MINISTÉRIO DA EDUCAÇÃO
UNIVERSIDADE FEDERAL DO PIAUÍ – EDITAL 16/2012

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COPESE
COORDENADORIA PERMANENTE DE SELEÇÃO
UNIVERSIDADE FEDERAL DO PIAUÍ

# EXAME DE PROFICIÊNCIA DE LEITURA EM LÍNGUA ESTRANGEIRA

DATA: 27/01/2013 HORÁRIO: das 8 às 11horas

# CADERNO DE PROVA

**Idioma:**
**INGLÊS**

**Área de Pesquisa:**
**(2) CIÊNCIAS EXATAS E DA TERRA, ENGENHARIAS**

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- ☑ Esta prova é constituída de um texto técnico-científico em língua estrangeira, seguido de 5 (cinco) questões abertas relativas ao texto apresentado.
- ☑ É permitido o uso de dicionário impresso, sendo vedados troca ou empréstimo durante a realização do Exame.
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# Using Algorithms to Fine-Tune Skis


Pete Wagner is 37 years old and living a life that many outdoor recreation enthusiasts envy. From tiny Placerville, CO, next to its more famous neighbor, Telluride, Wagner is carving out a niche to manufacture high-performance custom skis using a set of algorithms borrowed from his previous job designing golf clubs. A mechanical engineer by education and training, Wagner built a business plan that attracted enough investors from ski-mad Colorado to back his venture, which now is gaining recognition within the industry.

"It was a question of how to apply the skills I've got, and what I'm really good at, for a business that would work well culturally with Telluride," says Wagner, who left his job in the golf industry for skiing in Colorado. But first, he garnered an MBA from the University of Colorado, Boulder, where he developed the entrepreneurial chops to fund Wagner Skis.

The business is founded on Wagner's ability to write design algorithms that combine a customer's physical measurements such as height and weight with their skiing abilities and the type of conditions and terrain they normally ski. Drawing from a selection of high-end materials, he and his crew load the results into computer-controlled manufacturing equipment that precisely cuts the layers that are pressed together to form the ski. The result is a pair of skis or snowboard with the proper amount of flex and torsion optimized for weight, strength and quality of snow a customer expects to encounter.

"This is basically the way they build World Cup skis," says Wagner. "There's five types of wood cores, with different densities or thickness, depending on how and where you ski." Structural layers include fiberglass, carbon fiber, or an aluminum alloy. For example, Wagner builds skis for those skiing the hard snow and ice conditions typical of Eastern mountains with an aluminum alloy that provides high torsional rigidity needed for hard terrain. Powder hounds need a softer ski.

**Swing to Snow**

Wagner has honed his engineering skills developed at the University of California, San Diego, where he majored in mechanical engineering "because it provided a lot of flexibility in terms of what I could do with my education," he says. He focused on material studies and computer-aided design, and landed a job in the golf industry while at school.

There, he started writing design code for the manufacture of composite material golf equipment. "It was the perfect application of my mechanical engineering studies," he says. Using finite element analysis to break down a golfer's swing and incorporate such things as the spin rate of the ball and the head speed, he was able to custom design club shafts and grips. "It was a pretty sophisticated use of my mechanical engineering skills," he says. His transformation to snow sports started when he purchased a pricy set of skis, used them, and then tried a different set that performed

at a different level. "I realized I'd been crippling myself. Why wasn't there a better process for developing skis?"

So Wagner adapted his code used for designing golf clubs to skis, but could not find a buyer for his software. But he discovered the ski business is dominated by large firms that do most manufacturing in Eastern Europe. At business school, he put together a business plan as well as an advisory board for his new business. "It started out as an academic exercise," he says. "Is there a market, and can you make money doing this?"

Apparently so. Aided by investors he calls "ski angels," Wagner set up shop in 2006. He employs 11 workers from the small shop in Placerville, servicing customers who come mostly from his website. A five-minute survey collects a customer's "skier DNA" of height, weight, age and location, and a "mission statement" of ability and preferred terrain, such as powder, glades, moguls or off-piste.

Future Goals

"The algorithms come up with an optimal design of length, width, side cut radius, and tip and tail shapes, says Wagner."We calibrate stiffness and flex pattern and output a recipe for skis, with code for computer-controlled milling equipment." Workers assemble and finish the skis by hand.

Most of Wagner's equipment is off the shelf but he built the firm's ski press and edge-bending machine. In 2011, Wagner Skis produced over 1,000 sets of skis and Wagner says the operation is "growing at a nice rate, maybe 30% to 70% per year. But the ski market is not a huge market and we're not a huge business."

Industry officials worry about keeping people on the slopes as Baby Boomers age and conditions as climate change becomes more of a reality. For now, those who monitor the industry are noticing Wagner. Ski Magazine singled out his skis and other industry publications have noticed.

"Our biggest challenge now is marketing," says Wagner. "The competition is mostly multinational corporations. We're trying to create a broad awareness of ourselves. That's the biggest challenge."

*Fonte :Artigo de John Kosowatz, Senior Editor, ASME.org em 14/01/2013*
*Extraído de http://www.asme.org/kb/news---articles/articles/entrepreneurship/using-algorithms-to-fine-tune-skis*

**EM HIPÓTESE ALGUMA, SERÁ CONSIDERADA A RESPOSTA NESTE CADERNO.**

Depois de fazer a leitura do texto, responda as questões a seguir em português.

**QUESTÃO 01** - De que maneira o conhecimento sobre algoritmos mudou a trajetória profissional do engenheiro mecânico Pete Wagner? Qual fato provocou essa mudança para o trabalho direcionado a esportes com neve?

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**QUESTÃO 02** - O que é a “Wagner skis” e quem são os “Ski angels” citados no texto?

**QUESTÃO 03 -** Explique o processo de fabricação de um esqui personalizado.

**QUESTÃO 04 -** Que tipos de materiais podem ser usados nas camadas estruturais de fabricação de esquis?

**QUESTÃO 05 -** Como a empresa se saiu em 2011? Qual o maior desafio de Wagner para o futuro?