courses are introduced with a series of articles for pre-course reading/study, to provide an overview to the course and to broadly introduce the attendees to the subject matter.

This Course focusses firstly on the fundamentals of materials with important coverage of materials used in engineering design as well as many important material grades, special terminologies and understanding key topics such as extruded versus welded pipe materials. The need to understand the rating of metals and non-metals for pressure and temperature variables is dealt with in detail to ensure a wide understanding of materials.

The Course then addresses design requirements for equipment designs and engineering parts. The course covers selected applications in various processes, important materials properties and key details of manufacturing and assembly that should be carefully considered for successful long-term performance life in service. Much attention is paid to design lifetimes with alternate materials.

E4A also focuses on key approaches to the designs, points of critical importance and prior recorded failures, and thus serves to make attendees aware of the wider but important design considerations. The use of industry standards and ratings of institutes (such as ASME for pipes) - both metal and plastic and the service conditions to which the nominal coding applies - are addressed.
This course is thus to be considered as a broad-based and thorough overview of selection and design of materials for practical and reliable in-plant services.

The third main section of the Course addresses special materials applications including composites (fibre-glass), material combinations such as barriers and structural elements, modifications of polymers including additives, modifications of metals including Duplex SS, sandwiches and foams, and a range of other amazing materials. There is also a short course on solar panel materials and 3D printing of a range of engineering materials.
The final summary of the Course that we present at the end of DAY 2 is prepared as a series of DESIGN STAGES OR STEPS in a master chart with control checklists, and the appropriate design standards and design limitations are discussed and finalized. Interesting and unusual case studies are also presented.

Who should attend?

All qualified engineers, technologist and technicians who want to fully understand the modern need to deal with multi-variable problems and improve their design skills across many areas of current engineering work. We also address the economic impacts of multi-variable problems.

Requirements?

All E4A courses are live, on-line (webinar based) and extend over two days.

Quantity discounts are available for group attendances or multiple bookings paid in advance.

All courses include:
a. Interesting pre-reading material is sent to attendees normally two days prior to the start.
b. Course materials are emailed ahead to you for the course, and your personal library.
c. ZOOM links are sent to you 2 days prior to the course start date.
d. The Course framework and time-plan is sent ahead to attendees as an Excel Document enabling easy tracking.
e. Workshops, which include case studies and worked examples, are interspersed with tea and lunch breaks and all materials are sent ahead to attendees for these exercises.
f. A Certificate of Attendance, with CPD points reflected, is provided at the end of the event.

There is a full scope of reading material that extends the Course to enable the award of 3 CPD points and we will provide those details and discuss with attendees how these details can be addressed, at the time of your registration for the Course. The full live on-line attendance remains at 2 days.

Register?

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